SLR-QH-229

Seat No.	

Set P

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Design of Steel Structures (CIVPCC-07)

Day & Date: Saturday, 02-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume additional data if required and mention it clearly.
5) Use IS 800:2007 and Steel table are allowed after first 30 min.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) What is the minimum pitch distance according to IS 800:2007 if d is the bolt diameter?
a) 2d b) d
c) 1.7d d) 2.5d

2) What is the maximum distance between two consecutive bolts (in tension) if the plate thickness is 10 mm?
a) 160 mm b) 200 mm
c) 250 mm d) 180 mm

3) Two plates of 14 mm and 12 mm are joined by fillet weld, the maximum size of fillet weld may be _____.
a) 16.5 b) 15.5
c) 10.5 d) 12.5

4) If the fusion angle between two faces is 110° then the value of constant K is _____.
a) 0.7 b) 0.55
c) 0.65 d) 0.6

5) The maximum effective slenderness ratio for a member if always in tension (other than pretensioned member) is _____.
a) 180 b) 400
c) 250 d) 300

6) The failure mode in which an axially loaded compression member may fail is by _____.
a) local buckling
b) squashing
c) torsional buckling
d) All of these

7) The effective length of a structural steel compression member of length L effectively held in position and restrained against rotation at one end but neither held in position nor restrained against rotation at the other end, is _____.
a) L
b) 1.2 L
c) 0.8 L
d) 2.0 L

8) The yield stress ratio (ε) of Fe 410 grade of steel is _____.
a) 0.25
b) 0.5
c) 0.75
d) 1.0

9) In double lacing system the angle of inclination of lacing bar to the axis of the member should be in the range of _____.
a) 5° to 15°
b) 15° to 40°
c) 40° to 70°
d) 70° to 105°

10) The maximum allowable slenderness ratio of lacing bars in built-up columns is _____.
a) 85
b) 105
c) 145
d) 180

11) What is the effective depth of the web if the top flange restrained against lateral deflection and rotation (depth of web = d)?
a) d/2
b) 2d/3
c) d
d) d/3

12) When electric operated crane carries up to 50t then deflection of the gantry girder should not exceed _____.
a) L/500
b) L/1000
c) L/750
d) L/600

13) The thickness of base plate is determined from the _____.
a) Flexural strength of the plate
b) Shear strength of the plate
c) Bearing strength of the concrete pedestal
d) Punching criteria

14) Which of the following is a flexural member?
a) Stanchion
b) Girt
c) Boom
d) Strut

Seat No.	

Set **P**

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Design of Steel Structures (CIVPCC-07)

Day & Date: Saturday, 02-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. 2 is compulsory; answer any two remaining questions from Section – I.
2) Q. 6 is compulsory; answer any two from remaining questions from Section – II.
3) Figures to the right indicate full marks.
4) Assume additional data if required and mention it clearly.
5) Use IS 800:2007 and Steel table are allowed after first 30 mins.

Section – I

Q.2 Solve Following.

a) Differentiate PEB vs Conventional Buildings. **04**

b) Define Shape Factor and derive Shape factor for circle and Square. **06**

Q.3 **a)** Explain different Failure ways Bolted Connections. **03**

b) Two plates of 8 mm and 12 mm thickness are to be connected by butt weld. Joint is subjected to factored tensile load 330kN. Due to some reason weld length is restriction to 120 mm, check safety of joint if: **06**
i) Single groove is provided
ii) Double groove is provided
If the design is unsafe then calculate required effective weld length.

Q.4 Determine the tensile strength of an ISMC 175 when it is connected to gusset plate through the two flanges by two rows of 16mm bolts with a connection length of 200 mm. **09**

Q.5 Design a double angle tie member in a truss carries working load of 130kN. Also design a welded connection, if member is connected with 10 mm thick gusset plate back to back on opposite side. Use Fe 410 steel. **09**

Section – II

Q.6 **a)** Classify the following sections, where fy = 250 MPa. **03**

i) ISMB 400 @ 61.67 Kg/m
ii) ISHB 400 @ 77.4 Kg/m

b) An ISA 200×200×10 used as a strut has the effective length as 3.6 m. Calculate the strength when it is connected by: **07**

i) One bolt at each end
ii) Welded at each end

Q.7 Design a built up column consisting of two rolled Channel sections placed back to back to resist an axial load of 1300kN. The length of the column is 4.12 m. It is restrained against rotation and translation at bottom and restrained against rotation and free at top. Take fy=250MPa. Also design the single lacing system. **09**

Q.8 Design a laterally unsupported beam for the following data: **09**
Effective span = 5 m
Maximum bending moment = 480 kN-m
Maximum shear force = 230 kN
Steel of grade Fe 410

Q.9 A column ISHB 400 @77.4 kg/m carries an axial compressive factored load of 1200 KN. Design a suitable welded slab base. The base rests on M25 grade concrete pedestal. **09**

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Design of Steel Structures (CIVPCC-07)

Day & Date: Saturday, 02-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume additional data if required and mention it clearly.
5) Use IS 800:2007 and Steel table are allowed after first 30 min.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) The yield stress ratio (ε) of Fe 410 grade of steel is _____.
a) 0.25 b) 0.5
c) 0.75 d) 1.0

2) In double lacing system the angle of inclination of lacing bar to the axis of the member should be in the range of _____.
a) 5° to 15° b) 15° to 40°
c) 40° to 70° d) 70° to 105°

3) The maximum allowable slenderness ratio of lacing bars in built-up columns is _____.
a) 85 b) 105
c) 145 d) 180

4) What is the effective depth of the web if the top flange restrained against lateral deflection and rotation (depth of web = d)?
a) d/2 b) 2d/3
c) d d) d/3

5) When electric operated crane carries up to 50t then deflection of the gantry girder should not exceed _____.
a) L/500 b) L/1000
c) L/750 d) L/600

6) The thickness of base plate is determined from the _____.
a) Flexural strength of the plate
b) Shear strength of the plate
c) Bearing strength of the concrete pedestal
d) Punching criteria

7) Which of the following is a flexural member?
a) Stanchion
b) Girt
c) Boom
d) Strut

8) What is the minimum pitch distance according to IS 800:2007 if d is the bolt diameter?
a) 2d
b) d
c) 1.7d
d) 2.5d

9) What is the maximum distance between two consecutive bolts (in tension) if the plate thickness is 10 mm?
a) 160 mm
b) 200 mm
c) 250 mm
d) 180 mm

10) Two plates of 14 mm and 12 mm are joined by fillet weld, the maximum size of fillet weld may be _____.
a) 16.5
b) 15.5
c) 10.5
d) 12.5

11) If the fusion angle between two faces is 110° then the value of constant K is _____.
a) 0.7
b) 0.55
c) 0.65
d) 0.6

12) The maximum effective slenderness ratio for a member if always in tension (other than pretensioned member) is _____.
a) 180
b) 400
c) 250
d) 300

13) The failure mode in which an axially loaded compression member may fail is by _____.
a) local buckling
b) squashing
c) torsional buckling
d) All of these

14) The effective length of a structural steel compression member of length L effectively held in position and restrained against rotation at one end but neither held in position nor restrained against rotation at the other end, is _____.
a) L
b) 1.2 L
c) 0.8 L
d) 2.0 L

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Design of Steel Structures (CIVPCC-07)

Day & Date: Saturday, 02-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. 2 is compulsory; answer any two remaining questions from Section – I.
2) Q. 6 is compulsory; answer any two from remaining questions from Section – II.
3) Figures to the right indicate full marks.
4) Assume additional data if required and mention it clearly.
5) Use IS 800:2007 and Steel table are allowed after first 30 mins.

Section – I

Q.2 Solve Following.

a) Differentiate PEB vs Conventional Buildings. **04**

b) Define Shape Factor and derive Shape factor for circle and Square. **06**

Q.3 **a)** Explain different Failure ways Bolted Connections. **03**

b) Two plates of 8 mm and 12 mm thickness are to be connected by butt weld. Joint is subjected to factored tensile load 330kN. Due to some reason weld length is restriction to 120 mm, check safety of joint if: **06**
i) Single groove is provided
ii) Double groove is provided
If the design is unsafe then calculate required effective weld length.

Q.4 Determine the tensile strength of an ISMC 175 when it is connected to gusset plate through the two flanges by two rows of 16mm bolts with a connection length of 200 mm. **09**

Q.5 Design a double angle tie member in a truss carries working load of 130kN. Also design a welded connection, if member is connected with 10 mm thick gusset plate back to back on opposite side. Use Fe 410 steel. **09**

Section – II

Q.6 **a)** Classify the following sections, where fy = 250 MPa. **03**

i) ISMB 400 @ 61.67 Kg/m
ii) ISHB 400 @ 77.4 Kg/m

b) An ISA 200×200×10 used as a strut has the effective length as 3.6 m. Calculate the strength when it is connected by: **07**

i) One bolt at each end
ii) Welded at each end

Q.7 Design a built up column consisting of two rolled Channel sections placed back to back to resist an axial load of 1300kN. The length of the column is 4.12 m. It is restrained against rotation and translation at bottom and restrained against rotation and free at top. Take fy=250MPa. Also design the single lacing system. **09**

Q.8 Design a laterally unsupported beam for the following data: **09**
Effective span = 5 m
Maximum bending moment = 480 kN-m
Maximum shear force = 230 kN
Steel of grade Fe 410

Q.9 A column ISHB 400 @77.4 kg/m carries an axial compressive factored load of 1200 KN. Design a suitable welded slab base. The base rests on M25 grade concrete pedestal. **09**

Seat No.	

Set **R**

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Design of Steel Structures (CIVPCC-07)

Day & Date: Saturday, 02-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume additional data if required and mention it clearly.
5) Use IS 800:2007 and Steel table are allowed after first 30 min.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) What is the effective depth of the web if the top flange restrained against lateral deflection and rotation (depth of web = d)?
a) d/2 b) 2d/3
c) d d) d/3

2) When electric operated crane carries up to 50t then deflection of the gantry girder should not exceed _____.
a) L/500 b) L/1000
c) L/750 d) L/600

3) The thickness of base plate is determined from the _____.
a) Flexural strength of the plate
b) Shear strength of the plate
c) Bearing strength of the concrete pedestal
d) Punching criteria

4) Which of the following is a flexural member?
a) Stanchion b) Girt
c) Boom d) Strut

5) What is the minimum pitch distance according to IS 800:2007 if d is the bolt diameter?
a) 2d b) d
c) 1.7d d) 2.5d

6) What is the maximum distance between two consecutive bolts (in tension) if the plate thickness is 10 mm?

a) 160 mm b) 200 mm
c) 250 mm d) 180 mm

7) Two plates of 14 mm and 12 mm are joined by fillet weld, the maximum size of fillet weld may be _____.

a) 16.5 b) 15.5
c) 10.5 d) 12.5

8) If the fusion angle between two faces is 110° then the value of constant K is _____.

a) 0.7 b) 0.55
c) 0.65 d) 0.6

9) The maximum effective slenderness ratio for a member if always in tension (other than pretensioned member) is _____.

a) 180 b) 400
c) 250 d) 300

10) The failure mode in which an axially loaded compression member may fail is by _____.

a) local buckling b) squashing
c) torsional buckling d) All of these

11) The effective length of a structural steel compression member of length L effectively held in position and restrained against rotation at one end but neither held in position nor restrained against rotation at the other end, is _____.

a) L b) 1.2 L
c) 0.8 L d) 2.0 L

12) The yield stress ratio (ε) of Fe 410 grade of steel is _____.

a) 0.25 b) 0.5
c) 0.75 d) 1.0

13) In double lacing system the angle of inclination of lacing bar to the axis of the member should be in the range of _____.

a) 5° to 15° b) 15° to 40°
c) 40° to 70° d) 70° to 105°

14) The maximum allowable slenderness ratio of lacing bars in built-up columns is _____.

a) 85 b) 105
c) 145 d) 180

Seat No.	

Set **R**

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Design of Steel Structures (CIVPCC-07)

Day & Date: Saturday, 02-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. 2 is compulsory; answer any two remaining questions from Section – I.
2) Q. 6 is compulsory; answer any two from remaining questions from Section – II.
3) Figures to the right indicate full marks.
4) Assume additional data if required and mention it clearly.
5) Use IS 800:2007 and Steel table are allowed after first 30 mins.

Section – I

Q.2 Solve Following.

a) Differentiate PEB vs Conventional Buildings. **04**

b) Define Shape Factor and derive Shape factor for circle and Square. **06**

Q.3 **a)** Explain different Failure ways Bolted Connections. **03**

b) Two plates of 8 mm and 12 mm thickness are to be connected by butt weld. Joint is subjected to factored tensile load 330kN. Due to some reason weld length is restriction to 120 mm, check safety of joint if: **06**
i) Single groove is provided
ii) Double groove is provided
If the design is unsafe then calculate required effective weld length.

Q.4 Determine the tensile strength of an ISMC 175 when it is connected to gusset plate through the two flanges by two rows of 16mm bolts with a connection length of 200 mm. **09**

Q.5 Design a double angle tie member in a truss carries working load of 130kN. Also design a welded connection, if member is connected with 10 mm thick gusset plate back to back on opposite side. Use Fe 410 steel. **09**

Section – II

Q.6 **a)** Classify the following sections, where fy = 250 MPa. **03**

i) ISMB 400 @ 61.67 Kg/m
ii) ISHB 400 @ 77.4 Kg/m

b) An ISA 200×200×10 used as a strut has the effective length as 3.6 m. Calculate the strength when it is connected by: **07**

i) One bolt at each end
ii) Welded at each end

Q.7 Design a built up column consisting of two rolled Channel sections placed back to back to resist an axial load of 1300kN. The length of the column is 4.12 m. It is restrained against rotation and translation at bottom and restrained against rotation and free at top. Take fy=250MPa. Also design the single lacing system. **09**

Q.8 Design a laterally unsupported beam for the following data: **09**
Effective span = 5 m
Maximum bending moment = 480 kN-m
Maximum shear force = 230 kN
Steel of grade Fe 410

Q.9 A column ISHB 400 @77.4 kg/m carries an axial compressive factored load of 1200 KN. Design a suitable welded slab base. The base rests on M25 grade concrete pedestal. **09**

Seat No.	

Set S

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Design of Steel Structures (CIVPCC-07)

Day & Date: Saturday, 02-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
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4) Assume additional data if required and mention it clearly.
5) Use IS 800:2007 and Steel table are allowed after first 30 min.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) The failure mode in which an axially loaded compression member may fail is by _____.
a) local buckling b) squashing
c) torsional buckling d) All of these

2) The effective length of a structural steel compression member of length L effectively held in position and restrained against rotation at one end but neither held in position nor restrained against rotation at the other end, is _____.
a) L b) 1.2 L
c) 0.8 L d) 2.0 L

3) The yield stress ratio (ε) of Fe 410 grade of steel is _____.
a) 0.25 b) 0.5
c) 0.75 d) 1.0

4) In double lacing system the angle of inclination of lacing bar to the axis of the member should be in the range of _____.
a) 5° to 15° b) 15° to 40°
c) 40° to 70° d) 70° to 105°

5) The maximum allowable slenderness ratio of lacing bars in built-up columns is _____.
a) 85 b) 105
c) 145 d) 180

6) What is the effective depth of the web if the top flange restrained against lateral deflection and rotation (depth of web = d)?
a) d/2 b) 2d/3
c) d d) d/3

7) When electric operated crane carries up to 50t then deflection of the gantry girder should not exceed _____.
a) L/500 b) L/1000
c) L/750 d) L/600

8) The thickness of base plate is determined from the _____.
a) Flexural strength of the plate
b) Shear strength of the plate
c) Bearing strength of the concrete pedestal
d) Punching criteria

9) Which of the following is a flexural member?
a) Stanchion b) Girt
c) Boom d) Strut

10) What is the minimum pitch distance according to IS 800:2007 if d is the bolt diameter?
a) 2d b) d
c) 1.7d d) 2.5d

11) What is the maximum distance between two consecutive bolts (in tension) if the plate thickness is 10 mm?
a) 160 mm b) 200 mm
c) 250 mm d) 180 mm

12) Two plates of 14 mm and 12 mm are joined by fillet weld, the maximum size of fillet weld may be _____.
a) 16.5 b) 15.5
c) 10.5 d) 12.5

13) If the fusion angle between two faces is 110° then the value of constant K is _____.
a) 0.7 b) 0.55
c) 0.65 d) 0.6

14) The maximum effective slenderness ratio for a member if always in tension (other than pretensioned member) is _____.
a) 180 b) 400
c) 250 d) 300

Seat No.	

Set **S**

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Design of Steel Structures (CIVPCC-07)

Day & Date: Saturday, 02-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. 2 is compulsory; answer any two remaining questions from Section – I.
2) Q. 6 is compulsory; answer any two from remaining questions from Section – II.
3) Figures to the right indicate full marks.
4) Assume additional data if required and mention it clearly.
5) Use IS 800:2007 and Steel table are allowed after first 30 mins.

Section – I

Q.2 Solve Following.

a) Differentiate PEB vs Conventional Buildings. **04**

b) Define Shape Factor and derive Shape factor for circle and Square. **06**

Q.3 **a)** Explain different Failure ways Bolted Connections. **03**

b) Two plates of 8 mm and 12 mm thickness are to be connected by butt weld. Joint is subjected to factored tensile load 330kN. Due to some reason weld length is restriction to 120 mm, check safety of joint if: **06**
i) Single groove is provided
ii) Double groove is provided
If the design is unsafe then calculate required effective weld length.

Q.4 Determine the tensile strength of an ISMC 175 when it is connected to gusset plate through the two flanges by two rows of 16mm bolts with a connection length of 200 mm. **09**

Q.5 Design a double angle tie member in a truss carries working load of 130kN. Also design a welded connection, if member is connected with 10 mm thick gusset plate back to back on opposite side. Use Fe 410 steel. **09**

Section – II

Q.6 **a)** Classify the following sections, where fy = 250 MPa. **03**

i) ISMB 400 @ 61.67 Kg/m
ii) ISHB 400 @ 77.4 Kg/m

b) An ISA 200×200×10 used as a strut has the effective length as 3.6 m. Calculate the strength when it is connected by: **07**

i) One bolt at each end
ii) Welded at each end

Q.7 Design a built up column consisting of two rolled Channel sections placed back to back to resist an axial load of 1300kN. The length of the column is 4.12 m. It is restrained against rotation and translation at bottom and restrained against rotation and free at top. Take fy=250MPa. Also design the single lacing system. **09**

Q.8 Design a laterally unsupported beam for the following data: **09**
Effective span = 5 m
Maximum bending moment = 480 kN-m
Maximum shear force = 230 kN
Steel of grade Fe 410

Q.9 A column ISHB 400 @77.4 kg/m carries an axial compressive factored load of 1200 KN. Design a suitable welded slab base. The base rests on M25 grade concrete pedestal. **09**

SLR-QH-230

Seat No.	

Set P

T. Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Transportation Engineering (CIVPCC-08)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Solve following Multiple Choice Question: 14

1) The ruling design speed on plain terrain as per IRC for National Highways is _____.
a) 80 km/h b) 100 km/h
c) 120 km/h d) 60 km/h

2) The extra widening required on horizontal curves depends on _____.
a) Speed of vehicle b) Radius of curve
c) Length of vehicle d) All of the above

3) Super elevation is provided on horizontal curves to _____.
a) Reduce frictional demand between tires and road
b) Increase vehicle speed
c) Increase road strength
d) Reduce road length

4) The maximum superelevation in plain and rolling terrain as per IRC is _____.
a) 7% b) 10%
c) 5% d) 12%

5) The length of summit curve is designed with respect to _____.
a) Comfort criteria b) Sight distance
c) Aesthetics d) Pavement strength

6) What is the purpose of dowel bars in rigid pavements?
a) Drainage b) Expansion
c) Load transfer across joints d) Surface friction improvement

7) Which test is used for quality control of bituminous mix in flexible pavement construction?
a) Slump test
b) Los Angeles Abrasion test
c) Marshall Stability test
d) Soundness test

8) Which one of the following is not a step in cement concrete pavement construction?
a) Mixing
b) Compaction
c) Vibration
d) Tack coat application

9) Functional evaluation of pavement primarily assesses ____.
a) Pavement modulus
b) Structural strength
c) Surface distress and ride quality
d) Load carrying capacity

10) Which of the following is a common failure in cement concrete pavement?
a) Rutting
b) Alligator cracking
c) Pumping
d) Polishing

11) What are 'imaginary surfaces' in airport design?
a) Runways not yet constructed
b) Hypothetical boundaries for controlling obstacles
c) Water bodies near airports
d) Painted markings on runways

12) Runway orientation is primarily based on _____.
a) Ground slope
b) Wind direction
c) Terminal location
d) Taxiway alignment

13) What is the function of an exit taxiway?
a) To refuel aircraft
b) To allow aircraft to leave the runway quickly after landing
c) To store baggage
d) To park ground vehicles

14) Heliport site selection must consider _____.
a) Water availability
b) Elevation and surrounding obstacles
c) Runway lighting
d) Fuel pipeline network

Seat No.	

Set **P**

T. Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Transportation Engineering (CIVPCC-08)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data where needed & mention it clearly.
4) Draw neat sketches wherever necessary.

SECTION – I

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

a) Explain Principles of Highway planning.

b) Explain road development in India.

c) A vehicle is moving with speed of 88 kmph on descending gradient of 5%. Coefficient of Horizontal friction is 0.37 and reaction time is average of 2-3 seconds. Calculate Stopping Sight Distance (SSD).

d) Explain Tests on subgrade soils (CBR and Plate load tests).

e) Explain various causes of pavement failures.

Q.3 Solve the following. (Any Two) **12**

a) Calculate length of Valley curve required to move the vehicle with design speed of 80 kmph and reaction time of 2.5 seconds. Vehicle is moving with acceding gradient of 5% and then descending gradient of 3%. Coefficient of longitudinal friction is 0.37. Calculate length of valley curve for cases: -
i) L > SSD
ii) L < SSD

b) Explain Tests on aggregates and bituminous materials.

c) A 4 lane 2 ways road is presently carrying traffic of 1000 cvpd, vehicle damage factor is 3.5, rate of traffic growth is 8 % construction period is 2.5 years and design life is 25 years. Design CBR value is 5 %, design the pavement for granular base and sub-base conditions.

SECTION – II

Q.4 Solve the following. (Any Four) **16**

a) Explain Super elevation, Equilibrium cant and cant-deficiency, Gradients and grade compensation in Railway Engineering.

b) State functions of turn outs.

c) Explain in detail Bus transit, metro, mono rail, sky bus, flyovers, underpasses.

d) Explain characteristics of helicopter.

e) Explain Imaginary surfaces in Airport.

Q.5 Solve the following. (Any Two) **12**

a) A 7 degree curve branches off from 3 degree curve in opposite direction. If speed is restricted on branch line as 30 Kmph. permissible cant deficiency is 7.6 cm. Determine speed restriction on main line.

b) Explain Tracks fixtures and fastenings.

c) The length of runway at sea level under standard condition at zero gradient is 1000 m. The airport site is at an elevation of 500 m. The reference temperature is 25°C. The proposed runway permits ascending gradient of 0.4 %. Determine actual length of Runway.

SLR-QH-230

Seat No.	

Set Q

T. Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Transportation Engineering (CIVPCC-08)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Solve following Multiple Choice Question: 14

1) Which one of the following is not a step in cement concrete pavement construction?
a) Mixing b) Compaction
c) Vibration d) Tack coat application

2) Functional evaluation of pavement primarily assesses ____.
a) Pavement modulus
b) Structural strength
c) Surface distress and ride quality
d) Load carrying capacity

3) Which of the following is a common failure in cement concrete pavement?
a) Rutting b) Alligator cracking
c) Pumping d) Polishing

4) What are 'imaginary surfaces' in airport design?
a) Runways not yet constructed
b) Hypothetical boundaries for controlling obstacles
c) Water bodies near airports
d) Painted markings on runways

5) Runway orientation is primarily based on _____.
a) Ground slope b) Wind direction
c) Terminal location d) Taxiway alignment

6) What is the function of an exit taxiway?
a) To refuel aircraft
b) To allow aircraft to leave the runway quickly after landing
c) To store baggage
d) To park ground vehicles

7) Heliport site selection must consider _____.
   a) Water availability
   b) Elevation and surrounding obstacles
   c) Runway lighting
   d) Fuel pipeline network

8) The ruling design speed on plain terrain as per IRC for National Highways is _____.
   a) 80 km/h
   b) 100 km/h
   c) 120 km/h
   d) 60 km/h

9) The extra widening required on horizontal curves depends on _____.
   a) Speed of vehicle
   b) Radius of curve
   c) Length of vehicle
   d) All of the above

10) Super elevation is provided on horizontal curves to _____.
   a) Reduce frictional demand between tires and road
   b) Increase vehicle speed
   c) Increase road strength
   d) Reduce road length

11) The maximum superelevation in plain and rolling terrain as per IRC is _____.
   a) 7%
   b) 10%
   c) 5%
   d) 12%

12) The length of summit curve is designed with respect to _____.
   a) Comfort criteria
   b) Sight distance
   c) Aesthetics
   d) Pavement strength

13) What is the purpose of dowel bars in rigid pavements?
   a) Drainage
   b) Expansion
   c) Load transfer across joints
   d) Surface friction improvement

14) Which test is used for quality control of bituminous mix in flexible pavement construction?
   a) Slump test
   b) Los Angeles Abrasion test
   c) Marshall Stability test
   d) Soundness test

Seat No.	

Set **Q**

T. Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Transportation Engineering (CIVPCC-08)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data where needed & mention it clearly.
4) Draw neat sketches wherever necessary.

SECTION – I

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

a) Explain Principles of Highway planning.

b) Explain road development in India.

c) A vehicle is moving with speed of 88 kmph on descending gradient of 5%. Coefficient of Horizontal friction is 0.37 and reaction time is average of 2-3 seconds. Calculate Stopping Sight Distance (SSD).

d) Explain Tests on subgrade soils (CBR and Plate load tests).

e) Explain various causes of pavement failures.

Q.3 Solve the following. (Any Two) **12**

a) Calculate length of Valley curve required to move the vehicle with design speed of 80 kmph and reaction time of 2.5 seconds. Vehicle is moving with acceding gradient of 5% and then descending gradient of 3%. Coefficient of longitudinal friction is 0.37. Calculate length of valley curve for cases: -
i) L > SSD
ii) L < SSD

b) Explain Tests on aggregates and bituminous materials.

c) A 4 lane 2 ways road is presently carrying traffic of 1000 cvpd, vehicle damage factor is 3.5, rate of traffic growth is 8 % construction period is 2.5 years and design life is 25 years. Design CBR value is 5 %, design the pavement for granular base and sub-base conditions.

SECTION – II

Q.4 Solve the following. (Any Four) **16**

a) Explain Super elevation, Equilibrium cant and cant-deficiency, Gradients and grade compensation in Railway Engineering.

b) State functions of turn outs.

c) Explain in detail Bus transit, metro, mono rail, sky bus, flyovers, underpasses.

d) Explain characteristics of helicopter.

e) Explain Imaginary surfaces in Airport.

Q.5 Solve the following. (Any Two) **12**

a) A 7 degree curve branches off from 3 degree curve in opposite direction. If speed is restricted on branch line as 30 Kmph. permissible cant deficiency is 7.6 cm. Determine speed restriction on main line.

b) Explain Tracks fixtures and fastenings.

c) The length of runway at sea level under standard condition at zero gradient is 1000 m. The airport site is at an elevation of 500 m. The reference temperature is 25°C. The proposed runway permits ascending gradient of 0.4 %. Determine actual length of Runway.

Seat No.	

Set **R**

T. Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Transportation Engineering (CIVPCC-08)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Solve following Multiple Choice Question: **14**

1) What are 'imaginary surfaces' in airport design?
a) Runways not yet constructed
b) Hypothetical boundaries for controlling obstacles
c) Water bodies near airports
d) Painted markings on runways

2) Runway orientation is primarily based on _____.
a) Ground slope b) Wind direction
c) Terminal location d) Taxiway alignment

3) What is the function of an exit taxiway?
a) To refuel aircraft
b) To allow aircraft to leave the runway quickly after landing
c) To store baggage
d) To park ground vehicles

4) Heliport site selection must consider _____.
a) Water availability
b) Elevation and surrounding obstacles
c) Runway lighting
d) Fuel pipeline network

5) The ruling design speed on plain terrain as per IRC for National Highways is _____.
a) 80 km/h b) 100 km/h
c) 120 km/h d) 60 km/h

6) The extra widening required on horizontal curves depends on _____.
a) Speed of vehicle b) Radius of curve
c) Length of vehicle d) All of the above

7) Super elevation is provided on horizontal curves to _____.
a) Reduce frictional demand between tires and road
b) Increase vehicle speed
c) Increase road strength
d) Reduce road length

8) The maximum superelevation in plain and rolling terrain as per IRC is _____.
a) 7% b) 10%
c) 5% d) 12%

9) The length of summit curve is designed with respect to _____.
a) Comfort criteria b) Sight distance
c) Aesthetics d) Pavement strength

10) What is the purpose of dowel bars in rigid pavements?
a) Drainage b) Expansion
c) Load transfer across joints d) Surface friction improvement

11) Which test is used for quality control of bituminous mix in flexible pavement construction?
a) Slump test b) Los Angeles Abrasion test
c) Marshall Stability test d) Soundness test

12) Which one of the following is not a step in cement concrete pavement construction?
a) Mixing b) Compaction
c) Vibration d) Tack coat application

13) Functional evaluation of pavement primarily assesses ____.
a) Pavement modulus
b) Structural strength
c) Surface distress and ride quality
d) Load carrying capacity

14) Which of the following is a common failure in cement concrete pavement?
a) Rutting b) Alligator cracking
c) Pumping d) Polishing

Seat No.	

Set **R**

T. Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Transportation Engineering (CIVPCC-08)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data where needed & mention it clearly.
4) Draw neat sketches wherever necessary.

SECTION – I

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

a) Explain Principles of Highway planning.

b) Explain road development in India.

c) A vehicle is moving with speed of 88 kmph on descending gradient of 5%. Coefficient of Horizontal friction is 0.37 and reaction time is average of 2-3 seconds. Calculate Stopping Sight Distance (SSD).

d) Explain Tests on subgrade soils (CBR and Plate load tests).

e) Explain various causes of pavement failures.

Q.3 Solve the following. (Any Two) **12**

a) Calculate length of Valley curve required to move the vehicle with design speed of 80 kmph and reaction time of 2.5 seconds. Vehicle is moving with acceding gradient of 5% and then descending gradient of 3%. Coefficient of longitudinal friction is 0.37. Calculate length of valley curve for cases: -
i) L > SSD
ii) L < SSD

b) Explain Tests on aggregates and bituminous materials.

c) A 4 lane 2 ways road is presently carrying traffic of 1000 cvpd, vehicle damage factor is 3.5, rate of traffic growth is 8 % construction period is 2.5 years and design life is 25 years. Design CBR value is 5 %, design the pavement for granular base and sub-base conditions.

SECTION – II

Q.4 Solve the following. (Any Four) **16**

a) Explain Super elevation, Equilibrium cant and cant-deficiency, Gradients and grade compensation in Railway Engineering.

b) State functions of turn outs.

c) Explain in detail Bus transit, metro, mono rail, sky bus, flyovers, underpasses.

d) Explain characteristics of helicopter.

e) Explain Imaginary surfaces in Airport.

Q.5 Solve the following. (Any Two) **12**

a) A 7 degree curve branches off from 3 degree curve in opposite direction. If speed is restricted on branch line as 30 Kmph. permissible cant deficiency is 7.6 cm. Determine speed restriction on main line.

b) Explain Tracks fixtures and fastenings.

c) The length of runway at sea level under standard condition at zero gradient is 1000 m. The airport site is at an elevation of 500 m. The reference temperature is 25°C. The proposed runway permits ascending gradient of 0.4 %. Determine actual length of Runway.

Seat No.	

Set **S**

T. Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Transportation Engineering (CIVPCC-08)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Solve following Multiple Choice Question: 14

1) What is the purpose of dowel bars in rigid pavements?
a) Drainage b) Expansion
c) Load transfer across joints d) Surface friction improvement

2) Which test is used for quality control of bituminous mix in flexible pavement construction?
a) Slump test b) Los Angeles Abrasion test
c) Marshall Stability test d) Soundness test

3) Which one of the following is not a step in cement concrete pavement construction?
a) Mixing b) Compaction
c) Vibration d) Tack coat application

4) Functional evaluation of pavement primarily assesses ____.
a) Pavement modulus
b) Structural strength
c) Surface distress and ride quality
d) Load carrying capacity

5) Which of the following is a common failure in cement concrete pavement?
a) Rutting b) Alligator cracking
c) Pumping d) Polishing

6) What are 'imaginary surfaces' in airport design?
a) Runways not yet constructed
b) Hypothetical boundaries for controlling obstacles
c) Water bodies near airports
d) Painted markings on runways

7) Runway orientation is primarily based on _____.
- a) Ground slope
- b) Wind direction
- c) Terminal location
- d) Taxiway alignment

8) What is the function of an exit taxiway?
- a) To refuel aircraft
- b) To allow aircraft to leave the runway quickly after landing
- c) To store baggage
- d) To park ground vehicles

9) Heliport site selection must consider _____.
- a) Water availability
- b) Elevation and surrounding obstacles
- c) Runway lighting
- d) Fuel pipeline network

10) The ruling design speed on plain terrain as per IRC for National Highways is _____.
- a) 80 km/h
- b) 100 km/h
- c) 120 km/h
- d) 60 km/h

11) The extra widening required on horizontal curves depends on _____.
- a) Speed of vehicle
- b) Radius of curve
- c) Length of vehicle
- d) All of the above

12) Super elevation is provided on horizontal curves to _____.
- a) Reduce frictional demand between tires and road
- b) Increase vehicle speed
- c) Increase road strength
- d) Reduce road length

13) The maximum superelevation in plain and rolling terrain as per IRC is _____.
- a) 7%
- b) 10%
- c) 5%
- d) 12%

14) The length of summit curve is designed with respect to _____.
- a) Comfort criteria
- b) Sight distance
- c) Aesthetics
- d) Pavement strength

Seat No.	

Set **S**

T. Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Transportation Engineering (CIVPCC-08)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data where needed & mention it clearly.
4) Draw neat sketches wherever necessary.

SECTION – I

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

a) Explain Principles of Highway planning.

b) Explain road development in India.

c) A vehicle is moving with speed of 88 kmph on descending gradient of 5%. Coefficient of Horizontal friction is 0.37 and reaction time is average of 2-3 seconds. Calculate Stopping Sight Distance (SSD).

d) Explain Tests on subgrade soils (CBR and Plate load tests).

e) Explain various causes of pavement failures.

Q.3 Solve the following. (Any Two) **12**

a) Calculate length of Valley curve required to move the vehicle with design speed of 80 kmph and reaction time of 2.5 seconds. Vehicle is moving with acceding gradient of 5% and then descending gradient of 3%. Coefficient of longitudinal friction is 0.37. Calculate length of valley curve for cases: -
i) L > SSD
ii) L < SSD

b) Explain Tests on aggregates and bituminous materials.

c) A 4 lane 2 ways road is presently carrying traffic of 1000 cvpd, vehicle damage factor is 3.5, rate of traffic growth is 8 % construction period is 2.5 years and design life is 25 years. Design CBR value is 5 %, design the pavement for granular base and sub-base conditions.

SECTION – II

Q.4 Solve the following. (Any Four) **16**

a) Explain Super elevation, Equilibrium cant and cant-deficiency, Gradients and grade compensation in Railway Engineering.

b) State functions of turn outs.

c) Explain in detail Bus transit, metro, mono rail, sky bus, flyovers, underpasses.

d) Explain characteristics of helicopter.

e) Explain Imaginary surfaces in Airport.

Q.5 Solve the following. (Any Two) **12**

a) A 7 degree curve branches off from 3 degree curve in opposite direction. If speed is restricted on branch line as 30 Kmph. permissible cant deficiency is 7.6 cm. Determine speed restriction on main line.

b) Explain Tracks fixtures and fastenings.

c) The length of runway at sea level under standard condition at zero gradient is 1000 m. The airport site is at an elevation of 500 m. The reference temperature is 25°C. The proposed runway permits ascending gradient of 0.4 %. Determine actual length of Runway.

SLR-QH-231

Seat No.	

Set P

T.Y. (B. Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Geotechnical Engineering (CIVPCC-09)

Day & Date: Thursday, 07-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answers from the given options. 14

1) The ratio of volume of air to volume of voids is called _____.
a) porosity b) percentage voids
c) void ratio d) air content

2) As per IS classification, the soil is classified as coarse grained soil, if ___.
a) The % of soil passing through 75 μ sieve is greater than 50%
b) The % of soil passing through 4.75 mm sieve is greater than 50%
c) The % of soil retained on 75 μ sieve is greater than 50%
d) The % of soil retained on 4.75 mm sieve is greater than 50%

3) In flow net equipotential lines and flow lines intersect each other at an angle of _____.
a) 45-degrees b) 90-degrees
c) 30-degrees d) 60-degrees

4) Coefficient of permeability of a soil _____.
a) Increases with the decrease in temperature.
b) Increases with increase in temperature.
c) Does not depend upon temperature.
d) None of these.

5) Shear strength depends on _____.
a) Cohesion only
b) Angle of internal friction only
c) Both cohesion and angle of internal friction
d) None of these

6) Vane tester is normally used for determining in-situ shear strength of _____.

a) Soft clays
b) Sand
c) Stiff clays
d) Gravel

7) The 'y' intercept of Coulombs failure envelope is equal to _____.

a) Cohesion
b) Maximum shear stress
c) Maximum normal stress
d) Angle of friction

8) Compaction is a process is which _____.

a) Removal of water from the voids of the soil mass
b) Removal of air from the voids of the soil mass
c) Removal of both air and water from the voids of the soil mass
d) None of the above

9) Sheep foot rollers are preferred for _____.

a) Cohesionless soils
b) Cohesive soils
c) All types of soils
d) None of the above

10) In the field, compaction control is done by measuring the _____.

a) dry density
b) moisture content
c) both of these
d) None of these

11) When degree of consolidation is 40%, the time factor Tv is _____.

a) 0.196
b) 0.126
c) 0.158
d) 0.400

12) A change in voids ratio per unit change in pressure is termed as _____.

a) Coefficient of compressibility
b) Coefficient of volume change
c) Coefficient of consolidation
d) None of these

13) The coefficient of passive earth pressure for a bac fill having $\varphi = 35$, as per Rankine's theory is _____.

a) 027
b) 0.33
c) 1.67
d) 3.69

14) During passive earth pressure case the wall _____.

a) Moves towards the backfill
b) Away from the backfill
c) Does not move at all
d) None of the above

Seat No.	

Set **P**

T.Y. (B. Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Geotechnical Engineering (CIVPCC-09)

Day & Date: Thursday, 07-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 2 & Q. No. 6 are compulsory. Attempt any Two from Remaining from each section.
2) Figures to the right indicates full marks.
3) Assume suitable data if necessary & mention it clearly.

SECTION – I

Q.2 Answer the following questions. (Any Four) **08**

a) Define porosity and moisture content.

b) List the various methods of determination of water content.

c) Write a note on consistency of soil.

d) Explain the Darcy's Law.

e) Discuss the limitations of box shear test.

Q.3 a) Derive relation between voids ratio and porosity with the help of three phase diagram. **05**

b) A soil sample is compacted into a cylindrical mould of 10 cm dia 15 cm high. The weight of moist sample was 2360 gm. After oven drying the wt. of sample was 2200 gm. Determine, Moisture content, Bulk density, Dry Density, Voids ratio and degree of saturation. **05**

Q.4 a) Derive the equation of coefficient of permeability for falling head method. **05**

b) A constant head permeability test was carried out on a cylindrical sample of sand 10 cm diameter and 15 cm height. 160 cm^3 of water was collected in 1.75 min, under a head of 30 cm. Compute the coefficient of permeability in m/year and the velocity of flow in m/sec. **05**

Q.5 a) Explain the differences between the Direct shear test and Triaxial shear. **05**

b) An undrained triaxial test on a sample of compacted soil gave the following results. **05**

Cell pressure KN/m^2	100	200	300
Deviator pressure KN/m^2	140	180	230
Pore pressure KN/m^2	50	80	130

Find Total strength parameters.

SECTION – II

Q.6 Answer the following questions. (Any Four) **08**

a) Draw typical compaction curve for standard compaction test.

b) Enlist the assumptions made in Rankine's theory.

c) Write differences between consolidation and compaction.

d) Draw typical e-log p curve and label various parts of it.

e) Define Compression index.

Q.7 a) Write differences between Standard Proctor Test & Modified Proctor Test. **05**

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

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

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

Q.8 a) What is the pre-consolidation pressure? With a neat sketch explain procedure to calculate pre-consolidation pressure. **05**

b) A 1 cm thick laboratory soil sample reaches 60% consolidation in 32.5 seconds under double drainage conditions. Find how much time will it require for a 10 m thick layer in the field to reach the same degree of consolidation if it has drainage face on one side only. **05**

Q.9 a) Write differences between Active Earth Pressure and Passive Earth Pressure. **05**

b) A rigid vertical retaining wall 6 m high has a dry backfill of cohesionless soil. The properties are $\gamma = 16\ \mathrm{kN/m^3}, \varphi = 25°$. The backfill is subjected to uniform surcharge pressure of $10\ \mathrm{kN/m^2}$. Determine total active earth force and its point of application. **05**

Seat No.	

Set **Q**

T.Y. (B. Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Geotechnical Engineering (CIVPCC-09)

Day & Date: Thursday, 07-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answers from the given options. 14

1) Compaction is a process is which _____.
a) Removal of water from the voids of the soil mass
b) Removal of air from the voids of the soil mass
c) Removal of both air and water from the voids of the soil mass
d) None of the above

2) Sheep foot rollers are preferred for _____.
a) Cohesionless soils b) Cohesive soils
c) All types of soils d) None of the above

3) In the field, compaction control is done by measuring the _____.
a) dry density b) moisture content
c) both of these d) None of these

4) When degree of consolidation is 40%, the time factor Tv is _____.
a) 0.196 b) 0.126
c) 0.158 d) 0.400

5) A change in voids ratio per unit change in pressure is termed as _____.
a) Coefficient of compressibility b) Coefficient of volume change
c) Coefficient of consolidation d) None of these

6) The coefficient of passive earth pressure for a bac fill having $\varphi = 35$, as per Rankine's theory is _____.
a) 027 b) 0.33
c) 1.67 d) 3.69

7) During passive earth pressure case the wall _____.
a) Moves towards the backfill b) Away from the backfill
c) Does not move at all d) None of the above

8) The ratio of volume of air to volume of voids is called _____.
a) porosity b) percentage voids
c) void ratio d) air content

9) As per IS classification, the soil is classified as coarse grained soil, if ___.
a) The % of soil passing through 75 μ sieve is greater than 50%
b) The % of soil passing through 4.75 mm sieve is greater than 50%
c) The % of soil retained on 75 μ sieve is greater than 50%
d) The % of soil retained on 4.75 mm sieve is greater than 50%

10) In flow net equipotential lines and flow lines intersect each other at an angle of _____.
a) 45-degrees b) 90-degrees
c) 30-degrees d) 60-degrees

11) Coefficient of permeability of a soil _____.
a) Increases with the decrease in temperature.
b) Increases with increase in temperature.
c) Does not depend upon temperature.
d) None of these.

12) Shear strength depends on _____.
a) Cohesion only
b) Angle of internal friction only
c) Both cohesion and angle of internal friction
d) None of these

13) Vane tester is normally used for determining in-situ shear strength of _____.
a) Soft clays b) Sand
c) Stiff clays d) Gravel

14) The 'y' intercept of Coulombs failure envelope is equal to _____.
a) Cohesion b) Maximum shear stress
c) Maximum normal stress d) Angle of friction

Seat No.	

Set **Q**

T.Y. (B. Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Geotechnical Engineering (CIVPCC-09)

Day & Date: Thursday, 07-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 2 & Q. No. 6 are compulsory. Attempt any Two from Remaining from each section.
2) Figures to the right indicates full marks.
3) Assume suitable data if necessary & mention it clearly.

SECTION – I

Q.2 Answer the following questions. (Any Four) **08**

a) Define porosity and moisture content.

b) List the various methods of determination of water content.

c) Write a note on consistency of soil.

d) Explain the Darcy's Law.

e) Discuss the limitations of box shear test.

Q.3 a) Derive relation between voids ratio and porosity with the help of three phase diagram. **05**

b) A soil sample is compacted into a cylindrical mould of 10 cm dia 15 cm high. The weight of moist sample was 2360 gm. After oven drying the wt. of sample was 2200 gm. Determine, Moisture content, Bulk density, Dry Density, Voids ratio and degree of saturation. **05**

Q.4 a) Derive the equation of coefficient of permeability for falling head method. **05**

b) A constant head permeability test was carried out on a cylindrical sample of sand 10 cm diameter and 15 cm height. 160 cm^3 of water was collected in 1.75 min, under a head of 30 cm. Compute the coefficient of permeability in m/year and the velocity of flow in m/sec. **05**

Q.5 a) Explain the differences between the Direct shear test and Triaxial shear. **05**

b) An undrained triaxial test on a sample of compacted soil gave the following results. **05**

Cell pressure KN/m^2	100	200	300
Deviator pressure KN/m^2	140	180	230
Pore pressure KN/m^2	50	80	130

Find Total strength parameters.

SECTION – II

Q.6 Answer the following questions. (Any Four) **08**

a) Draw typical compaction curve for standard compaction test.

b) Enlist the assumptions made in Rankine's theory.

c) Write differences between consolidation and compaction.

d) Draw typical e-log p curve and label various parts of it.

e) Define Compression index.

Q.7 a) Write differences between Standard Proctor Test & Modified Proctor Test. **05**

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

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

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

Q.8 a) What is the pre-consolidation pressure? With a neat sketch explain procedure to calculate pre-consolidation pressure. **05**

b) A 1 cm thick laboratory soil sample reaches 60% consolidation in 32.5 seconds under double drainage conditions. Find how much time will it require for a 10 m thick layer in the field to reach the same degree of consolidation if it has drainage face on one side only. **05**

Q.9 a) Write differences between Active Earth Pressure and Passive Earth Pressure. **05**

b) A rigid vertical retaining wall 6 m high has a dry backfill of cohesionless soil. The properties are $\gamma = 16\ \mathrm{kN/m^3}, \varphi = 25°$. The backfill is subjected to uniform surcharge pressure of $10\ \mathrm{kN/m^2}$. Determine total active earth force and its point of application. **05**

Seat No.	

Set R

T.Y. (B. Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Geotechnical Engineering (CIVPCC-09)

Day & Date: Thursday, 07-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answers from the given options. 14

1) When degree of consolidation is 40%, the time factor Tv is _____.
a) 0.196 b) 0.126
c) 0.158 d) 0.400

2) A change in voids ratio per unit change in pressure is termed as _____.
a) Coefficient of compressibility b) Coefficient of volume change
c) Coefficient of consolidation d) None of these

3) The coefficient of passive earth pressure for a bac fill having $\varphi = 35$, as per Rankine's theory is _____.
a) 027 b) 0.33
c) 1.67 d) 3.69

4) During passive earth pressure case the wall _____.
a) Moves towards the backfill b) Away from the backfill
c) Does not move at all d) None of the above

5) The ratio of volume of air to volume of voids is called _____.
a) porosity b) percentage voids
c) void ratio d) air content

6) As per IS classification, the soil is classified as coarse grained soil, if ___.
a) The % of soil passing through 75 μ sieve is greater than 50%
b) The % of soil passing through 4.75 mm sieve is greater than 50%
c) The % of soil retained on 75 μ sieve is greater than 50%
d) The % of soil retained on 4.75 mm sieve is greater than 50%

7) In flow net equipotential lines and flow lines intersect each other at an angle of _____.
a) 45-degrees b) 90-degrees
c) 30-degrees d) 60-degrees

8) Coefficient of permeability of a soil _____.
a) Increases with the decrease in temperature.
b) Increases with increase in temperature.
c) Does not depend upon temperature.
d) None of these.

9) Shear strength depends on _____.
a) Cohesion only
b) Angle of internal friction only
c) Both cohesion and angle of internal friction
d) None of these

10) Vane tester is normally used for determining in-situ shear strength of _____.
a) Soft clays b) Sand
c) Stiff clays d) Gravel

11) The 'y' intercept of Coulombs failure envelope is equal to _____.
a) Cohesion b) Maximum shear stress
c) Maximum normal stress d) Angle of friction

12) Compaction is a process is which _____.
a) Removal of water from the voids of the soil mass
b) Removal of air from the voids of the soil mass
c) Removal of both air and water from the voids of the soil mass
d) None of the above

13) Sheep foot rollers are preferred for _____.
a) Cohesionless soils b) Cohesive soils
c) All types of soils d) None of the above

14) In the field, compaction control is done by measuring the _____.
a) dry density b) moisture content
c) both of these d) None of these

Seat No.	

Set **R**

T.Y. (B. Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Geotechnical Engineering (CIVPCC-09)

Day & Date: Thursday, 07-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 2 & Q. No. 6 are compulsory. Attempt any Two from Remaining from each section.
2) Figures to the right indicates full marks.
3) Assume suitable data if necessary & mention it clearly.

SECTION – I

Q.2 Answer the following questions. (Any Four) **08**

a) Define porosity and moisture content.

b) List the various methods of determination of water content.

c) Write a note on consistency of soil.

d) Explain the Darcy's Law.

e) Discuss the limitations of box shear test.

Q.3 a) Derive relation between voids ratio and porosity with the help of three phase diagram. **05**

b) A soil sample is compacted into a cylindrical mould of 10 cm dia 15 cm high. The weight of moist sample was 2360 gm. After oven drying the wt. of sample was 2200 gm. Determine, Moisture content, Bulk density, Dry Density, Voids ratio and degree of saturation. **05**

Q.4 a) Derive the equation of coefficient of permeability for falling head method. **05**

b) A constant head permeability test was carried out on a cylindrical sample of sand 10 cm diameter and 15 cm height. 160 cm^3 of water was collected in 1.75 min, under a head of 30 cm. Compute the coefficient of permeability in m/year and the velocity of flow in m/sec. **05**

Q.5 a) Explain the differences between the Direct shear test and Triaxial shear. **05**

b) An undrained triaxial test on a sample of compacted soil gave the following results. **05**

Cell pressure KN/m^2	100	200	300
Deviator pressure KN/m^2	140	180	230
Pore pressure KN/m^2	50	80	130

Find Total strength parameters.

SECTION – II

Q.6 Answer the following questions. (Any Four) **08**

a) Draw typical compaction curve for standard compaction test.

b) Enlist the assumptions made in Rankine's theory.

c) Write differences between consolidation and compaction.

d) Draw typical e-log p curve and label various parts of it.

e) Define Compression index.

Q.7 a) Write differences between Standard Proctor Test & Modified Proctor Test. **05**

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

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

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

Q.8 a) What is the pre-consolidation pressure? With a neat sketch explain procedure to calculate pre-consolidation pressure. **05**

b) A 1 cm thick laboratory soil sample reaches 60% consolidation in 32.5 seconds under double drainage conditions. Find how much time will it require for a 10 m thick layer in the field to reach the same degree of consolidation if it has drainage face on one side only. **05**

Q.9 a) Write differences between Active Earth Pressure and Passive Earth Pressure. **05**

b) A rigid vertical retaining wall 6 m high has a dry backfill of cohesionless soil. The properties are $\gamma = 16\ \mathrm{kN/m^3}, \varphi = 25°$. The backfill is subjected to uniform surcharge pressure of $10\ \mathrm{kN/m^2}$. Determine total active earth force and its point of application. **05**

Seat No.	

Set | **S**

T.Y. (B. Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Geotechnical Engineering (CIVPCC-09)

Day & Date: Thursday, 07-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) Vane tester is normally used for determining in-situ shear strength of _____.
a) Soft clays b) Sand
c) Stiff clays d) Gravel

2) The 'y' intercept of Coulombs failure envelope is equal to _____.
a) Cohesion b) Maximum shear stress
c) Maximum normal stress d) Angle of friction

3) Compaction is a process is which _____.
a) Removal of water from the voids of the soil mass
b) Removal of air from the voids of the soil mass
c) Removal of both air and water from the voids of the soil mass
d) None of the above

4) Sheep foot rollers are preferred for _____.
a) Cohesionless soils b) Cohesive soils
c) All types of soils d) None of the above

5) In the field, compaction control is done by measuring the _____.
a) dry density b) moisture content
c) both of these d) None of these

6) When degree of consolidation is 40%, the time factor Tv is _____.
a) 0.196 b) 0.126
c) 0.158 d) 0.400

7) A change in voids ratio per unit change in pressure is termed as _____.
a) Coefficient of compressibility b) Coefficient of volume change
c) Coefficient of consolidation d) None of these

8) The coefficient of passive earth pressure for a bac fill having $\varphi = 35$, as per Rankine's theory is _____.
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c) 1.67 d) 3.69

9) During passive earth pressure case the wall _____.
a) Moves towards the backfill b) Away from the backfill
c) Does not move at all d) None of the above

10) The ratio of volume of air to volume of voids is called _____.
a) porosity b) percentage voids
c) void ratio d) air content

11) As per IS classification, the soil is classified as coarse grained soil, if ___.
a) The % of soil passing through 75 μ sieve is greater than 50%
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13) Coefficient of permeability of a soil _____.
a) Increases with the decrease in temperature.
b) Increases with increase in temperature.
c) Does not depend upon temperature.
d) None of these.

14) Shear strength depends on _____.
a) Cohesion only
b) Angle of internal friction only
c) Both cohesion and angle of internal friction
d) None of these

SLR-QH-231

Seat No.	

Set S

T.Y. (B. Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Geotechnical Engineering (CIVPCC-09)

Day & Date: Thursday, 07-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 2 & Q. No. 6 are compulsory. Attempt any Two from Remaining from each section.
2) Figures to the right indicates full marks.
3) Assume suitable data if necessary & mention it clearly.

SECTION – I

Q.2 Answer the following questions. (Any Four) **08**

a) Define porosity and moisture content.

b) List the various methods of determination of water content.

c) Write a note on consistency of soil.

d) Explain the Darcy's Law.

e) Discuss the limitations of box shear test.

Q.3 a) Derive relation between voids ratio and porosity with the help of three phase diagram. **05**

b) A soil sample is compacted into a cylindrical mould of 10 cm dia 15 cm high. The weight of moist sample was 2360 gm. After oven drying the wt. of sample was 2200 gm. Determine, Moisture content, Bulk density, Dry Density, Voids ratio and degree of saturation. **05**

Q.4 a) Derive the equation of coefficient of permeability for falling head method. **05**

b) A constant head permeability test was carried out on a cylindrical sample of sand 10 cm diameter and 15 cm height. 160 cm^3 of water was collected in 1.75 min, under a head of 30 cm. Compute the coefficient of permeability in m/year and the velocity of flow in m/sec. **05**

Q.5 a) Explain the differences between the Direct shear test and Triaxial shear. **05**

b) An undrained triaxial test on a sample of compacted soil gave the following results. **05**

Cell pressure KN/m^2	100	200	300
Deviator pressure KN/m^2	140	180	230
Pore pressure KN/m^2	50	80	130

Find Total strength parameters.

SECTION – II

Q.6 Answer the following questions. (Any Four) **08**

a) Draw typical compaction curve for standard compaction test.

b) Enlist the assumptions made in Rankine's theory.

c) Write differences between consolidation and compaction.

d) Draw typical e-log p curve and label various parts of it.

e) Define Compression index.

Q.7 a) Write differences between Standard Proctor Test & Modified Proctor Test. **05**

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

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

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

Q.8 a) What is the pre-consolidation pressure? With a neat sketch explain procedure to calculate pre-consolidation pressure. **05**

b) A 1 cm thick laboratory soil sample reaches 60% consolidation in 32.5 seconds under double drainage conditions. Find how much time will it require for a 10 m thick layer in the field to reach the same degree of consolidation if it has drainage face on one side only. **05**

Q.9 a) Write differences between Active Earth Pressure and Passive Earth Pressure. **05**

b) A rigid vertical retaining wall 6 m high has a dry backfill of cohesionless soil. The properties are $\gamma = 16\ \mathrm{kN/m^3}, \varphi = 25°$. The backfill is subjected to uniform surcharge pressure of $10\ \mathrm{kN/m^2}$. Determine total active earth force and its point of application. **05**

SLR-QH-232

Seat No.	

Set P

T.Y. (B.Tech.) (Civil Engineering) (Sem - I) (New) (CBCS)
Examination: March/April – 2026
Advanced Concrete Technology (CIVPEC-01A)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top on page.
3) Figures to the right indicates full marks.
4) Use of non-programmable calculators is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Multiple choice questions: **14**

1) Which of the following is a pozzolanic material?
a) Silica fume b) Gypsum
c) Lime d) Slag

2) Plasticizers are mainly used to _____.
a) Reduce strength b) Increase workability
c) Accelerate setting d) Decrease durability

3) Segregation in concrete can be avoided by _____.
a) Adding more water b) Proper grading of aggregates
c) Using coarse sand d) Reducing cement content

4) Which test is non-destructive?
a) Compressive strength test b) Rebound hammer test
c) Flexural test d) Crushing value test

5) Self-compacting concrete (SCC) eliminates the need for _____.
a) Cement b) Compaction
c) Admixtures d) Aggregates

6) Fiber-reinforced concrete improves _____.
a) Compressive strength b) Ductility and toughness
c) Permeability d) None of these

7) Ferrocement is made of _____.
a) High grade concrete
b) Thin section with wire mesh reinforcement
c) Lightweight aggregate
d) Fly ash and lime

8) Mivan technology is related to _____.
a) Steel formwork system b) Pumped concrete
c) Precast flooring d) Grouting

9) In a central RMC plant, concrete is mixed _____.
a) At site b) At batching plant
c) During transit d) By hand

10) A key principle of quality control in concrete is _____.
a) Reduce inspection
b) Continuous monitoring and testing
c) Ignore variability
d) Use untested materials

11) The main parameter controlled in high-strength concrete mix design is _____.
a) Water-cement ratio b) Sand percentage
c) Mixing time d) Aggregate shape

12) Variability in test results is expressed statistically as _____.
a) Mean value b) Standard deviation
c) Range d) Median

13) The effect of silica fume in concrete is mainly to _____.
a) Increase permeability b) Reduce strength
c) Improve bond and strength d) Increase bleeding

14) Which type of concrete is used for radiation shielding?
a) High strength concrete b) High density concrete
c) Foam concrete d) Fiber reinforced concrete

Seat No.	

Set **P**

T.Y. (B.Tech.) (Civil Engineering) (Sem - I) (New) (CBCS)
Examination: March/April – 2026
Advanced Concrete Technology (CIVPEC-01A)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicates full marks.
3) Use of non-programmable calculator is allowed.

Section – I

Q.2 Answer the following questions. **10**

a) Discuss workability and the factors affecting it. Explain any two tests used to measure workability.

b) Describe different types and properties of fiber-reinforced concrete with a neat sketch.

Q.3 Answer Any Three following questions. **18**

a) Explain the types and functions of admixtures used in concrete and their effects on workability and setting.

b) Define durability and explain various causes of deterioration of concrete.

c) Describe non-destructive testing methods for assessing concrete structures.

d) Explain high-performance concrete - its composition, properties and applications.

e) Write a note on 3D-printing technology in construction and its advantages.

SECTION – II

Q.4 Answer the following questions. **10**

a) Explain sprayed concrete process and its applications.

b) Write a short note on roller compacted concrete and its field uses.

Q.5 Answer Any Three following questions. **18**

a) Explain the production process of ready-mixed concrete and its advantages.

b) Describe pumped concrete and the factors affecting its pumping efficiency.

c) Discuss the mix-design procedure for high-grade concrete with example parameters.

d) Write a note on sustainability of concrete industry and eco-friendly practices.

e) Explain the principles and tools of quality management used in concrete construction.

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Civil Engineering) (Sem - I) (New) (CBCS)
Examination: March/April – 2026
Advanced Concrete Technology (CIVPEC-01A)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top on page.
3) Figures to the right indicates full marks.
4) Use of non-programmable calculators is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Multiple choice questions: **14**

1) Mivan technology is related to _____.
a) Steel formwork system b) Pumped concrete
c) Precast flooring d) Grouting

2) In a central RMC plant, concrete is mixed _____.
a) At site b) At batching plant
c) During transit d) By hand

3) A key principle of quality control in concrete is _____.
a) Reduce inspection
b) Continuous monitoring and testing
c) Ignore variability
d) Use untested materials

4) The main parameter controlled in high-strength concrete mix design is _____.
a) Water-cement ratio b) Sand percentage
c) Mixing time d) Aggregate shape

5) Variability in test results is expressed statistically as _____.
a) Mean value b) Standard deviation
c) Range d) Median

6) The effect of silica fume in concrete is mainly to _____.
a) Increase permeability b) Reduce strength
c) Improve bond and strength d) Increase bleeding

7) Which type of concrete is used for radiation shielding?
a) High strength concrete b) High density concrete
c) Foam concrete d) Fiber reinforced concrete

8) Which of the following is a pozzolanic material?
a) Silica fume b) Gypsum
c) Lime d) Slag

9) Plasticizers are mainly used to _____.
a) Reduce strength b) Increase workability
c) Accelerate setting d) Decrease durability

10) Segregation in concrete can be avoided by _____.
a) Adding more water b) Proper grading of aggregates
c) Using coarse sand d) Reducing cement content

11) Which test is non-destructive?
a) Compressive strength test b) Rebound hammer test
c) Flexural test d) Crushing value test

12) Self-compacting concrete (SCC) eliminates the need for _____.
a) Cement b) Compaction
c) Admixtures d) Aggregates

13) Fiber-reinforced concrete improves _____.
a) Compressive strength b) Ductility and toughness
c) Permeability d) None of these

14) Ferrocement is made of _____.
a) High grade concrete
b) Thin section with wire mesh reinforcement
c) Lightweight aggregate
d) Fly ash and lime

SLR-QH-232

Seat No.	

Set Q

T.Y. (B.Tech.) (Civil Engineering) (Sem - I) (New) (CBCS)
Examination: March/April – 2026
Advanced Concrete Technology (CIVPEC-01A)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicates full marks.
3) Use of non-programmable calculator is allowed.

Section – I

Q.2 Answer the following questions. **10**

a) Discuss workability and the factors affecting it. Explain any two tests used to measure workability.

b) Describe different types and properties of fiber-reinforced concrete with a neat sketch.

Q.3 Answer Any Three following questions. **18**

a) Explain the types and functions of admixtures used in concrete and their effects on workability and setting.

b) Define durability and explain various causes of deterioration of concrete.

c) Describe non-destructive testing methods for assessing concrete structures.

d) Explain high-performance concrete - its composition, properties and applications.

e) Write a note on 3D-printing technology in construction and its advantages.

SECTION – II

Q.4 Answer the following questions. **10**

a) Explain sprayed concrete process and its applications.

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Q.5 Answer Any Three following questions. **18**

a) Explain the production process of ready-mixed concrete and its advantages.

b) Describe pumped concrete and the factors affecting its pumping efficiency.

c) Discuss the mix-design procedure for high-grade concrete with example parameters.

d) Write a note on sustainability of concrete industry and eco-friendly practices.

e) Explain the principles and tools of quality management used in concrete construction.

Seat No.	

Set **R**

T.Y. (B.Tech.) (Civil Engineering) (Sem - I) (New) (CBCS)
Examination: March/April – 2026
Advanced Concrete Technology (CIVPEC-01A)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top on page.
3) Figures to the right indicates full marks.
4) Use of non-programmable calculators is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Multiple choice questions: **14**

1) The main parameter controlled in high-strength concrete mix design is _____.
a) Water-cement ratio b) Sand percentage
c) Mixing time d) Aggregate shape

2) Variability in test results is expressed statistically as _____.
a) Mean value b) Standard deviation
c) Range d) Median

3) The effect of silica fume in concrete is mainly to _____.
a) Increase permeability b) Reduce strength
c) Improve bond and strength d) Increase bleeding

4) Which type of concrete is used for radiation shielding?
a) High strength concrete b) High density concrete
c) Foam concrete d) Fiber reinforced concrete

5) Which of the following is a pozzolanic material?
a) Silica fume b) Gypsum
c) Lime d) Slag

6) Plasticizers are mainly used to _____.
a) Reduce strength b) Increase workability
c) Accelerate setting d) Decrease durability

7) Segregation in concrete can be avoided by _____.
a) Adding more water b) Proper grading of aggregates
c) Using coarse sand d) Reducing cement content

8) Which test is non-destructive?
a) Compressive strength test b) Rebound hammer test
c) Flexural test d) Crushing value test

9) Self-compacting concrete (SCC) eliminates the need for _____.
a) Cement b) Compaction
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13) In a central RMC plant, concrete is mixed _____.
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14) A key principle of quality control in concrete is _____.
a) Reduce inspection
b) Continuous monitoring and testing
c) Ignore variability
d) Use untested materials

SLR-QH-232

Seat No.	

Set R

T.Y. (B.Tech.) (Civil Engineering) (Sem - I) (New) (CBCS)
Examination: March/April – 2026
Advanced Concrete Technology (CIVPEC-01A)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
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Section – I

Q.2 Answer the following questions. **10**

a) Discuss workability and the factors affecting it. Explain any two tests used to measure workability.

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a) Explain the types and functions of admixtures used in concrete and their effects on workability and setting.

b) Define durability and explain various causes of deterioration of concrete.

c) Describe non-destructive testing methods for assessing concrete structures.

d) Explain high-performance concrete - its composition, properties and applications.

e) Write a note on 3D-printing technology in construction and its advantages.

SECTION – II

Q.4 Answer the following questions. **10**

a) Explain sprayed concrete process and its applications.

b) Write a short note on roller compacted concrete and its field uses.

Q.5 Answer Any Three following questions. **18**

a) Explain the production process of ready-mixed concrete and its advantages.

b) Describe pumped concrete and the factors affecting its pumping efficiency.

c) Discuss the mix-design procedure for high-grade concrete with example parameters.

d) Write a note on sustainability of concrete industry and eco-friendly practices.

e) Explain the principles and tools of quality management used in concrete construction.

SLR-QH-232

Seat No.	

Set S

T.Y. (B.Tech.) (Civil Engineering) (Sem - I) (New) (CBCS)
Examination: March/April – 2026
Advanced Concrete Technology (CIVPEC-01A)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top on page.
3) Figures to the right indicates full marks.
4) Use of non-programmable calculators is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Multiple choice questions: **14**

1) Fiber-reinforced concrete improves _____.
a) Compressive strength b) Ductility and toughness
c) Permeability d) None of these

2) Ferrocement is made of _____.
a) High grade concrete
b) Thin section with wire mesh reinforcement
c) Lightweight aggregate
d) Fly ash and lime

3) Mivan technology is related to _____.
a) Steel formwork system b) Pumped concrete
c) Precast flooring d) Grouting

4) In a central RMC plant, concrete is mixed _____.
a) At site b) At batching plant
c) During transit d) By hand

5) A key principle of quality control in concrete is _____.
a) Reduce inspection
b) Continuous monitoring and testing
c) Ignore variability
d) Use untested materials

6) The main parameter controlled in high-strength concrete mix design is _____.
a) Water-cement ratio b) Sand percentage
c) Mixing time d) Aggregate shape

7) Variability in test results is expressed statistically as _____.
a) Mean value b) Standard deviation
c) Range d) Median

8) The effect of silica fume in concrete is mainly to _____.
a) Increase permeability b) Reduce strength
c) Improve bond and strength d) Increase bleeding

9) Which type of concrete is used for radiation shielding?
a) High strength concrete b) High density concrete
c) Foam concrete d) Fiber reinforced concrete

10) Which of the following is a pozzolanic material?
a) Silica fume b) Gypsum
c) Lime d) Slag

11) Plasticizers are mainly used to _____.
a) Reduce strength b) Increase workability
c) Accelerate setting d) Decrease durability

12) Segregation in concrete can be avoided by _____.
a) Adding more water b) Proper grading of aggregates
c) Using coarse sand d) Reducing cement content

13) Which test is non-destructive?
a) Compressive strength test b) Rebound hammer test
c) Flexural test d) Crushing value test

14) Self-compacting concrete (SCC) eliminates the need for _____.
a) Cement b) Compaction
c) Admixtures d) Aggregates

SLR-QH-232

Seat No.	

Set S

T.Y. (B.Tech.) (Civil Engineering) (Sem - I) (New) (CBCS)
Examination: March/April – 2026
Advanced Concrete Technology (CIVPEC-01A)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicates full marks.
3) Use of non-programmable calculator is allowed.

Section – I

Q.2 Answer the following questions. **10**

a) Discuss workability and the factors affecting it. Explain any two tests used to measure workability.

b) Describe different types and properties of fiber-reinforced concrete with a neat sketch.

Q.3 Answer Any Three following questions. **18**

a) Explain the types and functions of admixtures used in concrete and their effects on workability and setting.

b) Define durability and explain various causes of deterioration of concrete.

c) Describe non-destructive testing methods for assessing concrete structures.

d) Explain high-performance concrete - its composition, properties and applications.

e) Write a note on 3D-printing technology in construction and its advantages.

SECTION – II

Q.4 Answer the following questions. **10**

a) Explain sprayed concrete process and its applications.

b) Write a short note on roller compacted concrete and its field uses.

Q.5 Answer Any Three following questions. **18**

a) Explain the production process of ready-mixed concrete and its advantages.

b) Describe pumped concrete and the factors affecting its pumping efficiency.

c) Discuss the mix-design procedure for high-grade concrete with example parameters.

d) Write a note on sustainability of concrete industry and eco-friendly practices.

e) Explain the principles and tools of quality management used in concrete construction.

SLR-QH-233

Seat No.	

Set P

T.Y. (B.Tech.) (Civil Engineering) (Sem - I) (New) (CBCS)
Examination: March/April – 2026
Engineering Geology and Material Science (CIVPEC-01B)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top on page.
3) Figures to the right indicates full marks.
4) Use of non-programmable calculators is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Multiple choice questions: **14**

1) The study of rocks, minerals, and Earth's crust is mainly covered under _____.
a) Physical geology b) Structural geology
c) Engineering geology d) Mineralogy

2) The uppermost layer of the Earth is called _____.
a) Mantle b) Crust
c) Core d) Lithosphere

3) The product of both mechanical and chemical weathering is _____.
a) Clay b) Sandstone
c) Soil d) Gravel

4) Which of the following is not a rock-forming mineral?
a) Feldspar b) Quartz
c) Calcite d) Coal

5) Igneous rocks having large crystals are formed due to _____.
a) Rapid cooling b) Slow cooling
c) High pressure d) High temperature

6) The rock suitable for building foundation is _____.
a) Shale b) Laterite
c) Granite d) Marl

7) A fracture along which displacement has occurred is called _____.
a) Fold b) Fault
c) Joint d) Cleavage

8) Remote sensing helps in _____
a) Laboratory testing
b) Subsurface drilling
c) Obtaining surface information
d) Seismic wave analysis

9) The presence of groundwater can cause _____.
a) Strength gain in concrete
b) Settlement of foundations
c) Increase in bearing capacity
d) None of these

10) The property of a material to regain its original shape removal of load is _____.
a) Plasticity
b) Elasticity
c) Ductility
d) Toughness

11) Ceramics are generally _____.
a) Conductors
b) Insulators
c) Magnetic materials
d) Ductile

12) The main compound responsible for early strength in cement is _____.
a) C_2S
b) C_3S
c) C_3A
d) C_4AF

13) Shape Memory Alloys exhibit _____.
a) Self-healing property
b) Elastic deformation
c) Ability to regain shape when heated
d) None of these

14) Nanotechnology in construction materials improves _____.
a) Surface finish
b) Durability and strength
c) Color only
d) Curing time only

Seat No.	

Set **P**

T.Y. (B.Tech.) (Civil Engineering) (Sem - I) (New) (CBCS)
Examination: March/April – 2026
Engineering Geology and Material Science (CIVPEC-01B)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicates full marks.
3) Use of non-programmable calculator is allowed.

Section – I

Q.2 Answer the following questions. **10**

a) Explain the structure of the Earth with a neat labeled diagram.

b) Explain the importance of geology in civil engineering with examples.

Q.3 Answer Any Three following questions. **18**

a) Classify rocks on the basis of origin and discuss their engineering importance.

b) Explain the properties and uses of igneous, sedimentary, and metamorphic rocks.

c) Discuss different types of geological structures and their effects on design and construction.

d) Explain the role of remote sensing in geological mapping and site in investigation.

e) Describe landslides, their causes, effects, and control measures.

SECTION – II

Q.4 Answer the following questions. **10**

a) Discuss the classification of engineering materials with examples.

b) Explain the thermal and electrical properties of construction materials.

Q.5 Answer Any Three following questions.

a) Explain the process of manufacture and composition of Portland cement. **18**

b) Describe the properties and classification of aggregates.

c) Explain the concept of geopolymer concrete and its advantages.

d) Discuss smart and sustainable materials used in modern construction.

e) Explain nanotechnology and its application in improving material performance.

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Civil Engineering) (Sem - I) (New) (CBCS)
Examination: March/April – 2026
Engineering Geology and Material Science (CIVPEC-01B)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top on page.
3) Figures to the right indicates full marks.
4) Use of non-programmable calculators is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Multiple choice questions: **14**

1) Remote sensing helps in _____
a) Laboratory testing
b) Subsurface drilling
c) Obtaining surface information
d) Seismic wave analysis

2) The presence of groundwater can cause _____.
a) Strength gain in concrete b) Settlement of foundations
c) Increase in bearing capacity d) None of these

3) The property of a material to regain its original shape removal of load is _____.
a) Plasticity b) Elasticity
c) Ductility d) Toughness

4) Ceramics are generally _____.
a) Conductors b) Insulators
c) Magnetic materials d) Ductile

5) The main compound responsible for early strength in cement is _____.
a) C_2S b) C_3S
c) C_3A d) C_4AF

6) Shape Memory Alloys exhibit _____.
a) Self-healing property
b) Elastic deformation
c) Ability to regain shape when heated
d) None of these

7) Nanotechnology in construction materials improves _____.
a) Surface finish b) Durability and strength
c) Color only d) Curing time only

8) The study of rocks, minerals, and Earth's crust is mainly covered under _____.
a) Physical geology b) Structural geology
c) Engineering geology d) Mineralogy

9) The uppermost layer of the Earth is called _____.
a) Mantle b) Crust
c) Core d) Lithosphere

10) The product of both mechanical and chemical weathering is _____.
a) Clay b) Sandstone
c) Soil d) Gravel

11) Which of the following is not a rock-forming mineral?
a) Feldspar b) Quartz
c) Calcite d) Coal

12) Igneous rocks having large crystals are formed due to _____.
a) Rapid cooling b) Slow cooling
c) High pressure d) High temperature

13) The rock suitable for building foundation is _____.
a) Shale b) Laterite
c) Granite d) Marl

14) A fracture along which displacement has occurred is called _____.
a) Fold b) Fault
c) Joint d) Cleavage

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Civil Engineering) (Sem - I) (New) (CBCS)
Examination: March/April – 2026
Engineering Geology and Material Science (CIVPEC-01B)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicates full marks.
3) Use of non-programmable calculator is allowed.

Section – I

Q.2 Answer the following questions. **10**

a) Explain the structure of the Earth with a neat labeled diagram.

b) Explain the importance of geology in civil engineering with examples.

Q.3 Answer Any Three following questions. **18**

a) Classify rocks on the basis of origin and discuss their engineering importance.

b) Explain the properties and uses of igneous, sedimentary, and metamorphic rocks.

c) Discuss different types of geological structures and their effects on design and construction.

d) Explain the role of remote sensing in geological mapping and site in investigation.

e) Describe landslides, their causes, effects, and control measures.

SECTION – II

Q.4 Answer the following questions. **10**

a) Discuss the classification of engineering materials with examples.

b) Explain the thermal and electrical properties of construction materials.

Q.5 Answer Any Three following questions.

a) Explain the process of manufacture and composition of Portland cement. **18**

b) Describe the properties and classification of aggregates.

c) Explain the concept of geopolymer concrete and its advantages.

d) Discuss smart and sustainable materials used in modern construction.

e) Explain nanotechnology and its application in improving material performance.

Seat No.	

Set **R**

T.Y. (B.Tech.) (Civil Engineering) (Sem - I) (New) (CBCS)
Examination: March/April – 2026
Engineering Geology and Material Science (CIVPEC-01B)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top on page.
3) Figures to the right indicates full marks.
4) Use of non-programmable calculators is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Multiple choice questions: **14**

1) Ceramics are generally _____.
a) Conductors b) Insulators
c) Magnetic materials d) Ductile

2) The main compound responsible for early strength in cement is _____.
a) C_2S b) C_3S
c) C_3A d) C_4AF

3) Shape Memory Alloys exhibit _____.
a) Self-healing property
b) Elastic deformation
c) Ability to regain shape when heated
d) None of these

4) Nanotechnology in construction materials improves _____.
a) Surface finish b) Durability and strength
c) Color only d) Curing time only

5) The study of rocks, minerals, and Earth's crust is mainly covered under _____.
a) Physical geology b) Structural geology
c) Engineering geology d) Mineralogy

6) The uppermost layer of the Earth is called _____.
a) Mantle b) Crust
c) Core d) Lithosphere

7) The product of both mechanical and chemical weathering is _____.
a) Clay b) Sandstone
c) Soil d) Gravel

8) Which of the following is not a rock-forming mineral?
a) Feldspar b) Quartz
c) Calcite d) Coal

9) Igneous rocks having large crystals are formed due to _____.
a) Rapid cooling b) Slow cooling
c) High pressure d) High temperature

10) The rock suitable for building foundation is _____.
a) Shale b) Laterite
c) Granite d) Marl

11) A fracture along which displacement has occurred is called _____.
a) Fold b) Fault
c) Joint d) Cleavage

12) Remote sensing helps in _____
a) Laboratory testing
b) Subsurface drilling
c) Obtaining surface information
d) Seismic wave analysis

13) The presence of groundwater can cause _____.
a) Strength gain in concrete b) Settlement of foundations
c) Increase in bearing capacity d) None of these

14) The property of a material to regain its original shape removal of load is _____.
a) Plasticity b) Elasticity
c) Ductility d) Toughness

SLR-QH-233

Seat No.	

Set R

T.Y. (B.Tech.) (Civil Engineering) (Sem - I) (New) (CBCS)
Examination: March/April – 2026
Engineering Geology and Material Science (CIVPEC-01B)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicates full marks.
3) Use of non-programmable calculator is allowed.

Section – I

Q.2 Answer the following questions. **10**

a) Explain the structure of the Earth with a neat labeled diagram.

b) Explain the importance of geology in civil engineering with examples.

Q.3 Answer Any Three following questions. **18**

a) Classify rocks on the basis of origin and discuss their engineering importance.

b) Explain the properties and uses of igneous, sedimentary, and metamorphic rocks.

c) Discuss different types of geological structures and their effects on design and construction.

d) Explain the role of remote sensing in geological mapping and site in investigation.

e) Describe landslides, their causes, effects, and control measures.

SECTION – II

Q.4 Answer the following questions. **10**

a) Discuss the classification of engineering materials with examples.

b) Explain the thermal and electrical properties of construction materials.

Q.5 Answer Any Three following questions.

a) Explain the process of manufacture and composition of Portland cement. **18**

b) Describe the properties and classification of aggregates.

c) Explain the concept of geopolymer concrete and its advantages.

d) Discuss smart and sustainable materials used in modern construction.

e) Explain nanotechnology and its application in improving material performance.

SLR-QH-233

Seat No.		Set	S

T.Y. (B.Tech.) (Civil Engineering) (Sem - I) (New) (CBCS)
Examination: March/April – 2026
Engineering Geology and Material Science (CIVPEC-01B)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top on page.
3) Figures to the right indicates full marks.
4) Use of non-programmable calculators is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Multiple choice questions: **14**

1) The rock suitable for building foundation is _____.
a) Shale b) Laterite
c) Granite d) Marl

2) A fracture along which displacement has occurred is called _____.
a) Fold b) Fault
c) Joint d) Cleavage

3) Remote sensing helps in _____
a) Laboratory testing
b) Subsurface drilling
c) Obtaining surface information
d) Seismic wave analysis

4) The presence of groundwater can cause _____.
a) Strength gain in concrete b) Settlement of foundations
c) Increase in bearing capacity d) None of these

5) The property of a material to regain its original shape removal of load is _____.
a) Plasticity b) Elasticity
c) Ductility d) Toughness

6) Ceramics are generally _____.
a) Conductors b) Insulators
c) Magnetic materials d) Ductile

7) The main compound responsible for early strength in cement is _____.
a) C_2S b) C_3S
c) C_3A d) C_4AF

8) Shape Memory Alloys exhibit _____.
a) Self-healing property
b) Elastic deformation
c) Ability to regain shape when heated
d) None of these

9) Nanotechnology in construction materials improves _____.
a) Surface finish b) Durability and strength
c) Color only d) Curing time only

10) The study of rocks, minerals, and Earth's crust is mainly covered under _____.
a) Physical geology b) Structural geology
c) Engineering geology d) Mineralogy

11) The uppermost layer of the Earth is called _____.
a) Mantle b) Crust
c) Core d) Lithosphere

12) The product of both mechanical and chemical weathering is _____.
a) Clay b) Sandstone
c) Soil d) Gravel

13) Which of the following is not a rock-forming mineral?
a) Feldspar b) Quartz
c) Calcite d) Coal

14) Igneous rocks having large crystals are formed due to _____.
a) Rapid cooling b) Slow cooling
c) High pressure d) High temperature

SLR-QH-233

Seat No.		Set	S

T.Y. (B.Tech.) (Civil Engineering) (Sem - I) (New) (CBCS)
Examination: March/April – 2026
Engineering Geology and Material Science (CIVPEC-01B)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicates full marks.
3) Use of non-programmable calculator is allowed.

Section – I

Q.2 Answer the following questions. **10**

a) Explain the structure of the Earth with a neat labeled diagram.

b) Explain the importance of geology in civil engineering with examples.

Q.3 Answer Any Three following questions. **18**

a) Classify rocks on the basis of origin and discuss their engineering importance.

b) Explain the properties and uses of igneous, sedimentary, and metamorphic rocks.

c) Discuss different types of geological structures and their effects on design and construction.

d) Explain the role of remote sensing in geological mapping and site in investigation.

e) Describe landslides, their causes, effects, and control measures.

SECTION – II

Q.4 Answer the following questions. **10**

a) Discuss the classification of engineering materials with examples.

b) Explain the thermal and electrical properties of construction materials.

Q.5 Answer Any Three following questions.

a) Explain the process of manufacture and composition of Portland cement. **18**

b) Describe the properties and classification of aggregates.

c) Explain the concept of geopolymer concrete and its advantages.

d) Discuss smart and sustainable materials used in modern construction.

e) Explain nanotechnology and its application in improving material performance.

SLR-QH-234

Seat No.	

Set P

T.Y. (B.Tech.) (Civil Engineering) (Sem - I) (New) (CBCS)
Examination: March/April – 2026
Water and Sanitation Infrastructure (CIVPEC-01C)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) Lack of access to basic water and sanitation services can have a profound impact on _____.
a) Health and well-being b) Economic development
c) Education and livelihoods d) All of the above

2) Which region has the highest percentage of people lacking access to safe drinking water?
a) North America b) Western Europe
c) Sub-Saharan Africa d) Australia

3) If the chosen diameter of a pipe, is less than the economical diameter _____.
a) Cost of pipe will be less
b) Head loss will be high
c) Cost of pumping will be more than saving
d) All the above

4) Resistance offered by thrust block should be _____ times horizontal thrust.
a) <2 b) >2
c) >1.8 d) >1.5

5) Settling velocity of a spherical body in a viscous fluid is given by _____.
a) Reynolds law b) Newton's law
c) Stokes law d) Charles law

6) The thickness of the base material of a rapid sand filter on which filter media are supported is _____.

a) 45−60cm
b) 20−80cm
c) 30−75cm
d) 10−30cm

7) What is the primary substance responsible for temporary hardness in water?

a) Calcium bicarbonate
b) Sodium chloride
c) Magnesium chloride
d) Calcium sulfate

8) What is the primary reason for choosing an 'egg-shaped sewer' over a circular sewer when constructing a combined sewer system?

a) The shape provides maximum capacity during peak storm flow
b) They provide better self-cleansing velocity at 'low dry-weather flow'
c) The shape is structurally stronger than a circular cross-section
d) Egg-shaped sewers are easier to lay and maintain

9) The Rational Formula, Q=CIA, is most commonly used in storm water drainage design to estimate the peak runoff rate (Q). What does the factor 'C' represent in this formula?

a) The Catchment area of the watershed
b) The Time of Concentration
c) The Rainfall intensity in mm/hr
d) The Coefficient of runoff

10) A key design feature of a septic tank is that it must provide conditions for _____.

a) Removal of nutrients like nitrogen and phosphorus
b) Aerobic decomposition of solids and subsequent filtration
c) High-rate oxidation of organic matter using forced air
d) Settling of solids and anaerobic digestion of the settled sludge

11) In an oxidation pond, the dissolved oxygen (DO) required by the bacteria is supplied mainly by _____.

a) Mechanical surface aerators
b) Recirculation of highly oxygenated water
c) Absorption from the atmosphere
d) Photosynthesis by algae

12) The most aggressive and localized form of corrosion in water pipes, which often leads to rapid pipe failure (pinhole leaks) and is difficult to detect externally, is _____.

a) Erosion corrosion
b) Crevice corrosion
c) Pitting corrosion
d) Intergranular corrosion

13) Which year was the primary Indian legislation for the prevention and control of water pollution enacted?

a) 1986 (Environmental Protection Act)
b) 1972 (Wildlife Protection Act)
c) 1974 (Water Prevention and Control of Pollution Act)
d) 1981 (Air Prevention and Control of Pollution Act)

14) A maintenance practice for buried metal pipelines where metal blocks (like magnesium or zinc) are electrically connected to the pipe to divert corrosive currents is known as _____.

a) Anodic protection
b) Cathodic protection
c) Impressed current protection
d) Passivation

Seat No.	

Set **P**

T.Y. (B.Tech.) (Civil Engineering) (Sem - I) (New) (CBCS)
Examination: March/April – 2026
Water and Sanitation Infrastructure (CIVPEC-01C)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Section-I Q.4 is compulsory & attempt any two questions from the remaining question.
2) Section-II Q.6 is compulsory & attempt any two questions from the remaining question.
3) Figures to the right indicate full marks.
4) Use of Scientific calculator is allowed.
5) Assume additional suitable data if necessary and state it clearly.

SECTION – I

Q.2 **a)** What are the specific regional challenges of water and sanitation access in developing countries like India? **04**

b) Design a thrust block for 1000 m diameter conveying water at a pressure of 10 kg/cm^2 at a location where deviation angle is 45° in a horizontal plane. The subsoil has a density of 1800 kg/m, Angle of internal friction=30° and cohesion is zero. Velocity of flow in pipe is 2 m/sec. Take density of concrete as 2400 kg/m^3. Take soil cove = 0.6 m. **05**

Q.3 **a)** Write the factors governing the location of Intake. **04**

b) Explain the chemical principles for the removal of both types of hardness using the Lime-Soda process. **05**

Q.4 **a)** Find dimensions of rectangular sedimentation basin for following data: Volume of water = 3 mld, Detention Period = 4 hrs, Velocity of flow = 10 cm/min. consider effective depth=3m. sludge accumulation=1m, Freeboard=0.5m. **05**

b) Outline the key targets of Sustainable Development Goal 6 (SDG 6) and analyse their significance for global development. **05**

Q.5 **a)** What are the various forces acting on pressure conduits? Explain water hammer pressure. **04**

b) Explain the theory of flocculation and write purpose of the slow mixing process. **05**

SECTION – II

Q.6	**a)**	Discuss the necessity of sewer ventilation. Briefly explain any one common methods of ventilation used in sewer networks.	**05**
	b)	Describe the key design criteria for a constant-velocity Grit Removal Basin.	**05**
Q.7	**a)**	Explain the significance of Food-to-Microorganism (F/M) ratio in the design and operational control of Activated Sludge Process (ASP).	**05**
	b)	Analyse the major causes of leakage in a piped water distribution system.	**04**
Q.8	**a)**	Discuss the role and benefits of implementing Smart Metering and Real-Time Monitoring systems within a modern water distribution network.	**05**
	b)	Explain the primary hydraulic advantage of using an egg-shaped sewer cross-section.	**04**
Q.9	**a)**	State and explain Rational Formula.	**03**
	b)	Describe the functions of the three main zones within the septic tank.	**03**
	c)	Describe two distinct detection techniques used to pinpoint leaks.	**03**

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Civil Engineering) (Sem - I) (New) (CBCS)
Examination: March/April – 2026
Water and Sanitation Infrastructure (CIVPEC-01C)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) What is the primary reason for choosing an 'egg-shaped sewer' over a circular sewer when constructing a combined sewer system?
a) The shape provides maximum capacity during peak storm flow
b) They provide better self-cleansing velocity at 'low dry-weather flow'
c) The shape is structurally stronger than a circular cross-section
d) Egg-shaped sewers are easier to lay and maintain

2) The Rational Formula, Q=CIA, is most commonly used in storm water drainage design to estimate the peak runoff rate (Q). What does the factor 'C' represent in this formula?
a) The Catchment area of the watershed
b) The Time of Concentration
c) The Rainfall intensity in mm/hr
d) The Coefficient of runoff

3) A key design feature of a septic tank is that it must provide conditions for _____.
a) Removal of nutrients like nitrogen and phosphorus
b) Aerobic decomposition of solids and subsequent filtration
c) High-rate oxidation of organic matter using forced air
d) Settling of solids and anaerobic digestion of the settled sludge

4) In an oxidation pond, the dissolved oxygen (DO) required by the bacteria is supplied mainly by _____.
a) Mechanical surface aerators
b) Recirculation of highly oxygenated water
c) Absorption from the atmosphere
d) Photosynthesis by algae

5) The most aggressive and localized form of corrosion in water pipes, which often leads to rapid pipe failure (pinhole leaks) and is difficult to detect externally, is _____.

a) Erosion corrosion
b) Crevice corrosion
c) Pitting corrosion
d) Intergranular corrosion

6) Which year was the primary Indian legislation for the prevention and control of water pollution enacted?

a) 1986 (Environmental Protection Act)
b) 1972 (Wildlife Protection Act)
c) 1974 (Water Prevention and Control of Pollution Act)
d) 1981 (Air Prevention and Control of Pollution Act)

7) A maintenance practice for buried metal pipelines where metal blocks (like magnesium or zinc) are electrically connected to the pipe to divert corrosive currents is known as _____.

a) Anodic protection
b) Cathodic protection
c) Impressed current protection
d) Passivation

8) Lack of access to basic water and sanitation services can have a profound impact on _____.

a) Health and well-being
b) Economic development
c) Education and livelihoods
d) All of the above

9) Which region has the highest percentage of people lacking access to safe drinking water?

a) North America
b) Western Europe
c) Sub-Saharan Africa
d) Australia

10) If the chosen diameter of a pipe, is less than the economical diameter _____.

a) Cost of pipe will be less
b) Head loss will be high
c) Cost of pumping will be more than saving
d) All the above

11) Resistance offered by thrust block should be _____ times horizontal thrust.

a) <2
b) >2
c) >1.8
d) >1.5

12) Settling velocity of a spherical body in a viscous fluid is given by _____.

a) Reynolds law
b) Newton's law
c) Stokes law
d) Charles law

13) The thickness of the base material of a rapid sand filter on which filter media are supported is _____.

a) 45−60cm
b) 20−80cm
c) 30−75cm
d) 10−30cm

14) What is the primary substance responsible for temporary hardness in water?

a) Calcium bicarbonate
b) Sodium chloride
c) Magnesium chloride
d) Calcium sulfate

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Civil Engineering) (Sem - I) (New) (CBCS)
Examination: March/April – 2026
Water and Sanitation Infrastructure (CIVPEC-01C)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Section-I Q.4 is compulsory & attempt any two questions from the remaining question.
2) Section-II Q.6 is compulsory & attempt any two questions from the remaining question.
3) Figures to the right indicate full marks.
4) Use of Scientific calculator is allowed.
5) Assume additional suitable data if necessary and state it clearly.

SECTION – I

Q.2 **a)** What are the specific regional challenges of water and sanitation access in developing countries like India? **04**

b) Design a thrust block for 1000 m diameter conveying water at a pressure of 10 kg/cm^2 at a location where deviation angle is 45° in a horizontal plane. The subsoil has a density of 1800 kg/m, Angle of internal friction=30° and cohesion is zero. Velocity of flow in pipe is 2 m/sec. Take density of concrete as 2400 kg/m^3. Take soil cove = 0.6 m. **05**

Q.3 **a)** Write the factors governing the location of Intake. **04**

b) Explain the chemical principles for the removal of both types of hardness using the Lime-Soda process. **05**

Q.4 **a)** Find dimensions of rectangular sedimentation basin for following data: Volume of water = 3 mld, Detention Period = 4 hrs, Velocity of flow = 10 cm/min. consider effective depth=3m. sludge accumulation=1m, Freeboard=0.5m. **05**

b) Outline the key targets of Sustainable Development Goal 6 (SDG 6) and analyse their significance for global development. **05**

Q.5 **a)** What are the various forces acting on pressure conduits? Explain water hammer pressure. **04**

b) Explain the theory of flocculation and write purpose of the slow mixing process. **05**

SECTION – II

Q.6	**a)**	Discuss the necessity of sewer ventilation. Briefly explain any one common methods of ventilation used in sewer networks.	**05**
	b)	Describe the key design criteria for a constant-velocity Grit Removal Basin.	**05**
Q.7	**a)**	Explain the significance of Food-to-Microorganism (F/M) ratio in the design and operational control of Activated Sludge Process (ASP).	**05**
	b)	Analyse the major causes of leakage in a piped water distribution system.	**04**
Q.8	**a)**	Discuss the role and benefits of implementing Smart Metering and Real-Time Monitoring systems within a modern water distribution network.	**05**
	b)	Explain the primary hydraulic advantage of using an egg-shaped sewer cross-section.	**04**
Q.9	**a)**	State and explain Rational Formula.	**03**
	b)	Describe the functions of the three main zones within the septic tank.	**03**
	c)	Describe two distinct detection techniques used to pinpoint leaks.	**03**

Seat No.	

Set **R**

T.Y. (B.Tech.) (Civil Engineering) (Sem - I) (New) (CBCS)
Examination: March/April – 2026
Water and Sanitation Infrastructure (CIVPEC-01C)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. 14

1) In an oxidation pond, the dissolved oxygen (DO) required by the bacteria is supplied mainly by _____.
a) Mechanical surface aerators
b) Recirculation of highly oxygenated water
c) Absorption from the atmosphere
d) Photosynthesis by algae

2) The most aggressive and localized form of corrosion in water pipes, which often leads to rapid pipe failure (pinhole leaks) and is difficult to detect externally, is _____.
a) Erosion corrosion b) Crevice corrosion
c) Pitting corrosion d) Intergranular corrosion

3) Which year was the primary Indian legislation for the prevention and control of water pollution enacted?
a) 1986 (Environmental Protection Act)
b) 1972 (Wildlife Protection Act)
c) 1974 (Water Prevention and Control of Pollution Act)
d) 1981 (Air Prevention and Control of Pollution Act)

4) A maintenance practice for buried metal pipelines where metal blocks (like magnesium or zinc) are electrically connected to the pipe to divert corrosive currents is known as _____.
a) Anodic protection
b) Cathodic protection
c) Impressed current protection
d) Passivation

5) Lack of access to basic water and sanitation services can have a profound impact on _____.
   a) Health and well-being
   b) Economic development
   c) Education and livelihoods
   d) All of the above

6) Which region has the highest percentage of people lacking access to safe drinking water?
   a) North America
   b) Western Europe
   c) Sub-Saharan Africa
   d) Australia

7) If the chosen diameter of a pipe, is less than the economical diameter _____.
   a) Cost of pipe will be less
   b) Head loss will be high
   c) Cost of pumping will be more than saving
   d) All the above

8) Resistance offered by thrust block should be _____ times horizontal thrust.
   a) <2
   b) >2
   c) >1.8
   d) >1.5

9) Settling velocity of a spherical body in a viscous fluid is given by _____.
   a) Reynolds law
   b) Newton's law
   c) Stokes law
   d) Charles law

10) The thickness of the base material of a rapid sand filter on which filter media are supported is _____.
   a) 45−60cm
   b) 20−80cm
   c) 30−75cm
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11) What is the primary substance responsible for temporary hardness in water?
   a) Calcium bicarbonate
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12) What is the primary reason for choosing an 'egg-shaped sewer' over a circular sewer when constructing a combined sewer system?
   a) The shape provides maximum capacity during peak storm flow
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13) The Rational Formula, Q=CIA, is most commonly used in storm water drainage design to estimate the peak runoff rate (Q). What does the factor 'C' represent in this formula?

a) The Catchment area of the watershed
b) The Time of Concentration
c) The Rainfall intensity in mm/hr
d) The Coefficient of runoff

14) A key design feature of a septic tank is that it must provide conditions for _____.

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b) Aerobic decomposition of solids and subsequent filtration
c) High-rate oxidation of organic matter using forced air
d) Settling of solids and anaerobic digestion of the settled sludge

Seat No.	

Set **R**

T.Y. (B.Tech.) (Civil Engineering) (Sem - I) (New) (CBCS)
Examination: March/April – 2026
Water and Sanitation Infrastructure (CIVPEC-01C)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Section-I Q.4 is compulsory & attempt any two questions from the remaining question.
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SECTION – I

Q.2 **a)** What are the specific regional challenges of water and sanitation access in developing countries like India? **04**

b) Design a thrust block for 1000 m diameter conveying water at a pressure of 10 kg/cm^2 at a location where deviation angle is 45° in a horizontal plane. The subsoil has a density of 1800 kg/m, Angle of internal friction=30° and cohesion is zero. Velocity of flow in pipe is 2 m/sec. Take density of concrete as 2400 kg/m^3. Take soil cove = 0.6 m. **05**

Q.3 **a)** Write the factors governing the location of Intake. **04**

b) Explain the chemical principles for the removal of both types of hardness using the Lime-Soda process. **05**

Q.4 **a)** Find dimensions of rectangular sedimentation basin for following data: Volume of water = 3 mld, Detention Period = 4 hrs, Velocity of flow = 10 cm/min. consider effective depth=3m. sludge accumulation=1m, Freeboard=0.5m. **05**

b) Outline the key targets of Sustainable Development Goal 6 (SDG 6) and analyse their significance for global development. **05**

Q.5 **a)** What are the various forces acting on pressure conduits? Explain water hammer pressure. **04**

b) Explain the theory of flocculation and write purpose of the slow mixing process. **05**

SECTION – II

Q.6	**a)**	Discuss the necessity of sewer ventilation. Briefly explain any one common methods of ventilation used in sewer networks.	**05**
	b)	Describe the key design criteria for a constant-velocity Grit Removal Basin.	**05**
Q.7	**a)**	Explain the significance of Food-to-Microorganism (F/M) ratio in the design and operational control of Activated Sludge Process (ASP).	**05**
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	b)	Explain the primary hydraulic advantage of using an egg-shaped sewer cross-section.	**04**
Q.9	**a)**	State and explain Rational Formula.	**03**
	b)	Describe the functions of the three main zones within the septic tank.	**03**
	c)	Describe two distinct detection techniques used to pinpoint leaks.	**03**

Seat No.		Set	S

T.Y. (B.Tech.) (Civil Engineering) (Sem - I) (New) (CBCS)
Examination: March/April – 2026
Water and Sanitation Infrastructure (CIVPEC-01C)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) The thickness of the base material of a rapid sand filter on which filter media are supported is _____.
a) 45−60cm b) 20−80cm
c) 30−75cm d) 10−30cm

2) What is the primary substance responsible for temporary hardness in water?
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   c) Education and livelihoods
   d) All of the above

11) Which region has the highest percentage of people lacking access to safe drinking water?
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   c) Sub-Saharan Africa
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12) If the chosen diameter of a pipe, is less than the economical diameter _____.

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c) Cost of pumping will be more than saving
d) All the above

13) Resistance offered by thrust block should be _____ times horizontal thrust.

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b) >2
c) >1.8
d) >1.5

14) Settling velocity of a spherical body in a viscous fluid is given by _____.

a) Reynolds law
b) Newton's law
c) Stokes law
d) Charles law

Seat No.	

Set **S**

T.Y. (B.Tech.) (Civil Engineering) (Sem - I) (New) (CBCS)
Examination: March/April – 2026
Water and Sanitation Infrastructure (CIVPEC-01C)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Section-I Q.4 is compulsory & attempt any two questions from the remaining question.
2) Section-II Q.6 is compulsory & attempt any two questions from the remaining question.
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4) Use of Scientific calculator is allowed.
5) Assume additional suitable data if necessary and state it clearly.

SECTION – I

Q.2 **a)** What are the specific regional challenges of water and sanitation access in developing countries like India? **04**

b) Design a thrust block for 1000 m diameter conveying water at a pressure of 10 kg/cm^2 at a location where deviation angle is 45° in a horizontal plane. The subsoil has a density of 1800 kg/m, Angle of internal friction=30° and cohesion is zero. Velocity of flow in pipe is 2 m/sec. Take density of concrete as 2400 kg/m^3. Take soil cove = 0.6 m. **05**

Q.3 **a)** Write the factors governing the location of Intake. **04**

b) Explain the chemical principles for the removal of both types of hardness using the Lime-Soda process. **05**

Q.4 **a)** Find dimensions of rectangular sedimentation basin for following data: Volume of water = 3 mld, Detention Period = 4 hrs, Velocity of flow = 10 cm/min. consider effective depth=3m. sludge accumulation=1m, Freeboard=0.5m. **05**

b) Outline the key targets of Sustainable Development Goal 6 (SDG 6) and analyse their significance for global development. **05**

Q.5 **a)** What are the various forces acting on pressure conduits? Explain water hammer pressure. **04**

b) Explain the theory of flocculation and write purpose of the slow mixing process. **05**

SECTION – II

Q.6	**a)**	Discuss the necessity of sewer ventilation. Briefly explain any one common methods of ventilation used in sewer networks.	**05**
	b)	Describe the key design criteria for a constant-velocity Grit Removal Basin.	**05**
Q.7	**a)**	Explain the significance of Food-to-Microorganism (F/M) ratio in the design and operational control of Activated Sludge Process (ASP).	**05**
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Q.9	**a)**	State and explain Rational Formula.	**03**
	b)	Describe the functions of the three main zones within the septic tank.	**03**
	c)	Describe two distinct detection techniques used to pinpoint leaks.	**03**

SLR-QH-235

Seat No.		Set	P

Marks Obtained		Signature of Examiner		Signature of Junior Supervisor	

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Creativity and Design Thinking (AEC-02)

Day & Date: Tuesday, 12-05-2026 Max. Marks: 50
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Mention Question Paper Set (P/Q/R/S) on Top of Page.
4) Use of non-programmable calculators is allowed.

Answer

Q.1 Multiple Choice Questions.

1) Innovation mainly focuses on _____.
a) Generating ideas only b) Implementing creative ideas
c) Copying others d) Marketing

2) Creativity and Innovation together lead to _____.
a) Routine performance b) Problem discovery
c) Practical novelty d) Mechanical repetition

3) A characteristic of a creative person is _____.
a) Rigidity b) Curiosity
c) Fearfulness d) Passivity

4) Which of the following represents a major *barrier* to creativity?
a) Time pressure b) Risk-taking
c) Playfulness d) Flexibility

5) The “Ideate” stage in design thinking focuses on _____.
a) Understanding users b) Generating solutions
c) Testing ideas d) Building prototypes

6) Design thinking is fundamentally _____.
a) User-centered b) Manager-centered
c) Engineer-centered d) Cost-centered

7) Which of these helps to *overcome* creative blocks?
a) Collaboration b) Fear of mistakes
c) Over-planning d) Isolation

8) A design thinker empathizes to _____.
a) Know customer feelings and needs
b) Find product cost
c) Estimate profit
d) Collect market data

9) The *Define* phase results in _____.
a) Problem statement b) Prototype
c) Survey d) Marketing plan

10) Barriers to creativity can be removed through _____.
a) Open communication b) Discouragement
c) Repetition d) Judgmental thinking

11) The last phase of design thinking is _____.
a) Prototype b) Test
c) Ideate d) Define

12) Which term best describes the ability to see connections between unrelated ideas?
a) Fluency b) Flexibility
c) Originality d) Association

13) One of the benefits of design thinking is _____.
a) Focusing on user-friendly solutions
b) Ignoring customers
c) Cost reduction only
d) Quick fixes

14) Divergent and convergent thinking together ensure _____.
a) Balance between idea generation and selection
b) Faster production
c) Market analysis
d) Less creativity

15) In brainstorming, criticism should be ____.
a) Encouraged b) Postponed
c) Ignored d) Repeated

16) SCAMPER is mainly used for _____.
a) Modifying existing ideas b) Market study
c) Testing materials d) Estimating cost

17) In mind mapping, central themes are _____.
a) Placed at center with branches outward
b) At the edges
c) Hidden
d) Random

18) TRIZ encourages _____.
a) Systematic innovation through contradictions
b) Copying existing patents
c) Brainstorm blocking
d) Linear analysis

19) Which is a creative ideation technique?
a) Storyboarding b) Checklist creation
c) Prototype testing d) Quality audit

20) Concept sketching helps _____.
a) Express ideas visually b) Replace written reports
c) Perform tests d) Manage finance

21) In SCAMPER, “C” stands for _____.
a) Combine b) Copy
c) Create d) Classify

22) The purpose of divergent thinking is to _____.
a) Explore many possibilities b) Select one answer
c) Limit imagination d) Finalize design

23) Which of the following tools is best suited for *organizing ideas?*
a) Mind map b) Pie chart
c) Spreadsheet d) Histogram

24) “Storytelling” in concept development helps designers _____.
a) Communicate user experiences effectively
b) Draw detailed schematics
c) Analyze budget
d) Fix prototypes

25) The last step of concept development is _____.
a) Visualization of ideas b) Brainstorming
c) TRIZ analysis d) Market feedback

26) Prototyping in design helps _____.
a) Convert abstract ideas into tangible models
b) Replace manufacturing
c) Finalize budgets
d) Avoid testing

27) Which prototype type is *cheapest* and fastest?
a) Low-fidelity b) High-fidelity
c) Final d) Medium

28) High-fidelity prototypes allow _____.
a) User interaction and realism
b) Concept only
c) Paper sketching
d) Cost saving only

29) The iterative approach focuses on _____.
a) Refining design through repeated feedback
b) Making single model
c) Reducing creativity
d) Avoiding testing

30) The first step in rapid prototyping is _____.
a) 3D CAD modeling b) Final assembly
c) Testing d) Polishing

31) Which tool is commonly used in rapid prototyping?
a) 3D printer b) Spreadsheet
c) CNC lathe d) Mind map

32) User testing is most crucial in which stage?
a) Prototype evaluation b) Ideation
c) Definition d) Empathize

33) A real-life application of creative design is _____.
a) Smart wearable devices b) Paper waste
c) Redundant designs d) Manual data entry

34) Brainstorming during prototype improvement helps _____.
a) Generate alternative solutions
b) Restrict ideas
c) Delay work
d) Stop iteration

35) Which of the following prototypes allows early visualization?
a) Sketch model b) CAD simulation
c) Clay model d) Flowchart

36) Customer-driven design ensures _____.
a) Meeting user needs b) Reducing quality
c) Ignoring testing d) Increasing cost

37) The final output of iterative design is _____.
a) Optimized product meeting specifications
b) Initial draft
c) Prototype sketch
d) Raw material

38) The goal of sustainable design is _____.
a) Minimize negative environmental impact
b) Increase short-term gain
c) Use non-renewable resources
d) Ignore life cycle

39) Which phase is crucial for sustainability decisions?
a) Design stage b) Disposal
c) Marketing d) Sales

40) Product life-cycle assessment includes _____.
a) Raw material to end-of-life impact
b) Only production cost
c) Marketing only
d) Storage cost

41) A product designed for durability supports _____.
a) Longevity principle b) Obsolescence
c) Short-term use d) High waste

42) Eco-friendly design considers _____.
a) Material selection and energy efficiency
b) Only packaging
c) Advertisement
d) Color

43) "Design for reuse" aims to _____.
a) Extend product life b) Destroy waste
c) Limit recycling d) Increase cost

44) Agile development in design allows _____.
a) Rapid response to change b) Strict stepwise control
c) No feedback d) Delayed iterations

45) Spiral model combines _____.
a) Prototyping and risk management
b) Linear and agile stages
c) Testing and marketing
d) Sales and production

46) The staged (waterfall) model is _____.
a) Sequential b) Iterative
c) Flexible d) Rapid

47) Case studies in sustainable design show _____.
a) Application of eco-friendly materials
b) Ignoring user needs
c) Over-production
d) Energy waste

48) The most important sustainability factor in manufacturing is _____.
a) Resource efficiency
b) Advertisement
c) Branding
d) Design color

49) Which practice promotes a circular economy?
a) Recycling and remanufacturing
b) Landfilling
c) Burning waste
d) Exporting scrap

50) Sustainable engineering mainly targets _____.
a) Balance between economy, society, and environment
b) Maximizing output only
c) Technological monopoly
d) Short-term gains

Seat No.		Set	Q

Marks Obtained		Signature of Examiner		Signature of Junior Supervisor	

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Creativity and Design Thinking (AEC-02)

Day & Date: Tuesday, 12-05-2026 Max. Marks: 50
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
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4) Use of non-programmable calculators is allowed.

Answer

Q.1 Multiple Choice Questions.

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a) Combine b) Copy
c) Create d) Classify

2) The purpose of divergent thinking is to _____.
a) Explore many possibilities b) Select one answer
c) Limit imagination d) Finalize design

3) Which of the following tools is best suited for *organizing ideas?*
a) Mind map b) Pie chart
c) Spreadsheet d) Histogram

4) "Storytelling" in concept development helps designers _____.
a) Communicate user experiences effectively
b) Draw detailed schematics
c) Analyze budget
d) Fix prototypes

5) The last step of concept development is _____.
a) Visualization of ideas b) Brainstorming
c) TRIZ analysis d) Market feedback

6) Prototyping in design helps _____.
a) Convert abstract ideas into tangible models
b) Replace manufacturing
c) Finalize budgets
d) Avoid testing

7) Which prototype type is *cheapest* and fastest?
a) Low-fidelity b) High-fidelity
c) Final d) Medium

8) High-fidelity prototypes allow _____.
a) User interaction and realism
b) Concept only
c) Paper sketching
d) Cost saving only

9) The iterative approach focuses on _____.
a) Refining design through repeated feedback
b) Making single model
c) Reducing creativity
d) Avoiding testing

10) The first step in rapid prototyping is _____.
a) 3D CAD modeling b) Final assembly
c) Testing d) Polishing

11) Which tool is commonly used in rapid prototyping?
a) 3D printer b) Spreadsheet
c) CNC lathe d) Mind map

12) User testing is most crucial in which stage?
a) Prototype evaluation b) Ideation
c) Definition d) Empathize

13) A real-life application of creative design is _____.
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c) Redundant designs d) Manual data entry

14) Brainstorming during prototype improvement helps _____.
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b) Restrict ideas
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c) Clay model d) Flowchart

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c) Ignoring testing d) Increasing cost

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b) Initial draft
c) Prototype sketch
d) Raw material

18) The goal of sustainable design is _____.
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b) Increase short-term gain
c) Use non-renewable resources
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19) Which phase is crucial for sustainability decisions?
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c) Marketing d) Sales

20) Product life-cycle assessment includes _____.
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b) Only production cost
c) Marketing only
d) Storage cost

21) A product designed for durability supports _____.
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22) Eco-friendly design considers _____.
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c) Advertisement
d) Color

23) "Design for reuse" aims to _____.
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c) Testing and marketing
d) Sales and production

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a) Sequential b) Iterative
c) Flexible d) Rapid

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b) Ignoring user needs
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d) Energy waste

28) The most important sustainability factor in manufacturing is _____.
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c) Branding d) Design color

29) Which practice promotes a circular economy?
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b) Landfilling
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d) Exporting scrap

30) Sustainable engineering mainly targets _____.
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c) Technological monopoly
d) Short-term gains

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32) Creativity and Innovation together lead to _____.
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c) Practical novelty d) Mechanical repetition

33) A characteristic of a creative person is _____.
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c) Fearfulness d) Passivity

34) Which of the following represents a major *barrier* to creativity?
a) Time pressure b) Risk-taking
c) Playfulness d) Flexibility

35) The “Ideate” stage in design thinking focuses on _____.
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c) Testing ideas d) Building prototypes

36) Design thinking is fundamentally _____.
a) User-centered b) Manager-centered
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37) Which of these helps to *overcome* creative blocks?
a) Collaboration b) Fear of mistakes
c) Over-planning d) Isolation

38) A design thinker empathizes to _____.
a) Know customer feelings and needs
b) Find product cost
c) Estimate profit
d) Collect market data

39) The *Define* phase results in _____.
a) Problem statement b) Prototype
c) Survey d) Marketing plan

40) Barriers to creativity can be removed through _____.
a) Open communication b) Discouragement
c) Repetition d) Judgmental thinking

41) The last phase of design thinking is _____.
a) Prototype b) Test
c) Ideate d) Define

42) Which term best describes the ability to see connections between unrelated ideas?
a) Fluency b) Flexibility
c) Originality d) Association

43) One of the benefits of design thinking is _____.
a) Focusing on user-friendly solutions
b) Ignoring customers
c) Cost reduction only
d) Quick fixes

44) Divergent and convergent thinking together ensure _____.
a) Balance between idea generation and selection
b) Faster production
c) Market analysis
d) Less creativity

45) In brainstorming, criticism should be ____.
a) Encouraged b) Postponed
c) Ignored d) Repeated

46) SCAMPER is mainly used for _____.
a) Modifying existing ideas b) Market study
c) Testing materials d) Estimating cost

47) In mind mapping, central themes are _____.
a) Placed at center with branches outward
b) At the edges
c) Hidden
d) Random

48) TRIZ encourages _____.

a) Systematic innovation through contradictions
b) Copying existing patents
c) Brainstorm blocking
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49) Which is a creative ideation technique?

a) Storyboarding
b) Checklist creation
c) Prototype testing
d) Quality audit

50) Concept sketching helps _____.

a) Express ideas visually
b) Replace written reports
c) Perform tests
d) Manage finance

SLR-QH-235

Seat No.		Set	R

Marks Obtained		Signature of Examiner		Signature of Junior Supervisor	

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Creativity and Design Thinking (AEC-02)

Day & Date: Tuesday, 12-05-2026 Max. Marks: 50
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Mention Question Paper Set (P/Q/R/S) on Top of Page.
4) Use of non-programmable calculators is allowed.

Answer

Q.1 Multiple Choice Questions.

1) A product designed for durability supports _____.
a) Longevity principle b) Obsolescence
c) Short-term use d) High waste

2) Eco-friendly design considers _____.
a) Material selection and energy efficiency
b) Only packaging
c) Advertisement
d) Color

3) "Design for reuse" aims to _____.
a) Extend product life b) Destroy waste
c) Limit recycling d) Increase cost

4) Agile development in design allows _____.
a) Rapid response to change b) Strict stepwise control
c) No feedback d) Delayed iterations

5) Spiral model combines _____.
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b) Linear and agile stages
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6) The staged (waterfall) model is _____.
a) Sequential b) Iterative
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c) Repetition d) Judgmental thinking

21) The last phase of design thinking is _____.
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c) Ideate d) Define

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a) Storyboarding b) Checklist creation
c) Prototype testing d) Quality audit

30) Concept sketching helps _____.
a) Express ideas visually b) Replace written reports
c) Perform tests d) Manage finance

31) In SCAMPER, "C" stands for _____.
a) Combine b) Copy
c) Create d) Classify

32) The purpose of divergent thinking is to _____.
a) Explore many possibilities b) Select one answer
c) Limit imagination d) Finalize design

33) Which of the following tools is best suited for *organizing ideas?*
a) Mind map b) Pie chart
c) Spreadsheet d) Histogram

34) "Storytelling" in concept development helps designers _____.
a) Communicate user experiences effectively
b) Draw detailed schematics
c) Analyze budget
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c) Prototype sketch
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c) Use non-renewable resources
d) Ignore life cycle

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c) Marketing d) Sales

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c) Marketing only
d) Storage cost

SLR-QH-235

Seat No.		Set	S

Marks Obtained		Signature of Examiner		Signature of Junior Supervisor	

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Creativity and Design Thinking (AEC-02)

Day & Date: Tuesday, 12-05-2026 Max. Marks: 50
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Mention Question Paper Set (P/Q/R/S) on Top of Page.
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Answer

Q.1 Multiple Choice Questions.

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39) Which practice promotes a circular economy?
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a) Know customer feelings and needs
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c) Estimate profit
d) Collect market data

49) The *Define* phase results in _____.

a) Problem statement
b) Prototype
c) Survey
d) Marketing plan

50) Barriers to creativity can be removed through _____.

a) Open communication
b) Discouragement
c) Repetition
d) Judgmental thinking

SLR-QH-236

Seat No.		Set	P

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Honors in Innovation and Design Engineering (Stage - I)
Engineering Systems and Design Optimization (CIVHON-03A)

Day & Date: Thursday, 14-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page No. 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper Set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) Types of Optimization Algorithm are _____.
a) Single Variable Algorithm b) Multi Variable Algorithm
c) Specialized Algorithm d) All of these

2) Which of the following is not application of Optimization?
a) Maximize Discharge through Pipe
b) Minimize the cost of Construction
c) Calculation of shear force in column
d) None of these

3) Which are main goal of optimization?
a) Minimizing b) Maximising
c) Both a) and b) d) None of these

4) Region Elimination Methods are _____.
a) Fibonacci Search Method b) Golden Section Method
c) Both 'a' and 'b' d) None of these

5) Process involved in genetic Algorithm are _____.
a) Selection b) Mutation
c) Cross-over d) All of these

6) Re-analysis techniques in optimization are _____.
a) Fast Techniques b) Slow Techniques
c) Both a and b d) None of these

7) Gradient-Based Methods are _____.
a) Newton Raphson Method b) Bisection Method
c) Both ‘a’ and ‘b’ d) None of these

8) Which of the following field in which optimization is used?
a) Finance b) Demand and Supply
c) Airline d) All of these

9) Bracketing methods are _____.
a) Extensive search method b) Bound phase Method
c) Both a and b d) None of these

10) Which of the following is specialized method for optimization?
a) Integer Programming b) Geometric Programming
c) Simulated Annealing d) All of these

11) Which of the following is not type of crossover?
a) One-point crossover b) Two-point crossover
c) Three-point crossover d) Uniform crossover

12) Global Optimization considers _____.
a) Entire Region b) Only Boundary Points
c) Both a and b d) None of these

13) Which of the following is not method for multi-objective optimization?
a) Fibonacci Search Method
b) Unidirectional Search Method
c) Direct Search Method
d) Newton’s Method

14) Number of search direction required in Powell’s Conjugate Direction Method search are _____.
a) One b) Two
c) Three d) Four

Seat No.	

Set **P**

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Honors in Innovation and Design Engineering (Stage - I)
Engineering Systems and Design Optimization (CIVHON-03A)

Day & Date: Thursday, 14-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to right indicate full marks.
3) Assume suitable data wherever necessary and mention it clearly.

SECTION – I

Q.2 Answer the following. (Any Two) **12**

a) Formulate Optimization Problem in any field.

b) Describe 'Optimization Algorithm' in detail.

c) Explain various application of Optimization.

Q.3 Solve the following. (Any Two) **08**

a) Optimize the given function.
$f(x) = x^2 + \frac{36}{x}$ using extensive search method.
$a = 0, b = 5, n = 20$

b) Solve an optimization problem using 'Fibonacci Search Method' with the function.
$f(x) = x^2 + \frac{20}{x}, n = 3, k = 2, a = 0.4, b = 6.5$
$F_0 = 1, F_1 = 1, F_2 = 2, F_3 = 3, F_4 = 5$

c) Optimize the given function.
$f(x) = x^2 - 2x + 1$ Use Bisection method.
$a = 0 \quad b = 5 \quad \varepsilon = 10^{-3}$

Q.4 Solve the following. (Any Two) **08**

a) Optimize the given function using uni-directional search.
$f(x) = (x_1 - 6)^2 + (x_2 - 3)^2$
$x^{(0)} = (1,0), s = (1,1), \varepsilon = 10^{-3}$

b) Formulate an optimization search using steepest decent method.
$f(x) = {x_1}^2 - 2x_1x_2 - {x_2}^2, x^{(0)} = (1,1)$

c) Optimize the given function using Powell's conjugate directional Method.
$f(x) = {x_1}^2 - 3x_1x_2 + {x_2}^2$
$x^{(0)} = (1,1) \quad s_1 = (1,0) \quad s_2 = (0,1) \quad \varepsilon = 10^{-3}$

SECTION – II

Q.5 Answer the following. (Any Two) **12**

a) Optimize the given function.

$Z = 8\,x + 6y$

Subject to constraints

$2x + 4y \leq 16$

$x \leq 3$

$y \geq 0, x \geq 0$

b) Optimize the given function using Geometric Programming.

$f(x) = x_1 + x_2 + \frac{1}{x_1 x_2}$

c) Optimize the given function using Simulated Annealing.

$f(x) = 450 - {x_1}^2 - 2x_1{x_2}^2 - {x_2}^2$

$x^{(0)} = (1,1), \varepsilon = 10^{-3}$

Q.6 Answer the following. (Any Two) **08**

a) Explain ‘Genetic Algorithm’ in Details.

b) What is difference between ‘Genetic Algorithm’ & ‘Traditional Techniques’.

c) Write down computer programme for ‘Newton Raphson Method.

Q.7 Answer the following. (Any Two) **08**

a) Describe various ‘Reanalysis’ Techniques.

b) Explain ‘Reduction in size of optimization problem’.

c) What is the concept of ‘Multi-Level Optimization’?

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Honors in Innovation and Design Engineering (Stage - I)
Engineering Systems and Design Optimization (CIVHON-03A)

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MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) Which of the following field in which optimization is used?
a) Finance b) Demand and Supply
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2) Bracketing methods are _____.
a) Extensive search method b) Bound phase Method
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3) Which of the following is specialized method for optimization?
a) Integer Programming b) Geometric Programming
c) Simulated Annealing d) All of these

4) Which of the following is not type of crossover?
a) One-point crossover b) Two-point crossover
c) Three-point crossover d) Uniform crossover

5) Global Optimization considers _____.
a) Entire Region b) Only Boundary Points
c) Both a and b d) None of these

6) Which of the following is not method for multi-objective optimization?
a) Fibonacci Search Method
b) Unidirectional Search Method
c) Direct Search Method
d) Newton's Method

7) Number of search direction required in Powell's Conjugate Direction Method search are _____.
   a) One b) Two
   c) Three d) Four

8) Types of Optimization Algorithm are _____.
   a) Single Variable Algorithm b) Multi Variable Algorithm
   c) Specialized Algorithm d) All of these

9) Which of the following is not application of Optimization?
   a) Maximize Discharge through Pipe
   b) Minimize the cost of Construction
   c) Calculation of shear force in column
   d) None of these

10) Which are main goal of optimization?
   a) Minimizing b) Maximising
   c) Both a) and b) d) None of these

11) Region Elimination Methods are _____.
   a) Fibonacci Search Method b) Golden Section Method
   c) Both 'a' and 'b' d) None of these

12) Process involved in genetic Algorithm are _____.
   a) Selection b) Mutation
   c) Cross-over d) All of these

13) Re-analysis techniques in optimization are _____.
   a) Fast Techniques b) Slow Techniques
   c) Both a and b d) None of these

14) Gradient-Based Methods are _____.
   a) Newton Raphson Method b) Bisection Method
   c) Both 'a' and 'b' d) None of these

SLR-QH-236

Seat No.		Set	Q

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Honors in Innovation and Design Engineering (Stage - I)
Engineering Systems and Design Optimization (CIVHON-03A)

Day & Date: Thursday, 14-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to right indicate full marks.
3) Assume suitable data wherever necessary and mention it clearly.

SECTION – I

Q.2 Answer the following. (Any Two) **12**

a) Formulate Optimization Problem in any field.

b) Describe 'Optimization Algorithm' in detail.

c) Explain various application of Optimization.

Q.3 Solve the following. (Any Two) **08**

a) Optimize the given function.
$f(x) = x^2 + \frac{36}{x}$ using extensive search method.
$a = 0, b = 5, n = 20$

b) Solve an optimization problem using 'Fibonacci Search Method' with the function.
$f(x) = x^2 + \frac{20}{x}, n = 3, k = 2, a = 0.4, b = 6.5$
$F_0 = 1, F_1 = 1, F_2 = 2, F_3 = 3, F_4 = 5$

c) Optimize the given function.
$f(x) = x^2 - 2x + 1$ Use Bisection method.
$a = 0 \quad b = 5 \quad \varepsilon = 10^{-3}$

Q.4 Solve the following. (Any Two) **08**

a) Optimize the given function using uni-directional search.
$f(x) = (x_1 - 6)^2 + (x_2 - 3)^2$
$x^{(0)} = (1,0), s = (1,1), \varepsilon = 10^{-3}$

b) Formulate an optimization search using steepest decent method.
$f(x) = {x_1}^2 - 2x_1x_2 - {x_2}^2, x^{(0)} = (1,1)$

c) Optimize the given function using Powell's conjugate directional Method.
$f(x) = {x_1}^2 - 3x_1x_2 + {x_2}^2$
$x^{(0)} = (1,1) \quad s_1 = (1,0) \quad s_2 = (0,1) \quad \varepsilon = 10^{-3}$

SECTION – II

Q.5 Answer the following. (Any Two) **12**

a) Optimize the given function.

$Z = 8\,x + 6y$

Subject to constraints

$2x + 4y \leq 16$

$x \leq 3$

$y \geq 0, x \geq 0$

b) Optimize the given function using Geometric Programming.

$f(x) = x_1 + x_2 + \frac{1}{x_1 x_2}$

c) Optimize the given function using Simulated Annealing.

$f(x) = 450 - {x_1}^2 - 2x_1{x_2}^2 - {x_2}^2$

$x^{(0)} = (1,1), \varepsilon = 10^{-3}$

Q.6 Answer the following. (Any Two) **08**

a) Explain ‘Genetic Algorithm’ in Details.

b) What is difference between ‘Genetic Algorithm’ & ‘Traditional Techniques’.

c) Write down computer programme for ‘Newton Raphson Method.

Q.7 Answer the following. (Any Two) **08**

a) Describe various ‘Reanalysis’ Techniques.

b) Explain ‘Reduction in size of optimization problem’.

c) What is the concept of ‘Multi-Level Optimization’?

SLR-QH-236

Seat No.	

Set R

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Honors in Innovation and Design Engineering (Stage - I)
Engineering Systems and Design Optimization (CIVHON-03A)

Day & Date: Thursday, 14-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page No. 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper Set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) Which of the following is not type of crossover?
a) One-point crossover b) Two-point crossover
c) Three-point crossover d) Uniform crossover

2) Global Optimization considers _____.
a) Entire Region b) Only Boundary Points
c) Both a and b d) None of these

3) Which of the following is not method for multi-objective optimization?
a) Fibonacci Search Method
b) Unidirectional Search Method
c) Direct Search Method
d) Newton's Method

4) Number of search direction required in Powell's Conjugate Direction Method search are _____.
a) One b) Two
c) Three d) Four

5) Types of Optimization Algorithm are _____.
a) Single Variable Algorithm b) Multi Variable Algorithm
c) Specialized Algorithm d) All of these

6) Which of the following is not application of Optimization?
a) Maximize Discharge through Pipe
b) Minimize the cost of Construction
c) Calculation of shear force in column
d) None of these

7) Which are main goal of optimization?
a) Minimizing b) Maximising
c) Both a) and b) d) None of these

8) Region Elimination Methods are _____.
a) Fibonacci Search Method b) Golden Section Method
c) Both ‘a’ and ‘b’ d) None of these

9) Process involved in genetic Algorithm are _____.
a) Selection b) Mutation
c) Cross-over d) All of these

10) Re-analysis techniques in optimization are _____.
a) Fast Techniques b) Slow Techniques
c) Both a and b d) None of these

11) Gradient-Based Methods are _____.
a) Newton Raphson Method b) Bisection Method
c) Both ‘a’ and ‘b’ d) None of these

12) Which of the following field in which optimization is used?
a) Finance b) Demand and Supply
c) Airline d) All of these

13) Bracketing methods are _____.
a) Extensive search method b) Bound phase Method
c) Both a and b d) None of these

14) Which of the following is specialized method for optimization?
a) Integer Programming b) Geometric Programming
c) Simulated Annealing d) All of these

Seat No.	

Set **R**

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Honors in Innovation and Design Engineering (Stage - I)
Engineering Systems and Design Optimization (CIVHON-03A)

Day & Date: Thursday, 14-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to right indicate full marks.
3) Assume suitable data wherever necessary and mention it clearly.

SECTION – I

Q.2 Answer the following. (Any Two) **12**

a) Formulate Optimization Problem in any field.

b) Describe 'Optimization Algorithm' in detail.

c) Explain various application of Optimization.

Q.3 Solve the following. (Any Two) **08**

a) Optimize the given function.
$f(x) = x^2 + \frac{36}{x}$ using extensive search method.
$a = 0, b = 5, n = 20$

b) Solve an optimization problem using 'Fibonacci Search Method' with the function.
$f(x) = x^2 + \frac{20}{x}, n = 3, k = 2, a = 0.4, b = 6.5$
$F_0 = 1, F_1 = 1, F_2 = 2, F_3 = 3, F_4 = 5$

c) Optimize the given function.
$f(x) = x^2 - 2x + 1$ Use Bisection method.
$a = 0 \quad b = 5 \quad \varepsilon = 10^{-3}$

Q.4 Solve the following. (Any Two) **08**

a) Optimize the given function using uni-directional search.
$f(x) = (x_1 - 6)^2 + (x_2 - 3)^2$
$x^{(0)} = (1,0), s = (1,1), \varepsilon = 10^{-3}$

b) Formulate an optimization search using steepest decent method.
$f(x) = {x_1}^2 - 2x_1x_2 - {x_2}^2, x^{(0)} = (1,1)$

c) Optimize the given function using Powell's conjugate directional Method.
$f(x) = {x_1}^2 - 3x_1x_2 + {x_2}^2$
$x^{(0)} = (1,1) \quad s_1 = (1,0) \quad s_2 = (0,1) \quad \varepsilon = 10^{-3}$

SECTION – II

Q.5 Answer the following. (Any Two) **12**

a) Optimize the given function.

$Z = 8\,x + 6y$

Subject to constraints

$2x + 4y \leq 16$

$x \leq 3$

$y \geq 0, x \geq 0$

b) Optimize the given function using Geometric Programming.

$f(x) = x_1 + x_2 + \frac{1}{x_1 x_2}$

c) Optimize the given function using Simulated Annealing.

$f(x) = 450 - {x_1}^2 - 2x_1{x_2}^2 - {x_2}^2$

$x^{(0)} = (1,1), \varepsilon = 10^{-3}$

Q.6 Answer the following. (Any Two) **08**

a) Explain ‘Genetic Algorithm’ in Details.

b) What is difference between ‘Genetic Algorithm’ & ‘Traditional Techniques’.

c) Write down computer programme for ‘Newton Raphson Method.

Q.7 Answer the following. (Any Two) **08**

a) Describe various ‘Reanalysis’ Techniques.

b) Explain ‘Reduction in size of optimization problem’.

c) What is the concept of ‘Multi-Level Optimization’?

Seat No.	

Set | S

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Honors in Innovation and Design Engineering (Stage - I)
Engineering Systems and Design Optimization (CIVHON-03A)

Day & Date: Thursday, 14-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page No. 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper Set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) Re-analysis techniques in optimization are _____.
a) Fast Techniques b) Slow Techniques
c) Both a and b d) None of these

2) Gradient-Based Methods are _____.
a) Newton Raphson Method b) Bisection Method
c) Both 'a' and 'b' d) None of these

3) Which of the following field in which optimization is used?
a) Finance b) Demand and Supply
c) Airline d) All of these

4) Bracketing methods are _____.
a) Extensive search method b) Bound phase Method
c) Both a and b d) None of these

5) Which of the following is specialized method for optimization?
a) Integer Programming b) Geometric Programming
c) Simulated Annealing d) All of these

6) Which of the following is not type of crossover?
a) One-point crossover b) Two-point crossover
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7) Global Optimization considers _____.
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8) Which of the following is not method for multi-objective optimization?
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   b) Unidirectional Search Method
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9) Number of search direction required in Powell's Conjugate Direction Method search are _____.
   a) One
   b) Two
   c) Three
   d) Four

10) Types of Optimization Algorithm are _____.
   a) Single Variable Algorithm
   b) Multi Variable Algorithm
   c) Specialized Algorithm
   d) All of these

11) Which of the following is not application of Optimization?
   a) Maximize Discharge through Pipe
   b) Minimize the cost of Construction
   c) Calculation of shear force in column
   d) None of these

12) Which are main goal of optimization?
   a) Minimizing
   b) Maximising
   c) Both a) and b)
   d) None of these

13) Region Elimination Methods are _____.
   a) Fibonacci Search Method
   b) Golden Section Method
   c) Both 'a' and 'b'
   d) None of these

14) Process involved in genetic Algorithm are _____.
   a) Selection
   b) Mutation
   c) Cross-over
   d) All of these

Seat No.		Set	S

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Honors in Innovation and Design Engineering (Stage - I)
Engineering Systems and Design Optimization (CIVHON-03A)

Day & Date: Thursday, 14-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to right indicate full marks.
3) Assume suitable data wherever necessary and mention it clearly.

SECTION – I

Q.2 Answer the following. (Any Two) **12**

a) Formulate Optimization Problem in any field.

b) Describe 'Optimization Algorithm' in detail.

c) Explain various application of Optimization.

Q.3 Solve the following. (Any Two) **08**

a) Optimize the given function.
$f(x) = x^2 + \frac{36}{x}$ using extensive search method.
$a = 0, b = 5, n = 20$

b) Solve an optimization problem using 'Fibonacci Search Method' with the function.
$f(x) = x^2 + \frac{20}{x}, n = 3, k = 2, a = 0.4, b = 6.5$
$F_0 = 1, F_1 = 1, F_2 = 2, F_3 = 3, F_4 = 5$

c) Optimize the given function.
$f(x) = x^2 - 2x + 1$ Use Bisection method.
$a = 0 \quad b = 5 \quad \varepsilon = 10^{-3}$

Q.4 Solve the following. (Any Two) **08**

a) Optimize the given function using uni-directional search.
$f(x) = (x_1 - 6)^2 + (x_2 - 3)^2$
$x^{(0)} = (1,0), s = (1,1), \varepsilon = 10^{-3}$

b) Formulate an optimization search using steepest decent method.
$f(x) = {x_1}^2 - 2x_1x_2 - {x_2}^2, x^{(0)} = (1,1)$

c) Optimize the given function using Powell's conjugate directional Method.
$f(x) = {x_1}^2 - 3x_1x_2 + {x_2}^2$
$x^{(0)} = (1,1) \quad s_1 = (1,0) \quad s_2 = (0,1) \quad \varepsilon = 10^{-3}$

SECTION – II

Q.5 Answer the following. (Any Two) **12**

a) Optimize the given function.

$Z = 8\,x + 6y$

Subject to constraints

$2x + 4y \leq 16$

$x \leq 3$

$y \geq 0, x \geq 0$

b) Optimize the given function using Geometric Programming.

$f(x) = x_1 + x_2 + \frac{1}{x_1 x_2}$

c) Optimize the given function using Simulated Annealing.

$f(x) = 450 - {x_1}^2 - 2x_1{x_2}^2 - {x_2}^2$

$x^{(0)} = (1,1), \varepsilon = 10^{-3}$

Q.6 Answer the following. (Any Two) **08**

a) Explain ‘Genetic Algorithm’ in Details.

b) What is difference between ‘Genetic Algorithm’ & ‘Traditional Techniques’.

c) Write down computer programme for ‘Newton Raphson Method.

Q.7 Answer the following. (Any Two) **08**

a) Describe various ‘Reanalysis’ Techniques.

b) Explain ‘Reduction in size of optimization problem’.

c) What is the concept of ‘Multi-Level Optimization’?

SLR-QH-237

Seat No.		Set	P

T.Y. (B.Tech.) (Civil Engineering) (Sem - I) (New) (CBCS)
Examination: March/April – 2026
Honors in Infrastructure Engineering (Stage - I)
Roads and Highway Project Development (CIVHON-03B)

Day & Date: Thursday, 14-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose correct alternatives. **14**

1) The index map shows _____.
a) Topography b) Soil
c) Area of the site d) Plan

2) Detailed size drawings are prepared in which sheet?
a) A1 b) A2
c) A3 d) A4

3) The report that includes all the works including soil, bridges, topography, material studies and drainage studies is called as _____.
a) Feasibility report b) Detailed project report
c) Survey report d) Primary report

4) Which of the following must be considered while conducting a road survey?
a) Density b) Alignment of the curves
c) Specific gravity d) Atmospheric condition

5) Which of the following indicates the objective of road survey?
a) Specific gravity b) Density
c) Pavement design d) Detailed layout of road way

6) Transition curve is introduced in _____.
a) Horizontal curve
b) Circular curve
c) Between horizontal curve and circular curve
d) Vertical curve

7) In India, the type of traffic assumed to design pavements is _____.
   a) Low traffic
   b) Heavy traffic
   c) Mixed traffic flow
   d) Very low traffic

8) Scoping is procedure of _____ environmental issues.
   a) Identifying
   b) impact
   c) physical impact
   d) attributes

9) What is essential in an EIA?
   a) that it allows decision makers to assess a project's impacts in all its phases
   b) that it allows the public and other stakeholders to present their views and inputs on the planned development
   c) that it contributes to and improve the project design, so that environmental as well as Socio economic measures are core parts of it
   d) All of the above

10) EIA is study of probable change in socio economic and characteristics of environment due to proposed action.
   a) biophysical
   b) geological
   c) hydrological
   d) Potential

11) The DPR consists of how many components?
   a) One
   b) Two
   c) Three
   d) Four

12) The first step in the detail checklist of DPR is _____.
   a) Executive summary
   b) Background
   c) Roadway features
   d) General details of the project

13) Group index method of design of flexible pavement is _____.
   a) A theoretical method
   b) An empirical method based on physical properties of sub-grade soil
   c) An empirical method based on strength characteristics of subgrade soil
   d) A semi-empirical method

14) In highway construction, rolling starts from _____.
   a) Sides and proceed to center
   b) Center and proceed to sides
   c) One side and proceed to another side
   d) Any of the above

Seat No.		Set	P

T.Y. (B.Tech.) (Civil Engineering) (Sem - I) (New) (CBCS)
Examination: March/April – 2026
Honors in Infrastructure Engineering (Stage - I)
Roads and Highway Project Development (CIVHON-03B)

Day & Date: Thursday, 14-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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

Section – I

Q.2 Solve Any Two **14**

a) Write down salient features of ongoing Road project in India.

b) Define HR structure of construction industry. Write how to implement HR structure in project.

c) Explain topographic survey, Write its important for highway constructions?

Q.3 Solve Any Two **14**

a) Write Down material survey, Which type of test conducted on highway material?

b) A vertical summit curve is formed when an ascending gradient of 4% another descending gradient of 6%. find the length of summit curve to provide the required stopping sight distance for a design speed of 80 kmph. Take reaction time of driver is 2.3 sec and F=0.36.

c) Explain various design factors controlling the Horizontal alignment of highways.

Section – II

Q.4 Solve Any Two **14**

a) Describe the various components of process of EIA.

b) Explain stepwise the procedure for environment appraisal.

c) State the drawing required for DPR Project explain any one in details.

Q.5 Solve Any Two **14**

a) Difference between- Technical and financial Evaluation.

b) Write stepwise procedure of construction of Cement concrete road.

c) What are the desirable properties of sub grade soil? Enumerate the identification and classification teste of soils.

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Civil Engineering) (Sem - I) (New) (CBCS)
Examination: March/April – 2026
Honors in Infrastructure Engineering (Stage - I)
Roads and Highway Project Development (CIVHON-03B)

Day & Date: Thursday, 14-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose correct alternatives. **14**

1) Scoping is procedure of _____ environmental issues.
a) Identifying b) impact
c) physical impact d) attributes

2) What is essential in an EIA?
a) that it allows decision makers to assess a project's impacts in all its phases
b) that it allows the public and other stakeholders to present their views and inputs on the planned development
c) that it contributes to and improve the project design, so that environmental as well as Socio economic measures are core parts of it
d) All of the above

3) EIA is study of probable change in socio economic and characteristics of environment due to proposed action.
a) biophysical b) geological
c) hydrological d) Potential

4) The DPR consists of how many components?
a) One b) Two
c) Three d) Four

5) The first step in the detail checklist of DPR is _____.
a) Executive summary b) Background
c) Roadway features d) General details of the project

6) Group index method of design of flexible pavement is _____.
   a) A theoretical method
   b) An empirical method based on physical properties of sub-grade soil
   c) An empirical method based on strength characteristics of subgrade soil
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7) In highway construction, rolling starts from _____.
   a) Sides and proceed to center
   b) Center and proceed to sides
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8) The index map shows _____.
   a) Topography
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9) Detailed size drawings are prepared in which sheet?
   a) A1
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   d) A4

10) The report that includes all the works including soil, bridges, topography, material studies and drainage studies is called as _____.
   a) Feasibility report
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   c) Survey report
   d) Primary report

11) Which of the following must be considered while conducting a road survey?
   a) Density
   b) Alignment of the curves
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   d) Atmospheric condition

12) Which of the following indicates the objective of road survey?
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13) Transition curve is introduced in _____.
   a) Horizontal curve
   b) Circular curve
   c) Between horizontal curve and circular curve
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14) In India, the type of traffic assumed to design pavements is _____.
   a) Low traffic
   b) Heavy traffic
   c) Mixed traffic flow
   d) Very low traffic

SLR-QH-237

Seat No.	

Set Q

T.Y. (B.Tech.) (Civil Engineering) (Sem - I) (New) (CBCS)
Examination: March/April – 2026
Honors in Infrastructure Engineering (Stage - I)
Roads and Highway Project Development (CIVHON-03B)

Day & Date: Thursday, 14-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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

Section – I

Q.2 Solve Any Two **14**

a) Write down salient features of ongoing Road project in India.

b) Define HR structure of construction industry. Write how to implement HR structure in project.

c) Explain topographic survey, Write its important for highway constructions?

Q.3 Solve Any Two **14**

a) Write Down material survey, Which type of test conducted on highway material?

b) A vertical summit curve is formed when an ascending gradient of 4% another descending gradient of 6%. find the length of summit curve to provide the required stopping sight distance for a design speed of 80 kmph. Take reaction time of driver is 2.3 sec and F=0.36.

c) Explain various design factors controlling the Horizontal alignment of highways.

Section – II

Q.4 Solve Any Two **14**

a) Describe the various components of process of EIA.

b) Explain stepwise the procedure for environment appraisal.

c) State the drawing required for DPR Project explain any one in details.

Q.5 Solve Any Two **14**

a) Difference between- Technical and financial Evaluation.

b) Write stepwise procedure of construction of Cement concrete road.

c) What are the desirable properties of sub grade soil? Enumerate the identification and classification teste of soils.

Seat No.	

Set **R**

T.Y. (B.Tech.) (Civil Engineering) (Sem - I) (New) (CBCS)
Examination: March/April – 2026
Honors in Infrastructure Engineering (Stage - I)
Roads and Highway Project Development (CIVHON-03B)

Day & Date: Thursday, 14-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose correct alternatives. **14**

1) The DPR consists of how many components?
a) One b) Two
c) Three d) Four

2) The first step in the detail checklist of DPR is _____.
a) Executive summary b) Background
c) Roadway features d) General details of the project

3) Group index method of design of flexible pavement is _____.
a) A theoretical method
b) An empirical method based on physical properties of sub-grade soil
c) An empirical method based on strength characteristics of subgrade soil
d) A semi-empirical method

4) In highway construction, rolling starts from _____.
a) Sides and proceed to center
b) Center and proceed to sides
c) One side and proceed to another side
d) Any of the above

5) The index map shows _____.
a) Topography b) Soil
c) Area of the site d) Plan

6) Detailed size drawings are prepared in which sheet?
a) A1 b) A2
c) A3 d) A4

7) The report that includes all the works including soil, bridges, topography, material studies and drainage studies is called as _____.
a) Feasibility report
b) Detailed project report
c) Survey report
d) Primary report

8) Which of the following must be considered while conducting a road survey?
a) Density
b) Alignment of the curves
c) Specific gravity
d) Atmospheric condition

9) Which of the following indicates the objective of road survey?
a) Specific gravity
b) Density
c) Pavement design
d) Detailed layout of road way

10) Transition curve is introduced in _____.
a) Horizontal curve
b) Circular curve
c) Between horizontal curve and circular curve
d) Vertical curve

11) In India, the type of traffic assumed to design pavements is _____.
a) Low traffic
b) Heavy traffic
c) Mixed traffic flow
d) Very low traffic

12) Scoping is procedure of _____ environmental issues.
a) Identifying
b) impact
c) physical impact
d) attributes

13) What is essential in an EIA?
a) that it allows decision makers to assess a project's impacts in all its phases
b) that it allows the public and other stakeholders to present their views and inputs on the planned development
c) that it contributes to and improve the project design, so that environmental as well as Socio economic measures are core parts of it
d) All of the above

14) EIA is study of probable change in socio economic and characteristics of environment due to proposed action.
a) biophysical
b) geological
c) hydrological
d) Potential

SLR-QH-237

Seat No.		Set	R

T.Y. (B.Tech.) (Civil Engineering) (Sem - I) (New) (CBCS)
Examination: March/April – 2026
Honors in Infrastructure Engineering (Stage - I)
Roads and Highway Project Development (CIVHON-03B)

Day & Date: Thursday, 14-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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

Section – I

Q.2 Solve Any Two **14**

a) Write down salient features of ongoing Road project in India.

b) Define HR structure of construction industry. Write how to implement HR structure in project.

c) Explain topographic survey, Write its important for highway constructions?

Q.3 Solve Any Two **14**

a) Write Down material survey, Which type of test conducted on highway material?

b) A vertical summit curve is formed when an ascending gradient of 4% another descending gradient of 6%. find the length of summit curve to provide the required stopping sight distance for a design speed of 80 kmph. Take reaction time of driver is 2.3 sec and F=0.36.

c) Explain various design factors controlling the Horizontal alignment of highways.

Section – II

Q.4 Solve Any Two **14**

a) Describe the various components of process of EIA.

b) Explain stepwise the procedure for environment appraisal.

c) State the drawing required for DPR Project explain any one in details.

Q.5 Solve Any Two **14**

a) Difference between- Technical and financial Evaluation.

b) Write stepwise procedure of construction of Cement concrete road.

c) What are the desirable properties of sub grade soil? Enumerate the identification and classification teste of soils.

SLR-QH-237

Seat No.		Set	S

T.Y. (B.Tech.) (Civil Engineering) (Sem - I) (New) (CBCS)
Examination: March/April – 2026
Honors in Infrastructure Engineering (Stage - I)
Roads and Highway Project Development (CIVHON-03B)

Day & Date: Thursday, 14-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose correct alternatives. **14**

1) Transition curve is introduced in _____.
a) Horizontal curve
b) Circular curve
c) Between horizontal curve and circular curve
d) Vertical curve

2) In India, the type of traffic assumed to design pavements is _____.
a) Low traffic b) Heavy traffic
c) Mixed traffic flow d) Very low traffic

3) Scoping is procedure of _____ environmental issues.
a) Identifying b) impact
c) physical impact d) attributes

4) What is essential in an EIA?
a) that it allows decision makers to assess a project's impacts in all its phases
b) that it allows the public and other stakeholders to present their views and inputs on the planned development
c) that it contributes to and improve the project design, so that environmental as well as Socio economic measures are core parts of it
d) All of the above

5) EIA is study of probable change in socio economic and characteristics of environment due to proposed action.
a) biophysical b) geological
c) hydrological d) Potential

6) The DPR consists of how many components?
a) One b) Two
c) Three d) Four

7) The first step in the detail checklist of DPR is _____.
a) Executive summary b) Background
c) Roadway features d) General details of the project

8) Group index method of design of flexible pavement is _____.
a) A theoretical method
b) An empirical method based on physical properties of sub-grade soil
c) An empirical method based on strength characteristics of subgrade soil
d) A semi-empirical method

9) In highway construction, rolling starts from _____.
a) Sides and proceed to center
b) Center and proceed to sides
c) One side and proceed to another side
d) Any of the above

10) The index map shows _____.
a) Topography b) Soil
c) Area of the site d) Plan

11) Detailed size drawings are prepared in which sheet?
a) A1 b) A2
c) A3 d) A4

12) The report that includes all the works including soil, bridges, topography, material studies and drainage studies is called as _____.
a) Feasibility report b) Detailed project report
c) Survey report d) Primary report

13) Which of the following must be considered while conducting a road survey?
a) Density b) Alignment of the curves
c) Specific gravity d) Atmospheric condition

14) Which of the following indicates the objective of road survey?
a) Specific gravity b) Density
c) Pavement design d) Detailed layout of road way

SLR-QH-237

Seat No.		Set	S

T.Y. (B.Tech.) (Civil Engineering) (Sem - I) (New) (CBCS)
Examination: March/April – 2026
Honors in Infrastructure Engineering (Stage - I)
Roads and Highway Project Development (CIVHON-03B)

Day & Date: Thursday, 14-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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

Section – I

Q.2 Solve Any Two **14**

a) Write down salient features of ongoing Road project in India.

b) Define HR structure of construction industry. Write how to implement HR structure in project.

c) Explain topographic survey, Write its important for highway constructions?

Q.3 Solve Any Two **14**

a) Write Down material survey, Which type of test conducted on highway material?

b) A vertical summit curve is formed when an ascending gradient of 4% another descending gradient of 6%. find the length of summit curve to provide the required stopping sight distance for a design speed of 80 kmph. Take reaction time of driver is 2.3 sec and F=0.36.

c) Explain various design factors controlling the Horizontal alignment of highways.

Section – II

Q.4 Solve Any Two **14**

a) Describe the various components of process of EIA.

b) Explain stepwise the procedure for environment appraisal.

c) State the drawing required for DPR Project explain any one in details.

Q.5 Solve Any Two **14**

a) Difference between- Technical and financial Evaluation.

b) Write stepwise procedure of construction of Cement concrete road.

c) What are the desirable properties of sub grade soil? Enumerate the identification and classification teste of soils.

SLR-QH-238

Seat No.	

Set P

T.Y. (B.Tech.) (Civil Engineering) (Sem - I) (New) (CBCS)
Examination: March/April – 2026
Honors in Sustainability Engineering (Stage - I)
Sustainable Materials and Green Buildings (CIVHON-03C)

Day & Date: Thursday, 14-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Multiple Choice Questions. **14**

1) What are the three pillars of sustainability?
a) Reduce, Reuse, Recycle
b) Social, Economic, Environmental
c) Energy, Water, Waste
d) Urban, Industrial, Rural

2) Which of the following is NOT one of the 5R principles of sustainability?
a) Reduce b) Recycle
c) Recover d) Regulate

3) A key sustainability goal for the construction industry is _____.
a) Maximizing construction speed
b) Minimizing labor costs
c) Effective management of Construction and Demolition (C&D) waste
d) Using only traditional materials

4) CLC Blocks are characterized by their _____.
a) High density and weight
b) Cellular structure and light weight
c) High thermal conductivity
d) Soluble nature in water

5) Fly ash bricks are an example of a sustainable material because they _____.
   a) Are made from 100% virgin clay
   b) Utilize an industrial waste product
   c) Are more expensive than traditional bricks
   d) Require high-energy firing

6) AAC blocks stand for _____.
   a) Autoclaved Aerated Concrete
   b) Automated Aggregate Composite
   c) Advanced Aluminum Cement
   d) Alkali-Activated Compound

7) The use of Fly Ash in concrete improves _____.
   a) The rate of hydration
   b) Workability and long-term strength
   c) The initial setting time
   d) The cost of the concrete

8) Silica Fume in concrete is used primarily to _____.
   a) Reduce cost
   b) Increase workability
   c) Produce high-strength, low-permeability concrete
   d) Add color to the concrete

9) The core concept of a green building revolves around _____.
   a) Using only green-colored materials
   b) Maximizing the building's height
   c) Creating structures that are environmentally responsible and resource-efficient
   d) Building exclusively in rural areas

10) The necessity for green buildings arises from issues like _____.
   a) High initial cost
   b) Resource depletion and environmental degradation
   c) Lack of architectural styles
   d) Shortage of construction labor

11) The selection of a building site for a green project should consider _____.
   a) Proximity to sensitive ecological areas
   b) Access to public transport and existing infrastructure
   c) Potential for urban sprawl
   d) Both a) and b)

12) Proper building orientation (e.g., in the Northern Hemisphere) can help _____.

a) Maximize solar heat gain in summer
b) Maximize solar heat gain in winter and minimize it in summer
c) Block all-natural light
d) Increase reliance on artificial lighting

13) What does LEED stand for?

a) Leadership in Energy and Environmental Design
b) Low Energy and Economic Development
c) Legal Environmental Enforcement Directive
d) Land and Ecological Evaluation Database

14) GRIHA is a green building rating system developed for which country's context?

a) United States
b) United Kingdom
c) India
d) Germany

SLR-QH-238

Seat No.	

Set P

T.Y. (B.Tech.) (Civil Engineering) (Sem - I) (New) (CBCS)
Examination: March/April – 2026
Honors in Sustainability Engineering (Stage - I)
Sustainable Materials and Green Buildings (CIVHON-03C)

Day & Date: Thursday, 14-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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

Section – I

Q.2 **a)** Define sustainability in the context of civil engineering. Elaborate on the three pillars of sustainability and their inter-relationship. **05**

b) Explain the 5R principles of sustainability with a relevant case study from an urban area. **05**

Q.3 **a)** Discuss the challenges and opportunities associated with Construction and Demolition (C&D) waste management. How does it contribute to the sustainability goals of the construction industry? **05**

b) Classify green construction materials into natural and man-made categories. Provide three examples of each and justify their classification as “green.” **04**

Q.4 **a)** Describe the manufacturing process, properties, and advantages of CLC (Cellular Lightweight Concrete) blocks over traditional clay bricks. **05**

b) Compare and contrast Fly Ash Bricks and AAC (Autoclaved Aerated Concrete) blocks in terms of raw materials, manufacturing process, properties, and environmental benefits. **04**

Q.5 **a)** Explain the mechanism by which fly ash improves the long-term strength and durability of concrete. What are the potential drawbacks of using a high volume of fly ash? **05**

b) What is Silica Fume? Describe its effect on the micro-structure and properties of concrete, making it a high-performance material. **04**

SECTION – II

Q.6	**a)**	Define a Green Building. Discuss the necessity and core concepts behind the green building movement in India.	**05**
	b)	Elaborate on the fundamental principles of green building design. How do these principles guide the entire building lifecycle?	**05**
Q.7	**a)**	Illustrate with examples how the 5R principle (Refuse, Reduce, Reuse, Repurpose, Recycle) can be applied at various stages of a green building's life.	**05**
	b)	What factors should be considered during the selection of a site for a green building project to minimize its environmental impact?	**04**
Q.8	**a)**	Explain the significance of building orientation, form, and layout in achieving thermal comfort and reducing energy loads for heating and cooling.	**05**
	b)	What are low-energy materials? List any four such materials and justify their low embodied energy with reasons.	**04**
Q.9	**a)**	What is the fundamental purpose of a green building rating system? Explain its importance for promoting sustainable construction practices.	**05**
	b)	Compare and contrast the LEED (Leadership in Energy and Environmental Design) and GRIHA (Green Rating for Integrated Habitat Assessment) rating systems on the basis of their origin, approach, and key emphasis areas.	**04**

SLR-QH-238

Seat No.	

Set Q

T.Y. (B.Tech.) (Civil Engineering) (Sem - I) (New) (CBCS)
Examination: March/April – 2026
Honors in Sustainability Engineering (Stage - I)
Sustainable Materials and Green Buildings (CIVHON-03C)

Day & Date: Thursday, 14-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Multiple Choice Questions. **14**

1) Silica Fume in concrete is used primarily to _____.
a) Reduce cost
b) Increase workability
c) Produce high-strength, low-permeability concrete
d) Add color to the concrete

2) The core concept of a green building revolves around _____.
a) Using only green-colored materials
b) Maximizing the building's height
c) Creating structures that are environmentally responsible and resource-efficient
d) Building exclusively in rural areas

3) The necessity for green buildings arises from issues like _____.
a) High initial cost
b) Resource depletion and environmental degradation
c) Lack of architectural styles
d) Shortage of construction labor

4) The selection of a building site for a green project should consider _____.
a) Proximity to sensitive ecological areas
b) Access to public transport and existing infrastructure
c) Potential for urban sprawl
d) Both a) and b)

5) Proper building orientation (e.g., in the Northern Hemisphere) can help _____.
a) Maximize solar heat gain in summer
b) Maximize solar heat gain in winter and minimize it in summer
c) Block all-natural light
d) Increase reliance on artificial lighting

6) What does LEED stand for?
a) Leadership in Energy and Environmental Design
b) Low Energy and Economic Development
c) Legal Environmental Enforcement Directive
d) Land and Ecological Evaluation Database

7) GRIHA is a green building rating system developed for which country's context?
a) United States
b) United Kingdom
c) India
d) Germany

8) What are the three pillars of sustainability?
a) Reduce, Reuse, Recycle
b) Social, Economic, Environmental
c) Energy, Water, Waste
d) Urban, Industrial, Rural

9) Which of the following is NOT one of the 5R principles of sustainability?
a) Reduce
b) Recycle
c) Recover
d) Regulate

10) A key sustainability goal for the construction industry is _____.
a) Maximizing construction speed
b) Minimizing labor costs
c) Effective management of Construction and Demolition (C&D) waste
d) Using only traditional materials

11) CLC Blocks are characterized by their _____.
a) High density and weight
b) Cellular structure and light weight
c) High thermal conductivity
d) Soluble nature in water

12) Fly ash bricks are an example of a sustainable material because they _____.
a) Are made from 100% virgin clay
b) Utilize an industrial waste product
c) Are more expensive than traditional bricks
d) Require high-energy firing

13) AAC blocks stand for _____.

a) Autoclaved Aerated Concrete
b) Automated Aggregate Composite
c) Advanced Aluminum Cement
d) Alkali-Activated Compound

14) The use of Fly Ash in concrete improves _____.

a) The rate of hydration
b) Workability and long-term strength
c) The initial setting time
d) The cost of the concrete

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Civil Engineering) (Sem - I) (New) (CBCS)
Examination: March/April – 2026
Honors in Sustainability Engineering (Stage - I)
Sustainable Materials and Green Buildings (CIVHON-03C)

Day & Date: Thursday, 14-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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

Section – I

Q.2 **a)** Define sustainability in the context of civil engineering. Elaborate on the three pillars of sustainability and their inter-relationship. **05**

b) Explain the 5R principles of sustainability with a relevant case study from an urban area. **05**

Q.3 **a)** Discuss the challenges and opportunities associated with Construction and Demolition (C&D) waste management. How does it contribute to the sustainability goals of the construction industry? **05**

b) Classify green construction materials into natural and man-made categories. Provide three examples of each and justify their classification as “green.” **04**

Q.4 **a)** Describe the manufacturing process, properties, and advantages of CLC (Cellular Lightweight Concrete) blocks over traditional clay bricks. **05**

b) Compare and contrast Fly Ash Bricks and AAC (Autoclaved Aerated Concrete) blocks in terms of raw materials, manufacturing process, properties, and environmental benefits. **04**

Q.5 **a)** Explain the mechanism by which fly ash improves the long-term strength and durability of concrete. What are the potential drawbacks of using a high volume of fly ash? **05**

b) What is Silica Fume? Describe its effect on the micro-structure and properties of concrete, making it a high-performance material. **04**

SECTION – II

Q.6	**a)**	Define a Green Building. Discuss the necessity and core concepts behind the green building movement in India.	**05**
	b)	Elaborate on the fundamental principles of green building design. How do these principles guide the entire building lifecycle?	**05**
Q.7	**a)**	Illustrate with examples how the 5R principle (Refuse, Reduce, Reuse, Repurpose, Recycle) can be applied at various stages of a green building's life.	**05**
	b)	What factors should be considered during the selection of a site for a green building project to minimize its environmental impact?	**04**
Q.8	**a)**	Explain the significance of building orientation, form, and layout in achieving thermal comfort and reducing energy loads for heating and cooling.	**05**
	b)	What are low-energy materials? List any four such materials and justify their low embodied energy with reasons.	**04**
Q.9	**a)**	What is the fundamental purpose of a green building rating system? Explain its importance for promoting sustainable construction practices.	**05**
	b)	Compare and contrast the LEED (Leadership in Energy and Environmental Design) and GRIHA (Green Rating for Integrated Habitat Assessment) rating systems on the basis of their origin, approach, and key emphasis areas.	**04**

SLR-QH-238

Seat No.	

Set R

T.Y. (B.Tech.) (Civil Engineering) (Sem - I) (New) (CBCS)
Examination: March/April – 2026
Honors in Sustainability Engineering (Stage - I)
Sustainable Materials and Green Buildings (CIVHON-03C)

Day & Date: Thursday, 14-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Multiple Choice Questions. **14**

1) The selection of a building site for a green project should consider _____.
a) Proximity to sensitive ecological areas
b) Access to public transport and existing infrastructure
c) Potential for urban sprawl
d) Both a) and b)

2) Proper building orientation (e.g., in the Northern Hemisphere) can help _____.
a) Maximize solar heat gain in summer
b) Maximize solar heat gain in winter and minimize it in summer
c) Block all-natural light
d) Increase reliance on artificial lighting

3) What does LEED stand for?
a) Leadership in Energy and Environmental Design
b) Low Energy and Economic Development
c) Legal Environmental Enforcement Directive
d) Land and Ecological Evaluation Database

4) GRIHA is a green building rating system developed for which country's context?
a) United States b) United Kingdom
c) India d) Germany

5) What are the three pillars of sustainability?
a) Reduce, Reuse, Recycle
b) Social, Economic, Environmental
c) Energy, Water, Waste
d) Urban, Industrial, Rural

6) Which of the following is NOT one of the 5R principles of sustainability?
a) Reduce
b) Recycle
c) Recover
d) Regulate

7) A key sustainability goal for the construction industry is _____.
a) Maximizing construction speed
b) Minimizing labor costs
c) Effective management of Construction and Demolition (C&D) waste
d) Using only traditional materials

8) CLC Blocks are characterized by their _____.
a) High density and weight
b) Cellular structure and light weight
c) High thermal conductivity
d) Soluble nature in water

9) Fly ash bricks are an example of a sustainable material because they _____.
a) Are made from 100% virgin clay
b) Utilize an industrial waste product
c) Are more expensive than traditional bricks
d) Require high-energy firing

10) AAC blocks stand for _____.
a) Autoclaved Aerated Concrete
b) Automated Aggregate Composite
c) Advanced Aluminum Cement
d) Alkali-Activated Compound

11) The use of Fly Ash in concrete improves _____.
a) The rate of hydration
b) Workability and long-term strength
c) The initial setting time
d) The cost of the concrete

12) Silica Fume in concrete is used primarily to _____.
a) Reduce cost
b) Increase workability
c) Produce high-strength, low-permeability concrete
d) Add color to the concrete

13) The core concept of a green building revolves around _____.
   a) Using only green-colored materials
   b) Maximizing the building's height
   c) Creating structures that are environmentally responsible and resource-efficient
   d) Building exclusively in rural areas

14) The necessity for green buildings arises from issues like _____.
   a) High initial cost
   b) Resource depletion and environmental degradation
   c) Lack of architectural styles
   d) Shortage of construction labor

Seat No.	

Set **R**

T.Y. (B.Tech.) (Civil Engineering) (Sem - I) (New) (CBCS)
Examination: March/April – 2026
Honors in Sustainability Engineering (Stage - I)
Sustainable Materials and Green Buildings (CIVHON-03C)

Day & Date: Thursday, 14-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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

Section – I

Q.2	**a)**	Define sustainability in the context of civil engineering. Elaborate on the three pillars of sustainability and their inter-relationship.	**05**
	b)	Explain the 5R principles of sustainability with a relevant case study from an urban area.	**05**
Q.3	**a)**	Discuss the challenges and opportunities associated with Construction and Demolition (C&D) waste management. How does it contribute to the sustainability goals of the construction industry?	**05**
	b)	Classify green construction materials into natural and man-made categories. Provide three examples of each and justify their classification as “green.”	**04**
Q.4	**a)**	Describe the manufacturing process, properties, and advantages of CLC (Cellular Lightweight Concrete) blocks over traditional clay bricks.	**05**
	b)	Compare and contrast Fly Ash Bricks and AAC (Autoclaved Aerated Concrete) blocks in terms of raw materials, manufacturing process, properties, and environmental benefits.	**04**
Q.5	**a)**	Explain the mechanism by which fly ash improves the long-term strength and durability of concrete. What are the potential drawbacks of using a high volume of fly ash?	**05**
	b)	What is Silica Fume? Describe its effect on the micro-structure and properties of concrete, making it a high-performance material.	**04**

SECTION – II

Q.6	**a)**	Define a Green Building. Discuss the necessity and core concepts behind the green building movement in India.	**05**
	b)	Elaborate on the fundamental principles of green building design. How do these principles guide the entire building lifecycle?	**05**
Q.7	**a)**	Illustrate with examples how the 5R principle (Refuse, Reduce, Reuse, Repurpose, Recycle) can be applied at various stages of a green building's life.	**05**
	b)	What factors should be considered during the selection of a site for a green building project to minimize its environmental impact?	**04**
Q.8	**a)**	Explain the significance of building orientation, form, and layout in achieving thermal comfort and reducing energy loads for heating and cooling.	**05**
	b)	What are low-energy materials? List any four such materials and justify their low embodied energy with reasons.	**04**
Q.9	**a)**	What is the fundamental purpose of a green building rating system? Explain its importance for promoting sustainable construction practices.	**05**
	b)	Compare and contrast the LEED (Leadership in Energy and Environmental Design) and GRIHA (Green Rating for Integrated Habitat Assessment) rating systems on the basis of their origin, approach, and key emphasis areas.	**04**

SLR-QH-238

Seat No.		Set	S

T.Y. (B.Tech.) (Civil Engineering) (Sem - I) (New) (CBCS)
Examination: March/April – 2026
Honors in Sustainability Engineering (Stage - I)
Sustainable Materials and Green Buildings (CIVHON-03C)

Day & Date: Thursday, 14-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Multiple Choice Questions. **14**

1) AAC blocks stand for _____.
a) Autoclaved Aerated Concrete
b) Automated Aggregate Composite
c) Advanced Aluminum Cement
d) Alkali-Activated Compound

2) The use of Fly Ash in concrete improves _____.
a) The rate of hydration
b) Workability and long-term strength
c) The initial setting time
d) The cost of the concrete

3) Silica Fume in concrete is used primarily to _____.
a) Reduce cost
b) Increase workability
c) Produce high-strength, low-permeability concrete
d) Add color to the concrete

4) The core concept of a green building revolves around _____.
a) Using only green-colored materials
b) Maximizing the building's height
c) Creating structures that are environmentally responsible and resource-efficient
d) Building exclusively in rural areas

5) The necessity for green buildings arises from issues like _____.
   a) High initial cost
   b) Resource depletion and environmental degradation
   c) Lack of architectural styles
   d) Shortage of construction labor

6) The selection of a building site for a green project should consider _____.
   a) Proximity to sensitive ecological areas
   b) Access to public transport and existing infrastructure
   c) Potential for urban sprawl
   d) Both a) and b)

7) Proper building orientation (e.g., in the Northern Hemisphere) can help _____.
   a) Maximize solar heat gain in summer
   b) Maximize solar heat gain in winter and minimize it in summer
   c) Block all-natural light
   d) Increase reliance on artificial lighting

8) What does LEED stand for?
   a) Leadership in Energy and Environmental Design
   b) Low Energy and Economic Development
   c) Legal Environmental Enforcement Directive
   d) Land and Ecological Evaluation Database

9) GRIHA is a green building rating system developed for which country's context?
   a) United States
   b) United Kingdom
   c) India
   d) Germany

10) What are the three pillars of sustainability?
   a) Reduce, Reuse, Recycle
   b) Social, Economic, Environmental
   c) Energy, Water, Waste
   d) Urban, Industrial, Rural

11) Which of the following is NOT one of the 5R principles of sustainability?
   a) Reduce
   b) Recycle
   c) Recover
   d) Regulate

12) A key sustainability goal for the construction industry is _____.
   a) Maximizing construction speed
   b) Minimizing labor costs
   c) Effective management of Construction and Demolition (C&D) waste
   d) Using only traditional materials

13) CLC Blocks are characterized by their _____.

a) High density and weight
b) Cellular structure and light weight
c) High thermal conductivity
d) Soluble nature in water

14) Fly ash bricks are an example of a sustainable material because they _____.

a) Are made from 100% virgin clay
b) Utilize an industrial waste product
c) Are more expensive than traditional bricks
d) Require high-energy firing

Seat No.	

Set **S**

T.Y. (B.Tech.) (Civil Engineering) (Sem - I) (New) (CBCS)
Examination: March/April – 2026
Honors in Sustainability Engineering (Stage - I)
Sustainable Materials and Green Buildings (CIVHON-03C)

Day & Date: Thursday, 14-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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

Section – I

Q.2	**a)**	Define sustainability in the context of civil engineering. Elaborate on the three pillars of sustainability and their inter-relationship.	**05**
	b)	Explain the 5R principles of sustainability with a relevant case study from an urban area.	**05**
Q.3	**a)**	Discuss the challenges and opportunities associated with Construction and Demolition (C&D) waste management. How does it contribute to the sustainability goals of the construction industry?	**05**
	b)	Classify green construction materials into natural and man-made categories. Provide three examples of each and justify their classification as “green.”	**04**
Q.4	**a)**	Describe the manufacturing process, properties, and advantages of CLC (Cellular Lightweight Concrete) blocks over traditional clay bricks.	**05**
	b)	Compare and contrast Fly Ash Bricks and AAC (Autoclaved Aerated Concrete) blocks in terms of raw materials, manufacturing process, properties, and environmental benefits.	**04**
Q.5	**a)**	Explain the mechanism by which fly ash improves the long-term strength and durability of concrete. What are the potential drawbacks of using a high volume of fly ash?	**05**
	b)	What is Silica Fume? Describe its effect on the micro-structure and properties of concrete, making it a high-performance material.	**04**

SECTION – II

Q.6	**a)**	Define a Green Building. Discuss the necessity and core concepts behind the green building movement in India.	**05**
	b)	Elaborate on the fundamental principles of green building design. How do these principles guide the entire building lifecycle?	**05**
Q.7	**a)**	Illustrate with examples how the 5R principle (Refuse, Reduce, Reuse, Repurpose, Recycle) can be applied at various stages of a green building's life.	**05**
	b)	What factors should be considered during the selection of a site for a green building project to minimize its environmental impact?	**04**
Q.8	**a)**	Explain the significance of building orientation, form, and layout in achieving thermal comfort and reducing energy loads for heating and cooling.	**05**
	b)	What are low-energy materials? List any four such materials and justify their low embodied energy with reasons.	**04**
Q.9	**a)**	What is the fundamental purpose of a green building rating system? Explain its importance for promoting sustainable construction practices.	**05**
	b)	Compare and contrast the LEED (Leadership in Energy and Environmental Design) and GRIHA (Green Rating for Integrated Habitat Assessment) rating systems on the basis of their origin, approach, and key emphasis areas.	**04**

SLR-QH-239

Seat No.	

Set P

T.Y. (B.Tech.) (Civil Engineering) (Sem - I) (New) (CBCS)
Examination: March/April – 2026
Honors in Railway Infrastructure (Stage - I)
Underground Structures in Railway (CIVHON-03D)

Day & Date: Thursday, 14-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Choose the correct option. 14

1) Which of the following is NOT an advantage of tunnels over open cuts?
a) Less environmental disturbance
b) Ability to avoid surface obstructions
c) Lower construction cost
d) Less land area required

2) The primary advantage of tunnelling in comparison to open cuts is _____.
a) Increased surface area for excavation
b) Minimal surface disruption
c) Lower construction time
d) Easier muck removal

3) What is the role of ventilation in tunnelling?
a) To cool down the tunnel environment
b) To supply fresh air and remove harmful gases
c) To support tunnel construction
d) To prevent the entry of water into the tunnel

4) Which method is best suited for tunnelling in soft soils?
a) Shield tunnelling b) Fore poling method
c) Blasting d) Tunnel boring machine (TBM)

5) What is the primary purpose of a shield in tunnelling?
a) To provide ventilation
b) To support the tunnel face
c) To carry muck out of the tunnel
d) To control water flow

6) Which of the following is a type of drill bit used in tunnelling?
a) Carbide bit
b) Diamond bit
c) Tungsten bit
d) All of the above

7) Which system is used to control water pressure in water-bearing soils during tunnelling?
a) Shield system
b) Well points system
c) Grouting
d) Tunnel boring machine

8) In rock tunnelling, what is used to prevent the drill from slipping?
a) Drilling fluids
b) Rock bolts
c) Drill-bits
d) Forged bits

9) NATM is a tunnelling method that focuses on _____.
a) Full use of TBMs
b) Continuous monitoring and ground stabilization
c) Shield tunnelling
d) Explosive use

10) Which of the following is NOT a key feature of a Tunnel Boring Machine (TBM)?
a) Cutting head
b) Excavation chamber
c) Shield casing
d) Grout mixing chamber

11) The primary function of a shaft in tunnelling is to _____.
a) Ventilate the tunnel
b) Provide a construction entry point
c) Stabilize the tunnel walls
d) Drain water from the tunnel

12) The primary objective of tunnel lining is to _____.
a) Provide structural stability
b) Prevent water ingress
c) Increase tunnel diameter
d) Ensure worker safety

13) Which system is used for tunnel drainage?
a) Plenum system
b) Dewatering system
c) Shield system
d) Well point system

14) Which disease is a health concern for tunnel workers due to prolonged exposure to dust?
a) Silicosis
b) Asthma
c) Tuberculosis
d) Caisson’s disease

SLR-QH-239

Seat No.	

Set P

T.Y. (B.Tech.) (Civil Engineering) (Sem - I) (New) (CBCS)
Examination: March/April – 2026
Honors in Railway Infrastructure (Stage - I)
Underground Structures in Railway (CIVHON-03D)

Day & Date: Thursday, 14-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q.2 is compulsory; answer any two from remaining questions from Section – I.
2) Q.6 is compulsory; answer any two from remaining questions from Section – II.
3) Figures to the right indicate full marks.
4) Assume additional data if required and mention it clearly.

SECTION – I

Q.2	**a)**	Explain the advantages and disadvantages of tunnels compared to open cuts.	**05**
	b)	Describe the factors affecting the selection of alignment of a tunnel.	**05**
Q.3	**a)**	Explain the Fore Poling method of tunnelling with neat sketches.	**04**
	b)	Compare the Belgian method and German method of tunnelling in soft soil.	**05**
Q.4	**a)**	Explain the compressed air (plenum) process of tunnelling and its equipment.	**04**
	b)	Discuss the safety precautions to be observed during rock tunnelling and blasting operations.	**05**
Q.5	**a)**	What are the different drill-hole patterns used in rock tunnelling? Explain with sketches.	**05**
	b)	Write short note on Needle beam method.	**04**

SECTION – II

Q.6	**a)**	What are the types of supports used in tunnels? Explain their importance under adverse ground conditions.	**05**
	b)	Describe the working principle and types of Tunnel Boring Machines (TBM).	**05**
Q.7	**a)**	Explain the advantages, size, and location of shafts in tunnelling.	**04**
	b)	Describe the construction of shafts in rock and soft ground with necessary precautions.	**05**

Q.8	**a)**	Discuss the types of drainage systems used in tunnels - pre-drainage, dewatering, and permanent drainage.	**05**
	b)	Explain the methods of ventilation in tunnels, distinguishing between temporary and permanent systems.	**04**
Q.9	**a)**	Rock bolting	**05**
	b)	Dust prevention write notes on	**04**

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Civil Engineering) (Sem - I) (New) (CBCS)
Examination: March/April – 2026
Honors in Railway Infrastructure (Stage - I)
Underground Structures in Railway (CIVHON-03D)

Day & Date: Thursday, 14-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Choose the correct option. **14**

1) In rock tunnelling, what is used to prevent the drill from slipping?
a) Drilling fluids b) Rock bolts
c) Drill-bits d) Forged bits

2) NATM is a tunnelling method that focuses on _____.
a) Full use of TBMs
b) Continuous monitoring and ground stabilization
c) Shield tunnelling
d) Explosive use

3) Which of the following is NOT a key feature of a Tunnel Boring Machine (TBM)?
a) Cutting head b) Excavation chamber
c) Shield casing d) Grout mixing chamber

4) The primary function of a shaft in tunnelling is to _____.
a) Ventilate the tunnel
b) Provide a construction entry point
c) Stabilize the tunnel walls
d) Drain water from the tunnel

5) The primary objective of tunnel lining is to _____.
a) Provide structural stability
b) Prevent water ingress
c) Increase tunnel diameter
d) Ensure worker safety

6) Which system is used for tunnel drainage?
a) Plenum system
b) Dewatering system
c) Shield system
d) Well point system

7) Which disease is a health concern for tunnel workers due to prolonged exposure to dust?
a) Silicosis
b) Asthma
c) Tuberculosis
d) Caisson's disease

8) Which of the following is NOT an advantage of tunnels over open cuts?
a) Less environmental disturbance
b) Ability to avoid surface obstructions
c) Lower construction cost
d) Less land area required

9) The primary advantage of tunnelling in comparison to open cuts is _____.
a) Increased surface area for excavation
b) Minimal surface disruption
c) Lower construction time
d) Easier muck removal

10) What is the role of ventilation in tunnelling?
a) To cool down the tunnel environment
b) To supply fresh air and remove harmful gases
c) To support tunnel construction
d) To prevent the entry of water into the tunnel

11) Which method is best suited for tunnelling in soft soils?
a) Shield tunnelling
b) Fore poling method
c) Blasting
d) Tunnel boring machine (TBM)

12) What is the primary purpose of a shield in tunnelling?
a) To provide ventilation
b) To support the tunnel face
c) To carry muck out of the tunnel
d) To control water flow

13) Which of the following is a type of drill bit used in tunnelling?
a) Carbide bit
b) Diamond bit
c) Tungsten bit
d) All of the above

14) Which system is used to control water pressure in water-bearing soils during tunnelling?
a) Shield system
b) Well points system
c) Grouting
d) Tunnel boring machine

SLR-QH-239

Seat No.	

Set Q

T.Y. (B.Tech.) (Civil Engineering) (Sem - I) (New) (CBCS)
Examination: March/April – 2026
Honors in Railway Infrastructure (Stage - I)
Underground Structures in Railway (CIVHON-03D)

Day & Date: Thursday, 14-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q.2 is compulsory; answer any two from remaining questions from Section – I.
2) Q.6 is compulsory; answer any two from remaining questions from Section – II.
3) Figures to the right indicate full marks.
4) Assume additional data if required and mention it clearly.

SECTION – I

Q.2	**a)**	Explain the advantages and disadvantages of tunnels compared to open cuts.	**05**
	b)	Describe the factors affecting the selection of alignment of a tunnel.	**05**
Q.3	**a)**	Explain the Fore Poling method of tunnelling with neat sketches.	**04**
	b)	Compare the Belgian method and German method of tunnelling in soft soil.	**05**
Q.4	**a)**	Explain the compressed air (plenum) process of tunnelling and its equipment.	**04**
	b)	Discuss the safety precautions to be observed during rock tunnelling and blasting operations.	**05**
Q.5	**a)**	What are the different drill-hole patterns used in rock tunnelling? Explain with sketches.	**05**
	b)	Write short note on Needle beam method.	**04**

SECTION – II

Q.6	**a)**	What are the types of supports used in tunnels? Explain their importance under adverse ground conditions.	**05**
	b)	Describe the working principle and types of Tunnel Boring Machines (TBM).	**05**
Q.7	**a)**	Explain the advantages, size, and location of shafts in tunnelling.	**04**
	b)	Describe the construction of shafts in rock and soft ground with necessary precautions.	**05**

Q.8	**a)**	Discuss the types of drainage systems used in tunnels - pre-drainage, dewatering, and permanent drainage.	**05**
	b)	Explain the methods of ventilation in tunnels, distinguishing between temporary and permanent systems.	**04**
Q.9	**a)**	Rock bolting	**05**
	b)	Dust prevention write notes on	**04**

Seat No.	

Set **R**

T.Y. (B.Tech.) (Civil Engineering) (Sem - I) (New) (CBCS)
Examination: March/April – 2026
Honors in Railway Infrastructure (Stage - I)
Underground Structures in Railway (CIVHON-03D)

Day & Date: Thursday, 14-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Choose the correct option. **14**

1) The primary function of a shaft in tunnelling is to _____.
a) Ventilate the tunnel
b) Provide a construction entry point
c) Stabilize the tunnel walls
d) Drain water from the tunnel

2) The primary objective of tunnel lining is to _____.
a) Provide structural stability
b) Prevent water ingress
c) Increase tunnel diameter
d) Ensure worker safety

3) Which system is used for tunnel drainage?
a) Plenum system b) Dewatering system
c) Shield system d) Well point system

4) Which disease is a health concern for tunnel workers due to prolonged exposure to dust?
a) Silicosis b) Asthma
c) Tuberculosis d) Caisson's disease

5) Which of the following is NOT an advantage of tunnels over open cuts?
a) Less environmental disturbance
b) Ability to avoid surface obstructions
c) Lower construction cost
d) Less land area required

6) The primary advantage of tunnelling in comparison to open cuts is _____.
a) Increased surface area for excavation
b) Minimal surface disruption
c) Lower construction time
d) Easier muck removal

7) What is the role of ventilation in tunnelling?
a) To cool down the tunnel environment
b) To supply fresh air and remove harmful gases
c) To support tunnel construction
d) To prevent the entry of water into the tunnel

8) Which method is best suited for tunnelling in soft soils?
a) Shield tunnelling
b) Fore poling method
c) Blasting
d) Tunnel boring machine (TBM)

9) What is the primary purpose of a shield in tunnelling?
a) To provide ventilation
b) To support the tunnel face
c) To carry muck out of the tunnel
d) To control water flow

10) Which of the following is a type of drill bit used in tunnelling?
a) Carbide bit
b) Diamond bit
c) Tungsten bit
d) All of the above

11) Which system is used to control water pressure in water-bearing soils during tunnelling?
a) Shield system
b) Well points system
c) Grouting
d) Tunnel boring machine

12) In rock tunnelling, what is used to prevent the drill from slipping?
a) Drilling fluids
b) Rock bolts
c) Drill-bits
d) Forged bits

13) NATM is a tunnelling method that focuses on _____.
a) Full use of TBMs
b) Continuous monitoring and ground stabilization
c) Shield tunnelling
d) Explosive use

14) Which of the following is NOT a key feature of a Tunnel Boring Machine (TBM)?
a) Cutting head
b) Excavation chamber
c) Shield casing
d) Grout mixing chamber

SLR-QH-239

Seat No.	

Set R

T.Y. (B.Tech.) (Civil Engineering) (Sem - I) (New) (CBCS)
Examination: March/April – 2026
Honors in Railway Infrastructure (Stage - I)
Underground Structures in Railway (CIVHON-03D)

Day & Date: Thursday, 14-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q.2 is compulsory; answer any two from remaining questions from Section – I.
2) Q.6 is compulsory; answer any two from remaining questions from Section – II.
3) Figures to the right indicate full marks.
4) Assume additional data if required and mention it clearly.

SECTION – I

Q.2	**a)**	Explain the advantages and disadvantages of tunnels compared to open cuts.	**05**
	b)	Describe the factors affecting the selection of alignment of a tunnel.	**05**
Q.3	**a)**	Explain the Fore Poling method of tunnelling with neat sketches.	**04**
	b)	Compare the Belgian method and German method of tunnelling in soft soil.	**05**
Q.4	**a)**	Explain the compressed air (plenum) process of tunnelling and its equipment.	**04**
	b)	Discuss the safety precautions to be observed during rock tunnelling and blasting operations.	**05**
Q.5	**a)**	What are the different drill-hole patterns used in rock tunnelling? Explain with sketches.	**05**
	b)	Write short note on Needle beam method.	**04**

SECTION – II

Q.6	**a)**	What are the types of supports used in tunnels? Explain their importance under adverse ground conditions.	**05**
	b)	Describe the working principle and types of Tunnel Boring Machines (TBM).	**05**
Q.7	**a)**	Explain the advantages, size, and location of shafts in tunnelling.	**04**
	b)	Describe the construction of shafts in rock and soft ground with necessary precautions.	**05**

Q.8	**a)**	Discuss the types of drainage systems used in tunnels - pre-drainage, dewatering, and permanent drainage.	**05**
	b)	Explain the methods of ventilation in tunnels, distinguishing between temporary and permanent systems.	**04**
Q.9	**a)**	Rock bolting	**05**
	b)	Dust prevention write notes on	**04**

SLR-QH-239

Seat No.	

Set S

T.Y. (B.Tech.) (Civil Engineering) (Sem - I) (New) (CBCS)
Examination: March/April – 2026
Honors in Railway Infrastructure (Stage - I)
Underground Structures in Railway (CIVHON-03D)

Day & Date: Thursday, 14-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Choose the correct option. **14**

1) Which of the following is a type of drill bit used in tunnelling?
a) Carbide bit b) Diamond bit
c) Tungsten bit d) All of the above

2) Which system is used to control water pressure in water-bearing soils during tunnelling?
a) Shield system b) Well points system
c) Grouting d) Tunnel boring machine

3) In rock tunnelling, what is used to prevent the drill from slipping?
a) Drilling fluids b) Rock bolts
c) Drill-bits d) Forged bits

4) NATM is a tunnelling method that focuses on _____.
a) Full use of TBMs
b) Continuous monitoring and ground stabilization
c) Shield tunnelling
d) Explosive use

5) Which of the following is NOT a key feature of a Tunnel Boring Machine (TBM)?
a) Cutting head b) Excavation chamber
c) Shield casing d) Grout mixing chamber

6) The primary function of a shaft in tunnelling is to _____.
   a) Ventilate the tunnel
   b) Provide a construction entry point
   c) Stabilize the tunnel walls
   d) Drain water from the tunnel

7) The primary objective of tunnel lining is to _____.
   a) Provide structural stability
   b) Prevent water ingress
   c) Increase tunnel diameter
   d) Ensure worker safety

8) Which system is used for tunnel drainage?
   a) Plenum system
   b) Dewatering system
   c) Shield system
   d) Well point system

9) Which disease is a health concern for tunnel workers due to prolonged exposure to dust?
   a) Silicosis
   b) Asthma
   c) Tuberculosis
   d) Caisson's disease

10) Which of the following is NOT an advantage of tunnels over open cuts?
   a) Less environmental disturbance
   b) Ability to avoid surface obstructions
   c) Lower construction cost
   d) Less land area required

11) The primary advantage of tunnelling in comparison to open cuts is _____.
   a) Increased surface area for excavation
   b) Minimal surface disruption
   c) Lower construction time
   d) Easier muck removal

12) What is the role of ventilation in tunnelling?
   a) To cool down the tunnel environment
   b) To supply fresh air and remove harmful gases
   c) To support tunnel construction
   d) To prevent the entry of water into the tunnel

13) Which method is best suited for tunnelling in soft soils?
   a) Shield tunnelling
   b) Fore poling method
   c) Blasting
   d) Tunnel boring machine (TBM)

14) What is the primary purpose of a shield in tunnelling?
   a) To provide ventilation
   b) To support the tunnel face
   c) To carry muck out of the tunnel
   d) To control water flow

SLR-QH-239

Seat No.	

Set S

T.Y. (B.Tech.) (Civil Engineering) (Sem - I) (New) (CBCS)
Examination: March/April – 2026
Honors in Railway Infrastructure (Stage - I)
Underground Structures in Railway (CIVHON-03D)

Day & Date: Thursday, 14-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q.2 is compulsory; answer any two from remaining questions from Section – I.
2) Q.6 is compulsory; answer any two from remaining questions from Section – II.
3) Figures to the right indicate full marks.
4) Assume additional data if required and mention it clearly.

SECTION – I

Q.2	**a)**	Explain the advantages and disadvantages of tunnels compared to open cuts.	**05**
	b)	Describe the factors affecting the selection of alignment of a tunnel.	**05**
Q.3	**a)**	Explain the Fore Poling method of tunnelling with neat sketches.	**04**
	b)	Compare the Belgian method and German method of tunnelling in soft soil.	**05**
Q.4	**a)**	Explain the compressed air (plenum) process of tunnelling and its equipment.	**04**
	b)	Discuss the safety precautions to be observed during rock tunnelling and blasting operations.	**05**
Q.5	**a)**	What are the different drill-hole patterns used in rock tunnelling? Explain with sketches.	**05**
	b)	Write short note on Needle beam method.	**04**

SECTION – II

Q.6	**a)**	What are the types of supports used in tunnels? Explain their importance under adverse ground conditions.	**05**
	b)	Describe the working principle and types of Tunnel Boring Machines (TBM).	**05**
Q.7	**a)**	Explain the advantages, size, and location of shafts in tunnelling.	**04**
	b)	Describe the construction of shafts in rock and soft ground with necessary precautions.	**05**

Q.8	**a)**	Discuss the types of drainage systems used in tunnels - pre-drainage, dewatering, and permanent drainage.	**05**
	b)	Explain the methods of ventilation in tunnels, distinguishing between temporary and permanent systems.	**04**
Q.9	**a)**	Rock bolting	**05**
	b)	Dust prevention write notes on	**04**

SLR-QH-240

Seat No.	

Set P

T. Y. (B.Tech.) (Civil Engineering) (Semester - I) (Old) (CBCS)
Examination: March/April - 2026
Design of Steel Structures (BTN01501)

Day & Date: Saturday, 02-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary and mention it clearly.
5) Use of IS 800-2007 and Steel Book are allowed, but not allowed for MCQs (Q. No. 1) for first 30 minutes.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct option. **14**

1) A structural member subjected to compressive stress in a direction parallel to its longitudinal axis, is generally known as _____.
a) strut b) post
c) column d) All of these

2) If the outstand element of compression flange of rolled section is less than _____ the section is classified as plastic.
a) 8.4 £ b) 10.5 £
c) 9.4 £ d) 15.7 £

3) The structural advantages of using steel as a structural material is _____.
a) small weight to strength b) speed of dismantling
c) speed of erection d) All of above

4) In plastic analysis, the shape factor for Diamond section is _____.
a) 2.0 b) 1.7
c) 1.6 d) None of these

5) A beam section is selected & provided on the basis of _____.
a) Section modulus b) Deflection
c) Shear d) All of above

6) In case of an axially loaded column to the base plate in gusseted base are designed for _____.
a) 100% of the column load b) 50% of the column load
c) 25% of the column load d) erecting load only

7) Allowable deflection in case of laterally supported beams is _____.
a) L/300 b) L/250
c) L/325 d) L/400

8) The partial safety factor for the material of bolt is _____.
a) 1.0 b) 1.10
c) 1.5 d) 1.25

9) A gusset Plate is subjected to _____.
a) Direct stress b) Shear stress
c) Bending stress d) All the above

10) The most suitable compression member section for a roof truss is _____.
a) Single angle
b) Double angles placed back to back
c) Double angles placed as star
d) Tubes

11) The effective length of a column with one end effectively held in position and restrained against rotation but not held in position and free to rotate at the other end is _____.
a) 0.65L b) 0.8L
c) 1.2L d) 2L

12) The slenderness ratio of limited to lacing flat is _____.
a) 350 b) 145
c) 180 d) 250

13) Thickness of lacing flats for a single lacing system should not be less than of the length between the inner end bolts of the length between the inner end bolts.
a) 1/40 b) 1/60
c) 1/50 d) 1/70

14) Design of pins is primarily governed by _____.
a) Shear b) Bearing
c) Flexure d) All the above

SLR-QH-240

Seat No.	

Set P

T. Y. (B.Tech.) (Civil Engineering) (Semester - I) (Old) (CBCS)
Examination: March/April - 2026
Design of Steel Structures (BTN01501)

Day & Date: Saturday, 02-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q.5 and Q.7 are compulsory and solve any 2 questions from the remaining questions of each Section.
2) Figures to the right indicates full marks.
3) Use of IS 800-2007 and Steel Book are allowed, but not allowed for MCQs (Q. No. 1) for first 30 minutes.
4) Assume suitable data if necessary and mention state it clearly before the solution.
5) Draw the appropriate sketches whenever necessary.

Section – I

Q.2 **a)** State advantages and disadvantages of steel structures. **03**

b) Calculate the Strength of 18 mm diameter bolt of grade 4.6 for the lap joint. The main plate to be jointed are 10 mm thick. Use Fe 410 steel. **06**

Q.3 Design a tension member to carry a factored load of 310 kN. Use 20 mm diameter bolts of grade 5.6 for the connection. Use Fe 410 steel. **09**

Q.4 Design a Principal rafter in truss of length 3.0 m. The rafter can carry factored compressive load of 250 kN. Design a bolted connection using 10 mm thick gusset plate. Use steel of grade Fe 410, fy = 250 N/mm^2. **09**

Q.5 Attempt the Following.

a) Write a note on applications of PEB? **03**

b) What is Shape Factor? Find the shape factor for Rectangular Section. **04**

c) State the purpose of providing anchor bolts in the column foundations? **03**

Section – II

Q.6 A simply supported steel beam of 5.0 m effective span is laterally supported throughout. It carries a total uniformly distributed load of 45 kN (Inclusive of self weight). Design an appropriate section using steel of grade Fe 410. **09**

Q.7 Design a built up column consisting of two rolled steel channel sections placed back to back to resist an axial load of 1250 kN. The length of the column is 4.5 m. it is restrained against rotation and translation at both the ends. Take fy = 250MPa. Also design the batten system with bolted connection. **10**

Q.8 A column ISHB 350 @661.2 N/m carries an axial compressive factored load of 900 kN. Design a suitable welded slab base. The base rests on M25 grade concrete pedestal. **09**

Q.9 A Continuous Beam ABCD Fixed at support A and simply at B, C and at D. The Span AB carries a central point load of 70 kN, 2.5 m from each support. Span BC of 3.5 m length carries a point load of magnitude 110 kN a at distance 1m from support C. The Span CD is 4 m, subjected to UDL of intensity 35 kN/m. Find the Collapse moment and draw the bending moment diagram**.** **09**

Seat No.	

Set **Q**

T. Y. (B.Tech.) (Civil Engineering) (Semester - I) (Old) (CBCS)
Examination: March/April - 2026
Design of Steel Structures (BTN01501)

Day & Date: Saturday, 02-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary and mention it clearly.
5) Use of IS 800-2007 and Steel Book are allowed, but not allowed for MCQs (Q. No. 1) for first 30 minutes.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct option. **14**

1) The partial safety factor for the material of bolt is _____.
a) 1.0 b) 1.10
c) 1.5 d) 1.25

2) A gusset Plate is subjected to _____.
a) Direct stress b) Shear stress
c) Bending stress d) All the above

3) The most suitable compression member section for a roof truss is _____.
a) Single angle
b) Double angles placed back to back
c) Double angles placed as star
d) Tubes

4) The effective length of a column with one end effectively held in position and restrained against rotation but not held in position and free to rotate at the other end is _____.
a) 0.65L b) 0.8L
c) 1.2L d) 2L

5) The slenderness ratio of limited to lacing flat is _____.
a) 350 b) 145
c) 180 d) 250

6) Thickness of lacing flats for a single lacing system should not be less than of the length between the inner end bolts of the length between the inner end bolts.

a) 1/40 b) 1/60
c) 1/50 d) 1/70

7) Design of pins is primarily governed by _____.

a) Shear b) Bearing
c) Flexure d) All the above

8) A structural member subjected to compressive stress in a direction parallel to its longitudinal axis, is generally known as _____.

a) strut b) post
c) column d) All of these

9) If the outstand element of compression flange of rolled section is less than _____ the section is classified as plastic.

a) 8.4 £ b) 10.5 £
c) 9.4 £ d) 15.7 £

10) The structural advantages of using steel as a structural material is _____.

a) small weight to strength b) speed of dismantling
c) speed of erection d) All of above

11) In plastic analysis, the shape factor for Diamond section is _____.

a) 2.0 b) 1.7
c) 1.6 d) None of these

12) A beam section is selected & provided on the basis of _____.

a) Section modulus b) Deflection
c) Shear d) All of above

13) In case of an axially loaded column to the base plate in gusseted base are designed for _____.

a) 100% of the column load b) 50% of the column load
c) 25% of the column load d) erecting load only

14) Allowable deflection in case of laterally supported beams is _____.

a) L/300 b) L/250
c) L/325 d) L/400

SLR-QH-240

Seat No.	

Set Q

T. Y. (B.Tech.) (Civil Engineering) (Semester - I) (Old) (CBCS)
Examination: March/April - 2026
Design of Steel Structures (BTN01501)

Day & Date: Saturday, 02-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q.5 and Q.7 are compulsory and solve any 2 questions from the remaining questions of each Section.
2) Figures to the right indicates full marks.
3) Use of IS 800-2007 and Steel Book are allowed, but not allowed for MCQs (Q. No. 1) for first 30 minutes.
4) Assume suitable data if necessary and mention state it clearly before the solution.
5) Draw the appropriate sketches whenever necessary.

Section – I

Q.2 **a)** State advantages and disadvantages of steel structures. **03**

b) Calculate the Strength of 18 mm diameter bolt of grade 4.6 for the lap joint. The main plate to be jointed are 10 mm thick. Use Fe 410 steel. **06**

Q.3 Design a tension member to carry a factored load of 310 kN. Use 20 mm diameter bolts of grade 5.6 for the connection. Use Fe 410 steel. **09**

Q.4 Design a Principal rafter in truss of length 3.0 m. The rafter can carry factored compressive load of 250 kN. Design a bolted connection using 10 mm thick gusset plate. Use steel of grade Fe 410, fy = 250 N/mm^2. **09**

Q.5 Attempt the Following.

a) Write a note on applications of PEB? **03**

b) What is Shape Factor? Find the shape factor for Rectangular Section. **04**

c) State the purpose of providing anchor bolts in the column foundations? **03**

Section – II

Q.6 A simply supported steel beam of 5.0 m effective span is laterally supported throughout. It carries a total uniformly distributed load of 45 kN (Inclusive of self weight). Design an appropriate section using steel of grade Fe 410. **09**

Q.7 Design a built up column consisting of two rolled steel channel sections placed back to back to resist an axial load of 1250 kN. The length of the column is 4.5 m. it is restrained against rotation and translation at both the ends. Take fy = 250MPa. Also design the batten system with bolted connection. **10**

Q.8 A column ISHB 350 @661.2 N/m carries an axial compressive factored load of 900 kN. Design a suitable welded slab base. The base rests on M25 grade concrete pedestal. **09**

Q.9 A Continuous Beam ABCD Fixed at support A and simply at B, C and at D. The Span AB carries a central point load of 70 kN, 2.5 m from each support. Span BC of 3.5 m length carries a point load of magnitude 110 kN a at distance 1m from support C. The Span CD is 4 m, subjected to UDL of intensity 35 kN/m. Find the Collapse moment and draw the bending moment diagram**.** **09**

SLR-QH-240

Seat No.	

Set R

T. Y. (B.Tech.) (Civil Engineering) (Semester - I) (Old) (CBCS)
Examination: March/April - 2026
Design of Steel Structures (BTN01501)

Day & Date: Saturday, 02-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary and mention it clearly.
5) Use of IS 800-2007 and Steel Book are allowed, but not allowed for MCQs (Q. No. 1) for first 30 minutes.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct option. 14

1) The effective length of a column with one end effectively held in position and restrained against rotation but not held in position and free to rotate at the other end is _____.
a) 0.65L b) 0.8L
c) 1.2L d) 2L

2) The slenderness ratio of limited to lacing flat is _____.
a) 350 b) 145
c) 180 d) 250

3) Thickness of lacing flats for a single lacing system should not be less than of the length between the inner end bolts of the length between the inner end bolts.
a) 1/40 b) 1/60
c) 1/50 d) 1/70

4) Design of pins is primarily governed by _____.
a) Shear b) Bearing
c) Flexure d) All the above

5) A structural member subjected to compressive stress in a direction parallel to its longitudinal axis, is generally known as _____.
a) strut b) post
c) column d) All of these

6) If the outstand element of compression flange of rolled section is less than _____ the section is classified as plastic.
a) 8.4 £ b) 10.5 £
c) 9.4 £ d) 15.7 £

7) The structural advantages of using steel as a structural material is _____.
a) small weight to strength b) speed of dismantling
c) speed of erection d) All of above

8) In plastic analysis, the shape factor for Diamond section is _____.
a) 2.0 b) 1.7
c) 1.6 d) None of these

9) A beam section is selected & provided on the basis of _____.
a) Section modulus b) Deflection
c) Shear d) All of above

10) In case of an axially loaded column to the base plate in gusseted base are designed for _____.
a) 100% of the column load b) 50% of the column load
c) 25% of the column load d) erecting load only

11) Allowable deflection in case of laterally supported beams is _____.
a) L/300 b) L/250
c) L/325 d) L/400

12) The partial safety factor for the material of bolt is _____.
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c) 1.5 d) 1.25

13) A gusset Plate is subjected to _____.
a) Direct stress b) Shear stress
c) Bending stress d) All the above

14) The most suitable compression member section for a roof truss is _____.
a) Single angle
b) Double angles placed back to back
c) Double angles placed as star
d) Tubes

SLR-QH-240

Seat No.	

Set R

T. Y. (B.Tech.) (Civil Engineering) (Semester - I) (Old) (CBCS)
Examination: March/April - 2026
Design of Steel Structures (BTN01501)

Day & Date: Saturday, 02-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q.5 and Q.7 are compulsory and solve any 2 questions from the remaining questions of each Section.
2) Figures to the right indicates full marks.
3) Use of IS 800-2007 and Steel Book are allowed, but not allowed for MCQs (Q. No. 1) for first 30 minutes.
4) Assume suitable data if necessary and mention state it clearly before the solution.
5) Draw the appropriate sketches whenever necessary.

Section – I

Q.2 **a)** State advantages and disadvantages of steel structures. **03**

b) Calculate the Strength of 18 mm diameter bolt of grade 4.6 for the lap joint. The main plate to be jointed are 10 mm thick. Use Fe 410 steel. **06**

Q.3 Design a tension member to carry a factored load of 310 kN. Use 20 mm diameter bolts of grade 5.6 for the connection. Use Fe 410 steel. **09**

Q.4 Design a Principal rafter in truss of length 3.0 m. The rafter can carry factored compressive load of 250 kN. Design a bolted connection using 10 mm thick gusset plate. Use steel of grade Fe 410, fy = 250 N/mm^2. **09**

Q.5 Attempt the Following.

a) Write a note on applications of PEB? **03**

b) What is Shape Factor? Find the shape factor for Rectangular Section. **04**

c) State the purpose of providing anchor bolts in the column foundations? **03**

Section – II

Q.6 A simply supported steel beam of 5.0 m effective span is laterally supported throughout. It carries a total uniformly distributed load of 45 kN (Inclusive of self weight). Design an appropriate section using steel of grade Fe 410. **09**

Q.7 Design a built up column consisting of two rolled steel channel sections placed back to back to resist an axial load of 1250 kN. The length of the column is 4.5 m. it is restrained against rotation and translation at both the ends. Take fy = 250MPa. Also design the batten system with bolted connection. **10**

Q.8 A column ISHB 350 @661.2 N/m carries an axial compressive factored load of 900 kN. Design a suitable welded slab base. The base rests on M25 grade concrete pedestal. **09**

Q.9 A Continuous Beam ABCD Fixed at support A and simply at B, C and at D. The Span AB carries a central point load of 70 kN, 2.5 m from each support. Span BC of 3.5 m length carries a point load of magnitude 110 kN a at distance 1m from support C. The Span CD is 4 m, subjected to UDL of intensity 35 kN/m. Find the Collapse moment and draw the bending moment diagram**.** **09**

SLR-QH-240

Seat No.	

Set S

T. Y. (B.Tech.) (Civil Engineering) (Semester - I) (Old) (CBCS)
Examination: March/April - 2026
Design of Steel Structures (BTN01501)

Day & Date: Saturday, 02-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary and mention it clearly.
5) Use of IS 800-2007 and Steel Book are allowed, but not allowed for MCQs (Q. No. 1) for first 30 minutes.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct option. **14**

1) In case of an axially loaded column to the base plate in gusseted base are designed for _____.
a) 100% of the column load b) 50% of the column load
c) 25% of the column load d) erecting load only

2) Allowable deflection in case of laterally supported beams is _____.
a) L/300 b) L/250
c) L/325 d) L/400

3) The partial safety factor for the material of bolt is _____.
a) 1.0 b) 1.10
c) 1.5 d) 1.25

4) A gusset Plate is subjected to _____.
a) Direct stress b) Shear stress
c) Bending stress d) All the above

5) The most suitable compression member section for a roof truss is _____.
a) Single angle
b) Double angles placed back to back
c) Double angles placed as star
d) Tubes

6) The effective length of a column with one end effectively held in position and restrained against rotation but not held in position and free to rotate at the other end is _____.

a) 0.65L b) 0.8L
c) 1.2L d) 2L

7) The slenderness ratio of limited to lacing flat is _____.

a) 350 b) 145
c) 180 d) 250

8) Thickness of lacing flats for a single lacing system should not be less than of the length between the inner end bolts of the length between the inner end bolts.

a) 1/40 b) 1/60
c) 1/50 d) 1/70

9) Design of pins is primarily governed by _____.

a) Shear b) Bearing
c) Flexure d) All the above

10) A structural member subjected to compressive stress in a direction parallel to its longitudinal axis, is generally known as _____.

a) strut b) post
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11) If the outstand element of compression flange of rolled section is less than _____ the section is classified as plastic.

a) 8.4 £ b) 10.5 £
c) 9.4 £ d) 15.7 £

12) The structural advantages of using steel as a structural material is _____.

a) small weight to strength b) speed of dismantling
c) speed of erection d) All of above

13) In plastic analysis, the shape factor for Diamond section is _____.

a) 2.0 b) 1.7
c) 1.6 d) None of these

14) A beam section is selected & provided on the basis of _____.

a) Section modulus b) Deflection
c) Shear d) All of above

Seat No.	

Set **S**

T. Y. (B.Tech.) (Civil Engineering) (Semester - I) (Old) (CBCS)
Examination: March/April - 2026
Design of Steel Structures (BTN01501)

Day & Date: Saturday, 02-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q.5 and Q.7 are compulsory and solve any 2 questions from the remaining questions of each Section.
2) Figures to the right indicates full marks.
3) Use of IS 800-2007 and Steel Book are allowed, but not allowed for MCQs (Q. No. 1) for first 30 minutes.
4) Assume suitable data if necessary and mention state it clearly before the solution.
5) Draw the appropriate sketches whenever necessary.

Section – I

Q.2 **a)** State advantages and disadvantages of steel structures. **03**

b) Calculate the Strength of 18 mm diameter bolt of grade 4.6 for the lap joint. The main plate to be jointed are 10 mm thick. Use Fe 410 steel. **06**

Q.3 Design a tension member to carry a factored load of 310 kN. Use 20 mm diameter bolts of grade 5.6 for the connection. Use Fe 410 steel. **09**

Q.4 Design a Principal rafter in truss of length 3.0 m. The rafter can carry factored compressive load of 250 kN. Design a bolted connection using 10 mm thick gusset plate. Use steel of grade Fe 410, fy = 250 N/mm^2. **09**

Q.5 Attempt the Following.

a) Write a note on applications of PEB? **03**

b) What is Shape Factor? Find the shape factor for Rectangular Section. **04**

c) State the purpose of providing anchor bolts in the column foundations? **03**

Section – II

Q.6 A simply supported steel beam of 5.0 m effective span is laterally supported throughout. It carries a total uniformly distributed load of 45 kN (Inclusive of self weight). Design an appropriate section using steel of grade Fe 410. **09**

Q.7 Design a built up column consisting of two rolled steel channel sections placed back to back to resist an axial load of 1250 kN. The length of the column is 4.5 m. it is restrained against rotation and translation at both the ends. Take fy = 250MPa. Also design the batten system with bolted connection. **10**

Q.8 A column ISHB 350 @661.2 N/m carries an axial compressive factored load of 900 kN. Design a suitable welded slab base. The base rests on M25 grade concrete pedestal. **09**

Q.9 A Continuous Beam ABCD Fixed at support A and simply at B, C and at D. The Span AB carries a central point load of 70 kN, 2.5 m from each support. Span BC of 3.5 m length carries a point load of magnitude 110 kN a at distance 1m from support C. The Span CD is 4 m, subjected to UDL of intensity 35 kN/m. Find the Collapse moment and draw the bending moment diagram**.** **09**

SLR-QH-241

Seat No.	

Set P

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (Old) (CBCS)
Examination: March/April – 2026
Geotechnical Engineering (BTN01502)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) The unit weight of soil at zero air voids depends on _____.
a) Water content b) Specific gravity
c) Unit weight of water d) All of the above

2) The degree of saturation of a fully saturated soil is _____.
a) 0.25 b) 0.50
c) 1.0 d) 0.0

3) In flow net equipotential lines and flow lines intersect each other at an angle of _____.
a) 45-degress b) 90-degress
c) 30-degress d) 60-degress

4) Which test is suitable to find permeability of black cotton soil?
a) Constant head b) Falling head
c) Both d) None

5) Shear strength depends on _____.
a) Cohesion only
b) Angle of internal friction only
c) Both cohesion and angle of internal friction
d) None of these

6) In vane test vanes are welded _____ to rod.
a) Parallel b) Orthogonal
c) Inclined d) None

7) The angle of internal friction (φ) of a soil depends on _____.
a) Shape and roughness
b) State of packing and amount of interlocking
c) Lateral pressure
d) all of these

8) Compaction is a process is which _____.
a) Removal of water from the voids of the soil mass
b) Removal of air from the voids of the soil mass
c) Removal of both air and water from the voids of the soil mass
d) None of the above

9) The unit weight of soil at zero air voids depends on _____.
a) Specific gravity
b) Water content
c) Unit weight of water
d) All of the above

10) For a degree of consolidation of 50%, the time factor Tv is _____.
a) 0.3927
b) 0.1963
c) 0.5000
d) None

11) Consolidation is a process of removal of _____.
a) Air from the voids
b) Water from the voids
c) Both air and water from the voids
d) None of these

12) A change in voids ratio per unit change in pressure is termed as _____.
a) Coefficient of compressibility
b) Coefficient of volume change
c) Coefficient of consolidation
d) None of these

13) For a retaining wall of height 3 m with cohesion less backfill of $\varphi = 35$ the distance of resultant earth pressure above the base of wall is _____.
a) 0.33 m
b) 1.33 m
c) 1 m
d) 1.5 m

14) During active earth pressure case the wall _____.
a) Moves towards the backfill
b) Away from the backfill
c) Does not move at all
d) None of the above

Seat No.	

Set **P**

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (Old) (CBCS)
Examination: March/April – 2026
Geotechnical Engineering (BTN01502)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q.2 and Q.6 are compulsory.
2) Solve any two questions out of Q.no. 3, 4 and 5. and
3) Solve any two questions out of Q.no. 7, 8 and 9.
4) Figures to the right indicate full marks.
5) Assume suitable data if required and mention it clearly.

SECTION – I

Q.2 Answer any four questions. **08**

a) Define Voids Ratio and degree of saturation.

b) Write the limitations of Direct Shear Test.

c) Write any two applications of flow net.

d) Explain the Darcy's Law.

e) State Coulomb's Law of Shear Strength.

Q.3 a) Derive the relation between G, w, e and S with usual notations. **05**

b) 1 m^3 of wet soil weight = 20 KN its dry weight is 18 KN, G = 2.67. Calculate dry density, water content, void ratio, degree of saturation. **05**

Q.4 a) What is permeability of soil? Explain Constant Head Permeability Test with neat sketch. **05**

b) Calculate the coefficient of permeability of a soil sample 8 cm in height and 50 cm^2 in cross sectional area, if a quantity of water equals to 440 ml passed down in 12 minutes under an effective constant head of 40 cm. On oven drying the test specimen has mass of 498 gm, calculate seepage velocity. Take G = 2.70. **05**

Q.5 **a)** Explain Direct Shear Test to determine shear strength parameter of soil. **05**

b) Following results were obtained in direct box shear test on sandy clay. **05**

Normal Stress	50	100	200	300
Shear Stress	36	80	154	235

Determine the shear parameter.

SECTION – II

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

a) Define OMC and MDD.

b) Enlist the assumptions made in Rankine's theory.

c) Explain Over-Consolidated Soil.

d) Define Active earth pressure.

e) Define Coefficient of Consolidation.

Q.7 **a)** Explain Standard Proctor Test. **05**

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

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

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

Q.8 **a)** Explain the significance of Pre-consolidation Pressure. Describe the Casagrande method of determining it. **05**

b) The laboratory consolidation data for an undisturbed clay sample are as follows **05**
$e1 = 0.70, \sigma 1 = 100$ kN/m^2 and $e2 = 0.60, \sigma 2 = 300$ kN/m^2.

Q.9 **a)** Write differences between Active Earth Pressure and Passive Earth Pressure. **05**

b) A retaining wall 09 m height with a smooth vertical back retains a backfill with C = 0 kN/m^2, Φ = 25° and Y = 18 kN/m^3. What is the total Rankine's active thrust on the wall. **05**

Seat No.	

Set **Q**

T. Y. (B.Tech.) (Civil Engineering) (Semester - I) (Old) (CBCS)
Examination: March/April – 2026
Geotechnical Engineering (BTN01502)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Compaction is a process is which _____.
a) Removal of water from the voids of the soil mass
b) Removal of air from the voids of the soil mass
c) Removal of both air and water from the voids of the soil mass
d) None of the above

2) The unit weight of soil at zero air voids depends on _____.
a) Specific gravity b) Water content
c) Unit weight of water d) All of the above

3) For a degree of consolidation of 50%, the time factor Tv is _____.
a) 0.3927 b) 0.1963
c) 0.5000 d) None

4) Consolidation is a process of removal of _____.
a) Air from the voids
b) Water from the voids
c) Both air and water from the voids
d) None of these

5) A change in voids ratio per unit change in pressure is termed as _____.
a) Coefficient of compressibility b) Coefficient of volume change
c) Coefficient of consolidation d) None of these

6) For a retaining wall of height 3 m with cohesion less backfill of $\varphi = 35$ the distance of resultant earth pressure above the base of wall is _____.

a) 0.33 m
b) 1.33 m
c) 1 m
d) 1.5 m

7) During active earth pressure case the wall _____.

a) Moves towards the backfill
b) Away from the backfill
c) Does not move at all
d) None of the above

8) The unit weight of soil at zero air voids depends on _____.

a) Water content
b) Specific gravity
c) Unit weight of water
d) All of the above

9) The degree of saturation of a fully saturated soil is _____.

a) 0.25
b) 0.50
c) 1.0
d) 0.0

10) In flow net equipotential lines and flow lines intersect each other at an angle of _____.

a) 45-degress
b) 90-degress
c) 30-degress
d) 60-degress

11) Which test is suitable to find permeability of black cotton soil?

a) Constant head
b) Falling head
c) Both
d) None

12) Shear strength depends on _____.

a) Cohesion only
b) Angle of internal friction only
c) Both cohesion and angle of internal friction
d) None of these

13) In vane test vanes are welded _____ to rod.

a) Parallel
b) Orthogonal
c) Inclined
d) None

14) The angle of internal friction (φ) of a soil depends on _____.

a) Shape and roughness
b) State of packing and amount of interlocking
c) Lateral pressure
d) all of these

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (Old) (CBCS)
Examination: March/April – 2026
Geotechnical Engineering (BTN01502)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q.2 and Q.6 are compulsory.
2) Solve any two questions out of Q.no. 3, 4 and 5. and
3) Solve any two questions out of Q.no. 7, 8 and 9.
4) Figures to the right indicate full marks.
5) Assume suitable data if required and mention it clearly.

SECTION – I

Q.2 Answer any four questions. **08**

a) Define Voids Ratio and degree of saturation.

b) Write the limitations of Direct Shear Test.

c) Write any two applications of flow net.

d) Explain the Darcy's Law.

e) State Coulomb's Law of Shear Strength.

Q.3 a) Derive the relation between G, w, e and S with usual notations. **05**

b) 1 m^3 of wet soil weight = 20 KN its dry weight is 18 KN, G = 2.67. Calculate dry density, water content, void ratio, degree of saturation. **05**

Q.4 a) What is permeability of soil? Explain Constant Head Permeability Test with neat sketch. **05**

b) Calculate the coefficient of permeability of a soil sample 8 cm in height and 50 cm^2 in cross sectional area, if a quantity of water equals to 440 ml passed down in 12 minutes under an effective constant head of 40 cm. On oven drying the test specimen has mass of 498 gm, calculate seepage velocity. Take G = 2.70. **05**

Q.5 **a)** Explain Direct Shear Test to determine shear strength parameter of soil. **05**

b) Following results were obtained in direct box shear test on sandy clay. **05**

Normal Stress	50	100	200	300
Shear Stress	36	80	154	235

Determine the shear parameter.

SECTION – II

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

a) Define OMC and MDD.

b) Enlist the assumptions made in Rankine's theory.

c) Explain Over-Consolidated Soil.

d) Define Active earth pressure.

e) Define Coefficient of Consolidation.

Q.7 **a)** Explain Standard Proctor Test. **05**

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

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

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

Q.8 **a)** Explain the significance of Pre-consolidation Pressure. Describe the Casagrande method of determining it. **05**

b) The laboratory consolidation data for an undisturbed clay sample are as follows **05**
$e1 = 0.70, \sigma 1 = 100$ kN/m^2 and $e2 = 0.60, \sigma 2 = 300$ kN/m^2.

Q.9 **a)** Write differences between Active Earth Pressure and Passive Earth Pressure. **05**

b) A retaining wall 09 m height with a smooth vertical back retains a backfill with C = 0 kN/m^2, Φ = 25° and Y = 18 kN/m^3. What is the total Rankine's active thrust on the wall. **05**

Seat No.	

Set R

T. Y. (B.Tech.) (Civil Engineering) (Semester - I) (Old) (CBCS)
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Geotechnical Engineering (BTN01502)

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MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. 14

1) Consolidation is a process of removal of _____.
a) Air from the voids
b) Water from the voids
c) Both air and water from the voids
d) None of these

2) A change in voids ratio per unit change in pressure is termed as _____.
a) Coefficient of compressibility b) Coefficient of volume change
c) Coefficient of consolidation d) None of these

3) For a retaining wall of height 3 m with cohesion less backfill of $\varphi = 35$ the distance of resultant earth pressure above the base of wall is _____.
a) 0.33 m b) 1.33 m
c) 1 m d) 1.5 m

4) During active earth pressure case the wall _____.
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5) The unit weight of soil at zero air voids depends on _____.
a) Water content b) Specific gravity
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6) The degree of saturation of a fully saturated soil is _____.
a) 0.25 b) 0.50
c) 1.0 d) 0.0

7) In flow net equipotential lines and flow lines intersect each other at an angle of _____.
a) 45-degress b) 90-degress
c) 30-degress d) 60-degress

8) Which test is suitable to find permeability of black cotton soil?
a) Constant head b) Falling head
c) Both d) None

9) Shear strength depends on _____.
a) Cohesion only
b) Angle of internal friction only
c) Both cohesion and angle of internal friction
d) None of these

10) In vane test vanes are welded _____ to rod.
a) Parallel b) Orthogonal
c) Inclined d) None

11) The angle of internal friction (φ) of a soil depends on _____.
a) Shape and roughness
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13) The unit weight of soil at zero air voids depends on _____.
a) Specific gravity b) Water content
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14) For a degree of consolidation of 50%, the time factor Tv is _____.
a) 0.3927 b) 0.1963
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Seat No.	

Set **R**

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (Old) (CBCS)
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Geotechnical Engineering (BTN01502)

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SECTION – I

Q.2 Answer any four questions. **08**

a) Define Voids Ratio and degree of saturation.

b) Write the limitations of Direct Shear Test.

c) Write any two applications of flow net.

d) Explain the Darcy's Law.

e) State Coulomb's Law of Shear Strength.

Q.3 a) Derive the relation between G, w, e and S with usual notations. **05**

b) 1 m^3 of wet soil weight = 20 KN its dry weight is 18 KN, G = 2.67. Calculate dry density, water content, void ratio, degree of saturation. **05**

Q.4 a) What is permeability of soil? Explain Constant Head Permeability Test with neat sketch. **05**

b) Calculate the coefficient of permeability of a soil sample 8 cm in height and 50 cm^2 in cross sectional area, if a quantity of water equals to 440 ml passed down in 12 minutes under an effective constant head of 40 cm. On oven drying the test specimen has mass of 498 gm, calculate seepage velocity. Take G = 2.70. **05**

Q.5 **a)** Explain Direct Shear Test to determine shear strength parameter of soil. **05**

b) Following results were obtained in direct box shear test on sandy clay. **05**

Normal Stress	50	100	200	300
Shear Stress	36	80	154	235

Determine the shear parameter.

SECTION – II

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

a) Define OMC and MDD.

b) Enlist the assumptions made in Rankine's theory.

c) Explain Over-Consolidated Soil.

d) Define Active earth pressure.

e) Define Coefficient of Consolidation.

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Q.9 **a)** Write differences between Active Earth Pressure and Passive Earth Pressure. **05**

b) A retaining wall 09 m height with a smooth vertical back retains a backfill with C = 0 kN/m^2, Φ = 25° and Y = 18 kN/m^3. What is the total Rankine's active thrust on the wall. **05**

Seat No.	

Set **S**

T. Y. (B.Tech.) (Civil Engineering) (Semester - I) (Old) (CBCS)
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MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) In vane test vanes are welded _____ to rod.
a) Parallel b) Orthogonal
c) Inclined d) None

2) The angle of internal friction (φ) of a soil depends on _____.
a) Shape and roughness
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Seat No.	

Set **S**

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Examination: March/April – 2026
Geotechnical Engineering (BTN01502)

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SECTION – I

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Q.5 **a)** Explain Direct Shear Test to determine shear strength parameter of soil. **05**

b) Following results were obtained in direct box shear test on sandy clay. **05**

Normal Stress	50	100	200	300
Shear Stress	36	80	154	235

Determine the shear parameter.

SECTION – II

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

a) Define OMC and MDD.

b) Enlist the assumptions made in Rankine's theory.

c) Explain Over-Consolidated Soil.

d) Define Active earth pressure.

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Q.7 **a)** Explain Standard Proctor Test. **05**

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SLR-QH-242

Seat No.	

Set P

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (Old) (CBCS)
Examination: March/April – 2026
Highway and Tunnel Engineering (BTN01503)

Day & Date: Thursday, 07-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Multiple choice questions. **14**

1) Match List-I (class of road) with List-II (width of c/w) and select the correct answer using the codes _____.

List – I	List – II
A) Single lane	1) 7.5m
B) Two lane without raised Kerbs	2) 3.5m per lane
C) Two lane with raised Kerbs	3) 3.75m
D) Multilane pavement	4) 7.0m

Codes:

	A	B	C	D
a)	2	3	4	1
b)	4	1	2	3
c)	3	4	1	2
d)	2	1	4	3

2) Lag distance is the distance during the _____.
a) Vehicle travelled during the reaction time, t
b) Vehicle travelled during the speed, v
c) Vehicle travelled during the braking operation
d) None of these

3) In order to fit the transition, the circular curve is moved inwards by a certain distance known as _____.
a) Set back distance b) Shift of curve
c) Right of way d) Building control line

4) Grade compensation is not required for gradients flatter than _____.
a) 4% b) 5%
c) 6% d) 7%

5) In using the data from a plate bearing test for determining the modulus of subgrade reaction, the value of settlement to be used is _____.
a) 1.25mm b) 2.50mm
c) 3.75mm d) 1.75mm

6) The modulus of subgrade reaction using 30cm diameter plate is obtained as 16.86kg/cm^3, the value of the same using standard plate will be _____.
a) 7.75 kg/cm^3 b) 6.75 kg/cm^3
c) 8.75 kg/cm^3 d) 5.75 kg/cm^3

7) Which of the following represents hardest grade of bitumen?
a) 30/40 b) 60/70
c) 80/100 d) 100/120

8) Aggregate abrasion value indicates which of the following property?
a) Durability b) Toughness
c) Hardness d) Strength

9) When the bituminous surfacing is done on already existing black top road or over existing cement concrete road, the type of treatment given is _____.
a) Seal coat b) Tack coat
c) Prime coat d) Spray of emulsion

10) The critical combination of stresses for corner region in cement concrete road during summer midnight is _____.
a) Load stress + warping stress frictional stress
b) Load stress + warping stress + frictional stress
c) Load stress + warping stress
d) Load stress + frictional stress

11) DBFOT stands for _____.
a) Design, Build, Finance, Own, Transfer
b) Design, Borrow, Finance, Operate, Transfer
c) Design, Build, Finance, Operate, Transfer
d) Design, Build, Forecast, Operate, Transfer

12) The most suitable equipment for compacting clayey soils is a _____.
a) Smooth wheeled roller b) Pneumatic tyred roller
c) Sheep foot roller d) Vibrator

13) Bituminous concrete is a mix comprising of _____.
a) Fine aggregate, filler and bitumen
b) Fine aggregate and bitumen
c) Coarse aggregate, fine aggregate, filler and bitumen
d) Coarse aggregate, filler and bitumen

14) In full face method of constructing tunnel, the first operation relates to _____.

a) Removal of bottom portion
b) Excavation of one drift in the center
c) Removal of top portion
d) Excavation being done along the perimeter

Seat No.	

Set **P**

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (Old) (CBCS)
Examination: March/April – 2026
Highway and Tunnel Engineering (BTN01503)

Day & Date: Thursday, 07-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever needed and mention it clearly.

SECTION – I

Q.2 Solve any two questions. **12**

a) Explain the various factors to be considered in deciding the highway alignment.

b) Draw a typical cross section of Two Lane National Highway in cutting and embankment indicating width of road, camber, roadway and land.

c) Derive the expression for finding the stopping sight distance at level and at gradients.

Q.3 Solve any two questions. **16**

a) A radius of 500 m has to be provided at a locality due to site restrictions on a National Highway with design speed 100 kmph. Design the super elevation. Should there be any restriction in speed? Assume Suitable data.

b) On a two-way traffic road, the speed of overtaking and overtaken vehicles is 65kmph and 40kmph respectively. If the average acceleration 0.92m/sec^2. Determine the overtaking sight distance indicating the details of overtaking operations with sketch. Assume t=2.0sec

c) An expressway four lane divided, passing through a flat terrain has a horizontal curve of radius equal to ruling minimum radius and design speed is 120kmph. Assume design coefficient of lateral friction=0.15, length of the vehicle wheel base=6.1m. Calculate the following elements of the curve,

i) Ruling minimum radius
ii) Super elevation
iii) Extra Widening
iv) Length of transition curve using IRC equation. Assume Suitable data.

SECTION – II

Q.4 Solve any two questions. **12**

a) Differentiate between flexible & rigid pavement.

b) A pavement designer has arrived at a design traffic of 100 million standard axles for a newly developing national highway as per IRC-37 guidelines using the following data:
design life = 15 years, commercial vehicle count at the end of the construction = 4500 vehicles/day, annual traffic growth rate = 8%.
Calculate the vehicle damage factor used in this pavement design.
Explain the importance of Vehicle Damage Factor in flexible pavement design.

c) Write a short on applications of softening point & Ductility test on bitumen.

Q.5 Solve any two questions. **16**

a) Write a note on surface and sub surface drainage system for highway.

b) Calculate the stresses at the interior, edge and corner region of cement concrete pavement using Westergaard's analysis. Use the following data:
Wheel Load P = 4100kg, pavement thickness, h = 15cm, Poisson's ratio, $\mu = 0.15$, Modulus of subgrade reaction, K = 3.0kg/cm^3, Radius of contact area, a = 15cm, modulus of elasticity of concrete,
E = 3×10^5 kg/cm^2

c) State methods of tunneling in soft rock. Explain with sketch any one method in detail.

SLR-QH-242

Seat No.	

Set Q

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (Old) (CBCS)
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MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Multiple choice questions. **14**

1) Aggregate abrasion value indicates which of the following property?
a) Durability b) Toughness
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2) When the bituminous surfacing is done on already existing black top road or over existing cement concrete road, the type of treatment given is _____.
a) Seal coat b) Tack coat
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3) The critical combination of stresses for corner region in cement concrete road during summer midnight is _____.
a) Load stress + warping stress frictional stress
b) Load stress + warping stress + frictional stress
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7) In full face method of constructing tunnel, the first operation relates to _____.
a) Removal of bottom portion
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8) Match List-I (class of road) with List-II (width of c/w) and select the correct answer using the codes _____.

List – I		List – II	
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B)	Two lane without raised Kerbs	2)	3.5m per lane
C)	Two lane with raised Kerbs	3)	3.75m
D)	Multilane pavement	4)	7.0m

Codes:

	A	B	C	D
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c)	3	4	1	2
d)	2	1	4	3

9) Lag distance is the distance during the _____.
a) Vehicle travelled during the reaction time, t
b) Vehicle travelled during the speed, v
c) Vehicle travelled during the braking operation
d) None of these

10) In order to fit the transition, the circular curve is moved inwards by a certain distance known as _____.
a) Set back distance
b) Shift of curve
c) Right of way
d) Building control line

11) Grade compensation is not required for gradients flatter than _____.
a) 4%
b) 5%
c) 6%
d) 7%

12) In using the data from a plate bearing test for determining the modulus of subgrade reaction, the value of settlement to be used is _____.
a) 1.25mm
b) 2.50mm
c) 3.75mm
d) 1.75mm

13) The modulus of subgrade reaction using 30cm diameter plate is obtained as 16.86kg/cm^3, the value of the same using standard plate will be _____.

a) 7.75 kg/cm^3 b) 6.75 kg/cm^3
c) 8.75 kg/cm^3 d) 5.75 kg/cm^3

14) Which of the following represents hardest grade of bitumen?

a) 30/40 b) 60/70
c) 80/100 d) 100/120

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (Old) (CBCS)
Examination: March/April – 2026
Highway and Tunnel Engineering (BTN01503)

Day & Date: Thursday, 07-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever needed and mention it clearly.

SECTION – I

Q.2 Solve any two questions. **12**

a) Explain the various factors to be considered in deciding the highway alignment.

b) Draw a typical cross section of Two Lane National Highway in cutting and embankment indicating width of road, camber, roadway and land.

c) Derive the expression for finding the stopping sight distance at level and at gradients.

Q.3 Solve any two questions. **16**

a) A radius of 500 m has to be provided at a locality due to site restrictions on a National Highway with design speed 100 kmph. Design the super elevation. Should there be any restriction in speed? Assume Suitable data.

b) On a two-way traffic road, the speed of overtaking and overtaken vehicles is 65kmph and 40kmph respectively. If the average acceleration 0.92m/sec^2. Determine the overtaking sight distance indicating the details of overtaking operations with sketch. Assume t=2.0sec

c) An expressway four lane divided, passing through a flat terrain has a horizontal curve of radius equal to ruling minimum radius and design speed is 120kmph. Assume design coefficient of lateral friction=0.15, length of the vehicle wheel base=6.1m. Calculate the following elements of the curve,

i) Ruling minimum radius
ii) Super elevation
iii) Extra Widening
iv) Length of transition curve using IRC equation. Assume Suitable data.

SECTION – II

Q.4 Solve any two questions. **12**

a) Differentiate between flexible & rigid pavement.

b) A pavement designer has arrived at a design traffic of 100 million standard axles for a newly developing national highway as per IRC-37 guidelines using the following data:
design life = 15 years, commercial vehicle count at the end of the construction = 4500 vehicles/day, annual traffic growth rate = 8%.
Calculate the vehicle damage factor used in this pavement design.
Explain the importance of Vehicle Damage Factor in flexible pavement design.

c) Write a short on applications of softening point & Ductility test on bitumen.

Q.5 Solve any two questions. **16**

a) Write a note on surface and sub surface drainage system for highway.

b) Calculate the stresses at the interior, edge and corner region of cement concrete pavement using Westergaard's analysis. Use the following data:
Wheel Load P = 4100kg, pavement thickness, h = 15cm, Poisson's ratio, $\mu = 0.15$, Modulus of subgrade reaction, K = 3.0kg/cm^3, Radius of contact area, a = 15cm, modulus of elasticity of concrete,
E = 3×10^5 kg/cm^2

c) State methods of tunneling in soft rock. Explain with sketch any one method in detail.

SLR-QH-242

Seat No.	

Set R

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (Old) (CBCS)
Examination: March/April – 2026
Highway and Tunnel Engineering (BTN01503)

Day & Date: Thursday, 07-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Multiple choice questions. **14**

1) DBFOT stands for _____.
a) Design, Build, Finance, Own, Transfer
b) Design, Borrow, Finance, Operate, Transfer
c) Design, Build, Finance, Operate, Transfer
d) Design, Build, Forecast, Operate, Transfer

2) The most suitable equipment for compacting clayey soils is a _____.
a) Smooth wheeled roller b) Pneumatic tyred roller
c) Sheep foot roller d) Vibrator

3) Bituminous concrete is a mix comprising of _____.
a) Fine aggregate, filler and bitumen
b) Fine aggregate and bitumen
c) Coarse aggregate, fine aggregate, filler and bitumen
d) Coarse aggregate, filler and bitumen

4) In full face method of constructing tunnel, the first operation relates to _____.
a) Removal of bottom portion
b) Excavation of one drift in the center
c) Removal of top portion
d) Excavation being done along the perimeter

5) Match List-I (class of road) with List-II (width of c/w) and select the correct answer using the codes _____.

List – I	List – II
A) Single lane	1) 7.5m
B) Two lane without raised Kerbs	2) 3.5m per lane
C) Two lane with raised Kerbs	3) 3.75m
D) Multilane pavement	4) 7.0m

Codes:

	A	B	C	D
a)	2	3	4	1
b)	4	1	2	3
c)	3	4	1	2
d)	2	1	4	3

6) Lag distance is the distance during the _____.

a) Vehicle travelled during the reaction time, t
b) Vehicle travelled during the speed, v
c) Vehicle travelled during the braking operation
d) None of these

7) In order to fit the transition, the circular curve is moved inwards by a certain distance known as _____.

a) Set back distance
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c) Right of way
d) Building control line

8) Grade compensation is not required for gradients flatter than _____.

a) 4%
b) 5%
c) 6%
d) 7%

9) In using the data from a plate bearing test for determining the modulus of subgrade reaction, the value of settlement to be used is _____.

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c) 3.75mm
d) 1.75mm

10) The modulus of subgrade reaction using 30cm diameter plate is obtained as 16.86kg/cm^3, the value of the same using standard plate will be _____.

a) 7.75 kg/cm^3
b) 6.75 kg/cm^3
c) 8.75 kg/cm^3
d) 5.75 kg/cm^3

11) Which of the following represents hardest grade of bitumen?

a) 30/40
b) 60/70
c) 80/100
d) 100/120

12) Aggregate abrasion value indicates which of the following property?

a) Durability
b) Toughness
c) Hardness
d) Strength

13) When the bituminous surfacing is done on already existing black top road or over existing cement concrete road, the type of treatment given is _____.

a) Seal coat
b) Tack coat
c) Prime coat
d) Spray of emulsion

14) The critical combination of stresses for corner region in cement concrete road during summer midnight is _____.

a) Load stress + warping stress frictional stress
b) Load stress + warping stress + frictional stress
c) Load stress + warping stress
d) Load stress + frictional stress

Seat No.	

Set **R**

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (Old) (CBCS)
Examination: March/April – 2026
Highway and Tunnel Engineering (BTN01503)

Day & Date: Thursday, 07-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
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3) Assume suitable data wherever needed and mention it clearly.

SECTION – I

Q.2 Solve any two questions. **12**

a) Explain the various factors to be considered in deciding the highway alignment.

b) Draw a typical cross section of Two Lane National Highway in cutting and embankment indicating width of road, camber, roadway and land.

c) Derive the expression for finding the stopping sight distance at level and at gradients.

Q.3 Solve any two questions. **16**

a) A radius of 500 m has to be provided at a locality due to site restrictions on a National Highway with design speed 100 kmph. Design the super elevation. Should there be any restriction in speed? Assume Suitable data.

b) On a two-way traffic road, the speed of overtaking and overtaken vehicles is 65kmph and 40kmph respectively. If the average acceleration 0.92m/sec^2. Determine the overtaking sight distance indicating the details of overtaking operations with sketch. Assume t=2.0sec

c) An expressway four lane divided, passing through a flat terrain has a horizontal curve of radius equal to ruling minimum radius and design speed is 120kmph. Assume design coefficient of lateral friction=0.15, length of the vehicle wheel base=6.1m. Calculate the following elements of the curve,

i) Ruling minimum radius
ii) Super elevation
iii) Extra Widening
iv) Length of transition curve using IRC equation. Assume Suitable data.

SECTION – II

Q.4 Solve any two questions. **12**

a) Differentiate between flexible & rigid pavement.

b) A pavement designer has arrived at a design traffic of 100 million standard axles for a newly developing national highway as per IRC-37 guidelines using the following data:
design life = 15 years, commercial vehicle count at the end of the construction = 4500 vehicles/day, annual traffic growth rate = 8%.
Calculate the vehicle damage factor used in this pavement design.
Explain the importance of Vehicle Damage Factor in flexible pavement design.

c) Write a short on applications of softening point & Ductility test on bitumen.

Q.5 Solve any two questions. **16**

a) Write a note on surface and sub surface drainage system for highway.

b) Calculate the stresses at the interior, edge and corner region of cement concrete pavement using Westergaard's analysis. Use the following data:
Wheel Load P = 4100kg, pavement thickness, h = 15cm, Poisson's ratio, $\mu = 0.15$, Modulus of subgrade reaction, K = 3.0kg/cm^3, Radius of contact area, a = 15cm, modulus of elasticity of concrete,
E = 3×10^5 kg/cm^2

c) State methods of tunneling in soft rock. Explain with sketch any one method in detail.

Seat No.	

Set **S**

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (Old) (CBCS)
Examination: March/April – 2026
Highway and Tunnel Engineering (BTN01503)

Day & Date: Thursday, 07-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

Duration: 30 Minutes Marks:14

Q.1 Multiple choice questions. **14**

1) The modulus of subgrade reaction using 30cm diameter plate is obtained as 16.86kg/cm^3, the value of the same using standard plate will be _____.
a) 7.75 kg/cm^3 b) 6.75 kg/cm^3
c) 8.75 kg/cm^3 d) 5.75 kg/cm^3

2) Which of the following represents hardest grade of bitumen?
a) 30/40 b) 60/70
c) 80/100 d) 100/120

3) Aggregate abrasion value indicates which of the following property?
a) Durability b) Toughness
c) Hardness d) Strength

4) When the bituminous surfacing is done on already existing black top road or over existing cement concrete road, the type of treatment given is _____.
a) Seal coat b) Tack coat
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5) The critical combination of stresses for corner region in cement concrete road during summer midnight is _____.
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c) Load stress + warping stress
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6) DBFOT stands for _____.
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b) Design, Borrow, Finance, Operate, Transfer
c) Design, Build, Finance, Operate, Transfer
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7) The most suitable equipment for compacting clayey soils is a _____.
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8) Bituminous concrete is a mix comprising of _____.
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b) Excavation of one drift in the center
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d) Excavation being done along the perimeter

10) Match List-I (class of road) with List-II (width of c/w) and select the correct answer using the codes _____.

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C) Two lane with raised Kerbs	3) 3.75m
D) Multilane pavement	4) 7.0m

Codes:

	A	B	C	D
a)	2	3	4	1
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c)	3	4	1	2
d)	2	1	4	3

11) Lag distance is the distance during the _____.
a) Vehicle travelled during the reaction time, t
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c) Vehicle travelled during the braking operation
d) None of these

12) In order to fit the transition, the circular curve is moved inwards by a certain distance known as _____.
a) Set back distance
b) Shift of curve
c) Right of way
d) Building control line

13) Grade compensation is not required for gradients flatter than _____.

a) 4% b) 5%
c) 6% d) 7%

14) In using the data from a plate bearing test for determining the modulus of subgrade reaction, the value of settlement to be used is _____.

a) 1.25mm b) 2.50mm
c) 3.75mm d) 1.75mm

Seat No.		Set	S

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (Old) (CBCS)
Examination: March/April – 2026
Highway and Tunnel Engineering (BTN01503)

Day & Date: Thursday, 07-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever needed and mention it clearly.

SECTION – I

Q.2 Solve any two questions. **12**

a) Explain the various factors to be considered in deciding the highway alignment.

b) Draw a typical cross section of Two Lane National Highway in cutting and embankment indicating width of road, camber, roadway and land.

c) Derive the expression for finding the stopping sight distance at level and at gradients.

Q.3 Solve any two questions. **16**

a) A radius of 500 m has to be provided at a locality due to site restrictions on a National Highway with design speed 100 kmph. Design the super elevation. Should there be any restriction in speed? Assume Suitable data.

b) On a two-way traffic road, the speed of overtaking and overtaken vehicles is 65kmph and 40kmph respectively. If the average acceleration 0.92m/sec^2. Determine the overtaking sight distance indicating the details of overtaking operations with sketch. Assume t=2.0sec

c) An expressway four lane divided, passing through a flat terrain has a horizontal curve of radius equal to ruling minimum radius and design speed is 120kmph. Assume design coefficient of lateral friction=0.15, length of the vehicle wheel base=6.1m. Calculate the following elements of the curve,

i) Ruling minimum radius
ii) Super elevation
iii) Extra Widening
iv) Length of transition curve using IRC equation. Assume Suitable data.

SECTION – II

Q.4 Solve any two questions. **12**

a) Differentiate between flexible & rigid pavement.

b) A pavement designer has arrived at a design traffic of 100 million standard axles for a newly developing national highway as per IRC-37 guidelines using the following data:
design life = 15 years, commercial vehicle count at the end of the construction = 4500 vehicles/day, annual traffic growth rate = 8%.
Calculate the vehicle damage factor used in this pavement design.
Explain the importance of Vehicle Damage Factor in flexible pavement design.

c) Write a short on applications of softening point & Ductility test on bitumen.

Q.5 Solve any two questions. **16**

a) Write a note on surface and sub surface drainage system for highway.

b) Calculate the stresses at the interior, edge and corner region of cement concrete pavement using Westergaard's analysis. Use the following data:
Wheel Load P = 4100kg, pavement thickness, h = 15cm, Poisson's ratio, $\mu = 0.15$, Modulus of subgrade reaction, K = 3.0kg/cm^3, Radius of contact area, a = 15cm, modulus of elasticity of concrete,
E = 3×10^5 kg/cm^2

c) State methods of tunneling in soft rock. Explain with sketch any one method in detail.

SLR-QH-243

Seat No.	

Set P

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (Old) (CBCS)
Examination: March/April – 2026
Hydrology and Water Resources Engineering (BTN01504)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 MCQ/Objective type questions: 14

1) The water year in India starts on the first day of _____.
a) January b) April
c) June d) September

2) Depth-Area-Duration curves of precipitation at a station would normally be _____.
a) Curves, concave upwards, with duration increasing outward
b) Curves, concave downwards, with duration increasing outward
c) Curves, concave upwards, with duration decreasing outward
d) Curves, concave downwards, with duration decreasing outward

3) The S-curve hydrograph is the summation of _____.
a) Unit hydrograph b) Total runoff hydrograph
c) Effective rainfall hyetograph d) Base flow recession curve

4) Which of the following instrument is not connected with stream flow measurement?
a) Hygrometer b) Echo-depth recorder
c) Electro-magnetic flow meter d) Sounding weight

5) The geological formation, which yields only insignificant quantity of groundwater, is an _____.
a) aquifer b) aquifuse
c) aquiclude d) aquitard

6) The zone of aeration in a ground profile does not include _____.
a) capillary fringe
b) soil water zone
c) intermediate zone
d) saturation zone

7) The rate of flow of water through ground strata can be estimated by _____.
a) Darcy's formula
b) Stricker's formula
c) Dupuit's formula
d) Manning's formula

8) Pinpoint the correct statement _____.
a) irrigation helps in adopting mixed cropping
b) 'mixed cropping' means sowing of a different crop after a particular crop has been grown
c) over-irrigation may lead to saving in fertilizer
d) irrigation helps in avoiding mixed cropping

9) The interlinking of rivers can help in _____.
a) Increase in irrigation area
b) Control of flood
c) Both a and b
d) None of these

10) An irrigation project is classified as a major project when the cultural command involved in the project, is more than _____.
a) 2,000 hectares
b) 5,000 hectares
c) 10,000 hectares
d) None of the above

11) If the irrigation water applied to a field penetrates uniformly throughout, then the water distribution efficiency is _____.
a) 1
b) 0
c) 0.5
d) None of them, as more data is required to ascertain it

12) The efficiency of water conveyance does not depend upon _____.
a) climatic conditions
b) geometry of the conveyance system
c) nature of the boundary of the conveyance system
d) method of application of water

13) The capacity of an irrigation canal is usually controlled by _____.
a) average kharif demand
b) average rabi demand
c) kor demand of rabi crops
d) kor demand of kharif crops

14) Cooperative water users' organizations help in _____.
a) soil management
b) water management
c) soil conservation
d) None of these

Seat No.	

Set P

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (Old) (CBCS)
Examination: March/April – 2026
Hydrology and Water Resources Engineering (BTN01504)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Question no. 2 & 6 are compulsory in Section I & Section II, and solve any two questions from the remaining of each section.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary and state it clearly.

SECTION – I

Q.2 **a)** Define the following terms: **04**
i) Rain gauge density
ii) Evapotranspiration
iii) Specific yield of Aquifer
iv) W – Index

b) The average annual rainfall in cm, observed at four existing rain Gauge stations in a basin is 105, 79, 70, and 66 cm respectively. If the average depth of rainfall over the basin is to be estimated within a 10% error, determine the additional number of rain gauges needed. **06**

Q.3 **a)** What is a unit hydrograph? Enlist assumptions and limitations of 'Unit Hydrograph theory'. **04**

b) Find the ordinates of a storm hydrograph resulting from a 3-hour storm with rainfall of 2, 6.75, and 3.75 cm during subsequent 3-hour intervals. The ordinates of the unit hydrograph are given below. Assume an initial loss of 5 mm infiltration index of 2.5 mm/hour and base flow of 10 cumecs. **05**

Time (hr)	Ordinates of unit hydrograph (m^3/sec)
3	0
6	110
9	365
12	500
15	390
18	310
21	250
24	235
3	175
6	130
9	95

Time (hr)	Ordinates of unit hydrograph (m^3/sec)
12	65
15	40
18	22
21	10
24	0

Q.4 **a)** Enumerate the different methods used for stream gauging. Discuss any one of them in detail. **04**

b) Given the ordinates of runoff hydrograph from a catchment area of 100 sqkm having a constant base flow of 2 cumec. Derive the ordinates of UH **05**

Duration (h)	2	4	6	8	10	12	14
Ordinate of runoff hydrograph (m^3/s)	2	3	4	6	5	3	2

Q.5 **a)** Derive an equation for the steady state discharge of a well fully penetrating a 'Confined Aquifer'. **04**

b) In an artesian aquifer of 8m thick, a 10 cm diameter well is pumped at a constant rate of 100 lit/minute. The steady state drawdown observed in two wells located at a distance of 10 m and 50 m distances from the center of the well are 3 m and 0.5 m respectively, compute the transmissivity and the hydraulic conductivity of the aquifer. **05**

SECTION – II

Q.6 **a)** Enlist the proposed inter-basin water transfer links proposed for Himalayan Rivers, a Development component of the National perspective plan. State the advantages of the Himalayan component. **05**

b) With a neat sketch explain the general layout and component parts of the lift irrigation system also, state when it is required to be implemented. **05**

Q.7 **a)** Discuss the suitability and construction features of Kolhapur type weir for irrigation. **03**

b) The table below gives necessary data about the crops, their duty, and the area under each crop, commanded by a canal, taking off from a storage reservoir. Taking a time factor for a canal to be 10/20. Calculate the discharge required at the head of the canal. Also determine design discharge, if the capacity factor of a canal is 0.9. **06**

Crop	Base period	Area (hectares)	Duty at the head of canal (ha/cumec)
Sugarcane (yearly)	320	800	580
Overlap of sugarcane in hot weather	90	140	580
Wheat (Rabbi)	120	700	1600
Bajri (Kharif)	120	600	2000
Vegetable (Hot weather)	120	360	600

Q.8 **a)** Define the following terms: **03**

i) Gross Command area
ii) Crop period
iii) Base period

b) What is meant by watershed management? Why it is essential? Explain in detail. **06**

Q.9 **a)** What is meant by sedimentation of the reservoir? Enlist the measures adopted for control of sediment inflow in the reservoirs. **03**

b) The root zone of irrigation soil has a dry weight of 15.3 kN/m^3 and a field capacity of 30%. The root zone depth of the crop having, a permanent wilting coefficient 9% is 0.9m. **06**

Determine:

i) the Depth of moisture in the root zone at field capacity
ii) the Depth of moisture in the root zone at the permanent wilting point
iii) the Depth of water available

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (Old) (CBCS)
Examination: March/April – 2026
Hydrology and Water Resources Engineering (BTN01504)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

Duration: 30 Minutes Marks:14

Q.1 MCQ/Objective type questions: 14

1) Pinpoint the correct statement _____.
a) irrigation helps in adopting mixed cropping
b) 'mixed cropping' means sowing of a different crop after a particular crop has been grown
c) over-irrigation may lead to saving in fertilizer
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2) The interlinking of rivers can help in _____.
a) Increase in irrigation area b) Control of flood
c) Both a and b d) None of these

3) An irrigation project is classified as a major project when the cultural command involved in the project, is more than _____.
a) 2,000 hectares b) 5,000 hectares
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4) If the irrigation water applied to a field penetrates uniformly throughout, then the water distribution efficiency is _____.
a) 1
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5) The efficiency of water conveyance does not depend upon _____.
a) climatic conditions
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c) nature of the boundary of the conveyance system
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6) The capacity of an irrigation canal is usually controlled by _____.
a) average kharif demand b) average rabi demand
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Seat No.	

Set Q

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (Old) (CBCS)
Examination: March/April – 2026
Hydrology and Water Resources Engineering (BTN01504)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Question no. 2 & 6 are compulsory in Section I & Section II, and solve any two questions from the remaining of each section.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary and state it clearly.

SECTION – I

Q.2 a) Define the following terms: **04**
i) Rain gauge density
ii) Evapotranspiration
iii) Specific yield of Aquifer
iv) W – Index

b) The average annual rainfall in cm, observed at four existing rain Gauge stations in a basin is 105, 79, 70, and 66 cm respectively. If the average depth of rainfall over the basin is to be estimated within a 10% error, determine the additional number of rain gauges needed. **06**

Q.3 a) What is a unit hydrograph? Enlist assumptions and limitations of 'Unit Hydrograph theory'. **04**

b) Find the ordinates of a storm hydrograph resulting from a 3-hour storm with rainfall of 2, 6.75, and 3.75 cm during subsequent 3-hour intervals. The ordinates of the unit hydrograph are given below. Assume an initial loss of 5 mm infiltration index of 2.5 mm/hour and base flow of 10 cumecs. **05**

Time (hr)	Ordinates of unit hydrograph (m^3/sec)
3	0
6	110
9	365
12	500
15	390
18	310
21	250
24	235
3	175
6	130
9	95

Time (hr)	Ordinates of unit hydrograph (m^3/sec)
12	65
15	40
18	22
21	10
24	0

Q.4 **a)** Enumerate the different methods used for stream gauging. Discuss any one of them in detail. **04**

b) Given the ordinates of runoff hydrograph from a catchment area of 100 sqkm having a constant base flow of 2 cumec. Derive the ordinates of UH **05**

Duration (h)	2	4	6	8	10	12	14
Ordinate of runoff hydrograph (m^3/s)	2	3	4	6	5	3	2

Q.5 **a)** Derive an equation for the steady state discharge of a well fully penetrating a 'Confined Aquifer'. **04**

b) In an artesian aquifer of 8m thick, a 10 cm diameter well is pumped at a constant rate of 100 lit/minute. The steady state drawdown observed in two wells located at a distance of 10 m and 50 m distances from the center of the well are 3 m and 0.5 m respectively, compute the transmissivity and the hydraulic conductivity of the aquifer. **05**

SECTION – II

Q.6 **a)** Enlist the proposed inter-basin water transfer links proposed for Himalayan Rivers, a Development component of the National perspective plan. State the advantages of the Himalayan component. **05**

b) With a neat sketch explain the general layout and component parts of the lift irrigation system also, state when it is required to be implemented. **05**

Q.7 **a)** Discuss the suitability and construction features of Kolhapur type weir for irrigation. **03**

b) The table below gives necessary data about the crops, their duty, and the area under each crop, commanded by a canal, taking off from a storage reservoir. Taking a time factor for a canal to be 10/20. Calculate the discharge required at the head of the canal. Also determine design discharge, if the capacity factor of a canal is 0.9. **06**

Crop	Base period	Area (hectares)	Duty at the head of canal (ha/cumec)
Sugarcane (yearly)	320	800	580
Overlap of sugarcane in hot weather	90	140	580
Wheat (Rabbi)	120	700	1600
Bajri (Kharif)	120	600	2000
Vegetable (Hot weather)	120	360	600

Q.8 **a)** Define the following terms: **03**

i) Gross Command area
ii) Crop period
iii) Base period

b) What is meant by watershed management? Why it is essential? Explain in detail. **06**

Q.9 **a)** What is meant by sedimentation of the reservoir? Enlist the measures adopted for control of sediment inflow in the reservoirs. **03**

b) The root zone of irrigation soil has a dry weight of 15.3 kN/m^3 and a field capacity of 30%. The root zone depth of the crop having, a permanent wilting coefficient 9% is 0.9m. **06**

Determine:

i) the Depth of moisture in the root zone at field capacity
ii) the Depth of moisture in the root zone at the permanent wilting point
iii) the Depth of water available

Seat No.	

Set **R**

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (Old) (CBCS)
Examination: March/April – 2026
Hydrology and Water Resources Engineering (BTN01504)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 MCQ/Objective type questions: 14

1) If the irrigation water applied to a field penetrates uniformly throughout, then the water distribution efficiency is _____.
a) 1
b) 0
c) 0.5
d) None of them, as more data is required to ascertain it

2) The efficiency of water conveyance does not depend upon _____.
a) climatic conditions
b) geometry of the conveyance system
c) nature of the boundary of the conveyance system
d) method of application of water

3) The capacity of an irrigation canal is usually controlled by _____.
a) average kharif demand b) average rabi demand
c) kor demand of rabi crops d) kor demand of kharif crops

4) Cooperative water users' organizations help in _____.
a) soil management b) water management
c) soil conservation d) None of these

5) The water year in India starts on the first day of _____.
a) January b) April
c) June d) September

6) Depth-Area-Duration curves of precipitation at a station would normally be _____.
   a) Curves, concave upwards, with duration increasing outward
   b) Curves, concave downwards, with duration increasing outward
   c) Curves, concave upwards, with duration decreasing outward
   d) Curves, concave downwards, with duration decreasing outward

7) The S-curve hydrograph is the summation of _____.
   a) Unit hydrograph
   b) Total runoff hydrograph
   c) Effective rainfall hyetograph
   d) Base flow recession curve

8) Which of the following instrument is not connected with stream flow measurement?
   a) Hygrometer
   b) Echo-depth recorder
   c) Electro-magnetic flow meter
   d) Sounding weight

9) The geological formation, which yields only insignificant quantity of groundwater, is an _____.
   a) aquifer
   b) aquifuse
   c) aquiclude
   d) aquitard

10) The zone of aeration in a ground profile does not include _____.
   a) capillary fringe
   b) soil water zone
   c) intermediate zone
   d) saturation zone

11) The rate of flow of water through ground strata can be estimated by _____.
   a) Darcy's formula
   b) Stricker's formula
   c) Dupuit's formula
   d) Manning's formula

12) Pinpoint the correct statement _____.
   a) irrigation helps in adopting mixed cropping
   b) 'mixed cropping' means sowing of a different crop after a particular crop has been grown
   c) over-irrigation may lead to saving in fertilizer
   d) irrigation helps in avoiding mixed cropping

13) The interlinking of rivers can help in _____.
   a) Increase in irrigation area
   b) Control of flood
   c) Both a and b
   d) None of these

14) An irrigation project is classified as a major project when the cultural command involved in the project, is more than _____.
   a) 2,000 hectares
   b) 5,000 hectares
   c) 10,000 hectares
   d) None of the above

Seat No.	

Set **R**

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (Old) (CBCS)
Examination: March/April – 2026
Hydrology and Water Resources Engineering (BTN01504)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Question no. 2 & 6 are compulsory in Section I & Section II, and solve any two questions from the remaining of each section.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary and state it clearly.

SECTION – I

Q.2 **a)** Define the following terms: **04**
i) Rain gauge density
ii) Evapotranspiration
iii) Specific yield of Aquifer
iv) W – Index

b) The average annual rainfall in cm, observed at four existing rain Gauge stations in a basin is 105, 79, 70, and 66 cm respectively. If the average depth of rainfall over the basin is to be estimated within a 10% error, determine the additional number of rain gauges needed. **06**

Q.3 **a)** What is a unit hydrograph? Enlist assumptions and limitations of 'Unit Hydrograph theory'. **04**

b) Find the ordinates of a storm hydrograph resulting from a 3-hour storm with rainfall of 2, 6.75, and 3.75 cm during subsequent 3-hour intervals. The ordinates of the unit hydrograph are given below. Assume an initial loss of 5 mm infiltration index of 2.5 mm/hour and base flow of 10 cumecs. **05**

Time (hr)	Ordinates of unit hydrograph (m^3/sec)
3	0
6	110
9	365
12	500
15	390
18	310
21	250
24	235
3	175
6	130
9	95

Time (hr)	Ordinates of unit hydrograph (m^3/sec)
12	65
15	40
18	22
21	10
24	0

Q.4 **a)** Enumerate the different methods used for stream gauging. Discuss any one of them in detail. **04**

b) Given the ordinates of runoff hydrograph from a catchment area of 100 sqkm having a constant base flow of 2 cumec. Derive the ordinates of UH **05**

Duration (h)	2	4	6	8	10	12	14
Ordinate of runoff hydrograph (m^3/s)	2	3	4	6	5	3	2

Q.5 **a)** Derive an equation for the steady state discharge of a well fully penetrating a 'Confined Aquifer'. **04**

b) In an artesian aquifer of 8m thick, a 10 cm diameter well is pumped at a constant rate of 100 lit/minute. The steady state drawdown observed in two wells located at a distance of 10 m and 50 m distances from the center of the well are 3 m and 0.5 m respectively, compute the transmissivity and the hydraulic conductivity of the aquifer. **05**

SECTION – II

Q.6 **a)** Enlist the proposed inter-basin water transfer links proposed for Himalayan Rivers, a Development component of the National perspective plan. State the advantages of the Himalayan component. **05**

b) With a neat sketch explain the general layout and component parts of the lift irrigation system also, state when it is required to be implemented. **05**

Q.7 **a)** Discuss the suitability and construction features of Kolhapur type weir for irrigation. **03**

b) The table below gives necessary data about the crops, their duty, and the area under each crop, commanded by a canal, taking off from a storage reservoir. Taking a time factor for a canal to be 10/20. Calculate the discharge required at the head of the canal. Also determine design discharge, if the capacity factor of a canal is 0.9. **06**

Crop	Base period	Area (hectares)	Duty at the head of canal (ha/cumec)
Sugarcane (yearly)	320	800	580
Overlap of sugarcane in hot weather	90	140	580
Wheat (Rabbi)	120	700	1600
Bajri (Kharif)	120	600	2000
Vegetable (Hot weather)	120	360	600

Q.8 **a)** Define the following terms: **03**

i) Gross Command area
ii) Crop period
iii) Base period

b) What is meant by watershed management? Why it is essential? Explain in detail. **06**

Q.9 **a)** What is meant by sedimentation of the reservoir? Enlist the measures adopted for control of sediment inflow in the reservoirs. **03**

b) The root zone of irrigation soil has a dry weight of 15.3 kN/m^3 and a field capacity of 30%. The root zone depth of the crop having, a permanent wilting coefficient 9% is 0.9m. **06**

Determine:

i) the Depth of moisture in the root zone at field capacity
ii) the Depth of moisture in the root zone at the permanent wilting point
iii) the Depth of water available

Seat No.	

Set | S

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (Old) (CBCS)
Examination: March/April – 2026
Hydrology and Water Resources Engineering (BTN01504)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 MCQ/Objective type questions: 14

1) The zone of aeration in a ground profile does not include _____.
a) capillary fringe b) soil water zone
c) intermediate zone d) saturation zone

2) The rate of flow of water through ground strata can be estimated by _____.
a) Darcy's formula b) Stricker's formula
c) Dupuit's formula d) Manning's formula

3) Pinpoint the correct statement _____.
a) irrigation helps in adopting mixed cropping
b) 'mixed cropping' means sowing of a different crop after a particular crop has been grown
c) over-irrigation may lead to saving in fertilizer
d) irrigation helps in avoiding mixed cropping

4) The interlinking of rivers can help in _____.
a) Increase in irrigation area b) Control of flood
c) Both a and b d) None of these

5) An irrigation project is classified as a major project when the cultural command involved in the project, is more than _____.
a) 2,000 hectares b) 5,000 hectares
c) 10,000 hectares d) None of the above

6) If the irrigation water applied to a field penetrates uniformly throughout, then the water distribution efficiency is _____.
   a) 1
   b) 0
   c) 0.5
   d) None of them, as more data is required to ascertain it

7) The efficiency of water conveyance does not depend upon _____.
   a) climatic conditions
   b) geometry of the conveyance system
   c) nature of the boundary of the conveyance system
   d) method of application of water

8) The capacity of an irrigation canal is usually controlled by _____.
   a) average kharif demand
   b) average rabi demand
   c) kor demand of rabi crops
   d) kor demand of kharif crops

9) Cooperative water users' organizations help in _____.
   a) soil management
   b) water management
   c) soil conservation
   d) None of these

10) The water year in India starts on the first day of _____.
   a) January
   b) April
   c) June
   d) September

11) Depth-Area-Duration curves of precipitation at a station would normally be _____.
   a) Curves, concave upwards, with duration increasing outward
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12) The S-curve hydrograph is the summation of _____.
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13) Which of the following instrument is not connected with stream flow measurement?
   a) Hygrometer
   b) Echo-depth recorder
   c) Electro-magnetic flow meter
   d) Sounding weight

14) The geological formation, which yields only insignificant quantity of groundwater, is an _____.
   a) aquifer
   b) aquifuse
   c) aquiclude
   d) aquitard

Seat No.	

Set **S**

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (Old) (CBCS)
Examination: March/April – 2026
Hydrology and Water Resources Engineering (BTN01504)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Question no. 2 & 6 are compulsory in Section I & Section II, and solve any two questions from the remaining of each section.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary and state it clearly.

SECTION – I

Q.2 **a)** Define the following terms: **04**
i) Rain gauge density
ii) Evapotranspiration
iii) Specific yield of Aquifer
iv) W – Index

b) The average annual rainfall in cm, observed at four existing rain Gauge stations in a basin is 105, 79, 70, and 66 cm respectively. If the average depth of rainfall over the basin is to be estimated within a 10% error, determine the additional number of rain gauges needed. **06**

Q.3 **a)** What is a unit hydrograph? Enlist assumptions and limitations of 'Unit Hydrograph theory'. **04**

b) Find the ordinates of a storm hydrograph resulting from a 3-hour storm with rainfall of 2, 6.75, and 3.75 cm during subsequent 3-hour intervals. The ordinates of the unit hydrograph are given below. Assume an initial loss of 5 mm infiltration index of 2.5 mm/hour and base flow of 10 cumecs. **05**

Time (hr)	Ordinates of unit hydrograph (m^3/sec)
3	0
6	110
9	365
12	500
15	390
18	310
21	250
24	235
3	175
6	130
9	95

Time (hr)	Ordinates of unit hydrograph (m^3/sec)
12	65
15	40
18	22
21	10
24	0

Q.4 **a)** Enumerate the different methods used for stream gauging. Discuss any one of them in detail. **04**

b) Given the ordinates of runoff hydrograph from a catchment area of 100 sqkm having a constant base flow of 2 cumec. Derive the ordinates of UH **05**

Duration (h)	2	4	6	8	10	12	14
Ordinate of runoff hydrograph (m^3/s)	2	3	4	6	5	3	2

Q.5 **a)** Derive an equation for the steady state discharge of a well fully penetrating a 'Confined Aquifer'. **04**

b) In an artesian aquifer of 8m thick, a 10 cm diameter well is pumped at a constant rate of 100 lit/minute. The steady state drawdown observed in two wells located at a distance of 10 m and 50 m distances from the center of the well are 3 m and 0.5 m respectively, compute the transmissivity and the hydraulic conductivity of the aquifer. **05**

SECTION – II

Q.6 **a)** Enlist the proposed inter-basin water transfer links proposed for Himalayan Rivers, a Development component of the National perspective plan. State the advantages of the Himalayan component. **05**

b) With a neat sketch explain the general layout and component parts of the lift irrigation system also, state when it is required to be implemented. **05**

Q.7 **a)** Discuss the suitability and construction features of Kolhapur type weir for irrigation. **03**

b) The table below gives necessary data about the crops, their duty, and the area under each crop, commanded by a canal, taking off from a storage reservoir. Taking a time factor for a canal to be 10/20. Calculate the discharge required at the head of the canal. Also determine design discharge, if the capacity factor of a canal is 0.9. **06**

Crop	Base period	Area (hectares)	Duty at the head of canal (ha/cumec)
Sugarcane (yearly)	320	800	580
Overlap of sugarcane in hot weather	90	140	580
Wheat (Rabbi)	120	700	1600
Bajri (Kharif)	120	600	2000
Vegetable (Hot weather)	120	360	600

Q.8 **a)** Define the following terms: **03**

i) Gross Command area
ii) Crop period
iii) Base period

b) What is meant by watershed management? Why it is essential? Explain in detail. **06**

Q.9 **a)** What is meant by sedimentation of the reservoir? Enlist the measures adopted for control of sediment inflow in the reservoirs. **03**

b) The root zone of irrigation soil has a dry weight of 15.3 kN/m^3 and a field capacity of 30%. The root zone depth of the crop having, a permanent wilting coefficient 9% is 0.9m. **06**

Determine:

i) the Depth of moisture in the root zone at field capacity
ii) the Depth of moisture in the root zone at the permanent wilting point
iii) the Depth of water available

SLR-QH-244

Seat No.	

Set P

T.Y. (B.Tech.) (Civil Engineering) (Sem - I) (Old) (CBCS)
Examination: March/April – 2026
Design of Concrete Structures - I (BTN01505)

Day & Date: Monday, 11-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary and mention it clearly.
5) While solving MCQ, IS 456-2000 is not allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) In two ways restrained slab torsion steel is provided at _____. **01**
a) Top b) Bottom
c) Top & Bottom d) None of the above

2) Spacing of stirrups in a rectangular beam, is _____. **01**
a) Kept constant throughout the length
b) Decreased towards the center of the beam
c) Increased at the ends
d) Increased at the center of the beam

3) A rectangular slab 4m × 6m supported on two opposite shorter edge should be designed as _____. **01**
a) One way slab spanning along longer edge
b) Two ways slab
c) One way slab spanning along shorter edge
d) None of above

4) The effective cover of beam depends on _____. **01**
a) Diameter of main reinforcement
b) Grade of reinforcing steel
c) Width of beam
d) All of these

5) In a simply supported slab, alternate bars are curtailed at _____. **01**

a) $1/4^{th}$ of the span
b) $1/5^{th}$ of the span
c) $1/6^{th}$ of the span
d) $1/7^{th}$ of the span

6) A short column of size 250mm×350mm is provided with longitudinal reinforcement of diameter 20mm and the diameter of tie is 8mm. According to IS456:2000, the maximum spacing between two ties is _____. **01**

a) 200 mm
b) 350 mm
c) 300 mm
d) 250 mm

7) The length of torsion reinforcement in two ways slab is provided as _____. **01**

a) Shorter span/4
b) Shorter span/5
c) Shorter span/8
d) Shorter span/10

8) The minimum tension reinforcement for 250 mm × 400 mm effective deep beam of Fe500 grade steel is _____. **02**

a) 150 mm^2
b) 170 mm^2
c) 180 N/mm^2
d) 220 N/mm^2

9) The factored load carrying capacity of column of 300mm × 600mm size with minimum percentage of steel for M20 and Fe415 grade is _____. **02**

a) 1840 KN
b) 1900 KN
c) 1829 KN
d) 1800 KN

10) If the diameter of the longitudinal bars of a square column is 16 mm, the diameter of the lateral ties should not be less than _____. **01**

a) 4 mm
b) 5 mm
c) 6 mm
d) 8 mm

11) A axially loaded column is of 300 mm × 300 mm size. Effective length of column is 3 m. What is the minimum eccentricity of the axial load of the column. **02**

a) 0
b) 10 mm
c) 16 mm
d) 20 mm

Seat No.	

Set **P**

T.Y. (B.Tech.) (Civil Engineering) (Sem - I) (Old) (CBCS)
Examination: March/April – 2026
Design of Concrete Structures - I (BTN01505)

Day & Date: Monday, 11-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 2 and Q. No. 6 are compulsory.
2) Solve any two from Q. No. 3 to Q. No. 5 and Q. No. 7 to Q. No. 9 questions from each section.
3) Use of IS 456-2000 and non-programmable calculator are allowed.
4) Draw neat sketch's where required and assume suitable data if required and state it clearly.

SECTION – I

Q.2 A roof of clear dimensions 4m × 5m supported on walls of 230mm thickness, with corners are held down. All the four edges of the slab are discontinuous. Design the slab, if the beam is carrying a live load of 3 kN/m^2. Use M 20 & Fe 415 steel. **10**

Q.3 Design a simply supported beam of clear span of 5m has to carry a superimposed load of 45 kN/m at service. The beam has bearing of 400 mm of each end. Use M 20 & Fe 415 steel. **09**

Q.4 A doubly reinforced beam 250 mm × 450 mm deep to centre of tensile reinforcement is provided with 2 bars of 16 mm diameter as compression steel with an effective cover of 50 mm and 4 bars of 25 mm diameter as tensile steel. Determine flexural strength & safe UDL on the simply supported beam of span 6 m. if M20 and Fe 250 grade steel. **09**

Q.5 Calculate the limiting moment of resistance & reinforcement required for T beam section having following sectional properties: **09**
Width of flange=1400 mm
Flange thickness =100 mm
Width of rib=250 mm
Effective depth =500 mm
Materials: M20, Fe 250

SECTION – II

Q.6 Design a rectangular beam, continuous over four column supports with effective span 6m each. The beam is subjected to an imposed load of 10 kN/m and live load of 15 kN/m. Use M25 concrete and Fe500 steel. **10**

Q.7 Determine reinforcement required for a beam size 230 mm × 600 mm subjected to shear force of 60 kN, torsional moment of 35 kN.m and bending moment of 80 kN.m. Use M 20 concrete and Fe 500 steel. **09**

Q.8 A short column 420 mm × 420 mm is provided with 8-16 mm diameter. The length of column is 2.25 m. It is effectively held in position at both the ends & restrained against rotation at other end. Find ultimate load of the column. Use M20 & Fe 415. **09**

Q.9 Design a circular column of diameter 400 mm with helical reinforcement subjected to a load of 1400 kN. Use M25 concrete and Fe415 steel. The column has unsupported length of 3 m and is effectively held in position at both ends but not restrained against rotation. **09**

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Civil Engineering) (Sem - I) (Old) (CBCS)
Examination: March/April – 2026
Design of Concrete Structures - I (BTN01505)

Day & Date: Monday, 11-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
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4) Assume suitable data if necessary and mention it clearly.
5) While solving MCQ, IS 456-2000 is not allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) A short column of size 250mm×350mm is provided with longitudinal reinforcement of diameter 20mm and the diameter of tie is 8mm. According to IS456:2000, the maximum spacing between two ties is _____. **01**

a) 200 mm b) 350 mm
c) 300 mm d) 250 mm

2) The length of torsion reinforcement in two ways slab is provided as _____. **01**

a) Shorter span/4 b) Shorter span/5
c) Shorter span/8 d) Shorter span/10

3) The minimum tension reinforcement for 250 mm × 400 mm effective deep beam of Fe500 grade steel is _____. **02**

a) 150 mm^2 b) 170 mm^2
c) 180 N/mm^2 d) 220 N/mm^2

4) The factored load carrying capacity of column of 300mm × 600mm size with minimum percentage of steel for M20 and Fe415 grade is _____. **02**

a) 1840 KN b) 1900 KN
c) 1829 KN d) 1800 KN

5) If the diameter of the longitudinal bars of a square column is 16 mm, the diameter of the lateral ties should not be less than _____. **01**

a) 4 mm b) 5 mm
c) 6 mm d) 8 mm

6) A axially loaded column is of 300 mm × 300 mm size. Effective length of column is 3 m. What is the minimum eccentricity of the axial load of the column. **02**

a) 0 b) 10 mm
c) 16 mm d) 20 mm

7) In two ways restrained slab torsion steel is provided at _____. **01**

a) Top b) Bottom
c) Top & Bottom d) None of the above

8) Spacing of stirrups in a rectangular beam, is _____. **01**

a) Kept constant throughout the length
b) Decreased towards the center of the beam
c) Increased at the ends
d) Increased at the center of the beam

9) A rectangular slab 4m × 6m supported on two opposite shorter edge should be designed as _____. **01**

a) One way slab spanning along longer edge
b) Two ways slab
c) One way slab spanning along shorter edge
d) None of above

10) The effective cover of beam depends on _____. **01**

a) Diameter of main reinforcement
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c) Width of beam
d) All of these

11) In a simply supported slab, alternate bars are curtailed at _____. **01**

a) $1/4^{th}$ of the span b) $1/5^{th}$ of the span
c) $1/6^{th}$ of the span d) $1/7^{th}$ of the span

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Civil Engineering) (Sem - I) (Old) (CBCS)
Examination: March/April – 2026
Design of Concrete Structures - I (BTN01505)

Day & Date: Monday, 11-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 2 and Q. No. 6 are compulsory.
2) Solve any two from Q. No. 3 to Q. No. 5 and Q. No. 7 to Q. No. 9 questions from each section.
3) Use of IS 456-2000 and non-programmable calculator are allowed.
4) Draw neat sketch's where required and assume suitable data if required and state it clearly.

SECTION – I

Q.2 A roof of clear dimensions 4m × 5m supported on walls of 230mm thickness, with corners are held down. All the four edges of the slab are discontinuous. Design the slab, if the beam is carrying a live load of 3 kN/m^2. Use M 20 & Fe 415 steel. **10**

Q.3 Design a simply supported beam of clear span of 5m has to carry a superimposed load of 45 kN/m at service. The beam has bearing of 400 mm of each end. Use M 20 & Fe 415 steel. **09**

Q.4 A doubly reinforced beam 250 mm × 450 mm deep to centre of tensile reinforcement is provided with 2 bars of 16 mm diameter as compression steel with an effective cover of 50 mm and 4 bars of 25 mm diameter as tensile steel. Determine flexural strength & safe UDL on the simply supported beam of span 6 m. if M20 and Fe 250 grade steel. **09**

Q.5 Calculate the limiting moment of resistance & reinforcement required for T beam section having following sectional properties: **09**
Width of flange=1400 mm
Flange thickness =100 mm
Width of rib=250 mm
Effective depth =500 mm
Materials: M20, Fe 250

SECTION – II

Q.6 Design a rectangular beam, continuous over four column supports with effective span 6m each. The beam is subjected to an imposed load of 10 kN/m and live load of 15 kN/m. Use M25 concrete and Fe500 steel. **10**

Q.7 Determine reinforcement required for a beam size 230 mm × 600 mm subjected to shear force of 60 kN, torsional moment of 35 kN.m and bending moment of 80 kN.m. Use M 20 concrete and Fe 500 steel. **09**

Q.8 A short column 420 mm × 420 mm is provided with 8-16 mm diameter. The length of column is 2.25 m. It is effectively held in position at both the ends & restrained against rotation at other end. Find ultimate load of the column. Use M20 & Fe 415. **09**

Q.9 Design a circular column of diameter 400 mm with helical reinforcement subjected to a load of 1400 kN. Use M25 concrete and Fe415 steel. The column has unsupported length of 3 m and is effectively held in position at both ends but not restrained against rotation. **09**

Seat No.	

Set **R**

T.Y. (B.Tech.) (Civil Engineering) (Sem - I) (Old) (CBCS)
Examination: March/April – 2026
Design of Concrete Structures - I (BTN01505)

Day & Date: Monday, 11-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary and mention it clearly.
5) While solving MCQ, IS 456-2000 is not allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) The factored load carrying capacity of column of 300mm × 600mm size with minimum percentage of steel for M20 and Fe415 grade is _____. **02**

a) 1840 KN b) 1900 KN
c) 1829 KN d) 1800 KN

2) If the diameter of the longitudinal bars of a square column is 16 mm, the diameter of the lateral ties should not be less than _____. **01**

a) 4 mm b) 5 mm
c) 6 mm d) 8 mm

3) A axially loaded column is of 300 mm × 300 mm size. Effective length of column is 3 m. What is the minimum eccentricity of the axial load of the column. **02**

a) 0 b) 10 mm
c) 16 mm d) 20 mm

4) In two ways restrained slab torsion steel is provided at _____. **01**

a) Top b) Bottom
c) Top & Bottom d) None of the above

5) Spacing of stirrups in a rectangular beam, is _____. **01**

a) Kept constant throughout the length
b) Decreased towards the center of the beam
c) Increased at the ends
d) Increased at the center of the beam

6) A rectangular slab 4m × 6m supported on two opposite shorter edge should be designed as _____. **01**

a) One way slab spanning along longer edge
b) Two ways slab
c) One way slab spanning along shorter edge
d) None of above

7) The effective cover of beam depends on _____. **01**

a) Diameter of main reinforcement
b) Grade of reinforcing steel
c) Width of beam
d) All of these

8) In a simply supported slab, alternate bars are curtailed at _____. **01**

a) $1/4^{th}$ of the span
b) $1/5^{th}$ of the span
c) $1/6^{th}$ of the span
d) $1/7^{th}$ of the span

9) A short column of size 250mm×350mm is provided with longitudinal reinforcement of diameter 20mm and the diameter of tie is 8mm. According to IS456:2000, the maximum spacing between two ties is _____. **01**

a) 200 mm
b) 350 mm
c) 300 mm
d) 250 mm

10) The length of torsion reinforcement in two ways slab is provided as _____. **01**

a) Shorter span/4
b) Shorter span/5
c) Shorter span/8
d) Shorter span/10

11) The minimum tension reinforcement for 250 mm × 400 mm effective deep beam of Fe500 grade steel is _____. **02**

a) 150 mm^2
b) 170 mm^2
c) 180 N/mm^2
d) 220 N/mm^2

SLR-QH-244

Seat No.	

Set | **R**

T.Y. (B.Tech.) (Civil Engineering) (Sem - I) (Old) (CBCS)
Examination: March/April – 2026
Design of Concrete Structures - I (BTN01505)

Day & Date: Monday, 11-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 2 and Q. No. 6 are compulsory.
2) Solve any two from Q. No. 3 to Q. No. 5 and Q. No. 7 to Q. No. 9 questions from each section.
3) Use of IS 456-2000 and non-programmable calculator are allowed.
4) Draw neat sketch's where required and assume suitable data if required and state it clearly.

SECTION – I

Q.2 A roof of clear dimensions 4m × 5m supported on walls of 230mm thickness, with corners are held down. All the four edges of the slab are discontinuous. Design the slab, if the beam is carrying a live load of 3 kN/m^2. Use M 20 & Fe 415 steel. **10**

Q.3 Design a simply supported beam of clear span of 5m has to carry a superimposed load of 45 kN/m at service. The beam has bearing of 400 mm of each end. Use M 20 & Fe 415 steel. **09**

Q.4 A doubly reinforced beam 250 mm × 450 mm deep to centre of tensile reinforcement is provided with 2 bars of 16 mm diameter as compression steel with an effective cover of 50 mm and 4 bars of 25 mm diameter as tensile steel. Determine flexural strength & safe UDL on the simply supported beam of span 6 m. if M20 and Fe 250 grade steel. **09**

Q.5 Calculate the limiting moment of resistance & reinforcement required for T beam section having following sectional properties: **09**
Width of flange=1400 mm
Flange thickness =100 mm
Width of rib=250 mm
Effective depth =500 mm
Materials: M20, Fe 250

SECTION – II

Q.6 Design a rectangular beam, continuous over four column supports with effective span 6m each. The beam is subjected to an imposed load of 10 kN/m and live load of 15 kN/m. Use M25 concrete and Fe500 steel. **10**

Q.7 Determine reinforcement required for a beam size 230 mm × 600 mm subjected to shear force of 60 kN, torsional moment of 35 kN.m and bending moment of 80 kN.m. Use M 20 concrete and Fe 500 steel. **09**

Q.8 A short column 420 mm × 420 mm is provided with 8-16 mm diameter. The length of column is 2.25 m. It is effectively held in position at both the ends & restrained against rotation at other end. Find ultimate load of the column. Use M20 & Fe 415. **09**

Q.9 Design a circular column of diameter 400 mm with helical reinforcement subjected to a load of 1400 kN. Use M25 concrete and Fe415 steel. The column has unsupported length of 3 m and is effectively held in position at both ends but not restrained against rotation. **09**

Seat No.	

Set **S**

T.Y. (B.Tech.) (Civil Engineering) (Sem - I) (Old) (CBCS)
Examination: March/April – 2026
Design of Concrete Structures - I (BTN01505)

Day & Date: Monday, 11-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary and mention it clearly.
5) While solving MCQ, IS 456-2000 is not allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) The effective cover of beam depends on _____. **01**
a) Diameter of main reinforcement
b) Grade of reinforcing steel
c) Width of beam
d) All of these

2) In a simply supported slab, alternate bars are curtailed at _____. **01**
a) $1/4^{th}$ of the span b) $1/5^{th}$ of the span
c) $1/6^{th}$ of the span d) $1/7^{th}$ of the span

3) A short column of size 250mm×350mm is provided with longitudinal reinforcement of diameter 20mm and the diameter of tie is 8mm. According to IS456:2000, the maximum spacing between two ties is _____. **01**
a) 200 mm b) 350 mm
c) 300 mm d) 250 mm

4) The length of torsion reinforcement in two ways slab is provided as _____. **01**
a) Shorter span/4 b) Shorter span/5
c) Shorter span/8 d) Shorter span/10

5) The minimum tension reinforcement for 250 mm × 400 mm effective deep beam of Fe500 grade steel is _____. **02**
a) 150 mm^2 b) 170 mm^2
c) 180 N/mm^2 d) 220 N/mm^2

6) The factored load carrying capacity of column of 300mm × 600mm size with minimum percentage of steel for M20 and Fe415 grade is _____. **02**

a) 1840 KN
b) 1900 KN
c) 1829 KN
d) 1800 KN

7) If the diameter of the longitudinal bars of a square column is 16 mm, the diameter of the lateral ties should not be less than _____. **01**

a) 4 mm
b) 5 mm
c) 6 mm
d) 8 mm

8) A axially loaded column is of 300 mm × 300 mm size. Effective length of column is 3 m. What is the minimum eccentricity of the axial load of the column. **02**

a) 0
b) 10 mm
c) 16 mm
d) 20 mm

9) In two ways restrained slab torsion steel is provided at _____. **01**

a) Top
b) Bottom
c) Top & Bottom
d) None of the above

10) Spacing of stirrups in a rectangular beam, is _____. **01**

a) Kept constant throughout the length
b) Decreased towards the center of the beam
c) Increased at the ends
d) Increased at the center of the beam

11) A rectangular slab 4m × 6m supported on two opposite shorter edge should be designed as _____. **01**

a) One way slab spanning along longer edge
b) Two ways slab
c) One way slab spanning along shorter edge
d) None of above

SLR-QH-244

Seat No.	

Set S

T.Y. (B.Tech.) (Civil Engineering) (Sem - I) (Old) (CBCS)
Examination: March/April – 2026
Design of Concrete Structures - I (BTN01505)

Day & Date: Monday, 11-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 2 and Q. No. 6 are compulsory.
2) Solve any two from Q. No. 3 to Q. No. 5 and Q. No. 7 to Q. No. 9 questions from each section.
3) Use of IS 456-2000 and non-programmable calculator are allowed.
4) Draw neat sketch's where required and assume suitable data if required and state it clearly.

SECTION – I

Q.2 A roof of clear dimensions 4m × 5m supported on walls of 230mm thickness, with corners are held down. All the four edges of the slab are discontinuous. Design the slab, if the beam is carrying a live load of 3 kN/m^2. Use M 20 & Fe 415 steel. **10**

Q.3 Design a simply supported beam of clear span of 5m has to carry a superimposed load of 45 kN/m at service. The beam has bearing of 400 mm of each end. Use M 20 & Fe 415 steel. **09**

Q.4 A doubly reinforced beam 250 mm × 450 mm deep to centre of tensile reinforcement is provided with 2 bars of 16 mm diameter as compression steel with an effective cover of 50 mm and 4 bars of 25 mm diameter as tensile steel. Determine flexural strength & safe UDL on the simply supported beam of span 6 m. if M20 and Fe 250 grade steel. **09**

Q.5 Calculate the limiting moment of resistance & reinforcement required for T beam section having following sectional properties: **09**
Width of flange=1400 mm
Flange thickness =100 mm
Width of rib=250 mm
Effective depth =500 mm
Materials: M20, Fe 250

SECTION – II

Q.6 Design a rectangular beam, continuous over four column supports with effective span 6m each. The beam is subjected to an imposed load of 10 kN/m and live load of 15 kN/m. Use M25 concrete and Fe500 steel. **10**

Q.7 Determine reinforcement required for a beam size 230 mm × 600 mm subjected to shear force of 60 kN, torsional moment of 35 kN.m and bending moment of 80 kN.m. Use M 20 concrete and Fe 500 steel. **09**

Q.8 A short column 420 mm × 420 mm is provided with 8-16 mm diameter. The length of column is 2.25 m. It is effectively held in position at both the ends & restrained against rotation at other end. Find ultimate load of the column. Use M20 & Fe 415. **09**

Q.9 Design a circular column of diameter 400 mm with helical reinforcement subjected to a load of 1400 kN. Use M25 concrete and Fe415 steel. The column has unsupported length of 3 m and is effectively held in position at both ends but not restrained against rotation. **09**

SLR-QH-245

Seat No.	

Set P

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (Old) (CBCS)
Examination: March/April – 2026
Environmental Engineering - II (BTN01506)

Day & Date: Tuesday, 12-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) What is the quantity of wastewater required if water supply is 300 lpcd?
a) 260 lpcd b) 240 lpcd
c) 235 lpcd d) 250 lpcd

2) Which of the following is correct sequence?
a) Screening > Distribution > Aeration > Landfill
b) Screening > Sedimentation > Aeration > Landfill
c) Sedimentation > Aeration > Screening > Landfill
d) Aeration > Sedimentation > Landfill > Distribution

3) Which of the following are not the sources of wastewater?
a) Plume b) MSW
c) Industrial water d) All of the Above

4) In composting method by trenching, trenches of _____ m length are excavated.
a) 4 - 10 b) 7 - 12
c) 10 - 20 d) Above 20

5) Controlled tipping method of disposal of refuse requires an area of _____ m^2/c/yr.
a) 0.1 - 0.3 b) 0.3 - 0.5
c) 0.5 - 1.0 d) 1.0 - 1.2

6) Which type of pollutant does Ozone belong to?
a) Primary b) Secondary
c) Natural d) None of the above

7) The Fumigation plume from the stacks is observed in _____ type of atmosphere.
   a) Stable
   b) Unstable
   c) Inversion
   d) Neutral

8) As per CPCB, the COD limit is _____.
   a) 1000 mg/lt
   b) 800 mg/lt
   c) 250 mg/lt
   d) 300 mg/lt

9) Which of the standards govern the discharge of wastewater into streams?
   a) IS 10500:2016
   b) Schedule IV of Environmental (Protection) Rules,1986
   c) Schedule I of IUCN
   d) Schedule II of WHO

10) Which of the following is/are the sources of Air Pollution?
   a) Burning of Wood for Cooking
   b) Vehicular Emission
   c) Chimney Smoke from Industries
   d) All of the Above

11) What is Garbage?
   a) Domestic waste
   b) Wastewater from Landfill
   c) Both a) & b)
   d) None of the above

12) What is Leachate?
   a) rubbish or waste, especially domestic refuse
   b) wastewater from Landfill
   c) Both a) & b)
   d) None of the above

13) What is the sequence for Solid Waste treatment & Disposal?
   a) Segregation > Collection > Waste to energy > Landfill
   b) Waste to energy > Landfill > Segregation > Collection
   c) Landfill > Segregation > Collection > Waste to energy
   d) None of the above

14) The dilution method of sewage disposal is most preferred when _____.
   a) The sewage arriving at outfall point is septic
   b) There are non-forward currents
   c) Discharge in water body is not low
   d) All of the above

Seat No.		Set	P

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (Old) (CBCS)
Examination: March/April – 2026
Environmental Engineering - II (BTN01506)

Day & Date: Tuesday, 12-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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

SECTION – I

Q.2 **a)** Draw complete and neat sketch of Activated Sludge treatment plant and discuss each part. **07**

b) Define the following with equations: **03**
i) Mean Cell Residence Time
ii) F/M ratio

Q.3 **a)** Design a completely mixed ASP for following data: **06**
i) Wastewater flow = 20 MLd
ii) Influent BOD = 200 mg/Lit
iii) Effluent BOD = 25 mg/Lit
iv) MLSS = 2000 mg/Lit
v) F/M = 0.2
vi) SVI = 80 ml/gm
vii) Sludge age = 10 days
Assume any missing data appropriately.

b) What is Chemical Oxygen Demand? Differentiate between Chemical Oxygen Demand and Biochemical Oxygen Demand. **03**

Q.4 **a)** Explain Trickling filter with the help of a diagram. **06**

b) Differentiate between Vermicomposting and Indore Method of composting. **03**

Q.5 **a)** Determine Ultimate BOD & BOD_3. If the BOD_5 is 200 mg/lt at 20°C. assuming the deoxygenation constant as 0.25/day. **06**

b) Explain Moving Bed Biofilm Reactor with a neat diagram. **03**

SECTION – II

Q.6 **a)** Discuss the oxygen sag analysis with the help of a diagram. **04**

b) A stream, saturated with DO has flow of 1.3 m^3/s, BOD of 4 mg/L and rate constant of 0.25 per day. It receives an effluent discharge of 0.35 m^3/s. Having BOD 20 mg/L, DO 5 mg/L and rate constant 0.13 per day. The average velocity of flow of the stream is 0.15 m/s. Calculate the DO deficit at point 20 km & 40 km downstream. Assume that the temperature is 20°C throughout and BOD is measured at 5 days. Take saturation DO at 20°C as 9.17 mg/L. **06**

Q.7 **a)** With the help of a diagram, explain Electrostatic Precipitator. **05**

b) Discuss the sources of Air pollution, with the help of a diagram. **04**

Q.8 **a)** Illustrate the functioning of Bangalore method of composting with the help of a diagram. **05**

b) Explain the concept of number of trip for solid waste with the help of a diagram. **04**

Q.9 Discuss the following: **09**

i) Cyclone Precipitator
ii) Sludge drying Bed
iii) SBR

SLR-QH-245

Seat No.	

Set Q

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (Old) (CBCS)
Examination: March/April – 2026
Environmental Engineering - II (BTN01506)

Day & Date: Tuesday, 12-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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3) Figures to the right indicates full marks.
4) Assume suitable data if necessary and mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) As per CPCB, the COD limit is _____.
a) 1000 mg/lt b) 800 mg/lt
c) 250 mg/lt d) 300 mg/lt

2) Which of the standards govern the discharge of wastewater into streams?
a) IS 10500:2016
b) Schedule IV of Environmental (Protection) Rules,1986
c) Schedule I of IUCN
d) Schedule II of WHO

3) Which of the following is/are the sources of Air Pollution?
a) Burning of Wood for Cooking
b) Vehicular Emission
c) Chimney Smoke from Industries
d) All of the Above

4) What is Garbage?
a) Domestic waste b) Wastewater from Landfill
c) Both a) & b) d) None of the above

5) What is Leachate?
a) rubbish or waste, especially domestic refuse
b) wastewater from Landfill
c) Both a) & b)
d) None of the above

6) What is the sequence for Solid Waste treatment & Disposal?
   a) Segregation > Collection > Waste to energy > Landfill
   b) Waste to energy > Landfill > Segregation > Collection
   c) Landfill > Segregation > Collection > Waste to energy
   d) None of the above

7) The dilution method of sewage disposal is most preferred when _____.
   a) The sewage arriving at outfall point is septic
   b) There are non-forward currents
   c) Discharge in water body is not low
   d) All of the above

8) What is the quantity of wastewater required if water supply is 300 lpcd?
   a) 260 lpcd
   b) 240 lpcd
   c) 235 lpcd
   d) 250 lpcd

9) Which of the following is correct sequence?
   a) Screening > Distribution > Aeration > Landfill
   b) Screening > Sedimentation > Aeration > Landfill
   c) Sedimentation > Aeration > Screening > Landfill
   d) Aeration > Sedimentation > Landfill > Distribution

10) Which of the following are not the sources of wastewater?
   a) Plume
   b) MSW
   c) Industrial water
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11) In composting method by trenching, trenches of _____ m length are excavated.
   a) 4 - 10
   b) 7 - 12
   c) 10 - 20
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12) Controlled tipping method of disposal of refuse requires an area of _____ m^2/c/yr.
   a) 0.1 - 0.3
   b) 0.3 - 0.5
   c) 0.5 - 1.0
   d) 1.0 - 1.2

13) Which type of pollutant does Ozone belong to?
   a) Primary
   b) Secondary
   c) Natural
   d) None of the above

14) The Fumigation plume from the stacks is observed in _____ type of atmosphere.
   a) Stable
   b) Unstable
   c) Inversion
   d) Neutral

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (Old) (CBCS)
Examination: March/April – 2026
Environmental Engineering - II (BTN01506)

Day & Date: Tuesday, 12-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Question no. 2 is compulsory in section I, and solve any two questions from the remaining. Question no. 6 is compulsory in section II, and solve any two questions from the remaining.
2) Figures to the right indicate full marks.
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SECTION – I

Q.2 **a)** Draw complete and neat sketch of Activated Sludge treatment plant and discuss each part. **07**

b) Define the following with equations: **03**
i) Mean Cell Residence Time
ii) F/M ratio

Q.3 **a)** Design a completely mixed ASP for following data: **06**
i) Wastewater flow = 20 MLd
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iii) Effluent BOD = 25 mg/Lit
iv) MLSS = 2000 mg/Lit
v) F/M = 0.2
vi) SVI = 80 ml/gm
vii) Sludge age = 10 days
Assume any missing data appropriately.

b) What is Chemical Oxygen Demand? Differentiate between Chemical Oxygen Demand and Biochemical Oxygen Demand. **03**

Q.4 **a)** Explain Trickling filter with the help of a diagram. **06**

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b) Explain Moving Bed Biofilm Reactor with a neat diagram. **03**

SECTION – II

Q.6 **a)** Discuss the oxygen sag analysis with the help of a diagram. **04**

b) A stream, saturated with DO has flow of 1.3 m^3/s, BOD of 4 mg/L and rate constant of 0.25 per day. It receives an effluent discharge of 0.35 m^3/s. Having BOD 20 mg/L, DO 5 mg/L and rate constant 0.13 per day. The average velocity of flow of the stream is 0.15 m/s. Calculate the DO deficit at point 20 km & 40 km downstream. Assume that the temperature is 20°C throughout and BOD is measured at 5 days. Take saturation DO at 20°C as 9.17 mg/L. **06**

Q.7 **a)** With the help of a diagram, explain Electrostatic Precipitator. **05**

b) Discuss the sources of Air pollution, with the help of a diagram. **04**

Q.8 **a)** Illustrate the functioning of Bangalore method of composting with the help of a diagram. **05**

b) Explain the concept of number of trip for solid waste with the help of a diagram. **04**

Q.9 Discuss the following: **09**

i) Cyclone Precipitator
ii) Sludge drying Bed
iii) SBR

Seat No.	

Set R

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (Old) (CBCS)
Examination: March/April – 2026
Environmental Engineering - II (BTN01506)

Day & Date: Tuesday, 12-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. 14

1) What is Garbage?
a) Domestic waste
b) Wastewater from Landfill
c) Both a) & b)
d) None of the above

2) What is Leachate?
a) rubbish or waste, especially domestic refuse
b) wastewater from Landfill
c) Both a) & b)
d) None of the above

3) What is the sequence for Solid Waste treatment & Disposal?
a) Segregation > Collection > Waste to energy > Landfill
b) Waste to energy > Landfill > Segregation > Collection
c) Landfill > Segregation > Collection > Waste to energy
d) None of the above

4) The dilution method of sewage disposal is most preferred when _____.
a) The sewage arriving at outfall point is septic
b) There are non-forward currents
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d) All of the above

5) What is the quantity of wastewater required if water supply is 300 lpcd?
a) 260 lpcd
b) 240 lpcd
c) 235 lpcd
d) 250 lpcd

6) Which of the following is correct sequence?
   a) Screening > Distribution > Aeration > Landfill
   b) Screening > Sedimentation > Aeration > Landfill
   c) Sedimentation > Aeration > Screening > Landfill
   d) Aeration > Sedimentation > Landfill > Distribution

7) Which of the following are not the sources of wastewater?
   a) Plume
   b) MSW
   c) Industrial water
   d) All of the Above

8) In composting method by trenching, trenches of _____ m length are excavated.
   a) 4 - 10
   b) 7 - 12
   c) 10 - 20
   d) Above 20

9) Controlled tipping method of disposal of refuse requires an area of _____ m^2/c/yr.
   a) 0.1 - 0.3
   b) 0.3 - 0.5
   c) 0.5 - 1.0
   d) 1.0 - 1.2

10) Which type of pollutant does Ozone belong to?
   a) Primary
   b) Secondary
   c) Natural
   d) None of the above

11) The Fumigation plume from the stacks is observed in _____ type of atmosphere.
   a) Stable
   b) Unstable
   c) Inversion
   d) Neutral

12) As per CPCB, the COD limit is _____.
   a) 1000 mg/lt
   b) 800 mg/lt
   c) 250 mg/lt
   d) 300 mg/lt

13) Which of the standards govern the discharge of wastewater into streams?
   a) IS 10500:2016
   b) Schedule IV of Environmental (Protection) Rules,1986
   c) Schedule I of IUCN
   d) Schedule II of WHO

14) Which of the following is/are the sources of Air Pollution?
   a) Burning of Wood for Cooking
   b) Vehicular Emission
   c) Chimney Smoke from Industries
   d) All of the Above

Seat No.		Set	R

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (Old) (CBCS)
Examination: March/April – 2026
Environmental Engineering - II (BTN01506)

Day & Date: Tuesday, 12-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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

SECTION – I

Q.2 **a)** Draw complete and neat sketch of Activated Sludge treatment plant and discuss each part. **07**

b) Define the following with equations: **03**
i) Mean Cell Residence Time
ii) F/M ratio

Q.3 **a)** Design a completely mixed ASP for following data: **06**
i) Wastewater flow = 20 MLd
ii) Influent BOD = 200 mg/Lit
iii) Effluent BOD = 25 mg/Lit
iv) MLSS = 2000 mg/Lit
v) F/M = 0.2
vi) SVI = 80 ml/gm
vii) Sludge age = 10 days
Assume any missing data appropriately.

b) What is Chemical Oxygen Demand? Differentiate between Chemical Oxygen Demand and Biochemical Oxygen Demand. **03**

Q.4 **a)** Explain Trickling filter with the help of a diagram. **06**

b) Differentiate between Vermicomposting and Indore Method of composting. **03**

Q.5 **a)** Determine Ultimate BOD & BOD_3. If the BOD_5 is 200 mg/lt at 20°C. assuming the deoxygenation constant as 0.25/day. **06**

b) Explain Moving Bed Biofilm Reactor with a neat diagram. **03**

SECTION – II

Q.6 **a)** Discuss the oxygen sag analysis with the help of a diagram. **04**

b) A stream, saturated with DO has flow of 1.3 m^3/s, BOD of 4 mg/L and rate constant of 0.25 per day. It receives an effluent discharge of 0.35 m^3/s. Having BOD 20 mg/L, DO 5 mg/L and rate constant 0.13 per day. The average velocity of flow of the stream is 0.15 m/s. Calculate the DO deficit at point 20 km & 40 km downstream. Assume that the temperature is 20°C throughout and BOD is measured at 5 days. Take saturation DO at 20°C as 9.17 mg/L. **06**

Q.7 **a)** With the help of a diagram, explain Electrostatic Precipitator. **05**

b) Discuss the sources of Air pollution, with the help of a diagram. **04**

Q.8 **a)** Illustrate the functioning of Bangalore method of composting with the help of a diagram. **05**

b) Explain the concept of number of trip for solid waste with the help of a diagram. **04**

Q.9 Discuss the following: **09**

i) Cyclone Precipitator
ii) Sludge drying Bed
iii) SBR

SLR-QH-245

Seat No.	

Set S

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (Old) (CBCS)
Examination: March/April – 2026
Environmental Engineering - II (BTN01506)

Day & Date: Tuesday, 12-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which type of pollutant does Ozone belong to?
a) Primary b) Secondary
c) Natural d) None of the above

2) The Fumigation plume from the stacks is observed in _____ type of atmosphere.
a) Stable b) Unstable
c) Inversion d) Neutral

3) As per CPCB, the COD limit is _____.
a) 1000 mg/lt b) 800 mg/lt
c) 250 mg/lt d) 300 mg/lt

4) Which of the standards govern the discharge of wastewater into streams?
a) IS 10500:2016
b) Schedule IV of Environmental (Protection) Rules,1986
c) Schedule I of IUCN
d) Schedule II of WHO

5) Which of the following is/are the sources of Air Pollution?
a) Burning of Wood for Cooking
b) Vehicular Emission
c) Chimney Smoke from Industries
d) All of the Above

6) What is Garbage?
- a) Domestic waste
- b) Wastewater from Landfill
- c) Both a) & b)
- d) None of the above

7) What is Leachate?
- a) rubbish or waste, especially domestic refuse
- b) wastewater from Landfill
- c) Both a) & b)
- d) None of the above

8) What is the sequence for Solid Waste treatment & Disposal?
- a) Segregation > Collection > Waste to energy > Landfill
- b) Waste to energy > Landfill > Segregation > Collection
- c) Landfill > Segregation > Collection > Waste to energy
- d) None of the above

9) The dilution method of sewage disposal is most preferred when _____.
- a) The sewage arriving at outfall point is septic
- b) There are non-forward currents
- c) Discharge in water body is not low
- d) All of the above

10) What is the quantity of wastewater required if water supply is 300 lpcd?
- a) 260 lpcd
- b) 240 lpcd
- c) 235 lpcd
- d) 250 lpcd

11) Which of the following is correct sequence?
- a) Screening > Distribution > Aeration > Landfill
- b) Screening > Sedimentation > Aeration > Landfill
- c) Sedimentation > Aeration > Screening > Landfill
- d) Aeration > Sedimentation > Landfill > Distribution

12) Which of the following are not the sources of wastewater?
- a) Plume
- b) MSW
- c) Industrial water
- d) All of the Above

13) In composting method by trenching, trenches of _____ m length are excavated.
- a) 4 - 10
- b) 7 - 12
- c) 10 - 20
- d) Above 20

14) Controlled tipping method of disposal of refuse requires an area of _____ m^2/c/yr.
- a) 0.1 - 0.3
- b) 0.3 - 0.5
- c) 0.5 - 1.0
- d) 1.0 - 1.2

Seat No.		Set	S

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (Old) (CBCS)
Examination: March/April – 2026
Environmental Engineering - II (BTN01506)

Day & Date: Tuesday, 12-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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

SECTION – I

Q.2 **a)** Draw complete and neat sketch of Activated Sludge treatment plant and discuss each part. **07**

b) Define the following with equations: **03**
i) Mean Cell Residence Time
ii) F/M ratio

Q.3 **a)** Design a completely mixed ASP for following data: **06**
i) Wastewater flow = 20 MLd
ii) Influent BOD = 200 mg/Lit
iii) Effluent BOD = 25 mg/Lit
iv) MLSS = 2000 mg/Lit
v) F/M = 0.2
vi) SVI = 80 ml/gm
vii) Sludge age = 10 days
Assume any missing data appropriately.

b) What is Chemical Oxygen Demand? Differentiate between Chemical Oxygen Demand and Biochemical Oxygen Demand. **03**

Q.4 **a)** Explain Trickling filter with the help of a diagram. **06**

b) Differentiate between Vermicomposting and Indore Method of composting. **03**

Q.5 **a)** Determine Ultimate BOD & BOD_3. If the BOD_5 is 200 mg/lt at 20°C. assuming the deoxygenation constant as 0.25/day. **06**

b) Explain Moving Bed Biofilm Reactor with a neat diagram. **03**

SECTION – II

Q.6 **a)** Discuss the oxygen sag analysis with the help of a diagram. **04**

b) A stream, saturated with DO has flow of 1.3 m^3/s, BOD of 4 mg/L and rate constant of 0.25 per day. It receives an effluent discharge of 0.35 m^3/s. Having BOD 20 mg/L, DO 5 mg/L and rate constant 0.13 per day. The average velocity of flow of the stream is 0.15 m/s. Calculate the DO deficit at point 20 km & 40 km downstream. Assume that the temperature is 20°C throughout and BOD is measured at 5 days. Take saturation DO at 20°C as 9.17 mg/L. **06**

Q.7 **a)** With the help of a diagram, explain Electrostatic Precipitator. **05**

b) Discuss the sources of Air pollution, with the help of a diagram. **04**

Q.8 **a)** Illustrate the functioning of Bangalore method of composting with the help of a diagram. **05**

b) Explain the concept of number of trip for solid waste with the help of a diagram. **04**

Q.9 Discuss the following: **09**

i) Cyclone Precipitator
ii) Sludge drying Bed
iii) SBR

SLR-QH-246

Seat No.	

Set P

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (Old) (CBCS)
Examination: March/April – 2026
Risk Assessment and Vulnerability Analysis (BTN01514)

Day & Date: Thursday, 14-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) What is the primary goal of risk assessment?
a) Identifying all potential risks
b) Eliminating all risks
c) Evaluating and prioritizing risks
d) Mitigating all risks

2) Which of the following is NOT a step in the risk assessment process?
a) Risk identification b) Risk control
c) Risk analysis d) Risk evaluation

3) Vulnerability refers to _____.
a) The likelihood of a threat occurring
b) The potential impact of a threat
c) Weaknesses in a system that could be exploited
d) The effectiveness of security measures

4) Which of the following is NOT a common method for assessing risk?
a) Qualitative risk analysis b) Quantitative risk analysis
c) Probability risk assessment d) Semi-quantitative risk analysis

5) A risk matrix is used to _____.
a) Determine the probability of a risk occurring
b) Quantify the impact of a risk
c) Assess and prioritize risks based on their likelihood and impact
d) Calculate the total risk exposure of an organization

6) Which of the following is NOT a category typically included in a risk assessment?
a) Financial risks
b) Operational risks
c) Human resources risks
d) Marketing risks

7) In a qualitative risk assessment, risks are typically evaluated based on _____.
a) Numeric values
b) Financial impact
c) Descriptive scales
d) Probability distributions

8) Which of the following is a key benefit of conducting vulnerability analysis?
a) Identifying potential threats
b) Eliminating all risks
c) Understanding weaknesses in a system
d) Implementing security measures

9) Which of the following is NOT a common type of vulnerability?
a) Physical vulnerability
b) Software vulnerability
c) Environmental vulnerability
d) Human vulnerability

10) Which of the following is an example of a technical vulnerability?
a) Poor password policies
b) Untrained employees
c) Physical access to sensitive areas
d) Outdated software

11) The CIA triad stands for _____.
a) Confidentiality, Identification, Availability
b) Confidentiality, Integrity, Authentication
c) Confidentiality, Integrity, Availability
d) Confidentiality, Identification, Authentication

12) Which of the following is an example of a mitigation strategy for reducing risk?
a) Accepting the risk
b) Transferring the risk
c) Ignoring the risk
d) Enhancing the risk

13) Which risk response strategy involves taking specific actions to reduce the likelihood or impact of a risk?
a) Avoidance
b) Mitigation
c) Acceptance
d) Transference

14) Which of the following is a limitation of qualitative risk analysis?
a) Difficulty in prioritizing risks
b) Lack of depth in understanding risks
c) Inability to assess impact
d) Subjectivity in risk evaluation

Seat No.	

Set **P**

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (Old) (CBCS)
Examination: March/April – 2026
Risk Assessment and Vulnerability Analysis (BTN01514)

Day & Date: Thursday, 14-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Answer any two questions from each Section.
2) Figures to the right indicate full marks.
3) Assume additional data if required and mention it clearly.

Section – I

Q.2	**a)**	Explain the difference between risk assessment and vulnerability analysis.	**07**
	b)	Describe the relationship between exposure, vulnerability, and risk.	**07**
Q.3	**a)**	What role does data analysis play in risk assessment and vulnerability analysis?	**07**
	b)	List and explain the qualitative and quantitative methods used in Risk Assessment.	**07**
Q.4	**a)**	What are the steps involved in conducting a Risk Assessment?	**07**
	b)	Explain the different issues involved in urban planning.	**07**

Section – II

Q.5	**a)**	Explain vulnerability identification process.	**07**
	b)	How do you ensure the accuracy and reliability of risk assessments and vulnerability analyses?	**07**
Q.6	**a)**	Explain the concept of Risk Matrix.	**07**
	b)	What are some best practices for communicating risk assessment findings to stakeholders and decision-makers?	**07**
Q.7	**a)**	What are some challenges or limitations associated with conducting risk assessment and Vulnerability analysis?	**07**
	b)	Differentiate between Hazard, Risk, and Vulnerability.	**07**

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (Old) (CBCS)
Examination: March/April – 2026
Risk Assessment and Vulnerability Analysis (BTN01514)

Day & Date: Thursday, 14-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which of the following is a key benefit of conducting vulnerability analysis?
a) Identifying potential threats
b) Eliminating all risks
c) Understanding weaknesses in a system
d) Implementing security measures

2) Which of the following is NOT a common type of vulnerability?
a) Physical vulnerability b) Software vulnerability
c) Environmental vulnerability d) Human vulnerability

3) Which of the following is an example of a technical vulnerability?
a) Poor password policies
b) Untrained employees
c) Physical access to sensitive areas
d) Outdated software

4) The CIA triad stands for _____.
a) Confidentiality, Identification, Availability
b) Confidentiality, Integrity, Authentication
c) Confidentiality, Integrity, Availability
d) Confidentiality, Identification, Authentication

5) Which of the following is an example of a mitigation strategy for reducing risk?
a) Accepting the risk b) Transferring the risk
c) Ignoring the risk d) Enhancing the risk

6) Which risk response strategy involves taking specific actions to reduce the likelihood or impact of a risk?
   a) Avoidance
   b) Mitigation
   c) Acceptance
   d) Transference

7) Which of the following is a limitation of qualitative risk analysis?
   a) Difficulty in prioritizing risks
   b) Lack of depth in understanding risks
   c) Inability to assess impact
   d) Subjectivity in risk evaluation

8) What is the primary goal of risk assessment?
   a) Identifying all potential risks
   b) Eliminating all risks
   c) Evaluating and prioritizing risks
   d) Mitigating all risks

9) Which of the following is NOT a step in the risk assessment process?
   a) Risk identification
   b) Risk control
   c) Risk analysis
   d) Risk evaluation

10) Vulnerability refers to _____.
   a) The likelihood of a threat occurring
   b) The potential impact of a threat
   c) Weaknesses in a system that could be exploited
   d) The effectiveness of security measures

11) Which of the following is NOT a common method for assessing risk?
   a) Qualitative risk analysis
   b) Quantitative risk analysis
   c) Probability risk assessment
   d) Semi-quantitative risk analysis

12) A risk matrix is used to _____.
   a) Determine the probability of a risk occurring
   b) Quantify the impact of a risk
   c) Assess and prioritize risks based on their likelihood and impact
   d) Calculate the total risk exposure of an organization

13) Which of the following is NOT a category typically included in a risk assessment?
   a) Financial risks
   b) Operational risks
   c) Human resources risks
   d) Marketing risks

14) In a qualitative risk assessment, risks are typically evaluated based on _____.
   a) Numeric values
   b) Financial impact
   c) Descriptive scales
   d) Probability distributions

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (Old) (CBCS)
Examination: March/April – 2026
Risk Assessment and Vulnerability Analysis (BTN01514)

Day & Date: Thursday, 14-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Answer any two questions from each Section.
2) Figures to the right indicate full marks.
3) Assume additional data if required and mention it clearly.

Section – I

Q.2	**a)**	Explain the difference between risk assessment and vulnerability analysis.	**07**
	b)	Describe the relationship between exposure, vulnerability, and risk.	**07**
Q.3	**a)**	What role does data analysis play in risk assessment and vulnerability analysis?	**07**
	b)	List and explain the qualitative and quantitative methods used in Risk Assessment.	**07**
Q.4	**a)**	What are the steps involved in conducting a Risk Assessment?	**07**
	b)	Explain the different issues involved in urban planning.	**07**

Section – II

Q.5	**a)**	Explain vulnerability identification process.	**07**
	b)	How do you ensure the accuracy and reliability of risk assessments and vulnerability analyses?	**07**
Q.6	**a)**	Explain the concept of Risk Matrix.	**07**
	b)	What are some best practices for communicating risk assessment findings to stakeholders and decision-makers?	**07**
Q.7	**a)**	What are some challenges or limitations associated with conducting risk assessment and Vulnerability analysis?	**07**
	b)	Differentiate between Hazard, Risk, and Vulnerability.	**07**

Seat No.	

Set R

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (Old) (CBCS)
Examination: March/April – 2026
Risk Assessment and Vulnerability Analysis (BTN01514)

Day & Date: Thursday, 14-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) The CIA triad stands for _____.
a) Confidentiality, Identification, Availability
b) Confidentiality, Integrity, Authentication
c) Confidentiality, Integrity, Availability
d) Confidentiality, Identification, Authentication

2) Which of the following is an example of a mitigation strategy for reducing risk?
a) Accepting the risk
b) Transferring the risk
c) Ignoring the risk
d) Enhancing the risk

3) Which risk response strategy involves taking specific actions to reduce the likelihood or impact of a risk?
a) Avoidance
b) Mitigation
c) Acceptance
d) Transference

4) Which of the following is a limitation of qualitative risk analysis?
a) Difficulty in prioritizing risks
b) Lack of depth in understanding risks
c) Inability to assess impact
d) Subjectivity in risk evaluation

5) What is the primary goal of risk assessment?
a) Identifying all potential risks
b) Eliminating all risks
c) Evaluating and prioritizing risks
d) Mitigating all risks

6) Which of the following is NOT a step in the risk assessment process?
a) Risk identification
b) Risk control
c) Risk analysis
d) Risk evaluation

7) Vulnerability refers to _____.
a) The likelihood of a threat occurring
b) The potential impact of a threat
c) Weaknesses in a system that could be exploited
d) The effectiveness of security measures

8) Which of the following is NOT a common method for assessing risk?
a) Qualitative risk analysis
b) Quantitative risk analysis
c) Probability risk assessment
d) Semi-quantitative risk analysis

9) A risk matrix is used to _____.
a) Determine the probability of a risk occurring
b) Quantify the impact of a risk
c) Assess and prioritize risks based on their likelihood and impact
d) Calculate the total risk exposure of an organization

10) Which of the following is NOT a category typically included in a risk assessment?
a) Financial risks
b) Operational risks
c) Human resources risks
d) Marketing risks

11) In a qualitative risk assessment, risks are typically evaluated based on _____.
a) Numeric values
b) Financial impact
c) Descriptive scales
d) Probability distributions

12) Which of the following is a key benefit of conducting vulnerability analysis?
a) Identifying potential threats
b) Eliminating all risks
c) Understanding weaknesses in a system
d) Implementing security measures

13) Which of the following is NOT a common type of vulnerability?
a) Physical vulnerability
b) Software vulnerability
c) Environmental vulnerability
d) Human vulnerability

14) Which of the following is an example of a technical vulnerability?
a) Poor password policies
b) Untrained employees
c) Physical access to sensitive areas
d) Outdated software

Seat No.	

Set **R**

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (Old) (CBCS)
Examination: March/April – 2026
Risk Assessment and Vulnerability Analysis (BTN01514)

Day & Date: Thursday, 14-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Answer any two questions from each Section.
2) Figures to the right indicate full marks.
3) Assume additional data if required and mention it clearly.

Section – I

Q.2	**a)**	Explain the difference between risk assessment and vulnerability analysis.	**07**
	b)	Describe the relationship between exposure, vulnerability, and risk.	**07**
Q.3	**a)**	What role does data analysis play in risk assessment and vulnerability analysis?	**07**
	b)	List and explain the qualitative and quantitative methods used in Risk Assessment.	**07**
Q.4	**a)**	What are the steps involved in conducting a Risk Assessment?	**07**
	b)	Explain the different issues involved in urban planning.	**07**

Section – II

Q.5	**a)**	Explain vulnerability identification process.	**07**
	b)	How do you ensure the accuracy and reliability of risk assessments and vulnerability analyses?	**07**
Q.6	**a)**	Explain the concept of Risk Matrix.	**07**
	b)	What are some best practices for communicating risk assessment findings to stakeholders and decision-makers?	**07**
Q.7	**a)**	What are some challenges or limitations associated with conducting risk assessment and Vulnerability analysis?	**07**
	b)	Differentiate between Hazard, Risk, and Vulnerability.	**07**

Seat No.	

Set **S**

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (Old) (CBCS)
Examination: March/April – 2026
Risk Assessment and Vulnerability Analysis (BTN01514)

Day & Date: Thursday, 14-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which of the following is NOT a category typically included in a risk assessment?
a) Financial risks b) Operational risks
c) Human resources risks d) Marketing risks

2) In a qualitative risk assessment, risks are typically evaluated based on _____.
a) Numeric values b) Financial impact
c) Descriptive scales d) Probability distributions

3) Which of the following is a key benefit of conducting vulnerability analysis?
a) Identifying potential threats
b) Eliminating all risks
c) Understanding weaknesses in a system
d) Implementing security measures

4) Which of the following is NOT a common type of vulnerability?
a) Physical vulnerability b) Software vulnerability
c) Environmental vulnerability d) Human vulnerability

5) Which of the following is an example of a technical vulnerability?
a) Poor password policies
b) Untrained employees
c) Physical access to sensitive areas
d) Outdated software

6) The CIA triad stands for _____.
   a) Confidentiality, Identification, Availability
   b) Confidentiality, Integrity, Authentication
   c) Confidentiality, Integrity, Availability
   d) Confidentiality, Identification, Authentication

7) Which of the following is an example of a mitigation strategy for reducing risk?
   a) Accepting the risk
   b) Transferring the risk
   c) Ignoring the risk
   d) Enhancing the risk

8) Which risk response strategy involves taking specific actions to reduce the likelihood or impact of a risk?
   a) Avoidance
   b) Mitigation
   c) Acceptance
   d) Transference

9) Which of the following is a limitation of qualitative risk analysis?
   a) Difficulty in prioritizing risks
   b) Lack of depth in understanding risks
   c) Inability to assess impact
   d) Subjectivity in risk evaluation

10) What is the primary goal of risk assessment?
   a) Identifying all potential risks
   b) Eliminating all risks
   c) Evaluating and prioritizing risks
   d) Mitigating all risks

11) Which of the following is NOT a step in the risk assessment process?
   a) Risk identification
   b) Risk control
   c) Risk analysis
   d) Risk evaluation

12) Vulnerability refers to _____.
   a) The likelihood of a threat occurring
   b) The potential impact of a threat
   c) Weaknesses in a system that could be exploited
   d) The effectiveness of security measures

13) Which of the following is NOT a common method for assessing risk?
   a) Qualitative risk analysis
   b) Quantitative risk analysis
   c) Probability risk assessment
   d) Semi-quantitative risk analysis

14) A risk matrix is used to _____.
   a) Determine the probability of a risk occurring
   b) Quantify the impact of a risk
   c) Assess and prioritize risks based on their likelihood and impact
   d) Calculate the total risk exposure of an organization

SLR-QH-246

Seat No.	

Set S

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (Old) (CBCS)
Examination: March/April – 2026
Risk Assessment and Vulnerability Analysis (BTN01514)

Day & Date: Thursday, 14-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Answer any two questions from each Section.
2) Figures to the right indicate full marks.
3) Assume additional data if required and mention it clearly.

Section – I

Q.2	**a)**	Explain the difference between risk assessment and vulnerability analysis.	**07**
	b)	Describe the relationship between exposure, vulnerability, and risk.	**07**
Q.3	**a)**	What role does data analysis play in risk assessment and vulnerability analysis?	**07**
	b)	List and explain the qualitative and quantitative methods used in Risk Assessment.	**07**
Q.4	**a)**	What are the steps involved in conducting a Risk Assessment?	**07**
	b)	Explain the different issues involved in urban planning.	**07**

Section – II

Q.5	**a)**	Explain vulnerability identification process.	**07**
	b)	How do you ensure the accuracy and reliability of risk assessments and vulnerability analyses?	**07**
Q.6	**a)**	Explain the concept of Risk Matrix.	**07**
	b)	What are some best practices for communicating risk assessment findings to stakeholders and decision-makers?	**07**
Q.7	**a)**	What are some challenges or limitations associated with conducting risk assessment and Vulnerability analysis?	**07**
	b)	Differentiate between Hazard, Risk, and Vulnerability.	**07**

SLR-QH-247

Seat No.	

Set P

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (Old) (CBCS)
Examination: March/April – 2026
Planning and Design of Rural Roads (BTN01515)

Day & Date: Thursday, 14-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Solve following multiple choice questions: **14**

1) Intermediate sight distance is defined as ____ the stopping sight distance.
a) Three time b) One time
c) Twice d) Four time

2) Transition curve is provided at both ends of Curve.
a) Horizontal b) Vertical
c) Widening d) None of the above

3) What is the Side slope (H: V) for rural Roads when the condition is Embankment in silty/sandy/gravelly soil?
a) 2.5:1 to 3:1 b) 2:1
c) 1:1 to 0.5:1 d) 1/12:1 to 1/16:1

4) The required value of camber is dependent on the type of and rainfall.
a) Pavement b) Embankment
c) Rural d) None of these

5) The maximum super elevation on hill roads should not exceed _____.
a) 7% b) 8%
c) 9% d) 10%

6) The type of Transition Curve that is generally provided on hill road is _____.
a) Circular
b) Cubic parabola
c) Lemniscate spiral
d) Spiral

7) The water may be collected in _____.
a) Catch pits
b) Kerb
c) Longitudinal drains
d) Filter sand

8) The sight distance is measured along the middle of the _____.
a) Inner lane
b) Outer lane
c) Middle lane
d) None of these

9) Minimum thickness of the base of a flexible pavement is _____.
a) 15 cm
b) 20 cm
c) 10 cm
d) 5 cm

10) Which of the following it NOT a critical parameter to control cracking and rutting in a flexible pavement?
a) Tensile strain near the surface close to the edge of the wheel
b) Vertical sub-base strain
c) Vertical subgrade strain
d) Tensile strain at the bottom of bituminous layer

11) What is normally the primary objective of a Self Help Group (SHG)?
a) To provide micro-finance to groups
b) To improve technology of farming
c) To provide high quality seeds
d) To provide education needs

12) The interface treatment provided to plug in the voids of porous surfaces and to bond loose particles in bituminous pavements is called _____.
a) Tack coat
b) Prime coat
c) Seal coat
d) Surface dressing

13) Causeways are the type of _____.
a) Cross drainage structure
b) Side drains
c) Sub-surface drainage structure
d) Jelly drains

14) The seepage flow is present in _____.
a) Surface drainage
b) Sub surface drainage
c) Camber
d) Cross slope

SLR-QH-247

Seat No.	

Set P

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (Old) (CBCS)
Examination: March/April – 2026
Planning and Design of Rural Roads (BTN01515)

Day & Date: Thursday, 14-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever necessary and mention it clearly.
4) Draw neat sketches wherever necessary.

Section – I

Q.2 Solve Any Two of the following. **14**

a) Write short note on '*Planning Database in Rural Roads.'*

b) Explain in detail *''Road alignment and Surveys'* in rural roads.

c) Enlist and explain various factors affecting geometric design of roads.

Q.3 Solve Any Two of the following. **14**

a) One two-way traffic road, speed of overtaking vehicle is 65 kmph and overtaken vehicle is 45 kmph. If average acceleration is 0.92 m/sec^2 and reaction time is 2.5 seconds, calculate Overtaking Sight Distance (OSD).

b) What are the various *'Design parameters'* for Pavement design in Rural Roads?

c) CBR test is performed on flexible pavement and load verses penetration table is shown below, an initial traffic of 30 CVPD, with a growth rate of 6 per cent per annum for a location having annual rainfall of 1200 mm. The design life is 10 years. Determine the pavement thickness.

Penetration	0	0.5	1	1.5	2	2.5	3	4	5	7.5	10	12.5
Load (kg)	0	8	26	43	63	75	84	105	114	135	151	165

Section - II

Q.4 Solve Any Two of the following. **14**

a) Explain the requirements of surface drain; road side drains, shoulder drains, catch water drains.

b) Explain Standard design of culverts.

c) Explain Construction of *fly ash embankments.*

Q.5 Solve Any Two of the following. **14**

a) Explain *quality control in construction.*

b) Explain maintenance of paved roads.

c) Explain the concept of '*Rehabilitation*.'

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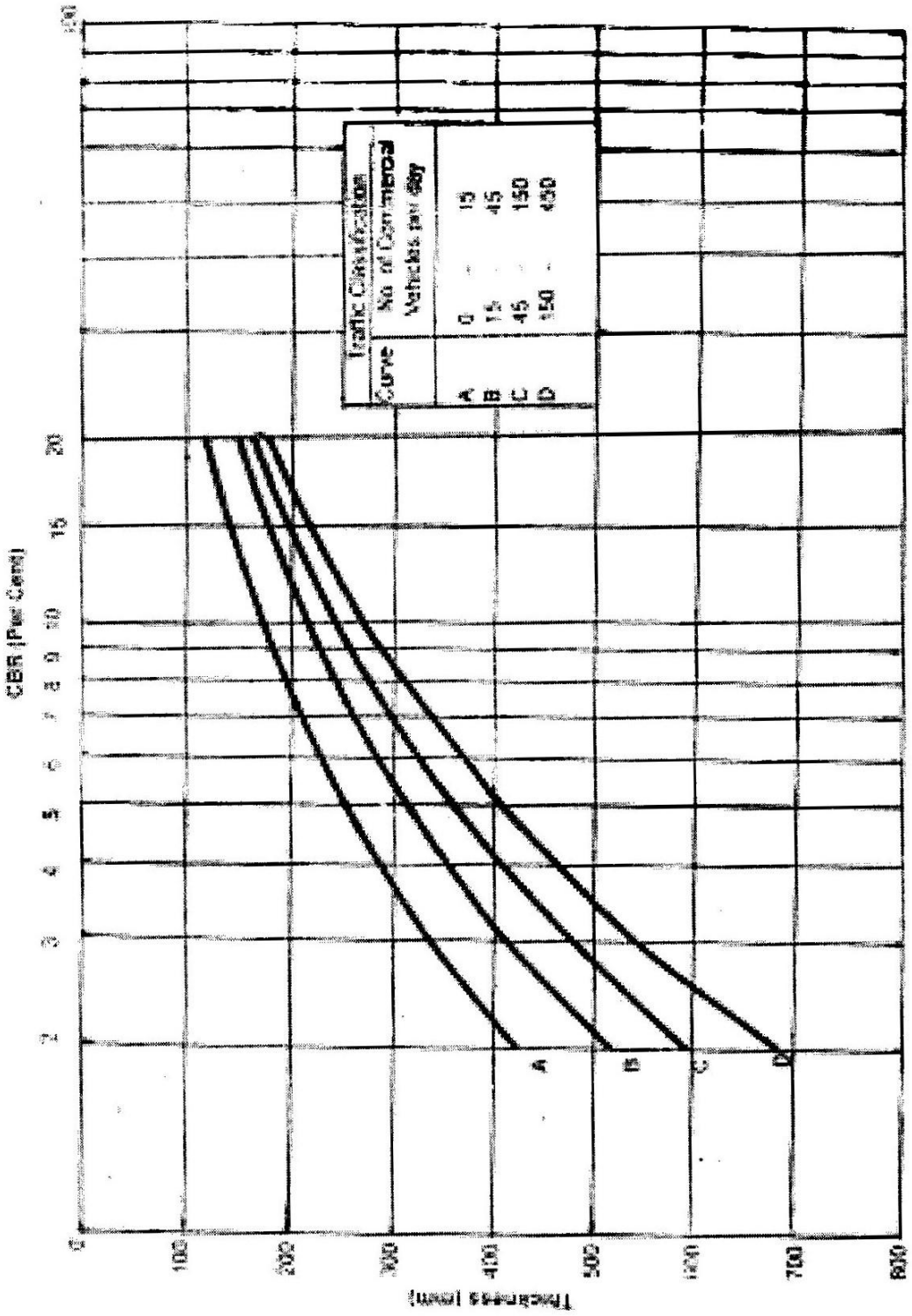
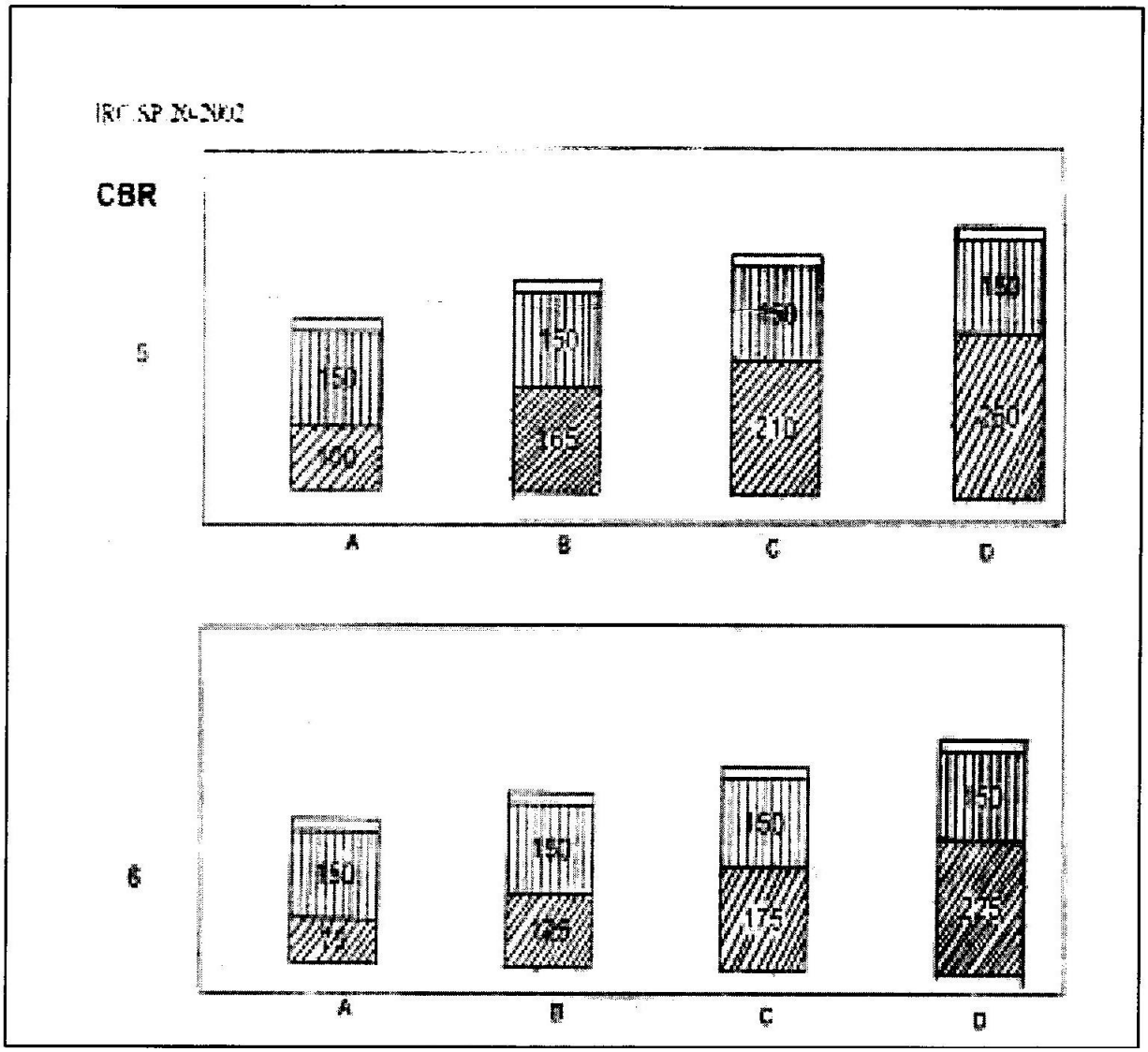


Fig. 5.1. CBR Curves for Flexible Pavement Design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SLR-QH-247

Seat No.	

Set Q

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (Old) (CBCS)
Examination: March/April – 2026
Planning and Design of Rural Roads (BTN01515)

Day & Date: Thursday, 14-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Solve following multiple choice questions: **14**

1) The sight distance is measured along the middle of the _____.

a) Inner lane b) Outer lane
c) Middle lane d) None of these

2) Minimum thickness of the base of a flexible pavement is _____.

a) 15 cm b) 20 cm
c) 10 cm d) 5 cm

3) Which of the following it NOT a critical parameter to control cracking and rutting in a flexible pavement?

a) Tensile strain near the surface close to the edge of the wheel
b) Vertical sub-base strain
c) Vertical subgrade strain
d) Tensile strain at the bottom of bituminous layer

4) What is normally the primary objective of a Self Help Group (SHG)?

a) To provide micro-finance to groups
b) To improve technology of farming
c) To provide high quality seeds
d) To provide education needs

5) The interface treatment provided to plug in the voids of porous surfaces and to bond loose particles in bituminous pavements is called _____.
a) Tack coat
b) Prime coat
c) Seal coat
d) Surface dressing

6) Causeways are the type of _____.
a) Cross drainage structure
b) Side drains
c) Sub-surface drainage structure
d) Jelly drains

7) The seepage flow is present in _____.
a) Surface drainage
b) Sub surface drainage
c) Camber
d) Cross slope

8) Intermediate sight distance is defined as ____ the stopping sight distance.
a) Three time
b) One time
c) Twice
d) Four time

9) Transition curve is provided at both ends of Curve.
a) Horizontal
b) Vertical
c) Widening
d) None of the above

10) What is the Side slope (H: V) for rural Roads when the condition is Embankment in silty/sandy/gravelly soil?
a) 2.5:1 to 3:1
b) 2:1
c) 1:1 to 0.5:1
d) 1/12:1 to 1/16:1

11) The required value of camber is dependent on the type of and rainfall.
a) Pavement
b) Embankment
c) Rural
d) None of these

12) The maximum super elevation on hill roads should not exceed _____.
a) 7%
b) 8%
c) 9%
d) 10%

13) The type of Transition Curve that is generally provided on hill road is _____.
a) Circular
b) Cubic parabola
c) Lemniscate spiral
d) Spiral

14) The water may be collected in _____.

a) Catch pits
b) Kerb
c) Longitudinal drains
d) Filter sand

SLR-QH-247

Seat No.	

Set Q

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (Old) (CBCS)
Examination: March/April – 2026
Planning and Design of Rural Roads (BTN01515)

Day & Date: Thursday, 14-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever necessary and mention it clearly.
4) Draw neat sketches wherever necessary.

Section – I

Q.2 Solve Any Two of the following. **14**

a) Write short note on '*Planning Database in Rural Roads.'*

b) Explain in detail *''Road alignment and Surveys'* in rural roads.

c) Enlist and explain various factors affecting geometric design of roads.

Q.3 Solve Any Two of the following. **14**

a) One two-way traffic road, speed of overtaking vehicle is 65 kmph and overtaken vehicle is 45 kmph. If average acceleration is 0.92 m/sec^2 and reaction time is 2.5 seconds, calculate Overtaking Sight Distance (OSD).

b) What are the various *'Design parameters'* for Pavement design in Rural Roads?

c) CBR test is performed on flexible pavement and load verses penetration table is shown below, an initial traffic of 30 CVPD, with a growth rate of 6 per cent per annum for a location having annual rainfall of 1200 mm. The design life is 10 years. Determine the pavement thickness.

Penetration	0	0.5	1	1.5	2	2.5	3	4	5	7.5	10	12.5
Load (kg)	0	8	26	43	63	75	84	105	114	135	151	165

Section - II

Q.4 Solve Any Two of the following. **14**

a) Explain the requirements of surface drain; road side drains, shoulder drains, catch water drains.

b) Explain Standard design of culverts.

c) Explain Construction of *fly ash embankments.*

Q.5 Solve Any Two of the following. **14**

a) Explain *quality control in construction.*

b) Explain maintenance of paved roads.

c) Explain the concept of '*Rehabilitation*.'

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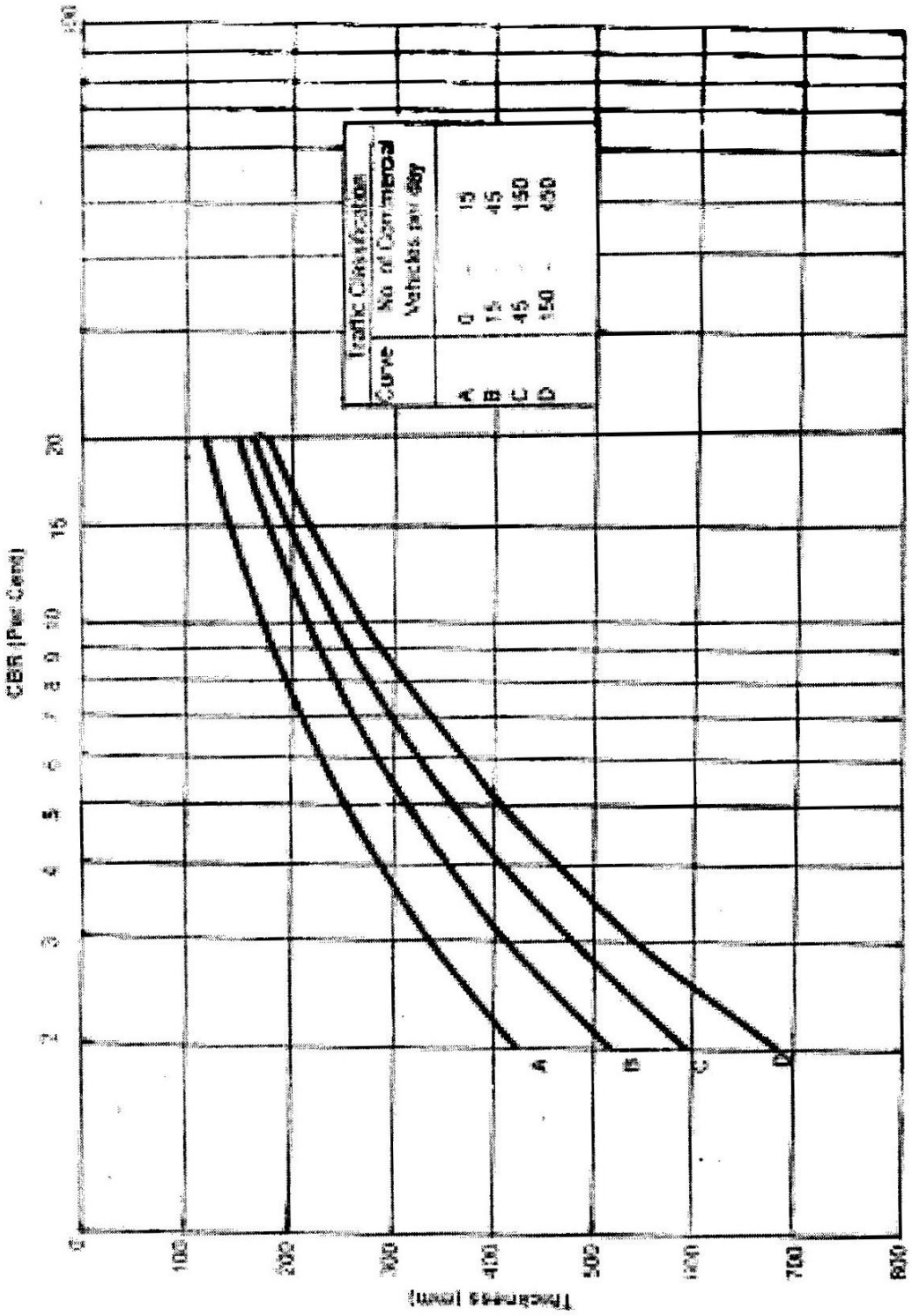
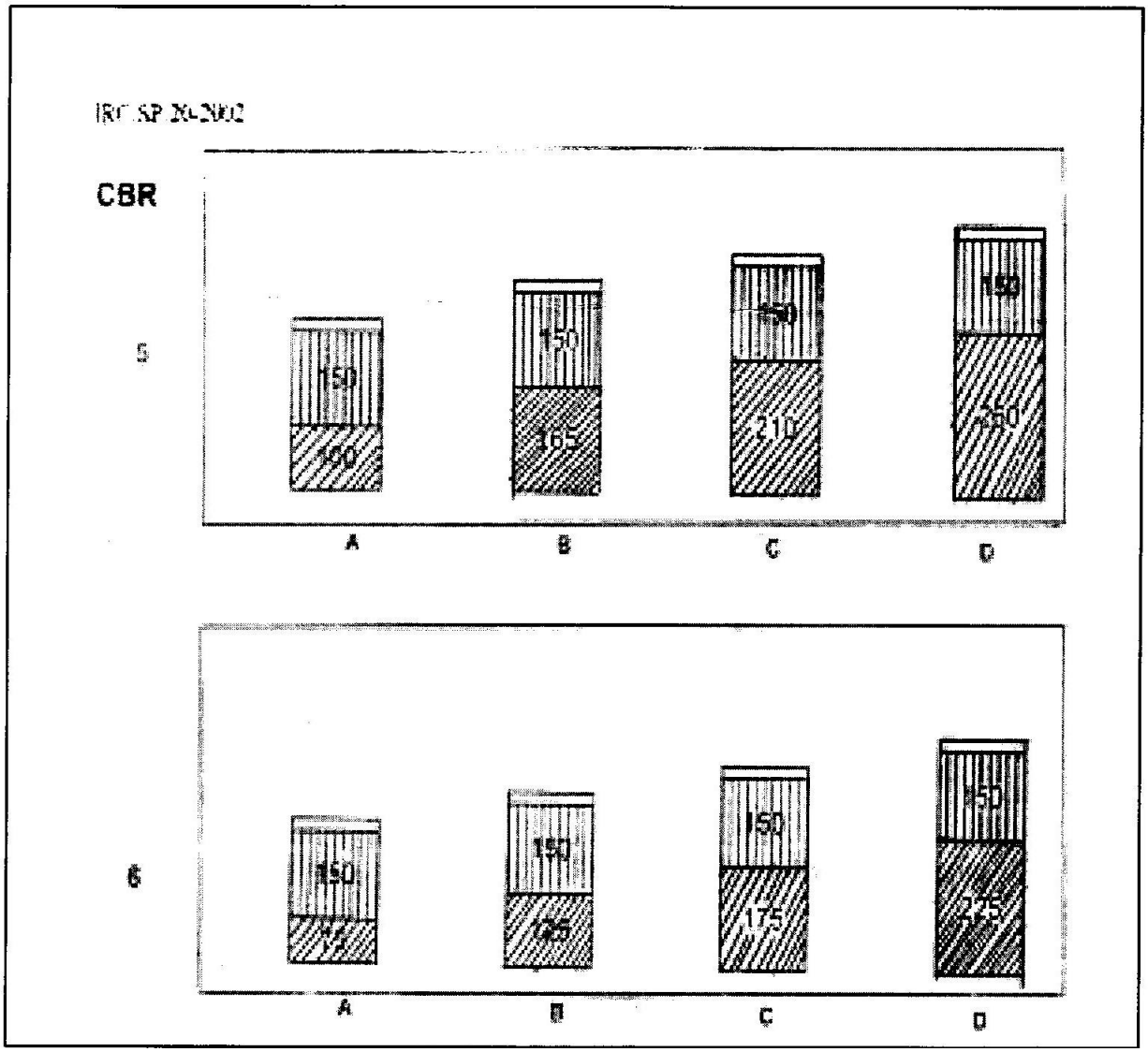


Fig. 5.1. CBR Curves for Flexible Pavement Design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SLR-QH-247

Seat No.	

Set R

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (Old) (CBCS)
Examination: March/April – 2026
Planning and Design of Rural Roads (BTN01515)

Day & Date: Thursday, 14-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Solve following multiple choice questions: 14

1) What is normally the primary objective of a Self Help Group (SHG)?

a) To provide micro-finance to groups
b) To improve technology of farming
c) To provide high quality seeds
d) To provide education needs

2) The interface treatment provided to plug in the voids of porous surfaces and to bond loose particles in bituminous pavements is called _____.

a) Tack coat b) Prime coat
c) Seal coat d) Surface dressing

3) Causeways are the type of _____.

a) Cross drainage structure
b) Side drains
c) Sub-surface drainage structure
d) Jelly drains

4) The seepage flow is present in _____.

a) Surface drainage b) Sub surface drainage
c) Camber d) Cross slope

5) Intermediate sight distance is defined as ____ the stopping sight distance.

a) Three time
b) One time
c) Twice
d) Four time

6) Transition curve is provided at both ends of Curve.

a) Horizontal
b) Vertical
c) Widening
d) None of the above

7) What is the Side slope (H: V) for rural Roads when the condition is Embankment in silty/sandy/gravelly soil?

a) 2.5:1 to 3:1
b) 2:1
c) 1:1 to 0.5:1
d) 1/12:1 to 1/16:1

8) The required value of camber is dependent on the type of and rainfall.

a) Pavement
b) Embankment
c) Rural
d) None of these

9) The maximum super elevation on hill roads should not exceed _____.

a) 7%
b) 8%
c) 9%
d) 10%

10) The type of Transition Curve that is generally provided on hill road is _____.

a) Circular
b) Cubic parabola
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c) Longitudinal drains
d) Filter sand

12) The sight distance is measured along the middle of the _____.

a) Inner lane
b) Outer lane
c) Middle lane
d) None of these

13) Minimum thickness of the base of a flexible pavement is _____.

a) 15 cm
b) 20 cm
c) 10 cm
d) 5 cm

14) Which of the following it NOT a critical parameter to control cracking and rutting in a flexible pavement?

a) Tensile strain near the surface close to the edge of the wheel
b) Vertical sub-base strain
c) Vertical subgrade strain
d) Tensile strain at the bottom of bituminous layer

SLR-QH-247

Seat No.	

Set R

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (Old) (CBCS)
Examination: March/April – 2026
Planning and Design of Rural Roads (BTN01515)

Day & Date: Thursday, 14-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever necessary and mention it clearly.
4) Draw neat sketches wherever necessary.

Section – I

Q.2 Solve Any Two of the following. **14**

a) Write short note on '*Planning Database in Rural Roads.'*

b) Explain in detail *''Road alignment and Surveys'* in rural roads.

c) Enlist and explain various factors affecting geometric design of roads.

Q.3 Solve Any Two of the following. **14**

a) One two-way traffic road, speed of overtaking vehicle is 65 kmph and overtaken vehicle is 45 kmph. If average acceleration is 0.92 m/sec^2 and reaction time is 2.5 seconds, calculate Overtaking Sight Distance (OSD).

b) What are the various *'Design parameters'* for Pavement design in Rural Roads?

c) CBR test is performed on flexible pavement and load verses penetration table is shown below, an initial traffic of 30 CVPD, with a growth rate of 6 per cent per annum for a location having annual rainfall of 1200 mm. The design life is 10 years. Determine the pavement thickness.

Penetration	0	0.5	1	1.5	2	2.5	3	4	5	7.5	10	12.5
Load (kg)	0	8	26	43	63	75	84	105	114	135	151	165

Section - II

Q.4 Solve Any Two of the following. **14**

a) Explain the requirements of surface drain; road side drains, shoulder drains, catch water drains.

b) Explain Standard design of culverts.

c) Explain Construction of *fly ash embankments.*

Q.5 Solve Any Two of the following. **14**

a) Explain *quality control in construction.*

b) Explain maintenance of paved roads.

c) Explain the concept of '*Rehabilitation*.'

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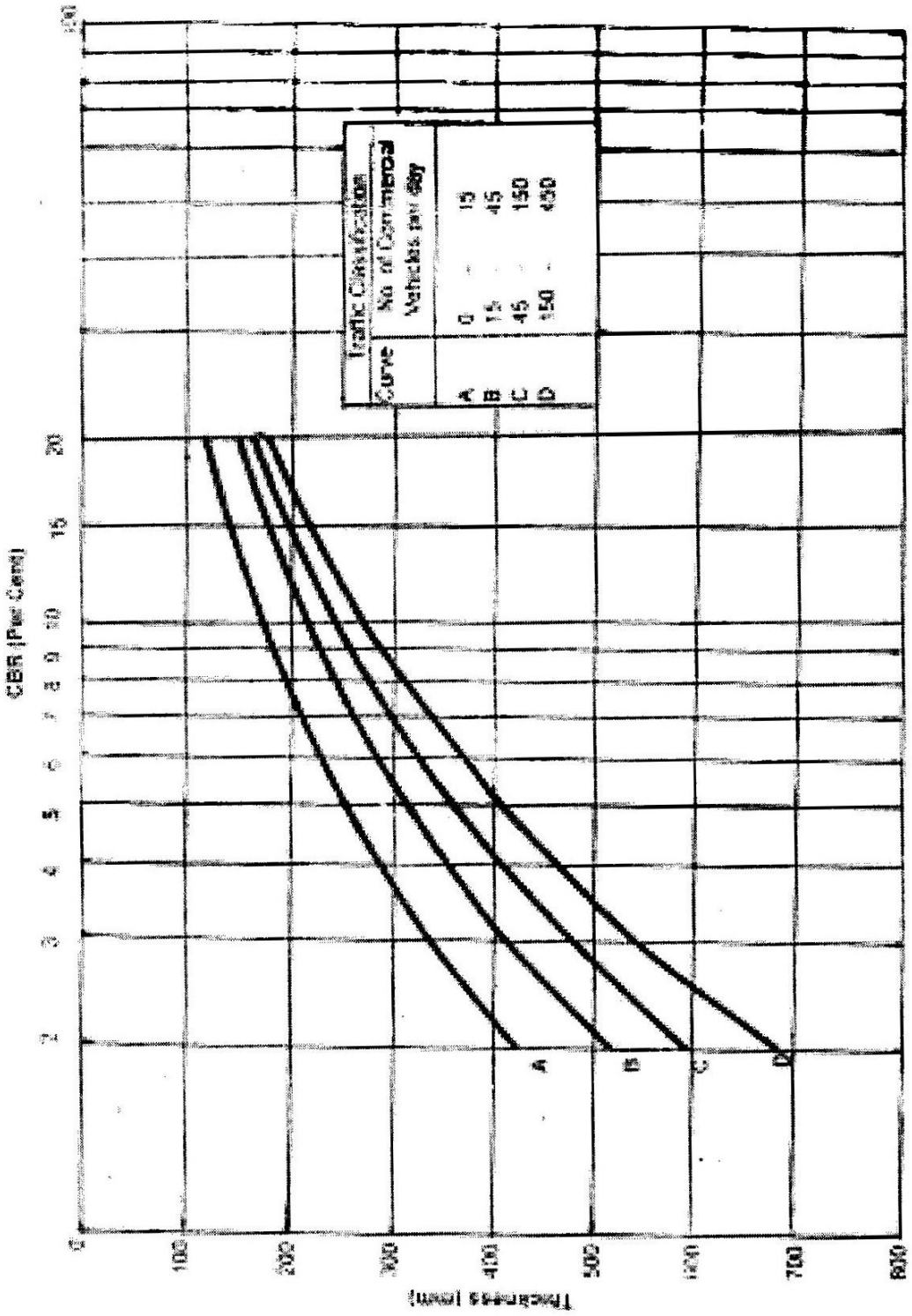
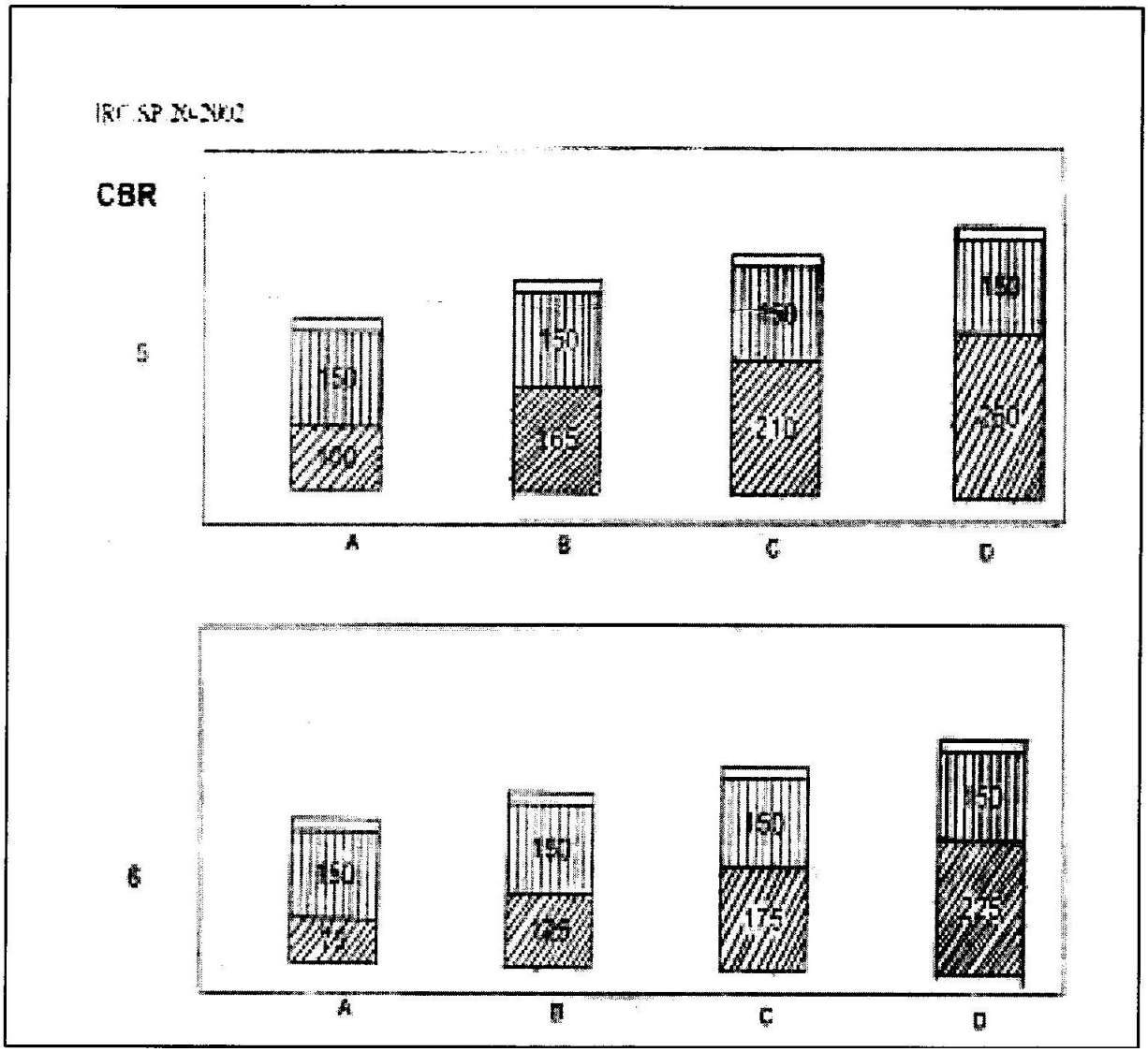


Fig. 5.1. CBR Curves for Flexible Pavement Design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SLR-QH-247

Seat No.	

Set S

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (Old) (CBCS)
Examination: March/April – 2026
Planning and Design of Rural Roads (BTN01515)

Day & Date: Thursday, 14-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Solve following multiple choice questions: **14**

1) The type of Transition Curve that is generally provided on hill road is _____.
a) Circular b) Cubic parabola
c) Lemniscate spiral d) Spiral

2) The water may be collected in _____.
a) Catch pits b) Kerb
c) Longitudinal drains d) Filter sand

3) The sight distance is measured along the middle of the _____.
a) Inner lane b) Outer lane
c) Middle lane d) None of these

4) Minimum thickness of the base of a flexible pavement is _____.
a) 15 cm b) 20 cm
c) 10 cm d) 5 cm

5) Which of the following it NOT a critical parameter to control cracking and rutting in a flexible pavement?
a) Tensile strain near the surface close to the edge of the wheel
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9) The seepage flow is present in _____.
a) Surface drainage
b) Sub surface drainage
c) Camber
d) Cross slope

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b) One time
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12) What is the Side slope (H: V) for rural Roads when the condition is Embankment in silty/sandy/gravelly soil?
a) 2.5:1 to 3:1
b) 2:1
c) 1:1 to 0.5:1
d) 1/12:1 to 1/16:1

13) The required value of camber is dependent on the type of and rainfall.

a) Pavement
b) Embankment
c) Rural
d) None of these

14) The maximum super elevation on hill roads should not exceed _____.

a) 7%
b) 8%
c) 9%
d) 10%

SLR-QH-247

Seat No.	

Set S

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (Old) (CBCS)
Examination: March/April – 2026
Planning and Design of Rural Roads (BTN01515)

Day & Date: Thursday, 14-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever necessary and mention it clearly.
4) Draw neat sketches wherever necessary.

Section – I

Q.2 Solve Any Two of the following. **14**

a) Write short note on '*Planning Database in Rural Roads.'*

b) Explain in detail *''Road alignment and Surveys'* in rural roads.

c) Enlist and explain various factors affecting geometric design of roads.

Q.3 Solve Any Two of the following. **14**

a) One two-way traffic road, speed of overtaking vehicle is 65 kmph and overtaken vehicle is 45 kmph. If average acceleration is 0.92 m/sec^2 and reaction time is 2.5 seconds, calculate Overtaking Sight Distance (OSD).

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c) CBR test is performed on flexible pavement and load verses penetration table is shown below, an initial traffic of 30 CVPD, with a growth rate of 6 per cent per annum for a location having annual rainfall of 1200 mm. The design life is 10 years. Determine the pavement thickness.

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Load (kg)	0	8	26	43	63	75	84	105	114	135	151	165

Section - II

Q.4 Solve Any Two of the following. **14**

a) Explain the requirements of surface drain; road side drains, shoulder drains, catch water drains.

b) Explain Standard design of culverts.

c) Explain Construction of *fly ash embankments.*

Q.5 Solve Any Two of the following. **14**

a) Explain *quality control in construction.*

b) Explain maintenance of paved roads.

c) Explain the concept of '*Rehabilitation*.'

IRC:SP-20-2002

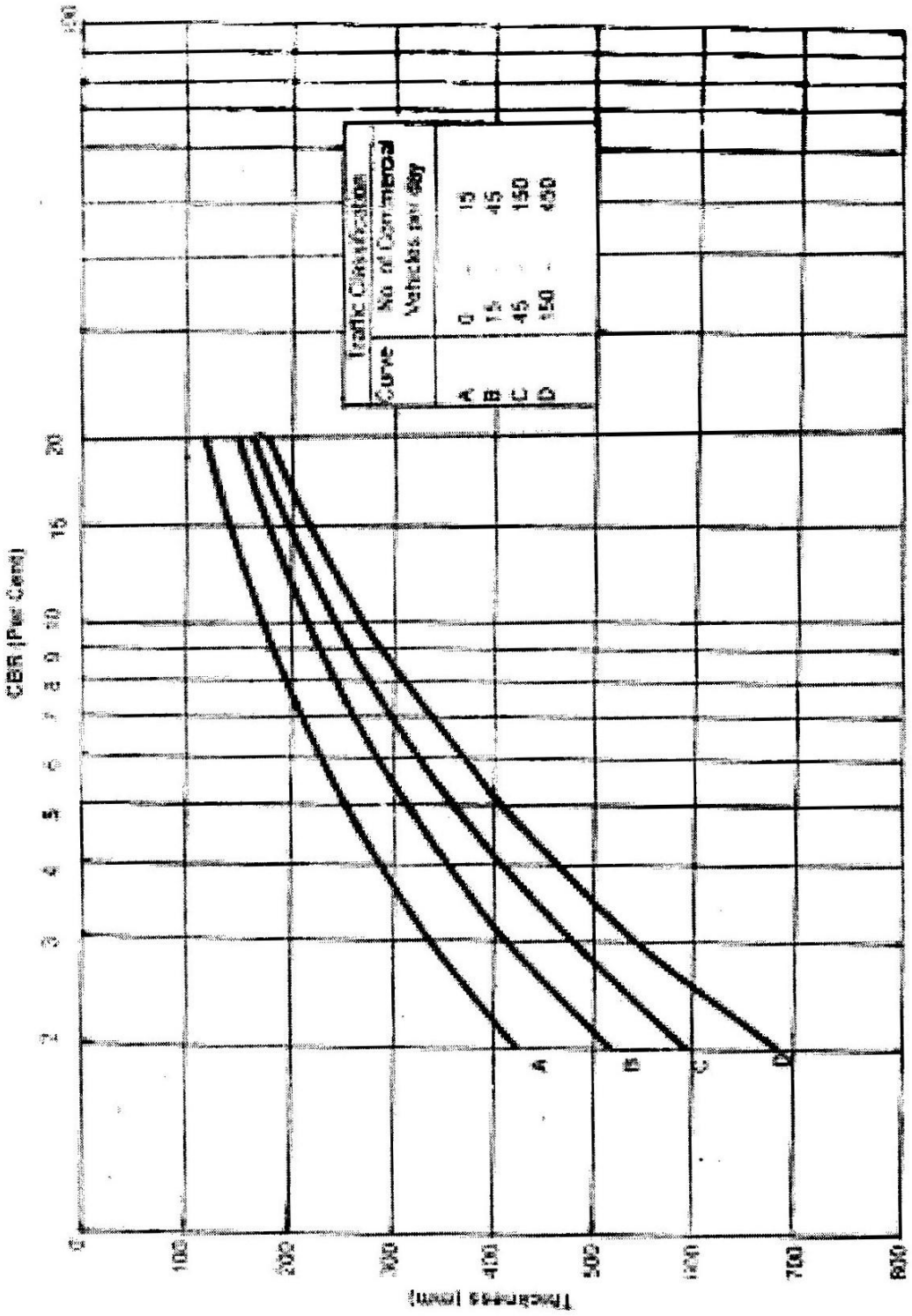
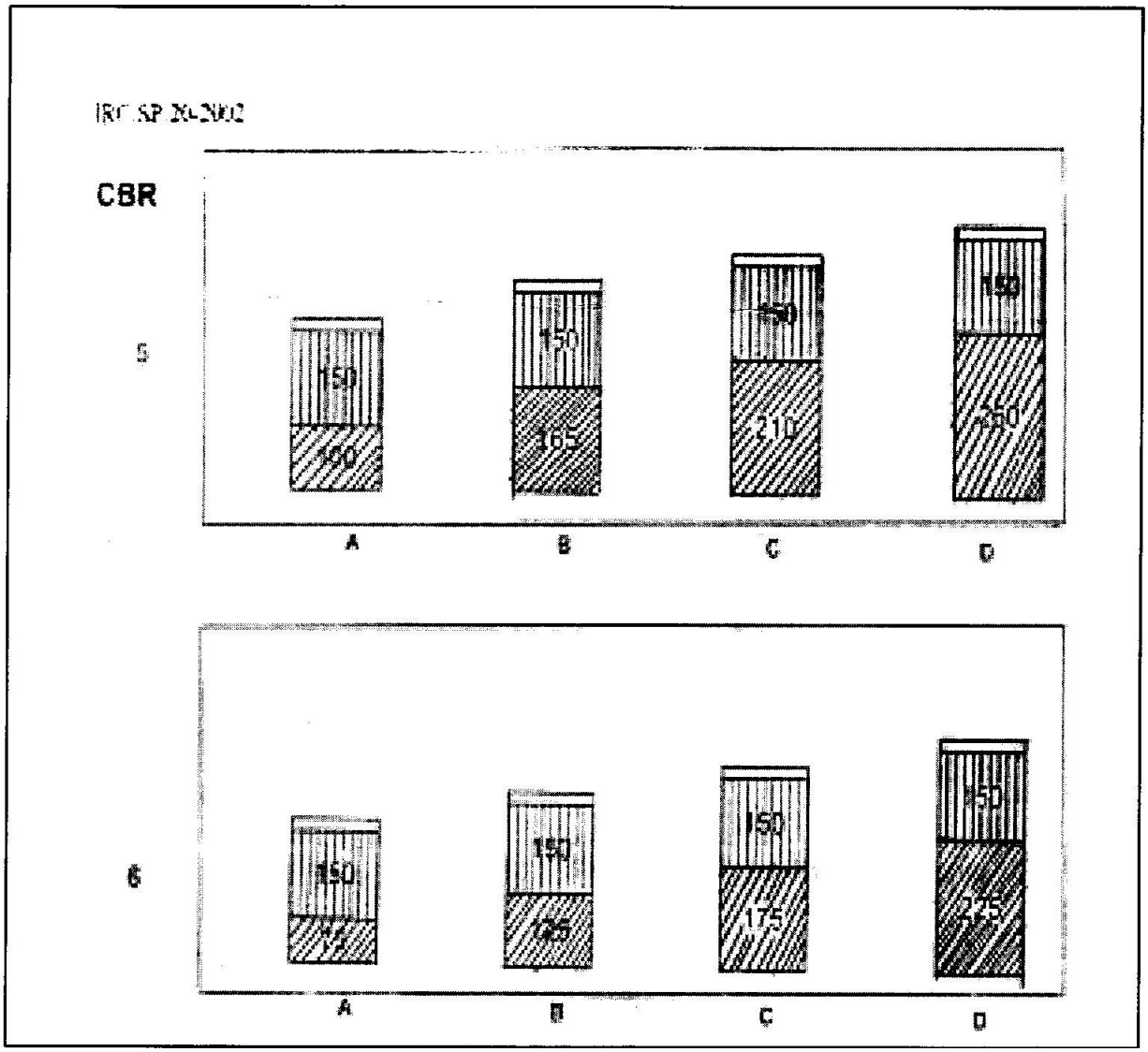


Fig. 5.1. CBR Curves for Flexible Pavement Design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SLR-QH-248

Seat No.	

Set P

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (Old) (CBCS)
Examination: March/April – 2026
Construction Materials: Sustainability and Usability (BTN01516)

Day & Date: Thursday, 14-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Multiple choice questions. **14**

1) Which of these materials is considered a salvaged material?
a) New bricks b) Reclaimed wood
c) Steel rods d) Fiber cement boards

2) Low-VOC paints are used in sustainable construction because they _____.
a) Improve structural integrity
b) Reduce air pollution and health hazards
c) Are cheaper than conventional paints
d) Enhance durability of the building

3) What does the term "cradle to cradle" imply in sustainable construction?
a) Recycling materials back into the production cycle
b) Using materials only once and disposing of them
c) Tracking energy usage from construction to demolition
d) Designing buildings with zero operational energy

4) Which dataset is commonly used for calculating the embodied energy of materials?
a) Environmental Product Declarations (EPDs)
b) Urban Land Institute Reports
c) Building Code Requirements
d) ASHRAE Standards

5) Embodied carbon refers to _____.
   a) The carbon released during a building's operation
   b) The total carbon emissions associated with a material's life cycle
   c) The amount of carbon stored in construction materials
   d) The carbon content in the atmosphere

6) Ferrocement is commonly used for _____.
   a) Roofing systems only
   b) Walls, roofs, and water tanks
   c) Decorative elements only
   d) Foundation systems

7) Which sustainable construction technique uses locally available materials and reduces energy consumption?
   a) Steam cured blocks
   b) Composite beam and panel
   c) Compressed Stabilized Earth Bricks (CSEB)
   d) Reinforced concrete masonry

8) Which industrial byproduct is widely used as a cement replacement in concrete production?
   a) Fly ash
   b) Paper waste
   c) Glass cullet
   d) Rubber crumbs

9) What is a common application of tires in sustainable construction?
   a) Roofing material
   b) Structural walls in earthship homes
   c) Flooring systems
   d) Window frames

10) What is a key principle in materials selection for eco-audits?
   a) Prioritizing the cheapest material available
   b) Considering environmental impact alongside performance and cost
   c) Avoiding renewable resources due to cost constraints
   d) Ignoring material durability for short-term projects

11) What is the function of property charts in material selection?
   a) To calculate the cost of materials
   b) To visualize and compare material properties like strength, energy use, and durability
   c) To assess the recyclability of materials
   d) To determine the legal requirements for materials

12) What is an example of systematic eco-selection in transportation applications?
   a) Using steel for crash barriers
   b) Designing lightweight car structures with composite materials
   c) Replacing aluminum parts with heavier alloys
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13) Initial embodied energy in buildings refers to _____.

a) The energy used in the production, transport, and assembly of materials
b) The energy consumed during the operational life of a building
c) The energy required for heating and cooling systems
d) The energy lost due to inefficiencies in construction techniques

14) Material substitution for eco-efficient design focuses on _____.

a) Replacing high-performance materials with low-cost alternatives
b) Using materials with lower environmental impact without compromising performance
c) Reducing overall project costs without considering sustainability
d) Increasing the complexity of material processing

Seat No.	

Set **P**

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (Old) (CBCS)
Examination: March/April – 2026
Construction Materials: Sustainability and Usability (BTN01516)

Day & Date: Thursday, 14-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Question no. 2 is compulsory in section I, and solve any two questions from the remaining.
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3) Figures to the right indicate full marks.
4) Assume suitable data wherever necessary and mention it clearly.
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Section – I

Q.2	**a)**	What are salvaged materials, and how do they contribute to waste reduction and resource efficiency in construction?	**05**
	b)	Explain the concept of low-VOC paints and their role in enhancing indoor air quality and reducing health risks.	**05**
Q.3	**a)**	How do biomaterials contribute to sustainable construction, and what distinguishes them from conventional materials?	**05**
	b)	What is the concept of embodied carbon, and how is it linked to the carbon footprint of materials?	**04**
Q.4	**a)**	Provide an overview of calculation techniques for embodied energy and carbon footprint in construction materials.	**05**
	b)	What strategies can be employed to offset the high embodied energy of materials in construction projects?	**04**
Q.5	**a)**	What are funicular shells, and how do they achieve strength and sustainability in construction?	**05**
	b)	Discuss the environmental benefits of using vaulted roofs in sustainable building design.	**04**

Section – II

Q.6	**a)**	Describe the innovative use of tires in creating structural elements in earthship or alternative homes.	**05**
	b)	What are the benefits of using demolition waste as an aggregate in concrete?	**05**
Q.7	**a)**	Provide examples of how post-consumer materials like glass bottles and paper waste are integrated into construction projects.	**05**
	b)	What is eco-auditing, and why is it important for evaluating the environmental impact of everyday items?	**04**
Q.8	**a)**	Explain the concept of material energy versus use-phase energy with an example of family cars.	**05**
	b)	Discuss the principles of materials selection and their significance in reducing environmental impact.	**04**
Q.9	**a)**	What is the difference between initial and recurring embodied energy in buildings, and why is it significant?	**05**
	b)	How does material substitution contribute to eco-efficient design? Provide an example.	**04**

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (Old) (CBCS)
Examination: March/April – 2026
Construction Materials: Sustainability and Usability (BTN01516)

Day & Date: Thursday, 14-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Multiple choice questions. **14**

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b) Structural walls in earthship homes
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d) Window frames

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   b) Reduce air pollution and health hazards
   c) Are cheaper than conventional paints
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10) What does the term “cradle to cradle” imply in sustainable construction?
   a) Recycling materials back into the production cycle
   b) Using materials only once and disposing of them
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   d) Reinforced concrete masonry

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (Old) (CBCS)
Examination: March/April – 2026
Construction Materials: Sustainability and Usability (BTN01516)

Day & Date: Thursday, 14-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Question no. 2 is compulsory in section I, and solve any two questions from the remaining.
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Section – I

Q.2	**a)**	What are salvaged materials, and how do they contribute to waste reduction and resource efficiency in construction?	**05**
	b)	Explain the concept of low-VOC paints and their role in enhancing indoor air quality and reducing health risks.	**05**
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	b)	Discuss the environmental benefits of using vaulted roofs in sustainable building design.	**04**

Section – II

Q.6	**a)**	Describe the innovative use of tires in creating structural elements in earthship or alternative homes.	**05**
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Seat No.	

Set **R**

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (Old) (CBCS)
Examination: March/April – 2026
Construction Materials: Sustainability and Usability (BTN01516)

Day & Date: Thursday, 14-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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Seat No.	

Set **R**

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (Old) (CBCS)
Examination: March/April – 2026
Construction Materials: Sustainability and Usability (BTN01516)

Day & Date: Thursday, 14-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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Section – I

Q.2	**a)**	What are salvaged materials, and how do they contribute to waste reduction and resource efficiency in construction?	**05**
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Section – II

Q.6	**a)**	Describe the innovative use of tires in creating structural elements in earthship or alternative homes.	**05**
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SLR-QH-248

Seat No.	

Set S

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (Old) (CBCS)
Examination: March/April – 2026
Construction Materials: Sustainability and Usability (BTN01516)

Day & Date: Thursday, 14-05-2026 Max. Marks: 70
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MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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Seat No.	

Set | S

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (Old) (CBCS)
Examination: March/April – 2026
Construction Materials: Sustainability and Usability (BTN01516)

Day & Date: Thursday, 14-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Question no. 2 is compulsory in section I, and solve any two questions from the remaining.
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Section – I

Q.2	**a)**	What are salvaged materials, and how do they contribute to waste reduction and resource efficiency in construction?	**05**
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Section – II

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SLR-QH-249

Seat No.	

Set P

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (Old) (CBCS)
Examination: March/April – 2026
Managing Innovation and Entrepreneurship (BTN01517)

Day & Date: Thursday, 14-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. 14

1) Which economic theory considers entrepreneurs as coordinators of scarce resources?
a) Innovation Theory b) Classical Theory
c) Risk-Bearing Theory d) Resource-Based Theory

2) What is a core distinction between managerial and entrepreneurial competencies?
a) Managerial competencies involve risk-taking, entrepreneurial competencies do not
b) Entrepreneurial competencies emphasize vision and innovation, while managerial competencies focus on stability and operations
c) Managerial competencies are industry-specific, while entrepreneurial competencies are universal
d) There is no distinction between the two

3) What is a major factor in entrepreneurial growth and development?
a) Declining market trends
b) Government policies and support
c) Technological stagnation
d) Reduced competition

4) What does the term "Shifting Composition of the Economy" refer to in innovation?
a) The transition from agriculture to industrial and service-based economies
b) The focus on rural over urban economic activities
c) The diminishing role of technology in the economy
d) A stagnant economic structure

5) In the innovation process, what stage follows “Concept Development”?
   a) Commercialization
   b) Prototype Development
   c) Idea Generation
   d) Marketing Strategy

6) Which of the following is a key feature of disruptive innovation strategies?
   a) Focusing only on premium customer segments
   b) Enhancing existing high-performance products
   c) Creating simpler, more affordable solutions for overlooked markets
   d) Maintaining the status quo in existing markets

7) Why is planning considered incompatible with innovation in entrepreneurship?
   a) It discourages flexibility and risk-taking.
   b) It prioritizes creativity over execution.
   c) It lacks a financial focus.
   d) It only applies to large enterprises

8) What is the primary role of continuous learning for entrepreneurs?
   a) To achieve financial stability
   b) To stay relevant in dynamic environments and adopt new technologies
   c) To do increamental development rather than radical development
   d) To specialize in a dual-skill areas

9) What is a strategic issue often faced by international entrepreneurs?
   a) Balancing centralized decision-making with the need for local responsiveness
   b) Avoiding partnerships with foreign stakeholders
   c) Developing identical marketing strategies across all international markets
   d) Limiting innovation to comply with host country regulations

10) How does the changing international environment influence international entrepreneurship?
   a) By creating equal opportunities for all businesses regardless of size
   b) By favoring large multinational corporations over small entrepreneurs
   c) By increasing access to global talent pools and resources for innovative ventures
   d) By standardizing regulatory frameworks across all regions

11) Which of these is NOT an entrepreneurial competency?

a) Risk-taking ability
b) Creative thinking
c) Financial literacy
d) Avoiding challenges

12) Which of the following is NOT one of the seven sources of innovative opportunity?

a) Industry and market structure changes
b) Demographics
c) Global warming
d) Process needs

13) What does ‘nAch’ stand for in entrepreneurial motivation?

a) Need for Acceptance
b) Need for Achievement
c) Need for Acknowledgment
d) Need for Affiliation

14) What is a business model?

a) It is a planned activity, designed for profit in marketplace
b) It is a planned activity, designed for established business
c) It is a planned activity, for generating new jobs
d) None of the above

SLR-QH-249

Seat No.	

Set P

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (Old) (CBCS)
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Managing Innovation and Entrepreneurship (BTN01517)

Day & Date: Thursday, 14-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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

Section – I

Q.2	**a)**	What are managerial competencies? Explain two in detail.	**04**
	b)	List types of entrepreneurship and types of businesses. Explain types of business in detail.	**06**
Q.3	**a)**	List 7 sources. Explain process needs, demographics & structure change.	**05**
	b)	List types of purposeful innovation. Explain purposeful innovation.	**04**
Q.4	**a)**	Explain government grants, angel investors, venture capital.	**05**
	b)	Explain 'innovation & entrepreneurship' in detail.	**04**
Q.5	**a)**	Give difference between types of innovative strategies with examples.	**05**
	b)	Define the term 'shifting economy' and explain the concept in detail with a sketch.	**04**

Section – II

Q.6	**a)**	Brief in short story of any successful Indian entrepreneur with turnover.	**06**
	b)	Explain adaptability and sustainability in detail.	**04**

Q.7 Write a note on Any Three of the following. **09**

a) Advantages of International Entrepreneurship
b) Elements of International business environment
c) Ethics in international entrepreneurship
d) Strategies in International Entrepreneurship

Q.8 Write a note on Any Three of the following. **09**

a) Methods of problem identification

b) Significance of problem solving

c) Steps in problem identification

d) Steps in problem solving

SLR-QH-249

Seat No.	

Set Q

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (Old) (CBCS)
Examination: March/April – 2026
Managing Innovation and Entrepreneurship (BTN01517)

Day & Date: Thursday, 14-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) What is the primary role of continuous learning for entrepreneurs?
a) To achieve financial stability
b) To stay relevant in dynamic environments and adopt new technologies
c) To do increamental development rather than radical development
d) To specialize in a dual-skill areas

2) What is a strategic issue often faced by international entrepreneurs?
a) Balancing centralized decision-making with the need for local responsiveness
b) Avoiding partnerships with foreign stakeholders
c) Developing identical marketing strategies across all international markets
d) Limiting innovation to comply with host country regulations

3) How does the changing international environment influence international entrepreneurship?
a) By creating equal opportunities for all businesses regardless of size
b) By favoring large multinational corporations over small entrepreneurs
c) By increasing access to global talent pools and resources for innovative ventures
d) By standardizing regulatory frameworks across all regions

4) Which of these is NOT an entrepreneurial competency?
   a) Risk-taking ability
   b) Creative thinking
   c) Financial literacy
   d) Avoiding challenges

5) Which of the following is NOT one of the seven sources of innovative opportunity?
   a) Industry and market structure changes
   b) Demographics
   c) Global warming
   d) Process needs

6) What does 'nAch' stand for in entrepreneurial motivation?
   a) Need for Acceptance
   b) Need for Achievement
   c) Need for Acknowledgment
   d) Need for Affiliation

7) What is a business model?
   a) It is a planned activity, designed for profit in marketplace
   b) It is a planned activity, designed for established business
   c) It is a planned activity, for generating new jobs
   d) None of the above

8) Which economic theory considers entrepreneurs as coordinators of scarce resources?
   a) Innovation Theory
   b) Classical Theory
   c) Risk-Bearing Theory
   d) Resource-Based Theory

9) What is a core distinction between managerial and entrepreneurial competencies?
   a) Managerial competencies involve risk-taking, entrepreneurial competencies do not
   b) Entrepreneurial competencies emphasize vision and innovation, while managerial competencies focus on stability and operations
   c) Managerial competencies are industry-specific, while entrepreneurial competencies are universal
   d) There is no distinction between the two

10) What is a major factor in entrepreneurial growth and development?
   a) Declining market trends
   b) Government policies and support
   c) Technological stagnation
   d) Reduced competition

11) What does the term "Shifting Composition of the Economy" refer to in innovation?
   a) The transition from agriculture to industrial and service-based economies
   b) The focus on rural over urban economic activities
   c) The diminishing role of technology in the economy
   d) A stagnant economic structure

12) In the innovation process, what stage follows “Concept Development”?

a) Commercialization
b) Prototype Development
c) Idea Generation
d) Marketing Strategy

13) Which of the following is a key feature of disruptive innovation strategies?

a) Focusing only on premium customer segments
b) Enhancing existing high-performance products
c) Creating simpler, more affordable solutions for overlooked markets
d) Maintaining the status quo in existing markets

14) Why is planning considered incompatible with innovation in entrepreneurship?

a) It discourages flexibility and risk-taking.
b) It prioritizes creativity over execution.
c) It lacks a financial focus.
d) It only applies to large enterprises

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (Old) (CBCS)
Examination: March/April – 2026
Managing Innovation and Entrepreneurship (BTN01517)

Day & Date: Thursday, 14-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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

Section – I

Q.2	**a)**	What are managerial competencies? Explain two in detail.	**04**
	b)	List types of entrepreneurship and types of businesses. Explain types of business in detail.	**06**
Q.3	**a)**	List 7 sources. Explain process needs, demographics & structure change.	**05**
	b)	List types of purposeful innovation. Explain purposeful innovation.	**04**
Q.4	**a)**	Explain government grants, angel investors, venture capital.	**05**
	b)	Explain ‘innovation & entrepreneurship’ in detail.	**04**
Q.5	**a)**	Give difference between types of innovative strategies with examples.	**05**
	b)	Define the term ‘shifting economy’ and explain the concept in detail with a sketch.	**04**

Section – II

Q.6	**a)**	Brief in short story of any successful Indian entrepreneur with turnover.	**06**
	b)	Explain adaptability and sustainability in detail.	**04**

Q.7 Write a note on Any Three of the following. **09**

a) Advantages of International Entrepreneurship
b) Elements of International business environment
c) Ethics in international entrepreneurship
d) Strategies in International Entrepreneurship

Q.8 Write a note on Any Three of the following. **09**

a) Methods of problem identification

b) Significance of problem solving

c) Steps in problem identification

d) Steps in problem solving

Seat No.	

Set R

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (Old) (CBCS)
Examination: March/April – 2026
Managing Innovation and Entrepreneurship (BTN01517)

Day & Date: Thursday, 14-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which of these is NOT an entrepreneurial competency?
a) Risk-taking ability b) Creative thinking
c) Financial literacy d) Avoiding challenges

2) Which of the following is NOT one of the seven sources of innovative opportunity?
a) Industry and market structure changes
b) Demographics
c) Global warming
d) Process needs

3) What does 'nAch' stand for in entrepreneurial motivation?
a) Need for Acceptance b) Need for Achievement
c) Need for Acknowledgment d) Need for Affiliation

4) What is a business model?
a) It is a planned activity, designed for profit in marketplace
b) It is a planned activity, designed for established business
c) It is a planned activity, for generating new jobs
d) None of the above

5) Which economic theory considers entrepreneurs as coordinators of scarce resources?
a) Innovation Theory b) Classical Theory
c) Risk-Bearing Theory d) Resource-Based Theory

6) What is a core distinction between managerial and entrepreneurial competencies?
   a) Managerial competencies involve risk-taking, entrepreneurial competencies do not
   b) Entrepreneurial competencies emphasize vision and innovation, while managerial competencies focus on stability and operations
   c) Managerial competencies are industry-specific, while entrepreneurial competencies are universal
   d) There is no distinction between the two

7) What is a major factor in entrepreneurial growth and development?
   a) Declining market trends
   b) Government policies and support
   c) Technological stagnation
   d) Reduced competition

8) What does the term “Shifting Composition of the Economy” refer to in innovation?
   a) The transition from agriculture to industrial and service-based economies
   b) The focus on rural over urban economic activities
   c) The diminishing role of technology in the economy
   d) A stagnant economic structure

9) In the innovation process, what stage follows “Concept Development”?
   a) Commercialization
   b) Prototype Development
   c) Idea Generation
   d) Marketing Strategy

10) Which of the following is a key feature of disruptive innovation strategies?
   a) Focusing only on premium customer segments
   b) Enhancing existing high-performance products
   c) Creating simpler, more affordable solutions for overlooked markets
   d) Maintaining the status quo in existing markets

11) Why is planning considered incompatible with innovation in entrepreneurship?
   a) It discourages flexibility and risk-taking.
   b) It prioritizes creativity over execution.
   c) It lacks a financial focus.
   d) It only applies to large enterprises

12) What is the primary role of continuous learning for entrepreneurs?
   a) To achieve financial stability
   b) To stay relevant in dynamic environments and adopt new technologies
   c) To do increamental development rather than radical development
   d) To specialize in a dual-skill areas

13) What is a strategic issue often faced by international entrepreneurs?
   a) Balancing centralized decision-making with the need for local responsiveness
   b) Avoiding partnerships with foreign stakeholders
   c) Developing identical marketing strategies across all international markets
   d) Limiting innovation to comply with host country regulations

14) How does the changing international environment influence international entrepreneurship?
   a) By creating equal opportunities for all businesses regardless of size
   b) By favoring large multinational corporations over small entrepreneurs
   c) By increasing access to global talent pools and resources for innovative ventures
   d) By standardizing regulatory frameworks across all regions

Seat No.	

Set | **R**

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (Old) (CBCS)
Examination: March/April – 2026
Managing Innovation and Entrepreneurship (BTN01517)

Day & Date: Thursday, 14-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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

Section – I

Q.2	**a)**	What are managerial competencies? Explain two in detail.	**04**
	b)	List types of entrepreneurship and types of businesses. Explain types of business in detail.	**06**
Q.3	**a)**	List 7 sources. Explain process needs, demographics & structure change.	**05**
	b)	List types of purposeful innovation. Explain purposeful innovation.	**04**
Q.4	**a)**	Explain government grants, angel investors, venture capital.	**05**
	b)	Explain ‘innovation & entrepreneurship’ in detail.	**04**
Q.5	**a)**	Give difference between types of innovative strategies with examples.	**05**
	b)	Define the term ‘shifting economy’ and explain the concept in detail with a sketch.	**04**

Section – II

Q.6	**a)**	Brief in short story of any successful Indian entrepreneur with turnover.	**06**
	b)	Explain adaptability and sustainability in detail.	**04**

Q.7 Write a note on Any Three of the following. **09**

a) Advantages of International Entrepreneurship
b) Elements of International business environment
c) Ethics in international entrepreneurship
d) Strategies in International Entrepreneurship

Q.8 Write a note on Any Three of the following. **09**

a) Methods of problem identification

b) Significance of problem solving

c) Steps in problem identification

d) Steps in problem solving

Seat No.	

Set **S**

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (Old) (CBCS)
Examination: March/April – 2026
Managing Innovation and Entrepreneurship (BTN01517)

Day & Date: Thursday, 14-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which of the following is a key feature of disruptive innovation strategies?
a) Focusing only on premium customer segments
b) Enhancing existing high-performance products
c) Creating simpler, more affordable solutions for overlooked markets
d) Maintaining the status quo in existing markets

2) Why is planning considered incompatible with innovation in entrepreneurship?
a) It discourages flexibility and risk-taking.
b) It prioritizes creativity over execution.
c) It lacks a financial focus.
d) It only applies to large enterprises

3) What is the primary role of continuous learning for entrepreneurs?
a) To achieve financial stability
b) To stay relevant in dynamic environments and adopt new technologies
c) To do increamental development rather than radical development
d) To specialize in a dual-skill areas

4) What is a strategic issue often faced by international entrepreneurs?
   a) Balancing centralized decision-making with the need for local responsiveness
   b) Avoiding partnerships with foreign stakeholders
   c) Developing identical marketing strategies across all international markets
   d) Limiting innovation to comply with host country regulations

5) How does the changing international environment influence international entrepreneurship?
   a) By creating equal opportunities for all businesses regardless of size
   b) By favoring large multinational corporations over small entrepreneurs
   c) By increasing access to global talent pools and resources for innovative ventures
   d) By standardizing regulatory frameworks across all regions

6) Which of these is NOT an entrepreneurial competency?
   a) Risk-taking ability
   b) Creative thinking
   c) Financial literacy
   d) Avoiding challenges

7) Which of the following is NOT one of the seven sources of innovative opportunity?
   a) Industry and market structure changes
   b) Demographics
   c) Global warming
   d) Process needs

8) What does ‘nAch’ stand for in entrepreneurial motivation?
   a) Need for Acceptance
   b) Need for Achievement
   c) Need for Acknowledgment
   d) Need for Affiliation

9) What is a business model?
   a) It is a planned activity, designed for profit in marketplace
   b) It is a planned activity, designed for established business
   c) It is a planned activity, for generating new jobs
   d) None of the above

10) Which economic theory considers entrepreneurs as coordinators of scarce resources?
   a) Innovation Theory
   b) Classical Theory
   c) Risk-Bearing Theory
   d) Resource-Based Theory

11) What is a core distinction between managerial and entrepreneurial competencies?
   a) Managerial competencies involve risk-taking, entrepreneurial competencies do not
   b) Entrepreneurial competencies emphasize vision and innovation, while managerial competencies focus on stability and operations
   c) Managerial competencies are industry-specific, while entrepreneurial competencies are universal
   d) There is no distinction between the two

12) What is a major factor in entrepreneurial growth and development?
   a) Declining market trends
   b) Government policies and support
   c) Technological stagnation
   d) Reduced competition

13) What does the term “Shifting Composition of the Economy” refer to in innovation?
   a) The transition from agriculture to industrial and service-based economies
   b) The focus on rural over urban economic activities
   c) The diminishing role of technology in the economy
   d) A stagnant economic structure

14) In the innovation process, what stage follows “Concept Development”?
   a) Commercialization
   b) Prototype Development
   c) Idea Generation
   d) Marketing Strategy

Seat No.	

Set **S**

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (Old) (CBCS)
Examination: March/April – 2026
Managing Innovation and Entrepreneurship (BTN01517)

Day & Date: Thursday, 14-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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

Section – I

Q.2	**a)**	What are managerial competencies? Explain two in detail.	**04**
	b)	List types of entrepreneurship and types of businesses. Explain types of business in detail.	**06**
Q.3	**a)**	List 7 sources. Explain process needs, demographics & structure change.	**05**
	b)	List types of purposeful innovation. Explain purposeful innovation.	**04**
Q.4	**a)**	Explain government grants, angel investors, venture capital.	**05**
	b)	Explain ‘innovation & entrepreneurship’ in detail.	**04**
Q.5	**a)**	Give difference between types of innovative strategies with examples.	**05**
	b)	Define the term ‘shifting economy’ and explain the concept in detail with a sketch.	**04**

Section – II

Q.6	**a)**	Brief in short story of any successful Indian entrepreneur with turnover.	**06**
	b)	Explain adaptability and sustainability in detail.	**04**

Q.7 Write a note on Any Three of the following. **09**

a) Advantages of International Entrepreneurship
b) Elements of International business environment
c) Ethics in international entrepreneurship
d) Strategies in International Entrepreneurship

Q.8 Write a note on Any Three of the following. **09**

a) Methods of problem identification

b) Significance of problem solving

c) Steps in problem identification

d) Steps in problem solving

SLR-QH-253

Seat No.	

Set P

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (Old) (CBCS)
Examination: March/April – 2026
Stress and Coping (BTN01511)

Day & Date: Sunday, 10-05-2026 Max. Marks: 50
Time: 10:00 AM To 12:00 PM

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

MCQ/Objective Type Questions

Duration: 20 Minutes Marks:10

Q.1 Choose the correct Answer. **10**

1) Which of the following best defines Stress?
a) A positive emotional state.
b) A physical and psychological response to demands.
c) A permanent personality trait.
d) A learned coping technique.

2) Chronic Stress is most likely to cause _____.
a) Increased immunity
b) Improved digestion
c) Heart disease and hypertension
d) Higher energy levels

3) Social support helps on coping because it _____.
a) Increase stress levels
b) Reduces physiological arousal
c) Stops all stressors
d) Replaces coping strategies

4) Which of the following are the physical symptoms of anxiety?
a) Racing heart b) Sweaty palms
c) Flushed cheeks d) All of the above

5) Which of the following busters?
a) Trying to find something funny in a difficult situation
b) Developing a support network
c) Taking a mindful walk
d) All of the above

6) Aches, shallow breathing, and sweating frequent colds are _____.
   a) Physical symptoms of stress
   b) Behavioral symptoms of stress
   c) Emotional symptoms of stress
   d) Cognitive symptoms of stress

7) When is a person more likely to have difficulty in coping with a stressful situation?
   a) When he is over the age of fifty
   b) When he expects a positive outcome
   c) When he thinks he does not have control over the situation
   d) When he has a good social support network

8) Which one is not considered as Environmental stressors?
   a) Weather
   b) Traffic
   c) Financial problem
   d) Substandard housing

9) A good was to prevent stress is _____.
   a) Drinking beverages high in caffeine
   b) Sitting Idel, doing nothing
   c) Over eating
   d) Taking time out for relaxation

10) Which of the following is an example of maladaptive coping?
   a) Planning
   b) Positive reframing
   c) Substance abuse
   d) Relaxation techniques

SLR-QH-253

Seat No.	

Set P

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (Old) (CBCS)
Examination: March/April – 2026
Stress and Coping (BTN01511)

Day & Date: Sunday, 10-05-2026 Max. Marks: 40
Time: 10:00 AM To 12:00 PM

Instructions: 1) Solve Any Four from Q. No. 2 to Q. No. 7.
2) Figures to the right indicate full marks.

Q.2 Explain the concept of Stress. Discuss the different types of Stress with suitable examples. **10**

Q.3 Explain psychological & behavioral consequences of stress in detail. **10**

Q.4 What is coping? Distinguish between problem focused coping & emotion focused coping. **10**

Q.5 Discuss the importance of social support in Stress Management and how they help on reducing stress. **10**

Q.6 Discuss the nature of stress response. **10**

Q.7 Explain various sources of stress in detail. **10**

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (Old) (CBCS)
Examination: March/April – 2026
Stress and Coping (BTN01511)

Day & Date: Sunday, 10-05-2026 Max. Marks: 50
Time: 10:00 AM To 12:00 PM

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

MCQ/Objective Type Questions

Duration: 20 Minutes Marks:10

Q.1 Choose the correct Answer. **10**

1) Aches, shallow breathing, and sweating frequent colds are _____.
a) Physical symptoms of stress
b) Behavioral symptoms of stress
c) Emotional symptoms of stress
d) Cognitive symptoms of stress

2) When is a person more likely to have difficulty in coping with a stressful situation?
a) When he is over the age of fifty
b) When he expects a positive outcome
c) When he thinks he does not have control over the situation
d) When he has a good social support network

3) Which one is not considered as Environmental stressors?
a) Weather b) Traffic
c) Financial problem d) Substandard housing

4) A good was to prevent stress is _____.
a) Drinking beverages high in caffeine
b) Sitting Idel, doing nothing
c) Over eating
d) Taking time out for relaxation

5) Which of the following is an example of maladaptive coping?
a) Planning b) Positive reframing
c) Substance abuse d) Relaxation techniques

6) Which of the following best defines Stress?
   a) A positive emotional state.
   b) A physical and psychological response to demands.
   c) A permanent personality trait.
   d) A learned coping technique.

7) Chronic Stress is most likely to cause _____.
   a) Increased immunity
   b) Improved digestion
   c) Heart disease and hypertension
   d) Higher energy levels

8) Social support helps on coping because it _____.
   a) Increase stress levels
   b) Reduces physiological arousal
   c) Stops all stressors
   d) Replaces coping strategies

9) Which of the following are the physical symptoms of anxiety?
   a) Racing heart
   b) Sweaty palms
   c) Flushed cheeks
   d) All of the above

10) Which of the following busters?
   a) Trying to find something funny in a difficult situation
   b) Developing a support network
   c) Taking a mindful walk
   d) All of the above

SLR-QH-253

Seat No.	

Set Q

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (Old) (CBCS)
Examination: March/April – 2026
Stress and Coping (BTN01511)

Day & Date: Sunday, 10-05-2026 Max. Marks: 40
Time: 10:00 AM To 12:00 PM

Instructions: 1) Solve Any Four from Q. No. 2 to Q. No. 7.
2) Figures to the right indicate full marks.

Q.2 Explain the concept of Stress. Discuss the different types of Stress with suitable examples. **10**

Q.3 Explain psychological & behavioral consequences of stress in detail. **10**

Q.4 What is coping? Distinguish between problem focused coping & emotion focused coping. **10**

Q.5 Discuss the importance of social support in Stress Management and how they help on reducing stress. **10**

Q.6 Discuss the nature of stress response. **10**

Q.7 Explain various sources of stress in detail. **10**

SLR-QH-253

Seat No.	

Set R

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (Old) (CBCS)
Examination: March/April – 2026
Stress and Coping (BTN01511)

Day & Date: Sunday, 10-05-2026 Max. Marks: 50
Time: 10:00 AM To 12:00 PM

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

MCQ/Objective Type Questions

Duration: 20 Minutes Marks:10

Q.1 Choose the correct Answer. **10**

1) A good was to prevent stress is _____.
a) Drinking beverages high in caffeine
b) Sitting Idel, doing nothing
c) Over eating
d) Taking time out for relaxation

2) Which of the following is an example of maladaptive coping?
a) Planning b) Positive reframing
c) Substance abuse d) Relaxation techniques

3) Which of the following best defines Stress?
a) A positive emotional state.
b) A physical and psychological response to demands.
c) A permanent personality trait.
d) A learned coping technique.

4) Chronic Stress is most likely to cause _____.
a) Increased immunity
b) Improved digestion
c) Heart disease and hypertension
d) Higher energy levels

5) Social support helps on coping because it _____.
a) Increase stress levels
b) Reduces physiological arousal
c) Stops all stressors
d) Replaces coping strategies

6) Which of the following are the physical symptoms of anxiety?
   a) Racing heart
   b) Sweaty palms
   c) Flushed cheeks
   d) All of the above

7) Which of the following busters?
   a) Trying to find something funny in a difficult situation
   b) Developing a support network
   c) Taking a mindful walk
   d) All of the above

8) Aches, shallow breathing, and sweating frequent colds are _____.
   a) Physical symptoms of stress
   b) Behavioral symptoms of stress
   c) Emotional symptoms of stress
   d) Cognitive symptoms of stress

9) When is a person more likely to have difficulty in coping with a stressful situation?
   a) When he is over the age of fifty
   b) When he expects a positive outcome
   c) When he thinks he does not have control over the situation
   d) When he has a good social support network

10) Which one is not considered as Environmental stressors?
   a) Weather
   b) Traffic
   c) Financial problem
   d) Substandard housing

SLR-QH-253

Seat No.	

Set R

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (Old) (CBCS)
Examination: March/April – 2026
Stress and Coping (BTN01511)

Day & Date: Sunday, 10-05-2026 Max. Marks: 40
Time: 10:00 AM To 12:00 PM

Instructions: 1) Solve Any Four from Q. No. 2 to Q. No. 7.
2) Figures to the right indicate full marks.

Q.2 Explain the concept of Stress. Discuss the different types of Stress with suitable examples. **10**

Q.3 Explain psychological & behavioral consequences of stress in detail. **10**

Q.4 What is coping? Distinguish between problem focused coping & emotion focused coping. **10**

Q.5 Discuss the importance of social support in Stress Management and how they help on reducing stress. **10**

Q.6 Discuss the nature of stress response. **10**

Q.7 Explain various sources of stress in detail. **10**

SLR-QH-253

Seat No.	

Set S

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (Old) (CBCS)
Examination: March/April – 2026
Stress and Coping (BTN01511)

Day & Date: Sunday, 10-05-2026 Max. Marks: 50
Time: 10:00 AM To 12:00 PM

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

MCQ/Objective Type Questions

Duration: 20 Minutes Marks:10

Q.1 Choose the correct Answer. **10**

1) Social support helps on coping because it _____.
a) Increase stress levels
b) Reduces physiological arousal
c) Stops all stressors
d) Replaces coping strategies

2) Which of the following are the physical symptoms of anxiety?
a) Racing heart b) Sweaty palms
c) Flushed cheeks d) All of the above

3) Which of the following busters?
a) Trying to find something funny in a difficult situation
b) Developing a support network
c) Taking a mindful walk
d) All of the above

4) Aches, shallow breathing, and sweating frequent colds are _____.
a) Physical symptoms of stress
b) Behavioral symptoms of stress
c) Emotional symptoms of stress
d) Cognitive symptoms of stress

5) When is a person more likely to have difficulty in coping with a stressful situation?
a) When he is over the age of fifty
b) When he expects a positive outcome
c) When he thinks he does not have control over the situation
d) When he has a good social support network

6) Which one is not considered as Environmental stressors?

a) Weather
b) Traffic
c) Financial problem
d) Substandard housing

7) A good was to prevent stress is _____.

a) Drinking beverages high in caffeine
b) Sitting Idel, doing nothing
c) Over eating
d) Taking time out for relaxation

8) Which of the following is an example of maladaptive coping?

a) Planning
b) Positive reframing
c) Substance abuse
d) Relaxation techniques

9) Which of the following best defines Stress?

a) A positive emotional state.
b) A physical and psychological response to demands.
c) A permanent personality trait.
d) A learned coping technique.

10) Chronic Stress is most likely to cause _____.

a) Increased immunity
b) Improved digestion
c) Heart disease and hypertension
d) Higher energy levels

Seat No.	

Set **S**

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (Old) (CBCS)
Examination: March/April – 2026
Stress and Coping (BTN01511)

Day & Date: Sunday, 10-05-2026 Max. Marks: 40
Time: 10:00 AM To 12:00 PM

Instructions: 1) Solve Any Four from Q. No. 2 to Q. No. 7.
2) Figures to the right indicate full marks.

Q.2 Explain the concept of Stress. Discuss the different types of Stress with suitable examples. **10**

Q.3 Explain psychological & behavioral consequences of stress in detail. **10**

Q.4 What is coping? Distinguish between problem focused coping & emotion focused coping. **10**

Q.5 Discuss the importance of social support in Stress Management and how they help on reducing stress. **10**

Q.6 Discuss the nature of stress response. **10**

Q.7 Explain various sources of stress in detail. **10**

SLR-QH-254

Seat No.	

Set P

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (Old) (CBCS)
Examination: March/April – 2026
Professional Ethics & Human Value (BTN01512)

Day & Date: Sunday, 10-05-2026 Max. Marks: 50
Time: 10:00 AM To 12:00 PM

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

MCQ/Objective Type Questions

Duration: 20 Minutes Marks:10

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

1) Professional ethics primarily refers to _____.
a) Personal hobbies
b) Standards of behavior expected in a profession
c) Religious gridlines
d) Social media etiquette

2) Professional values are important because they _____.
a) Reduce work quality
b) Promote trust and credibility
c) Slow down productivity
d) Encourage personal gain

3) One of the basic desires of every human being is to be always ____.
a) Happy b) Sad
c) Laugh d) Earn money

4) _____ is defined as the duty, obligation or even authority.
a) Work b) Responsibility
c) Democracy d) Authority

5) The participation of human beings is seen in two forms _____.
a) Prosperity & Work b) Behavior & Wealth
c) Behavior & Work d) Values & Understanding

6) Courage is the tendency to accept and face _____.
a) Self confidence
b) Physical courage
c) Risks and difficult tasks in rational ways
d) Social courage

7) Which value promotes treating everyone fairly?

a) Favoritism
b) Respect
c) Equality
d) Corruption

8) Which of the following best defines empathy?

a) Feeling superior to others
b) Understanding other's feelings
c) Ignoring emotional cues
d) Forcing opinions on people

9) Which of the following is a core professional value?

a) Integrity
b) Dishonesty
c) Bias
d) Manipulation

10) Value and skills should go hand in hand.

a) True
b) False
c) Can not tell
d) Wrong question

Seat No.	

Set **P**

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (Old) (CBCS)
Examination: March/April – 2026
Professional Ethics & Human Value (BTN01512)

Day & Date: Sunday, 10-05-2026 Max. Marks: 40
Time: 10:00 AM To 12:00 PM

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

Q.2 Explain in details the difference between Moral & Ethics. **10**

OR

Distinguish between Kohlberg's and Gilligan's approach to Ethical (Moral) Judgements.

Q.3 Explain the concept of Moral Courage. Why is moral courage necessary for upholding ethical values in challenges situations? **10**

OR

Explain the role of Engineer as Manager.

Q.4 **Write short notes on (Any Four)** **20**

a) Empathy as a professional value
b) Integrity on professional life
c) Plagiarism and intellectual honesty
d) Honesty
e) Respect for other
f) Character
g) Intellectual property rights

SLR-QH-254

Seat No.	

Set Q

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (Old) (CBCS)
Examination: March/April – 2026
Professional Ethics & Human Value (BTN01512)

Day & Date: Sunday, 10-05-2026 Max. Marks: 50
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3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 20 Minutes Marks:10

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d) Forcing opinions on people

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c) Bias d) Manipulation

5) Value and skills should go hand in hand.
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c) Can not tell d) Wrong question

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a) Personal hobbies
b) Standards of behavior expected in a profession
c) Religious gridlines
d) Social media etiquette

7) Professional values are important because they _____.
a) Reduce work quality
b) Promote trust and credibility
c) Slow down productivity
d) Encourage personal gain

8) One of the basic desires of every human being is to be always ____.
a) Happy
b) Sad
c) Laugh
d) Earn money

9) _____ is defined as the duty, obligation or even authority.
a) Work
b) Responsibility
c) Democracy
d) Authority

10) The participation of human beings is seen in two forms _____.
a) Prosperity & Work
b) Behavior & Wealth
c) Behavior & Work
d) Values & Understanding

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (Old) (CBCS)
Examination: March/April – 2026
Professional Ethics & Human Value (BTN01512)

Day & Date: Sunday, 10-05-2026 Max. Marks: 40
Time: 10:00 AM To 12:00 PM

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

Q.2 Explain in details the difference between Moral & Ethics. **10**

OR

Distinguish between Kohlberg's and Gilligan's approach to Ethical (Moral) Judgements.

Q.3 Explain the concept of Moral Courage. Why is moral courage necessary for upholding ethical values in challenges situations? **10**

OR

Explain the role of Engineer as Manager.

Q.4 **Write short notes on (Any Four)** **20**

a) Empathy as a professional value
b) Integrity on professional life
c) Plagiarism and intellectual honesty
d) Honesty
e) Respect for other
f) Character
g) Intellectual property rights

Seat No.	

Set **R**

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (Old) (CBCS)
Examination: March/April – 2026
Professional Ethics & Human Value (BTN01512)

Day & Date: Sunday, 10-05-2026 Max. Marks: 50
Time: 10:00 AM To 12:00 PM

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

MCQ/Objective Type Questions

Duration: 20 Minutes Marks:10

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

1) Which of the following is a core professional value?
a) Integrity b) Dishonesty
c) Bias d) Manipulation

2) Value and skills should go hand in hand.
a) True b) False
c) Can not tell d) Wrong question

3) Professional ethics primarily refers to _____.
a) Personal hobbies
b) Standards of behavior expected in a profession
c) Religious gridlines
d) Social media etiquette

4) Professional values are important because they _____.
a) Reduce work quality
b) Promote trust and credibility
c) Slow down productivity
d) Encourage personal gain

5) One of the basic desires of every human being is to be always ____.
a) Happy b) Sad
c) Laugh d) Earn money

6) _____ is defined as the duty, obligation or even authority.
a) Work b) Responsibility
c) Democracy d) Authority

7) The participation of human beings is seen in two forms _____.
   a) Prosperity & Work
   b) Behavior & Wealth
   c) Behavior & Work
   d) Values & Understanding

8) Courage is the tendency to accept and face _____.
   a) Self confidence
   b) Physical courage
   c) Risks and difficult tasks in rational ways
   d) Social courage

9) Which value promotes treating everyone fairly?
   a) Favoritism
   b) Respect
   c) Equality
   d) Corruption

10) Which of the following best defines empathy?
   a) Feeling superior to others
   b) Understanding other's feelings
   c) Ignoring emotional cues
   d) Forcing opinions on people

Seat No.	

Set **R**

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (Old) (CBCS)
Examination: March/April – 2026
Professional Ethics & Human Value (BTN01512)

Day & Date: Sunday, 10-05-2026 Max. Marks: 40
Time: 10:00 AM To 12:00 PM

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

Q.2 Explain in details the difference between Moral & Ethics. **10**

OR

Distinguish between Kohlberg's and Gilligan's approach to Ethical (Moral) Judgements.

Q.3 Explain the concept of Moral Courage. Why is moral courage necessary for upholding ethical values in challenges situations? **10**

OR

Explain the role of Engineer as Manager.

Q.4 **Write short notes on (Any Four)** **20**

a) Empathy as a professional value
b) Integrity on professional life
c) Plagiarism and intellectual honesty
d) Honesty
e) Respect for other
f) Character
g) Intellectual property rights

Seat No.	

Set **S**

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (Old) (CBCS)
Examination: March/April – 2026
Professional Ethics & Human Value (BTN01512)

Day & Date: Sunday, 10-05-2026 Max. Marks: 50
Time: 10:00 AM To 12:00 PM

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

MCQ/Objective Type Questions

Duration: 20 Minutes Marks:10

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

1) One of the basic desires of every human being is to be always ____.
a) Happy b) Sad
c) Laugh d) Earn money

2) _____ is defined as the duty, obligation or even authority.
a) Work b) Responsibility
c) Democracy d) Authority

3) The participation of human beings is seen in two forms _____.
a) Prosperity & Work b) Behavior & Wealth
c) Behavior & Work d) Values & Understanding

4) Courage is the tendency to accept and face _____.
a) Self confidence
b) Physical courage
c) Risks and difficult tasks in rational ways
d) Social courage

5) Which value promotes treating everyone fairly?
a) Favoritism b) Respect
c) Equality d) Corruption

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7) Which of the following is a core professional value?
a) Integrity
b) Dishonesty
c) Bias
d) Manipulation

8) Value and skills should go hand in hand.
a) True
b) False
c) Can not tell
d) Wrong question

9) Professional ethics primarily refers to _____.
a) Personal hobbies
b) Standards of behavior expected in a profession
c) Religious gridlines
d) Social media etiquette

10) Professional values are important because they _____.
a) Reduce work quality
b) Promote trust and credibility
c) Slow down productivity
d) Encourage personal gain

Seat No.	

Set **S**

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (Old) (CBCS)
Examination: March/April – 2026
Professional Ethics & Human Value (BTN01512)

Day & Date: Sunday, 10-05-2026 Max. Marks: 40
Time: 10:00 AM To 12:00 PM

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

Q.2 Explain in details the difference between Moral & Ethics. **10**

OR

Distinguish between Kohlberg's and Gilligan's approach to Ethical (Moral) Judgements.

Q.3 Explain the concept of Moral Courage. Why is moral courage necessary for upholding ethical values in challenges situations? **10**

OR

Explain the role of Engineer as Manager.

Q.4 **Write short notes on (Any Four)** **20**

a) Empathy as a professional value
b) Integrity on professional life
c) Plagiarism and intellectual honesty
d) Honesty
e) Respect for other
f) Character
g) Intellectual property rights

SLR-QH-255

Seat No.		Set	P

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Design of Concrete Structures - I (CIVPCC-10)

Day & Date: Friday, 15-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) While solving MCQ, IS 456-2000 is not allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) The design shear strength of concrete τ_c in beams depends on _____. **01**
a) Grade of concrete and percentage of tension steel
b) Grade of steel only
c) Concrete grade only
d) Shear force

2) The limit state of serviceability includes _____. **01**
a) Collapse b) Shear failure
c) Deflection and Cracking d) Torsion failure

3) Minimum reinforcement for slab using HYSD bars is _____. **01**
a) 0.15% of gross area b) 0.12% of gross area
c) 0.20% of gross area d) 0.10% of gross area

4) Torsion reinforcement at the corners of a two-way slab is what fraction of the maximum midspan reinforcement? **01**
a) 25% b) 50%
c) 75% d) 100%

5) For a stair step with a Riser (R) of 150 mm and Going (G) of 250 mm, the dead load of the waist slab of thickness 150 mm, is approximately _____. **02**
a) 3.75 kN/m^2 b) 4.37 kN/m^2
c) 5.34 kN/m^2 d) 6.25 kN/m^2

6) The live load for stairs in public buildings as per IS 875 is _____. **01**

a) 2.0 kN/m^2 b) 3.0 kN/m^2

c) 5.0 kN/m^2 d) 1.5 kN/m^2

7) The deep beam 300mm × 500 mm subjected to shear force of 150 kN and torsion 30 kN-m, then equivalent shear is _____. **02**

a) 180 kN b) 210 kN

c) 246 kN d) 310 kN

8) The maximum percentage of longitudinal reinforcement in a column is _____. **01**

a) 6% b) 4%

c) 8% d) 10%

9) A short column 400 mm × 400 mm is reinforced with 4 bars of 20 mm diameter. Using M20/Fe 415, its axial load capacity (Pu) is _____. **02**

a) 1240 KN b) 1392 KN

c) 1550 KN d) 1680 KN

10) The critical section for two-way shear (punching shear) in a footing is at _____. **01**

a) Face of column b) (2d) from face of column

c) (d) from face of column d) (d/2) from face of column

11) Footings are designed for which limit state? **01**

a) Serviceability b) Durability

c) Collapse d) Deflection

Seat No.	

Set **P**

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Design of Concrete Structures - I (CIVPCC-10)

Day & Date: Friday, 15-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 2 and Q. No. 6 are compulsory.
2) Solve any two from Q. No. 3 to Q. No. 5 and Q. No. 7 to Q. No. 9 questions from each section.
3) Use of IS 456-2000 is allowed.
4) Draw neat sketch's where required and assume suitable data if required and state it clearly.
5) Figures to the right indicate full marks.

SECTION – I

Q.2 Calculate the ultimate moment of resistance of doubly reinforced beam of size 250 mm × 500 mm, if it is reinforced with 2 bars of 16 mm diameter on compression side & 4 bars of 25 mm diameter on tension side. Assume M20 and Fe 250. Effective cover provided is 50 mm on both the sides. **08**

Q.3 Design the simply supported rectangular beam of 300 mm width to carry live load of 12 kN/m. The span of the beam is 6 m and width of support is 230 mm. Use M20, Fe 415. **10**

Q.4 A hall has clear dimension of 3 m × 9 m with wall thickness of 230 mm. The live load on slab is 3 kN/m^2 and finish load of 1 kN/m^2 may be assumed. Using M 25 grade concrete and Fe 500 steel, design the slab. **10**

Q.5 Design a dog-legged type staircase for a residential building using following data: **10**

a) floor to floor height = 3.6 m
b) size of steps: Riser = 180 mm and tread = 250 mm
c) LL = 3.2 KN/m^2
d) assume width of stair = 1 m
e) Material – M 20, Fe 415
f) width of beams = 300 mm

The stair is supported at top and bottom risers by beam spanning parallel with risers at the landing slab on either side. Sketch the reinforcement details.

SECTION – II

Q.6 Determine reinforcement required for a rectangular beam section with following data: **08**

Size of beam = 300 mm × 600 mm

Factored shear force (Vu) = 95 kN,

Factored torsional moment (Tu) = 45 kNm

Factored bending moment (Mu) = 115 kN.m

Use M 20 concrete and Fe 415 steel and sketch the reinforcement details.

Q.7 A short column 500 mm × 500 mm is provided with 8-16 mm diameter. The length of column is 2.25 m. It is effectively held in position at both the ends & restrained against rotation at one end. Find ultimate load of the column. Use M20 & Fe 415. **10**

Q.8 Design a circular column of diameter 400 mm with helical reinforcement subjected to a load of 1200 kN. Use M25 concrete and Fe 415 steel. The column has unsupported length of 3 m and is effectively held in position at both ends but not restrained against rotation. **10**

Q.9 A rectangular column 400 mm × 600 mm carries an axial load of 2000 kN. The SBC of soil is 150 kN/m^2. Using M20 concrete and Fe 415 steel, design a rectangular footing to support the column. Sketch the reinforcement details. **10**

SLR-QH-255

Seat No.	

Set Q

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Design of Concrete Structures - I (CIVPCC-10)

Day & Date: Friday, 15-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) While solving MCQ, IS 456-2000 is not allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) The live load for stairs in public buildings as per IS 875 is _____. **01**
a) 2.0 kN/m^2 b) 3.0 kN/m^2
c) 5.0 kN/m^2 d) 1.5 kN/m^2

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a) 0.15% of gross area
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b) 4.37 kN/m^2
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d) 6.25 kN/m^2

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Design of Concrete Structures - I (CIVPCC-10)

Day & Date: Friday, 15-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 2 and Q. No. 6 are compulsory.
2) Solve any two from Q. No. 3 to Q. No. 5 and Q. No. 7 to Q. No. 9 questions from each section.
3) Use of IS 456-2000 is allowed.
4) Draw neat sketch's where required and assume suitable data if required and state it clearly.
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SECTION – I

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e) Material – M 20, Fe 415
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Q.6 Determine reinforcement required for a rectangular beam section with following data: **08**

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Q.7 A short column 500 mm × 500 mm is provided with 8-16 mm diameter. The length of column is 2.25 m. It is effectively held in position at both the ends & restrained against rotation at one end. Find ultimate load of the column. Use M20 & Fe 415. **10**

Q.8 Design a circular column of diameter 400 mm with helical reinforcement subjected to a load of 1200 kN. Use M25 concrete and Fe 415 steel. The column has unsupported length of 3 m and is effectively held in position at both ends but not restrained against rotation. **10**

Q.9 A rectangular column 400 mm × 600 mm carries an axial load of 2000 kN. The SBC of soil is 150 kN/m^2. Using M20 concrete and Fe 415 steel, design a rectangular footing to support the column. Sketch the reinforcement details. **10**

SLR-QH-255

Seat No.	

Set R

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Design of Concrete Structures - I (CIVPCC-10)

Day & Date: Friday, 15-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) While solving MCQ, IS 456-2000 is not allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) A short column 400 mm × 400 mm is reinforced with 4 bars of 20 mm diameter. Using M20/Fe 415, its axial load capacity (Pu) is _____. **02**

a) 1240 KN b) 1392 KN
c) 1550 KN d) 1680 KN

2) The critical section for two-way shear (punching shear) in a footing is at _____. **01**

a) Face of column b) (2d) from face of column
c) (d) from face of column d) (d/2) from face of column

3) Footings are designed for which limit state? **01**

a) Serviceability b) Durability
c) Collapse d) Deflection

4) The design shear strength of concrete τ_c in beams depends on _____. **01**

a) Grade of concrete and percentage of tension steel
b) Grade of steel only
c) Concrete grade only
d) Shear force

5) The limit state of serviceability includes _____. **01**

a) Collapse b) Shear failure
c) Deflection and Cracking d) Torsion failure

6) Minimum reinforcement for slab using HYSD bars is _____. **01**

a) 0.15% of gross area b) 0.12% of gross area
c) 0.20% of gross area d) 0.10% of gross area

7) Torsion reinforcement at the corners of a two-way slab is what fraction of the maximum midspan reinforcement? **01**

a) 25% b) 50%
c) 75% d) 100%

8) For a stair step with a Riser (R) of 150 mm and Going (G) of 250 mm, the dead load of the waist slab of thickness 150 mm, is approximately _____. **02**

a) 3.75 kN/m^2 b) 4.37 kN/m^2
c) 5.34 kN/m^2 d) 6.25 kN/m^2

9) The live load for stairs in public buildings as per IS 875 is _____. **01**

a) 2.0 kN/m^2 b) 3.0 kN/m^2
c) 5.0 kN/m^2 d) 1.5 kN/m^2

10) The deep beam 300mm × 500 mm subjected to shear force of 150 kN and torsion 30 kN-m, then equivalent shear is _____. **02**

a) 180 kN b) 210 kN
c) 246 kN d) 310 kN

11) The maximum percentage of longitudinal reinforcement in a column is _____. **01**

a) 6% b) 4%
c) 8% d) 10%

Seat No.	

Set **R**

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Design of Concrete Structures - I (CIVPCC-10)

Day & Date: Friday, 15-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 2 and Q. No. 6 are compulsory.
2) Solve any two from Q. No. 3 to Q. No. 5 and Q. No. 7 to Q. No. 9 questions from each section.
3) Use of IS 456-2000 is allowed.
4) Draw neat sketch's where required and assume suitable data if required and state it clearly.
5) Figures to the right indicate full marks.

SECTION – I

Q.2 Calculate the ultimate moment of resistance of doubly reinforced beam of size 250 mm × 500 mm, if it is reinforced with 2 bars of 16 mm diameter on compression side & 4 bars of 25 mm diameter on tension side. Assume M20 and Fe 250. Effective cover provided is 50 mm on both the sides. **08**

Q.3 Design the simply supported rectangular beam of 300 mm width to carry live load of 12 kN/m. The span of the beam is 6 m and width of support is 230 mm. Use M20, Fe 415. **10**

Q.4 A hall has clear dimension of 3 m × 9 m with wall thickness of 230 mm. The live load on slab is 3 kN/m^2 and finish load of 1 kN/m^2 may be assumed. Using M 25 grade concrete and Fe 500 steel, design the slab. **10**

Q.5 Design a dog-legged type staircase for a residential building using following data: **10**

a) floor to floor height = 3.6 m
b) size of steps: Riser = 180 mm and tread = 250 mm
c) LL = 3.2 KN/m^2
d) assume width of stair = 1 m
e) Material – M 20, Fe 415
f) width of beams = 300 mm

The stair is supported at top and bottom risers by beam spanning parallel with risers at the landing slab on either side. Sketch the reinforcement details.

SECTION – II

Q.6 Determine reinforcement required for a rectangular beam section with following data: **08**

Size of beam = 300 mm × 600 mm

Factored shear force (Vu) = 95 kN,

Factored torsional moment (Tu) = 45 kNm

Factored bending moment (Mu) = 115 kN.m

Use M 20 concrete and Fe 415 steel and sketch the reinforcement details.

Q.7 A short column 500 mm × 500 mm is provided with 8-16 mm diameter. The length of column is 2.25 m. It is effectively held in position at both the ends & restrained against rotation at one end. Find ultimate load of the column. Use M20 & Fe 415. **10**

Q.8 Design a circular column of diameter 400 mm with helical reinforcement subjected to a load of 1200 kN. Use M25 concrete and Fe 415 steel. The column has unsupported length of 3 m and is effectively held in position at both ends but not restrained against rotation. **10**

Q.9 A rectangular column 400 mm × 600 mm carries an axial load of 2000 kN. The SBC of soil is 150 kN/m^2. Using M20 concrete and Fe 415 steel, design a rectangular footing to support the column. Sketch the reinforcement details. **10**

Seat No.	

Set **S**

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Design of Concrete Structures - I (CIVPCC-10)

Day & Date: Friday, 15-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) While solving MCQ, IS 456-2000 is not allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) Torsion reinforcement at the corners of a two-way slab is what fraction of the maximum midspan reinforcement? **01**
a) 25% b) 50%
c) 75% d) 100%

2) For a stair step with a Riser (R) of 150 mm and Going (G) of 250 mm, the dead load of the waist slab of thickness 150 mm, is approximately _____. **02**
a) 3.75 kN/m^2 b) 4.37 kN/m^2
c) 5.34 kN/m^2 d) 6.25 kN/m^2

3) The live load for stairs in public buildings as per IS 875 is _____. **01**
a) 2.0 kN/m^2 b) 3.0 kN/m^2
c) 5.0 kN/m^2 d) 1.5 kN/m^2

4) The deep beam 300mm × 500 mm subjected to shear force of 150 kN and torsion 30 kN-m, then equivalent shear is _____. **02**
a) 180 kN b) 210 kN
c) 246 kN d) 310 kN

5) The maximum percentage of longitudinal reinforcement in a column is _____. **01**
a) 6% b) 4%
c) 8% d) 10%

6) A short column 400 mm × 400 mm is reinforced with 4 bars of 20 mm diameter. Using M20/Fe 415, its axial load capacity (Pu) is _____. **02**

a) 1240 KN
b) 1392 KN
c) 1550 KN
d) 1680 KN

7) The critical section for two-way shear (punching shear) in a footing is at _____. **01**

a) Face of column
b) (2d) from face of column
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d) (d/2) from face of column

8) Footings are designed for which limit state? **01**

a) Serviceability
b) Durability
c) Collapse
d) Deflection

9) The design shear strength of concrete τ_c in beams depends on _____. **01**

a) Grade of concrete and percentage of tension steel
b) Grade of steel only
c) Concrete grade only
d) Shear force

10) The limit state of serviceability includes _____. **01**

a) Collapse
b) Shear failure
c) Deflection and Cracking
d) Torsion failure

11) Minimum reinforcement for slab using HYSD bars is _____. **01**

a) 0.15% of gross area
b) 0.12% of gross area
c) 0.20% of gross area
d) 0.10% of gross area

Seat No.	

Set **S**

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Design of Concrete Structures - I (CIVPCC-10)

Day & Date: Friday, 15-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 2 and Q. No. 6 are compulsory.
2) Solve any two from Q. No. 3 to Q. No. 5 and Q. No. 7 to Q. No. 9 questions from each section.
3) Use of IS 456-2000 is allowed.
4) Draw neat sketch's where required and assume suitable data if required and state it clearly.
5) Figures to the right indicate full marks.

SECTION – I

Q.2 Calculate the ultimate moment of resistance of doubly reinforced beam of size 250 mm × 500 mm, if it is reinforced with 2 bars of 16 mm diameter on compression side & 4 bars of 25 mm diameter on tension side. Assume M20 and Fe 250. Effective cover provided is 50 mm on both the sides. **08**

Q.3 Design the simply supported rectangular beam of 300 mm width to carry live load of 12 kN/m. The span of the beam is 6 m and width of support is 230 mm. Use M20, Fe 415. **10**

Q.4 A hall has clear dimension of 3 m × 9 m with wall thickness of 230 mm. The live load on slab is 3 kN/m^2 and finish load of 1 kN/m^2 may be assumed. Using M 25 grade concrete and Fe 500 steel, design the slab. **10**

Q.5 Design a dog-legged type staircase for a residential building using following data: **10**

a) floor to floor height = 3.6 m
b) size of steps: Riser = 180 mm and tread = 250 mm
c) LL = 3.2 KN/m^2
d) assume width of stair = 1 m
e) Material – M 20, Fe 415
f) width of beams = 300 mm

The stair is supported at top and bottom risers by beam spanning parallel with risers at the landing slab on either side. Sketch the reinforcement details.

SECTION – II

Q.6 Determine reinforcement required for a rectangular beam section with following data: **08**

Size of beam = 300 mm × 600 mm

Factored shear force (Vu) = 95 kN,

Factored torsional moment (Tu) = 45 kNm

Factored bending moment (Mu) = 115 kN.m

Use M 20 concrete and Fe 415 steel and sketch the reinforcement details.

Q.7 A short column 500 mm × 500 mm is provided with 8-16 mm diameter. The length of column is 2.25 m. It is effectively held in position at both the ends & restrained against rotation at one end. Find ultimate load of the column. Use M20 & Fe 415. **10**

Q.8 Design a circular column of diameter 400 mm with helical reinforcement subjected to a load of 1200 kN. Use M25 concrete and Fe 415 steel. The column has unsupported length of 3 m and is effectively held in position at both ends but not restrained against rotation. **10**

Q.9 A rectangular column 400 mm × 600 mm carries an axial load of 2000 kN. The SBC of soil is 150 kN/m^2. Using M20 concrete and Fe 415 steel, design a rectangular footing to support the column. Sketch the reinforcement details. **10**

SLR-QH-256

Seat No.	

Set P

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April - 2026
Hydrology and Water Resources Engineering (CIVPCC-11)

Day & Date: Monday, 18-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) If the intensity of rainfall is less than the infiltration capacity of the soil, then the infiltration rate will be _____.
a) equal to the rate of rainfall
b) equal to the infiltration capacity
c) more than the infiltration capacity
d) has no relation either with the rainfall intensity or the infiltration capacity.

2) Transpiration ratio of a crop increases, when _____.
a) the water required by the crop is more
b) the water required by the crop is less
c) the harvesting period is more
d) the harvesting period is less

3) Generally the average depth of rainfall _____.
a) decreases from the centre of storm towards its periphery
b) increases from the centre of storm towards its periphery
c) decreases from periphery of storm towards the center of storm
d) all of these

4) The S-curve is used _____.
a) to develop synthetic unit hydrograph
b) to derive unit hydrograph of a complex storm
c) to convert the unit hydrograph of any given duration into a unit hydrograph of any other desired duration
d) to estimate the peak flow of a basin from the given storm

5) A flood with a return period of 100 years which occurs _____.
a) every Hundredth years
b) once in every hundred year on the average
c) The maximum observed flood in the past hundred years
d) only after hundred years in the immediate future

6) The volume of ground water, which can be extracted by gravity drainage from a soil stratum, when expressed as percentage fraction of the cum of the soil stratum, is called _____.
a) pellicular water
b) available water
c) field capacity
d) specific yield

7) Water wells excavated through confined aquifers are known as _____.
a) artesian wells
b) pressure wells
c) both a) and b)
d) none of these

8) Minor irrigation scheme is limited up to _____.
a) 150 hectors
b) 200 hectors
c) 2000 hectors
d) 5000 hectors

9) Percolation tank is example of _____.
a) major irrigation scheme
b) Minor irrigation scheme
c) medium irrigation scheme
d) both a) and b)

10) With the increase in supplied irrigation water, the yield of crops _____.
a) increases continuously
b) decreases continuously
c) increases up to a certain limit, and then becomes constant
d) increases up to a certain limit, and then decreases

11) The crop, out of the following, which is not a cash crop, is _____.
a) Jute
b) Tea
c) Rice
d) Sugarcane

12) Consumptive use of water for a crop represents _____.
a) the transpiration needs of the crop
b) evaporation needs of the cropped area
c) evapotranspiration needs of the cropped area plus the minor quantity required in plant metabolism
d) None of the above

13) The most economical method of-soil conservation is to _____.
a) construct check dams
b) construct contour bunds
c) drain the soil
d) a forest the soil

14) Cooperative water users organizations helps in _____.
a) soil management
b) water management
c) soil conservation
d) none of these

Seat No.	

Set P

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April - 2026
Hydrology and Water Resources Engineering (CIVPCC-11)

Day & Date: Monday, 18-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Question No. 2 is compulsory in section I, and solve any two questions from the remaining.
2) Question No. 6 is compulsory in section II, and solve any two questions from remaining.
3) Figures to the right indicate full marks.
4) Assume suitable data if necessary and state it clearly.

SECTION – I

Q.2 **a)** What is mean by precipitation enlist and explain forms of precipitation. **05**

b) Find the ordinates of a storm hydrograph resulting from a 3 hours storm with rainfall of 2, 6.75 and 3.75 cm during sub sequent 3 hours intervals. The ordinates of unit hydrograph are given below. Assume an initial loss of 5 mm infiltration index of 2.5 mm/hour and base flow of 10 cumecs. **05**

Time (hr)	3	6	9	12	15	18	21	24
Ordinates of unit hydrograph (m^3/sec)	0	110	365	500	390	310	250	235

Q.3 **a)** Derive equation for steady state discharge for well completely penetrating unconfined aquifer. **04**

b) The isohyets for annual-rainfall over a catchment were drawn. The areas of strips between the isohyets are indicated below. Find the average depth of annual precipitation over the basin. **05**

Isohyets (cm)	Area between Isohyets (sq.km.)
9-10	22
10-11	80
11-12	105
12-13	98
13-14	78
14-15	16

Q.4 **a)** Enlist different methods of stream gauging and explain any one method with neat sketch. **04**

b) During the recuperation test of well the recuperation of depression head from 2.5 to 1.6 m were found to take place in 70 minutes. Determine the yield from a well if its diameter is 3 m under depression heads of 3.5 m. also, determine diameter of well to yield 10 l/sec under depression head of 2.5m. **05**

Q.5 **a)** Define Unit Hydrograph and state assumptions made in its derivation. **04**

b) A precipitation station 'X' was inoperative for some time during which a storm occurred. The storm rainfall totals at the stations 'A', 'B', 'C' surrounding station 'X' were respectively 6.60, 4.80 and 3.70 cm. The normal annual precipitation amounts at stations X, A, B and C are 65.6, 72.6, 51.8 and 38.2 cm. Estimate the missing storm precipitation at station X. **05**

SECTION – II

Q.6 **a)** Explain different methods of allocation of water to the users and explain Warabandi. **05**

b) What is meant by 'Duty' and 'Delta' of canal water? Derive a relationship between duty and delta for a given base period. **05**

Q.7 **a)** State the main components of Drip Irrigation system and describe the functions of each. **04**

b) Table below gives necessary data about the crop, their duty and the area under each crop, commanded by a canal taking off from storage reservoir. Find the reservoir capacities if the canal losses are 20% and reservoir losses are 12%. **05**

Crop	Base period (days)	Duty at field (ha / cumec)	Area under the crop (Ha)
Wheat	120	1800	4800
Sugarcane	360	800	5600
Cotton	200	1400	2400
Rice	120	900	3200
Vegetables	120	700	1400

Q.8 **a)** Explain the need of soil and water conservation. **04**

b) What are the different types of Sprinkler irrigation method? Explain any one with neat sketch. **05**

Q.9 **a)** Enlist and explain different methods used for water conservation in a catchment. **04**

b) After how many days will you supply water to soil (clay loam), in order to ensure efficient irrigation of the given crop if: **05**

i) Field capacity of soil - 27%
ii) Permanent wilting point - 14%
iii) Density of soil - 1.5 gm/cm^3
iv) Effective depth of root zone - 75 cm
v) Daily consumptive use of water for a given crop - 11 mm

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April - 2026
Hydrology and Water Resources Engineering (CIVPCC-11)

Day & Date: Monday, 18-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Minor irrigation scheme is limited up to _____.
a) 150 hectors b) 200 hectors
c) 2000 hectors d) 5000 hectors

2) Percolation tank is example of _____.
a) major irrigation scheme b) Minor irrigation scheme
c) medium irrigation scheme d) both a) and b)

3) With the increase in supplied irrigation water, the yield of crops _____.
a) increases continuously
b) decreases continuously
c) increases up to a certain limit, and then becomes constant
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4) The crop, out of the following, which is not a cash crop, is _____.
a) Jute b) Tea
c) Rice d) Sugarcane

5) Consumptive use of water for a crop represents _____.
a) the transpiration needs of the crop
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d) None of the above

6) The most economical method of-soil conservation is to _____.
a) construct check dams b) construct contour bunds
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7) Cooperative water users organizations helps in _____.
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12) A flood with a return period of 100 years which occurs _____.
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c) The maximum observed flood in the past hundred years
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13) The volume of ground water, which can be extracted by gravity drainage from a soil stratum, when expressed as percentage fraction of the cum of the soil stratum, is called _____.
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c) field capacity d) specific yield

14) Water wells excavated through confined aquifers are known as _____.
a) artesian wells b) pressure wells
c) both a) and b) d) none of these

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April - 2026
Hydrology and Water Resources Engineering (CIVPCC-11)

Day & Date: Monday, 18-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Question No. 2 is compulsory in section I, and solve any two questions from the remaining.
2) Question No. 6 is compulsory in section II, and solve any two questions from remaining.
3) Figures to the right indicate full marks.
4) Assume suitable data if necessary and state it clearly.

SECTION – I

Q.2 **a)** What is mean by precipitation enlist and explain forms of precipitation. **05**

b) Find the ordinates of a storm hydrograph resulting from a 3 hours storm with rainfall of 2, 6.75 and 3.75 cm during sub sequent 3 hours intervals. The ordinates of unit hydrograph are given below. Assume an initial loss of 5 mm infiltration index of 2.5 mm/hour and base flow of 10 cumecs. **05**

Time (hr)	3	6	9	12	15	18	21	24
Ordinates of unit hydrograph (m^3/sec)	0	110	365	500	390	310	250	235

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Isohyets (cm)	Area between Isohyets (sq.km.)
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13-14	78
14-15	16

Q.4 **a)** Enlist different methods of stream gauging and explain any one method with neat sketch. **04**

b) During the recuperation test of well the recuperation of depression head from 2.5 to 1.6 m were found to take place in 70 minutes. Determine the yield from a well if its diameter is 3 m under depression heads of 3.5 m. also, determine diameter of well to yield 10 l/sec under depression head of 2.5m. **05**

Q.5 **a)** Define Unit Hydrograph and state assumptions made in its derivation. **04**

b) A precipitation station 'X' was inoperative for some time during which a storm occurred. The storm rainfall totals at the stations 'A', 'B', 'C' surrounding station 'X' were respectively 6.60, 4.80 and 3.70 cm. The normal annual precipitation amounts at stations X, A, B and C are 65.6, 72.6, 51.8 and 38.2 cm. Estimate the missing storm precipitation at station X. **05**

SECTION – II

Q.6 **a)** Explain different methods of allocation of water to the users and explain Warabandi. **05**

b) What is meant by 'Duty' and 'Delta' of canal water? Derive a relationship between duty and delta for a given base period. **05**

Q.7 **a)** State the main components of Drip Irrigation system and describe the functions of each. **04**

b) Table below gives necessary data about the crop, their duty and the area under each crop, commanded by a canal taking off from storage reservoir. Find the reservoir capacities if the canal losses are 20% and reservoir losses are 12%. **05**

Crop	Base period (days)	Duty at field (ha / cumec)	Area under the crop (Ha)
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Rice	120	900	3200
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Q.8 **a)** Explain the need of soil and water conservation. **04**

b) What are the different types of Sprinkler irrigation method? Explain any one with neat sketch. **05**

Q.9 **a)** Enlist and explain different methods used for water conservation in a catchment. **04**

b) After how many days will you supply water to soil (clay loam), in order to ensure efficient irrigation of the given crop if: **05**

i) Field capacity of soil - 27%
ii) Permanent wilting point - 14%
iii) Density of soil - 1.5 gm/cm^3
iv) Effective depth of root zone - 75 cm
v) Daily consumptive use of water for a given crop - 11 mm

Seat No.	

Set **R**

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April - 2026
Hydrology and Water Resources Engineering (CIVPCC-11)

Day & Date: Monday, 18-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) The crop, out of the following, which is not a cash crop, is _____.
a) Jute b) Tea
c) Rice d) Sugarcane

2) Consumptive use of water for a crop represents _____.
a) the transpiration needs of the crop
b) evaporation needs of the cropped area
c) evapotranspiration needs of the cropped area plus the minor quantity required in plant metabolism
d) None of the above

3) The most economical method of-soil conservation is to _____.
a) construct check dams b) construct contour bunds
c) drain the soil d) a forest the soil

4) Cooperative water users organizations helps in _____.
a) soil management b) water management
c) soil conservation d) none of these

5) If the intensity of rainfall is less than the infiltration capacity of the soil, then the infiltration rate will be _____.
a) equal to the rate of rainfall
b) equal to the infiltration capacity
c) more than the infiltration capacity
d) has no relation either with the rainfall intensity or the infiltration capacity.

6) Transpiration ratio of a crop increases, when _____.
a) the water required by the crop is more
b) the water required by the crop is less
c) the harvesting period is more
d) the harvesting period is less

7) Generally the average depth of rainfall _____.
a) decreases from the centre of storm towards its periphery
b) increases from the centre of storm towards its periphery
c) decreases from periphery of storm towards the center of storm
d) all of these

8) The S-curve is used _____.
a) to develop synthetic unit hydrograph
b) to derive unit hydrograph of a complex storm
c) to convert the unit hydrograph of any given duration into a unit hydrograph of any other desired duration
d) to estimate the peak flow of a basin from the given storm

9) A flood with a return period of 100 years which occurs _____.
a) every Hundredth years
b) once in every hundred year on the average
c) The maximum observed flood in the past hundred years
d) only after hundred years in the immediate future

10) The volume of ground water, which can be extracted by gravity drainage from a soil stratum, when expressed as percentage fraction of the cum of the soil stratum, is called _____.
a) pellicular water b) available water
c) field capacity d) specific yield

11) Water wells excavated through confined aquifers are known as _____.
a) artesian wells b) pressure wells
c) both a) and b) d) none of these

12) Minor irrigation scheme is limited up to _____.
a) 150 hectors b) 200 hectors
c) 2000 hectors d) 5000 hectors

13) Percolation tank is example of _____.
a) major irrigation scheme b) Minor irrigation scheme
c) medium irrigation scheme d) both a) and b)

14) With the increase in supplied irrigation water, the yield of crops _____.
a) increases continuously
b) decreases continuously
c) increases up to a certain limit, and then becomes constant
d) increases up to a certain limit, and then decreases

Seat No.	

Set R

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April - 2026
Hydrology and Water Resources Engineering (CIVPCC-11)

Day & Date: Monday, 18-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Question No. 2 is compulsory in section I, and solve any two questions from the remaining.
2) Question No. 6 is compulsory in section II, and solve any two questions from remaining.
3) Figures to the right indicate full marks.
4) Assume suitable data if necessary and state it clearly.

SECTION – I

Q.2 **a)** What is mean by precipitation enlist and explain forms of precipitation. **05**

b) Find the ordinates of a storm hydrograph resulting from a 3 hours storm with rainfall of 2, 6.75 and 3.75 cm during sub sequent 3 hours intervals. The ordinates of unit hydrograph are given below. Assume an initial loss of 5 mm infiltration index of 2.5 mm/hour and base flow of 10 cumecs. **05**

Time (hr)	3	6	9	12	15	18	21	24
Ordinates of unit hydrograph (m^3/sec)	0	110	365	500	390	310	250	235

Q.3 **a)** Derive equation for steady state discharge for well completely penetrating unconfined aquifer. **04**

b) The isohyets for annual-rainfall over a catchment were drawn. The areas of strips between the isohyets are indicated below. Find the average depth of annual precipitation over the basin. **05**

Isohyets (cm)	Area between Isohyets (sq.km.)
9-10	22
10-11	80
11-12	105
12-13	98
13-14	78
14-15	16

Q.4 **a)** Enlist different methods of stream gauging and explain any one method with neat sketch. **04**

b) During the recuperation test of well the recuperation of depression head from 2.5 to 1.6 m were found to take place in 70 minutes. Determine the yield from a well if its diameter is 3 m under depression heads of 3.5 m. also, determine diameter of well to yield 10 l/sec under depression head of 2.5m. **05**

Q.5 **a)** Define Unit Hydrograph and state assumptions made in its derivation. **04**

b) A precipitation station 'X' was inoperative for some time during which a storm occurred. The storm rainfall totals at the stations 'A', 'B', 'C' surrounding station 'X' were respectively 6.60, 4.80 and 3.70 cm. The normal annual precipitation amounts at stations X, A, B and C are 65.6, 72.6, 51.8 and 38.2 cm. Estimate the missing storm precipitation at station X. **05**

SECTION – II

Q.6 **a)** Explain different methods of allocation of water to the users and explain Warabandi. **05**

b) What is meant by 'Duty' and 'Delta' of canal water? Derive a relationship between duty and delta for a given base period. **05**

Q.7 **a)** State the main components of Drip Irrigation system and describe the functions of each. **04**

b) Table below gives necessary data about the crop, their duty and the area under each crop, commanded by a canal taking off from storage reservoir. Find the reservoir capacities if the canal losses are 20% and reservoir losses are 12%. **05**

Crop	Base period (days)	Duty at field (ha / cumec)	Area under the crop (Ha)
Wheat	120	1800	4800
Sugarcane	360	800	5600
Cotton	200	1400	2400
Rice	120	900	3200
Vegetables	120	700	1400

Q.8 **a)** Explain the need of soil and water conservation. **04**

b) What are the different types of Sprinkler irrigation method? Explain any one with neat sketch. **05**

Q.9 **a)** Enlist and explain different methods used for water conservation in a catchment. **04**

b) After how many days will you supply water to soil (clay loam), in order to ensure efficient irrigation of the given crop if: **05**

i) Field capacity of soil - 27%
ii) Permanent wilting point - 14%
iii) Density of soil - 1.5 gm/cm^3
iv) Effective depth of root zone - 75 cm
v) Daily consumptive use of water for a given crop - 11 mm

Seat No.	

Set **S**

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April - 2026
Hydrology and Water Resources Engineering (CIVPCC-11)

Day & Date: Monday, 18-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) The volume of ground water, which can be extracted by gravity drainage from a soil stratum, when expressed as percentage fraction of the cum of the soil stratum, is called _____.
a) pellicular water b) available water
c) field capacity d) specific yield

2) Water wells excavated through confined aquifers are known as _____.
a) artesian wells b) pressure wells
c) both a) and b) d) none of these

3) Minor irrigation scheme is limited up to _____.
a) 150 hectors b) 200 hectors
c) 2000 hectors d) 5000 hectors

4) Percolation tank is example of _____.
a) major irrigation scheme b) Minor irrigation scheme
c) medium irrigation scheme d) both a) and b)

5) With the increase in supplied irrigation water, the yield of crops _____.
a) increases continuously
b) decreases continuously
c) increases up to a certain limit, and then becomes constant
d) increases up to a certain limit, and then decreases

6) The crop, out of the following, which is not a cash crop, is _____.
a) Jute b) Tea
c) Rice d) Sugarcane

7) Consumptive use of water for a crop represents _____.
a) the transpiration needs of the crop
b) evaporation needs of the cropped area
c) evapotranspiration needs of the cropped area plus the minor quantity required in plant metabolism
d) None of the above

8) The most economical method of-soil conservation is to _____.
a) construct check dams
b) construct contour bunds
c) drain the soil
d) a forest the soil

9) Cooperative water users organizations helps in _____.
a) soil management
b) water management
c) soil conservation
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10) If the intensity of rainfall is less than the infiltration capacity of the soil, then the infiltration rate will be _____.
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c) decreases from periphery of storm towards the center of storm
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13) The S-curve is used _____.
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b) to derive unit hydrograph of a complex storm
c) to convert the unit hydrograph of any given duration into a unit hydrograph of any other desired duration
d) to estimate the peak flow of a basin from the given storm

14) A flood with a return period of 100 years which occurs _____.
a) every Hundredth years
b) once in every hundred year on the average
c) The maximum observed flood in the past hundred years
d) only after hundred years in the immediate future

Seat No.	

Set **S**

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April - 2026
Hydrology and Water Resources Engineering (CIVPCC-11)

Day & Date: Monday, 18-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Question No. 2 is compulsory in section I, and solve any two questions from the remaining.
2) Question No. 6 is compulsory in section II, and solve any two questions from remaining.
3) Figures to the right indicate full marks.
4) Assume suitable data if necessary and state it clearly.

SECTION – I

Q.2 **a)** What is mean by precipitation enlist and explain forms of precipitation. **05**

b) Find the ordinates of a storm hydrograph resulting from a 3 hours storm with rainfall of 2, 6.75 and 3.75 cm during sub sequent 3 hours intervals. The ordinates of unit hydrograph are given below. Assume an initial loss of 5 mm infiltration index of 2.5 mm/hour and base flow of 10 cumecs. **05**

Time (hr)	3	6	9	12	15	18	21	24
Ordinates of unit hydrograph (m^3/sec)	0	110	365	500	390	310	250	235

Q.3 **a)** Derive equation for steady state discharge for well completely penetrating unconfined aquifer. **04**

b) The isohyets for annual-rainfall over a catchment were drawn. The areas of strips between the isohyets are indicated below. Find the average depth of annual precipitation over the basin. **05**

Isohyets (cm)	Area between Isohyets (sq.km.)
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10-11	80
11-12	105
12-13	98
13-14	78
14-15	16

Q.4 **a)** Enlist different methods of stream gauging and explain any one method with neat sketch. **04**

b) During the recuperation test of well the recuperation of depression head from 2.5 to 1.6 m were found to take place in 70 minutes. Determine the yield from a well if its diameter is 3 m under depression heads of 3.5 m. also, determine diameter of well to yield 10 l/sec under depression head of 2.5m. **05**

Q.5 **a)** Define Unit Hydrograph and state assumptions made in its derivation. **04**

b) A precipitation station 'X' was inoperative for some time during which a storm occurred. The storm rainfall totals at the stations 'A', 'B', 'C' surrounding station 'X' were respectively 6.60, 4.80 and 3.70 cm. The normal annual precipitation amounts at stations X, A, B and C are 65.6, 72.6, 51.8 and 38.2 cm. Estimate the missing storm precipitation at station X. **05**

SECTION – II

Q.6 **a)** Explain different methods of allocation of water to the users and explain Warabandi. **05**

b) What is meant by 'Duty' and 'Delta' of canal water? Derive a relationship between duty and delta for a given base period. **05**

Q.7 **a)** State the main components of Drip Irrigation system and describe the functions of each. **04**

b) Table below gives necessary data about the crop, their duty and the area under each crop, commanded by a canal taking off from storage reservoir. Find the reservoir capacities if the canal losses are 20% and reservoir losses are 12%. **05**

Crop	Base period (days)	Duty at field (ha / cumec)	Area under the crop (Ha)
Wheat	120	1800	4800
Sugarcane	360	800	5600
Cotton	200	1400	2400
Rice	120	900	3200
Vegetables	120	700	1400

Q.8 **a)** Explain the need of soil and water conservation. **04**

b) What are the different types of Sprinkler irrigation method? Explain any one with neat sketch. **05**

Q.9 **a)** Enlist and explain different methods used for water conservation in a catchment. **04**

b) After how many days will you supply water to soil (clay loam), in order to ensure efficient irrigation of the given crop if: **05**

i) Field capacity of soil - 27%
ii) Permanent wilting point - 14%
iii) Density of soil - 1.5 gm/cm^3
iv) Effective depth of root zone - 75 cm
v) Daily consumptive use of water for a given crop - 11 mm

SLR-QH-257

Seat No.		Set	P

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Construction Management Practices (CIVPCC-12)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) In PERT, the beta distribution is used because _____.
a) It is symmetric
b) It can model skewed activity time distributions with defined endpoints
c) It requires only one time estimate
d) It follows a normal curve exactly

2) Which of the following is NOT a time estimate used in PERT?
a) Optimistic time b) Pessimistic time
c) Most likely time d) Deterministic time

3) The primary objective of construction safety management is to _____.
a) Reduce project cost only
b) Prevent accidents, injuries, and occupational hazards
c) Speed up construction activities
d) Avoid legal formalities

4) PPE stands for _____.
a) Project Planning Equipment
b) Personal Protective Equipment
c) Pre-Planned Execution
d) Physical Protection Engineering

5) The cycle time of a scraper includes _____.
a) Load time only
b) Load + haul + dump + return time
c) Haul and dump time only
d) Maneuver time only

6) The main advantage of aluminium formwork over conventional steel formwork is _____.
a) Higher strength
b) Lighter weight, faster assembly, higher reusability, and smoother concrete finish
c) Lower initial cost
d) better resistance to corrosion only

7) The efficiency of a trencher machine depends on _____.
a) Operator height
b) Soil type, trench depth, and machine speed
c) Weather conditions only
d) Crane capacity nearby

8) Mivan formwork uses which material?
a) Steel plates
b) Aluminium alloy panels
c) Timber planks
d) Fibre-reinforced plastic

9) A Gantt chart is primarily used for _____.
a) Finding the critical path
b) Resource levelling
c) Displaying project schedule with activities plotted against time on a bar chart
d) Calculating project cost

10) Primavera is categorized as _____.
a) A free open-source scheduling tool
b) A professional enterprise-level Project Management Software
c) A simple spreadsheet application
d) A Building Information Modelling (BIM) tool

11) Fulkerson's Rule is used for _____.
a) Calculating float of activities
b) Numbering events in a network diagram such that tail event number is always less than head event number
c) Finding the critical path
d) Resource levelling

12) On the critical path, the value of total float is always _____.
a) Maximum
b) Equal to 1
c) Zero
d) Negative

13) Which of the following software is open-source and freely available for project scheduling?
a) MS Project
b) Primavera P6
c) Google Spreadsheet
d) PRINCE2

14) PRINCE stands for _____.

a) Project Resource and Integration Network for Construction Execution
b) Projects in Controlled Environments
c) Programme for Integrated Construction Evaluation
d) Project Review and Improvement Network for Cost Estimation

Seat No.	

Set P

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Construction Management Practices (CIVPCC-12)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Question No. 2 is compulsory in section I, and solve any two questions from the remaining.
2) Question No. 6 is compulsory in section II, and solve any two questions from remaining.
3) Figures to the right indicate full marks.
4) Assume suitable data if necessary and state it clearly.

SECTION – I

Q.2 a) The following activities are involved in a construction project. Draw the network diagram, perform forward and backward pass, calculate all floats, identify the critical path, and find the project duration. **08**

Activity	Predecessor	Duration (Days)
A	-	4
B	-	6
C	A	5
D	A	3
E	B, C	7
F	D	4
G	E, F	3

b) Explain Fulkerson's Rule for numbering events in a network with an example. **04**

Q.3 a) What is network compression? Explain the step-by-step procedure for crashing a network. **04**

b) What is updating? Explain the step-by-step procedure for updating. **04**

Q.4 A project has the following activities with normal time, crash time, normal cost and crash cost. The indirect cost = ₹100 per day. **08**

Activity	Normal Time (days)	Crash Time (days)	Normal Cost (₹)	Crash Cost (₹)
A	6	4	300	500
B	5	3	200	400
C	7	5	350	650
D	4	2	250	450

Q.5 **a)** Describe any four Project Management Software tools used in construction projects. **04**

b) What is CPM? Explain the step-by-step procedure to find the critical path of a project. **04**

SECTION – II

Q.6 A project consists of the following activities with three-time estimates. Calculate expected time table Draw network diagram Find paths and critical path Calculate variance and standard deviation. **12**

Activity	Predecessor	Optimistic (to)	Most Likely (tm)	Pessimistic (tp)
A	-	2	4	6
B	A	3	5	9
C	A	1	2	3
D	B	4	6	8
E	C	2	3	4
F	D, E	3	5	7

Q.7 Explain construction safety on the following sites: (Solve any Two) **08**

a) Dam construction
b) Tunnel construction
c) Bridge construction. Highlight specific hazards and preventive measures for each.

Q.8 Explain the following earth-moving equipment with their working principles, applications, and factors affecting production: (Solve any Two) **08**

a) Bulldozer
b) Scraper
c) Power Shovel

Q.9 **a)** Describe Mivan (Aluminium) formwork with its components, advantages. **04**

b) Compare Aluform, Tunnel Form, and Mivan formwork under: material, application. **04**

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Construction Management Practices (CIVPCC-12)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Mivan formwork uses which material?
a) Steel plates
b) Aluminium alloy panels
c) Timber planks
d) Fibre-reinforced plastic

2) A Gantt chart is primarily used for _____.
a) Finding the critical path
b) Resource levelling
c) Displaying project schedule with activities plotted against time on a bar chart
d) Calculating project cost

3) Primavera is categorized as _____.
a) A free open-source scheduling tool
b) A professional enterprise-level Project Management Software
c) A simple spreadsheet application
d) A Building Information Modelling (BIM) tool

4) Fulkerson's Rule is used for _____.
a) Calculating float of activities
b) Numbering events in a network diagram such that tail event number is always less than head event number
c) Finding the critical path
d) Resource levelling

5) On the critical path, the value of total float is always _____.
a) Maximum
b) Equal to 1
c) Zero
d) Negative

6) Which of the following software is open-source and freely available for project scheduling?
a) MS Project
b) Primavera P6
c) Google Spreadsheet
d) PRINCE2

7) PRINCE stands for _____.
a) Project Resource and Integration Network for Construction Execution
b) Projects in Controlled Environments
c) Programme for Integrated Construction Evaluation
d) Project Review and Improvement Network for Cost Estimation

8) In PERT, the beta distribution is used because _____.
a) It is symmetric
b) It can model skewed activity time distributions with defined endpoints
c) It requires only one time estimate
d) It follows a normal curve exactly

9) Which of the following is NOT a time estimate used in PERT?
a) Optimistic time
b) Pessimistic time
c) Most likely time
d) Deterministic time

10) The primary objective of construction safety management is to _____.
a) Reduce project cost only
b) Prevent accidents, injuries, and occupational hazards
c) Speed up construction activities
d) Avoid legal formalities

11) PPE stands for _____.
a) Project Planning Equipment
b) Personal Protective Equipment
c) Pre-Planned Execution
d) Physical Protection Engineering

12) The cycle time of a scraper includes _____.
a) Load time only
b) Load + haul + dump + return time
c) Haul and dump time only
d) Maneuver time only

13) The main advantage of aluminium formwork over conventional steel formwork is _____.
a) Higher strength
b) Lighter weight, faster assembly, higher reusability, and smoother concrete finish
c) Lower initial cost
d) better resistance to corrosion only

14) The efficiency of a trencher machine depends on _____.

a) Operator height
b) Soil type, trench depth, and machine speed
c) Weather conditions only
d) Crane capacity nearby

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Construction Management Practices (CIVPCC-12)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Question No. 2 is compulsory in section I, and solve any two questions from the remaining.
2) Question No. 6 is compulsory in section II, and solve any two questions from remaining.
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4) Assume suitable data if necessary and state it clearly.

SECTION – I

Q.2 **a)** The following activities are involved in a construction project. Draw the network diagram, perform forward and backward pass, calculate all floats, identify the critical path, and find the project duration. **08**

Activity	Predecessor	Duration (Days)
A	-	4
B	-	6
C	A	5
D	A	3
E	B, C	7
F	D	4
G	E, F	3

b) Explain Fulkerson's Rule for numbering events in a network with an example. **04**

Q.3 **a)** What is network compression? Explain the step-by-step procedure for crashing a network. **04**

b) What is updating? Explain the step-by-step procedure for updating. **04**

Q.4 A project has the following activities with normal time, crash time, normal cost and crash cost. The indirect cost = ₹100 per day. **08**

Activity	Normal Time (days)	Crash Time (days)	Normal Cost (₹)	Crash Cost (₹)
A	6	4	300	500
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SECTION – II

Q.6 A project consists of the following activities with three-time estimates. Calculate expected time table Draw network diagram Find paths and critical path Calculate variance and standard deviation. **12**

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E	C	2	3	4
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Q.7 Explain construction safety on the following sites: (Solve any Two) **08**

a) Dam construction
b) Tunnel construction
c) Bridge construction. Highlight specific hazards and preventive measures for each.

Q.8 Explain the following earth-moving equipment with their working principles, applications, and factors affecting production: (Solve any Two) **08**

a) Bulldozer
b) Scraper
c) Power Shovel

Q.9 **a)** Describe Mivan (Aluminium) formwork with its components, advantages. **04**

b) Compare Aluform, Tunnel Form, and Mivan formwork under: material, application. **04**

SLR-QH-257

Seat No.	

Set R

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Construction Management Practices (CIVPCC-12)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Fulkerson's Rule is used for _____.
a) Calculating float of activities
b) Numbering events in a network diagram such that tail event number is always less than head event number
c) Finding the critical path
d) Resource levelling

2) On the critical path, the value of total float is always _____.
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3) Which of the following software is open-source and freely available for project scheduling?
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9) The cycle time of a scraper includes _____.
a) Load time only
b) Load + haul + dump + return time
c) Haul and dump time only
d) Maneuver time only

10) The main advantage of aluminium formwork over conventional steel formwork is _____.
a) Higher strength
b) Lighter weight, faster assembly, higher reusability, and smoother concrete finish
c) Lower initial cost
d) better resistance to corrosion only

11) The efficiency of a trencher machine depends on _____.
a) Operator height
b) Soil type, trench depth, and machine speed
c) Weather conditions only
d) Crane capacity nearby

12) Mivan formwork uses which material?
a) Steel plates
b) Aluminium alloy panels
c) Timber planks
d) Fibre-reinforced plastic

13) A Gantt chart is primarily used for _____.
a) Finding the critical path
b) Resource levelling
c) Displaying project schedule with activities plotted against time on a bar chart
d) Calculating project cost

14) Primavera is categorized as _____.

a) A free open-source scheduling tool
b) A professional enterprise-level Project Management Software
c) A simple spreadsheet application
d) A Building Information Modelling (BIM) tool

Seat No.	

Set **R**

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Construction Management Practices (CIVPCC-12)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Question No. 2 is compulsory in section I, and solve any two questions from the remaining.
2) Question No. 6 is compulsory in section II, and solve any two questions from remaining.
3) Figures to the right indicate full marks.
4) Assume suitable data if necessary and state it clearly.

SECTION – I

Q.2 **a)** The following activities are involved in a construction project. Draw the network diagram, perform forward and backward pass, calculate all floats, identify the critical path, and find the project duration. **08**

Activity	Predecessor	Duration (Days)
A	-	4
B	-	6
C	A	5
D	A	3
E	B, C	7
F	D	4
G	E, F	3

b) Explain Fulkerson's Rule for numbering events in a network with an example. **04**

Q.3 **a)** What is network compression? Explain the step-by-step procedure for crashing a network. **04**

b) What is updating? Explain the step-by-step procedure for updating. **04**

Q.4 A project has the following activities with normal time, crash time, normal cost and crash cost. The indirect cost = ₹100 per day. **08**

Activity	Normal Time (days)	Crash Time (days)	Normal Cost (₹)	Crash Cost (₹)
A	6	4	300	500
B	5	3	200	400
C	7	5	350	650
D	4	2	250	450

Q.5 **a)** Describe any four Project Management Software tools used in construction projects. **04**

b) What is CPM? Explain the step-by-step procedure to find the critical path of a project. **04**

SECTION – II

Q.6 A project consists of the following activities with three-time estimates. Calculate expected time table Draw network diagram Find paths and critical path Calculate variance and standard deviation. **12**

Activity	Predecessor	Optimistic (to)	Most Likely (tm)	Pessimistic (tp)
A	-	2	4	6
B	A	3	5	9
C	A	1	2	3
D	B	4	6	8
E	C	2	3	4
F	D, E	3	5	7

Q.7 Explain construction safety on the following sites: (Solve any Two) **08**

a) Dam construction
b) Tunnel construction
c) Bridge construction. Highlight specific hazards and preventive measures for each.

Q.8 Explain the following earth-moving equipment with their working principles, applications, and factors affecting production: (Solve any Two) **08**

a) Bulldozer
b) Scraper
c) Power Shovel

Q.9 **a)** Describe Mivan (Aluminium) formwork with its components, advantages. **04**

b) Compare Aluform, Tunnel Form, and Mivan formwork under: material, application. **04**

SLR-QH-257

Seat No.		Set	S

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Construction Management Practices (CIVPCC-12)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) The main advantage of aluminium formwork over conventional steel formwork is _____.
a) Higher strength
b) Lighter weight, faster assembly, higher reusability, and smoother concrete finish
c) Lower initial cost
d) better resistance to corrosion only

2) The efficiency of a trencher machine depends on _____.
a) Operator height
b) Soil type, trench depth, and machine speed
c) Weather conditions only
d) Crane capacity nearby

3) Mivan formwork uses which material?
a) Steel plates b) Aluminium alloy panels
c) Timber planks d) Fibre-reinforced plastic

4) A Gantt chart is primarily used for _____.
a) Finding the critical path
b) Resource levelling
c) Displaying project schedule with activities plotted against time on a bar chart
d) Calculating project cost

5) Primavera is categorized as _____.
a) A free open-source scheduling tool
b) A professional enterprise-level Project Management Software
c) A simple spreadsheet application
d) A Building Information Modelling (BIM) tool

6) Fulkerson's Rule is used for _____.
a) Calculating float of activities
b) Numbering events in a network diagram such that tail event number is always less than head event number
c) Finding the critical path
d) Resource levelling

7) On the critical path, the value of total float is always _____.
a) Maximum
b) Equal to 1
c) Zero
d) Negative

8) Which of the following software is open-source and freely available for project scheduling?
a) MS Project
b) Primavera P6
c) Google Spreadsheet
d) PRINCE2

9) PRINCE stands for _____.
a) Project Resource and Integration Network for Construction Execution
b) Projects in Controlled Environments
c) Programme for Integrated Construction Evaluation
d) Project Review and Improvement Network for Cost Estimation

10) In PERT, the beta distribution is used because _____.
a) It is symmetric
b) It can model skewed activity time distributions with defined endpoints
c) It requires only one time estimate
d) It follows a normal curve exactly

11) Which of the following is NOT a time estimate used in PERT?
a) Optimistic time
b) Pessimistic time
c) Most likely time
d) Deterministic time

12) The primary objective of construction safety management is to _____.
a) Reduce project cost only
b) Prevent accidents, injuries, and occupational hazards
c) Speed up construction activities
d) Avoid legal formalities

13) PPE stands for _____.
a) Project Planning Equipment
b) Personal Protective Equipment
c) Pre-Planned Execution
d) Physical Protection Engineering

14) The cycle time of a scraper includes _____.
a) Load time only
b) Load + haul + dump + return time
c) Haul and dump time only
d) Maneuver time only

Seat No.	

Set S

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Construction Management Practices (CIVPCC-12)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Question No. 2 is compulsory in section I, and solve any two questions from the remaining.
2) Question No. 6 is compulsory in section II, and solve any two questions from remaining.
3) Figures to the right indicate full marks.
4) Assume suitable data if necessary and state it clearly.

SECTION – I

Q.2 a) The following activities are involved in a construction project. Draw the network diagram, perform forward and backward pass, calculate all floats, identify the critical path, and find the project duration. **08**

Activity	Predecessor	Duration (Days)
A	-	4
B	-	6
C	A	5
D	A	3
E	B, C	7
F	D	4
G	E, F	3

b) Explain Fulkerson's Rule for numbering events in a network with an example. **04**

Q.3 a) What is network compression? Explain the step-by-step procedure for crashing a network. **04**

b) What is updating? Explain the step-by-step procedure for updating. **04**

Q.4 A project has the following activities with normal time, crash time, normal cost and crash cost. The indirect cost = ₹100 per day. **08**

Activity	Normal Time (days)	Crash Time (days)	Normal Cost (₹)	Crash Cost (₹)
A	6	4	300	500
B	5	3	200	400
C	7	5	350	650
D	4	2	250	450

Q.5 **a)** Describe any four Project Management Software tools used in construction projects. **04**

b) What is CPM? Explain the step-by-step procedure to find the critical path of a project. **04**

SECTION – II

Q.6 A project consists of the following activities with three-time estimates. Calculate expected time table Draw network diagram Find paths and critical path Calculate variance and standard deviation. **12**

Activity	Predecessor	Optimistic (to)	Most Likely (tm)	Pessimistic (tp)
A	-	2	4	6
B	A	3	5	9
C	A	1	2	3
D	B	4	6	8
E	C	2	3	4
F	D, E	3	5	7

Q.7 Explain construction safety on the following sites: (Solve any Two) **08**

a) Dam construction
b) Tunnel construction
c) Bridge construction. Highlight specific hazards and preventive measures for each.

Q.8 Explain the following earth-moving equipment with their working principles, applications, and factors affecting production: (Solve any Two) **08**

a) Bulldozer
b) Scraper
c) Power Shovel

Q.9 **a)** Describe Mivan (Aluminium) formwork with its components, advantages. **04**

b) Compare Aluform, Tunnel Form, and Mivan formwork under: material, application. **04**

SLR-QH-258

Seat No.		Set	P

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Foundation Engineering (CIVPEC - 02A)

Day & Date: Friday, 22-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) Which of the following is a method of soil exploration?
a) Tacheometry b) Chain surveying
c) Wash boring d) Levelling

2) The RQD in rock drilling stands for _____.
a) Rock Quality Design b) Rock Quantity Designation
c) Rock Quality Designation d) Rock Quotation Data

3) Bearing capacity of soil is defined as _____.
a) Weight of structure
b) Ability of soil to support loads safely
c) Depth of footing
d) Density of soil

4) Terzaghi's bearing capacity theory is applicable mainly for _____.
a) Deep foundations b) Shallow foundations
c) Raft foundations only d) Pile foundations only

5) A strap footing consists of _____.
a) Two isolated footings connected by a beam
b) Single raft slab
c) Pile and pile cap
d) Circular footing only

6) A rectangular combined footing is used when _____.
   a) Column loads are equal and symmetrically placed
   b) Columns are unequal or asymmetrical
   c) Soil is rocky
   d) Foundation is circular

7) Terzaghi's bearing capacity factors depends on ____.
   a) Cohesion of soil
   b) Φ of soil
   c) Permeability of soil
   d) None

8) A Cast in situ piles are constructed by _____.
   a) Driving precast piles
   b) Placing steel sheets
   c) Using timber sections
   d) Casting concrete in boreholes at site

9) Dynamic formulae for pile capacity are based on _____.
   a) Energy principles during driving
   b) Static equilibrium only
   c) Water pressure
   d) Soil classification

10) Under-reamed piles are especially suitable for _____.
   a) Rocky soils
   b) Sandy soils
   c) Black cotton soils
   d) Gravel deposits

11) The slip circle method assumes the failure surface to be _____.
   a) Triangular
   b) Circular
   c) Rectangular
   d) Parabolic

12) The factor of safety in slope stability is the ratio of _____.
   a) Driving forces to resisting forces
   b) Resisting forces to driving forces
   c) Load to area
   d) Stress to strain

13) Which type of cofferdam is suitable for deep water and large areas?
   a) Earth fill cofferdam
   b) Rock fill cofferdam
   c) Cellular cofferdam
   d) Timber crib cofferdam

14) Vibro-floatation is mainly used for _____.
   a) Clay stabilization
   b) Concrete curing
   c) Rock blasting
   d) Densification of granular soils

Seat No.	

Set **P**

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Foundation Engineering (CIVPEC - 02A)

Day & Date: Friday, 22-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q.2 and Q.6 are compulsory questions, solve any two from remaining questions from Section – I & any two from remaining questions from Section – II
2) Figures to the right indicate full marks.
3) Assume suitable data if required and mention it clearly.

SECTION – I

Q.2 Solve the following questions.

a) With the help of neat sketch, define **04**
i) Area ratio
ii) Inside clearance ratio
iii) Outside clearance ratio
iv) Recovery ratio

b) Draw a typical Bore hole log chart. **03**

c) Distinguish between disturbed and undisturbed soil samples. **03**

Q.3 Solve of the following questions.

a) Explain the different modes of shear failure with the help of neat sketches. **04**

b) Determine the depth at which a circular footing of 1.8 m diameter be installed to provide a factor of safety 3 to carry a safe load of 2000 KN. Soil has following properties. **05**
$C = 10\ kN/m^2\ \ \Phi = 30°\ \ \Upsilon = 18\ kN/m^3\ N_c = 37.2, N_q = 22.5\ \ N_\Upsilon = 19.7$

Q.4 Solve the following questions.

a) Write a note on standard penetration test and its corrections. **04**

b) A square footing of size 1.2 m × 1.2 m carries a load of 250 kN/ m^2 and immediate settlement under foundation is 25 mm. Calculate the immediate settlement of a footing of size 3 m × 3 m carrying a load of 200 kN/m^2? The subsoil conditions are identical in both the footings. take Iw = 0.62 and 0.84 for first and second footing respectively. **05**

Q.5 Solve of the following questions.

a) With neat sketches, explain different types of shallow foundations. **04**

b) Proportion of trapezoidal combined footing for two columns 350×350 mm carrying column loads of 1000 KN and 1400 KN. If the spacing between the columns is 4 m. Take the allowable soil pressure 280 kN/m^2 and length of the footing as 5 m. **05**

SECTION – II

Q.6 Solve the following questions.

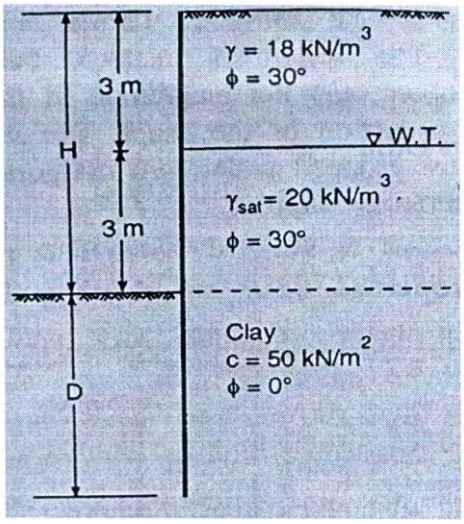
a) List and explain the classification of pile foundations based on functions and installation method. **05**

b) A group of 16 piles of 500 mm diameter is arranged with a centre to centre spacing of 1 m. The piles are 8 m long and are embedded in soft clay with cohesion of 40 kN/m^2.Bearing resistance neglected for piles. Take adhesion factor as 0.7. Determine the ultimate load capacity of pile group. **05**

Q.7 Solve the following questions.

a) Draw a neat sketch of well foundation and mention its parts. **04**

b) Compute the embedment length D for the sheet pile wall shown in fig. **05**



Q.8 Solve the following questions.

a) Explain the causes for a slope failure. **04**

b) Explain Swedish Circle method of stability analysis of slopes. **05**

Q.9 Solve the following questions.

a) Explain in detail applications of Geotextile in civil engineering. **04**

b) What is expansive soil. What are the precautions are to be taken before starting of construction in expansive soil? **05**

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Foundation Engineering (CIVPEC - 02A)

Day & Date: Friday, 22-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) A Cast in situ piles are constructed by _____.
a) Driving precast piles
b) Placing steel sheets
c) Using timber sections
d) Casting concrete in boreholes at site

2) Dynamic formulae for pile capacity are based on _____.
a) Energy principles during driving
b) Static equilibrium only
c) Water pressure
d) Soil classification

3) Under-reamed piles are especially suitable for _____.
a) Rocky soils b) Sandy soils
c) Black cotton soils d) Gravel deposits

4) The slip circle method assumes the failure surface to be _____.
a) Triangular b) Circular
c) Rectangular d) Parabolic

5) The factor of safety in slope stability is the ratio of _____.
a) Driving forces to resisting forces
b) Resisting forces to driving forces
c) Load to area
d) Stress to strain

6) Which type of cofferdam is suitable for deep water and large areas?
a) Earth fill cofferdam b) Rock fill cofferdam
c) Cellular cofferdam d) Timber crib cofferdam

7) Vibro-floatation is mainly used for _____.
a) Clay stabilization b) Concrete curing
c) Rock blasting d) Densification of granular soils

8) Which of the following is a method of soil exploration?
a) Tacheometry b) Chain surveying
c) Wash boring d) Levelling

9) The RQD in rock drilling stands for _____.
a) Rock Quality Design b) Rock Quantity Designation
c) Rock Quality Designation d) Rock Quotation Data

10) Bearing capacity of soil is defined as _____.
a) Weight of structure
b) Ability of soil to support loads safely
c) Depth of footing
d) Density of soil

11) Terzaghi's bearing capacity theory is applicable mainly for _____.
a) Deep foundations b) Shallow foundations
c) Raft foundations only d) Pile foundations only

12) A strap footing consists of _____.
a) Two isolated footings connected by a beam
b) Single raft slab
c) Pile and pile cap
d) Circular footing only

13) A rectangular combined footing is used when _____.
a) Column loads are equal and symmetrically placed
b) Columns are unequal or asymmetrical
c) Soil is rocky
d) Foundation is circular

14) Terzaghi's bearing capacity factors depends on ____.
a) Cohesion of soil b) Φ of soil
c) Permeability of soil d) None

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Foundation Engineering (CIVPEC - 02A)

Day & Date: Friday, 22-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q.2 and Q.6 are compulsory questions, solve any two from remaining questions from Section – I & any two from remaining questions from Section – II
2) Figures to the right indicate full marks.
3) Assume suitable data if required and mention it clearly.

SECTION – I

Q.2 Solve the following questions.

a) With the help of neat sketch, define **04**
i) Area ratio
ii) Inside clearance ratio
iii) Outside clearance ratio
iv) Recovery ratio

b) Draw a typical Bore hole log chart. **03**

c) Distinguish between disturbed and undisturbed soil samples. **03**

Q.3 Solve of the following questions.

a) Explain the different modes of shear failure with the help of neat sketches. **04**

b) Determine the depth at which a circular footing of 1.8 m diameter be installed to provide a factor of safety 3 to carry a safe load of 2000 KN. Soil has following properties. **05**
$C = 10\ kN/m^2\ \ \Phi = 30°\ \ \Upsilon = 18\ kN/m^3\ N_c = 37.2, N_q = 22.5\ \ N_\Upsilon = 19.7$

Q.4 Solve the following questions.

a) Write a note on standard penetration test and its corrections. **04**

b) A square footing of size 1.2 m × 1.2 m carries a load of 250 kN/ m^2 and immediate settlement under foundation is 25 mm. Calculate the immediate settlement of a footing of size 3 m × 3 m carrying a load of 200 kN/m^2? The subsoil conditions are identical in both the footings. take Iw = 0.62 and 0.84 for first and second footing respectively. **05**

Q.5 Solve of the following questions.

a) With neat sketches, explain different types of shallow foundations. **04**

b) Proportion of trapezoidal combined footing for two columns 350×350 mm carrying column loads of 1000 KN and 1400 KN. If the spacing between the columns is 4 m. Take the allowable soil pressure 280 kN/m^2 and length of the footing as 5 m. **05**

SECTION – II

Q.6 Solve the following questions.

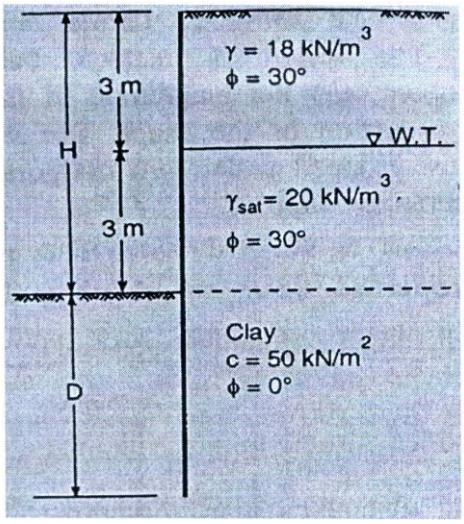
a) List and explain the classification of pile foundations based on functions and installation method. **05**

b) A group of 16 piles of 500 mm diameter is arranged with a centre to centre spacing of 1 m. The piles are 8 m long and are embedded in soft clay with cohesion of 40 kN/m^2.Bearing resistance neglected for piles. Take adhesion factor as 0.7. Determine the ultimate load capacity of pile group. **05**

Q.7 Solve the following questions.

a) Draw a neat sketch of well foundation and mention its parts. **04**

b) Compute the embedment length D for the sheet pile wall shown in fig. **05**



Q.8 Solve the following questions.

a) Explain the causes for a slope failure. **04**

b) Explain Swedish Circle method of stability analysis of slopes. **05**

Q.9 Solve the following questions.

a) Explain in detail applications of Geotextile in civil engineering. **04**

b) What is expansive soil. What are the precautions are to be taken before starting of construction in expansive soil? **05**

Seat No.	

Set **R**

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Foundation Engineering (CIVPEC - 02A)

Day & Date: Friday, 22-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) The slip circle method assumes the failure surface to be _____.
a) Triangular b) Circular
c) Rectangular d) Parabolic

2) The factor of safety in slope stability is the ratio of _____.
a) Driving forces to resisting forces
b) Resisting forces to driving forces
c) Load to area
d) Stress to strain

3) Which type of cofferdam is suitable for deep water and large areas?
a) Earth fill cofferdam b) Rock fill cofferdam
c) Cellular cofferdam d) Timber crib cofferdam

4) Vibro-floatation is mainly used for _____.
a) Clay stabilization b) Concrete curing
c) Rock blasting d) Densification of granular soils

5) Which of the following is a method of soil exploration?
a) Tacheometry b) Chain surveying
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6) The RQD in rock drilling stands for _____.
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7) Bearing capacity of soil is defined as _____.
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   b) Ability of soil to support loads safely
   c) Depth of footing
   d) Density of soil

8) Terzaghi's bearing capacity theory is applicable mainly for _____.
   a) Deep foundations
   b) Shallow foundations
   c) Raft foundations only
   d) Pile foundations only

9) A strap footing consists of _____.
   a) Two isolated footings connected by a beam
   b) Single raft slab
   c) Pile and pile cap
   d) Circular footing only

10) A rectangular combined footing is used when _____.
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13) Dynamic formulae for pile capacity are based on _____.
   a) Energy principles during driving
   b) Static equilibrium only
   c) Water pressure
   d) Soil classification

14) Under-reamed piles are especially suitable for _____.
   a) Rocky soils
   b) Sandy soils
   c) Black cotton soils
   d) Gravel deposits

Seat No.	

Set **R**

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Foundation Engineering (CIVPEC - 02A)

Day & Date: Friday, 22-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q.2 and Q.6 are compulsory questions, solve any two from remaining questions from Section – I & any two from remaining questions from Section – II
2) Figures to the right indicate full marks.
3) Assume suitable data if required and mention it clearly.

SECTION – I

Q.2 Solve the following questions.

a) With the help of neat sketch, define **04**
i) Area ratio
ii) Inside clearance ratio
iii) Outside clearance ratio
iv) Recovery ratio

b) Draw a typical Bore hole log chart. **03**

c) Distinguish between disturbed and undisturbed soil samples. **03**

Q.3 Solve of the following questions.

a) Explain the different modes of shear failure with the help of neat sketches. **04**

b) Determine the depth at which a circular footing of 1.8 m diameter be installed to provide a factor of safety 3 to carry a safe load of 2000 KN. Soil has following properties. **05**
$C = 10\ kN/m^2\ \ \Phi = 30°\ \ \Upsilon = 18\ kN/m^3\ N_c = 37.2, N_q = 22.5\ \ N_\Upsilon = 19.7$

Q.4 Solve the following questions.

a) Write a note on standard penetration test and its corrections. **04**

b) A square footing of size 1.2 m × 1.2 m carries a load of 250 kN/ m^2 and immediate settlement under foundation is 25 mm. Calculate the immediate settlement of a footing of size 3 m × 3 m carrying a load of 200 kN/m^2? The subsoil conditions are identical in both the footings. take Iw = 0.62 and 0.84 for first and second footing respectively. **05**

Q.5 Solve of the following questions.

a) With neat sketches, explain different types of shallow foundations. **04**

b) Proportion of trapezoidal combined footing for two columns 350×350 mm carrying column loads of 1000 KN and 1400 KN. If the spacing between the columns is 4 m. Take the allowable soil pressure 280 kN/m^2 and length of the footing as 5 m. **05**

SECTION – II

Q.6 Solve the following questions.

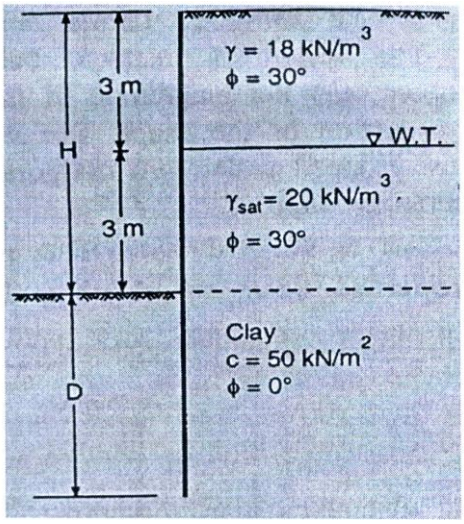
a) List and explain the classification of pile foundations based on functions and installation method. **05**

b) A group of 16 piles of 500 mm diameter is arranged with a centre to centre spacing of 1 m. The piles are 8 m long and are embedded in soft clay with cohesion of 40 kN/m^2.Bearing resistance neglected for piles. Take adhesion factor as 0.7. Determine the ultimate load capacity of pile group. **05**

Q.7 Solve the following questions.

a) Draw a neat sketch of well foundation and mention its parts. **04**

b) Compute the embedment length D for the sheet pile wall shown in fig. **05**



Q.8 Solve the following questions.

a) Explain the causes for a slope failure. **04**

b) Explain Swedish Circle method of stability analysis of slopes. **05**

Q.9 Solve the following questions.

a) Explain in detail applications of Geotextile in civil engineering. **04**

b) What is expansive soil. What are the precautions are to be taken before starting of construction in expansive soil? **05**

SLR-QH-258

Seat No.		Set	S

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Foundation Engineering (CIVPEC - 02A)

Day & Date: Friday, 22-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) A rectangular combined footing is used when _____.
a) Column loads are equal and symmetrically placed
b) Columns are unequal or asymmetrical
c) Soil is rocky
d) Foundation is circular

2) Terzaghi's bearing capacity factors depends on ____.
a) Cohesion of soil b) Φ of soil
c) Permeability of soil d) None

3) A Cast in situ piles are constructed by _____.
a) Driving precast piles
b) Placing steel sheets
c) Using timber sections
d) Casting concrete in boreholes at site

4) Dynamic formulae for pile capacity are based on _____.
a) Energy principles during driving
b) Static equilibrium only
c) Water pressure
d) Soil classification

5) Under-reamed piles are especially suitable for _____.
a) Rocky soils b) Sandy soils
c) Black cotton soils d) Gravel deposits

6) The slip circle method assumes the failure surface to be _____.
a) Triangular b) Circular
c) Rectangular d) Parabolic

7) The factor of safety in slope stability is the ratio of _____.
a) Driving forces to resisting forces
b) Resisting forces to driving forces
c) Load to area
d) Stress to strain

8) Which type of cofferdam is suitable for deep water and large areas?
a) Earth fill cofferdam b) Rock fill cofferdam
c) Cellular cofferdam d) Timber crib cofferdam

9) Vibro-floatation is mainly used for _____.
a) Clay stabilization b) Concrete curing
c) Rock blasting d) Densification of granular soils

10) Which of the following is a method of soil exploration?
a) Tacheometry b) Chain surveying
c) Wash boring d) Levelling

11) The RQD in rock drilling stands for _____.
a) Rock Quality Design b) Rock Quantity Designation
c) Rock Quality Designation d) Rock Quotation Data

12) Bearing capacity of soil is defined as _____.
a) Weight of structure
b) Ability of soil to support loads safely
c) Depth of footing
d) Density of soil

13) Terzaghi's bearing capacity theory is applicable mainly for _____.
a) Deep foundations b) Shallow foundations
c) Raft foundations only d) Pile foundations only

14) A strap footing consists of _____.
a) Two isolated footings connected by a beam
b) Single raft slab
c) Pile and pile cap
d) Circular footing only

Seat No.	

Set **S**

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Foundation Engineering (CIVPEC - 02A)

Day & Date: Friday, 22-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q.2 and Q.6 are compulsory questions, solve any two from remaining questions from Section – I & any two from remaining questions from Section – II
2) Figures to the right indicate full marks.
3) Assume suitable data if required and mention it clearly.

SECTION – I

Q.2 Solve the following questions.

a) With the help of neat sketch, define **04**
i) Area ratio
ii) Inside clearance ratio
iii) Outside clearance ratio
iv) Recovery ratio

b) Draw a typical Bore hole log chart. **03**

c) Distinguish between disturbed and undisturbed soil samples. **03**

Q.3 Solve of the following questions.

a) Explain the different modes of shear failure with the help of neat sketches. **04**

b) Determine the depth at which a circular footing of 1.8 m diameter be installed to provide a factor of safety 3 to carry a safe load of 2000 KN. Soil has following properties. **05**
$C = 10\ kN/m^2\ \ \Phi = 30°\ \ \Upsilon = 18\ kN/m^3\ N_c = 37.2, N_q = 22.5\ \ N_\Upsilon = 19.7$

Q.4 Solve the following questions.

a) Write a note on standard penetration test and its corrections. **04**

b) A square footing of size 1.2 m × 1.2 m carries a load of 250 kN/ m^2 and immediate settlement under foundation is 25 mm. Calculate the immediate settlement of a footing of size 3 m × 3 m carrying a load of 200 kN/m^2? The subsoil conditions are identical in both the footings. take Iw = 0.62 and 0.84 for first and second footing respectively. **05**

Q.5 Solve of the following questions.

a) With neat sketches, explain different types of shallow foundations. **04**

b) Proportion of trapezoidal combined footing for two columns 350×350 mm carrying column loads of 1000 KN and 1400 KN. If the spacing between the columns is 4 m. Take the allowable soil pressure 280 kN/m^2 and length of the footing as 5 m. **05**

SECTION – II

Q.6 Solve the following questions.

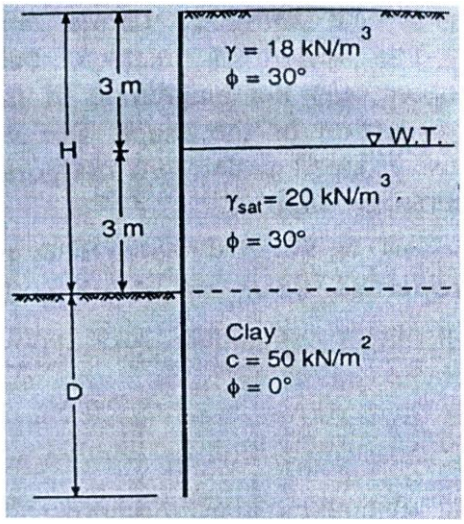
a) List and explain the classification of pile foundations based on functions and installation method. **05**

b) A group of 16 piles of 500 mm diameter is arranged with a centre to centre spacing of 1 m. The piles are 8 m long and are embedded in soft clay with cohesion of 40 kN/m^2.Bearing resistance neglected for piles. Take adhesion factor as 0.7. Determine the ultimate load capacity of pile group. **05**

Q.7 Solve the following questions.

a) Draw a neat sketch of well foundation and mention its parts. **04**

b) Compute the embedment length D for the sheet pile wall shown in fig. **05**



Q.8 Solve the following questions.

a) Explain the causes for a slope failure. **04**

b) Explain Swedish Circle method of stability analysis of slopes. **05**

Q.9 Solve the following questions.

a) Explain in detail applications of Geotextile in civil engineering. **04**

b) What is expansive soil. What are the precautions are to be taken before starting of construction in expansive soil? **05**

SLR-QH-260

Seat No.	

Set P

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Air and Noise Pollution and Control (CIVPEC - 02C)

Day & Date: Friday, 22-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) Radioactive element emission in the atmosphere causes _____ effects in human beings.
a) Carcinogenic b) Pulmonary
c) Allergic d) Genetic

2) _____ is commonly found carcinogenic indoor pollutant.
a) Ozone b) Radon
c) Both a) & b) d) Uranium

3) What is high pressure area with sinking air also known as?
a) Anti-cyclone b) Eddy zone
c) Cyclone d) Richardson zone

4) When Environmental Lapse Rate equals to Adiabatic Lapse Rate and both the lines coincide, the environment is called _____.
a) Neutral b) Unstable
c) Stable d) Calm

5) _____ prevents upward movement of air pollutants if it exists in atmosphere.
a) DALR b) Wind
c) Clouds d) An inversion

6) If stack is having cross sectional area of 5 sq.m. then no. of traverse points shall be equal to _____.
a) 4 b) 20
c) 12 d) 30

7) Which of the following greenhouse gas is contributed by cattle farming?
a) Nitrous oxide
b) Methane
c) Carbon Monoxide
d) CFC

8) In ESP particulates are separated by virtue of _____ action.
a) Gravitational
b) Electrostatic
c) Centrifugal
d) Diffusion

9) Cyclonic Scubber is a type of _____.
a) Stack monitoring kit
b) Dry collector
c) Wet collector
d) Bag house filter

10) Which of the following is the largest sink for carbon dioxide gas?
a) Oceans
b) Forests
c) Ice sheets
d) Grasslands

11) Concentration of pollutants in stack emissions can be measured by _____.
a) High volume sampler
b) Stack monitoring kit
c) Thermometer
d) Hygrometer

12) As per CPCB, the permissible nighttime noise limit in educational areas is _____.
a) 55 dB(A)
b) 65 dB(A)
c) 40 dB(A)
d) 85 dB(A)

13) Which of the following is a psychological effect of noise pollution?
a) Cancer
b) Asthma
c) Anxiety and stress
d) Diabetes

14) Prolonged exposure to high noise levels can lead to _____.
a) Improved hearing
b) Hearing loss
c) Enhanced concentration
d) Better sleep

Seat No.	

Set **P**

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Air and Noise Pollution and Control (CIVPEC - 02C)

Day & Date: Friday, 22-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) In section- I Q. No. 2 is compulsory and solve any two questions from the remaining. (Q. No. 3, 4 & 5)
2) In section- II Q. No. 6 is compulsory and solve any two questions from the remaining (Q. No. 7, 8, & 9)
3) Figures to the right indicates full marks.
4) Assume suitable data wherever needed & mention it clearly.

SECTION – I

Q.2 **a)** What are different zones of atmosphere? Explain with the help of neat graph. **05**

b) Explain the different sources of particulate matter. Illustrate with examples. **05**

Q.3 **a)** Explain the effects of SO_2 on man and plants. Give concentration values. **05**

b) What is meant by radiation inversion and subsidence inversion? Explain with sketch. **04**

Q.4 **a)** Give Gaussian dispersion model equation used for prediction of concentration of air pollutants. **04**

b) A factory uses 150000 litre of fuel oil per month. The exhaust gases from factory contain the following quantities of pollutant per ML per year: **05**

i) Particulate matter= 3 tonnes
ii) Sulphur dioxide= 59.7 tonnes
iii) Hydrocarbons= 0.37 tonnes
iv) Carbon monoxide= 0.5 tonnes. Determine the safe height of chimney required for safe dispersion of pollutants.

Q.5 **a)** Explain stack monitoring? Write in detail isokinetic sampling? **04**

b) A conventional cyclone with diameter 1 m handles 3m^3/sec of air carrying particles of density 2000 kg/m^3. Number of effective turns = 6. Determine cut size diameter (dpc) if $\mu = 1.80 \times 10^{-5}$kg/m.sec. (Note - treat it as a standard cyclone). **05**

SECTION – II

Q.6 **a)** Define air pollution index. Explain any one method of determining API with the help of illustrative example. **05**

b) A settling chamber is designed for removing 90 μ dia. Particles with 100% efficiency. The particulate matter density is 1200 kg/m^3. Depth and width of chamber is 2 m each. Determine: **05**

i) Length of chamber required without trays
ii) Length of chamber with 10 trays.

Q.7 **a)** An ESP with overall spacing of 0.23 cm and mean gas velocity 1.2 m/s has collector plate area of 6000 m^2 gives efficiency of 97% in treating 200 m3/s of gas. To achieve 98% and 99% efficiency. What should be plate area required? **05**

b) Explain the principle working of settling chamber. **04**

Q.8 **a)** Explain any two methods of controlling gaseous pollutants. **04**

b) Describe the impact of long-term exposure to high noise levels on children's learning and cognitive development. **05**

Q.9 Write short notes on following: **09**

a) Role of Noise Mapping and GIS in environmental noise assessment

b) Sources of noise

c) Instrumentation Requirements in noise

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Air and Noise Pollution and Control (CIVPEC - 02C)

Day & Date: Friday, 22-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) In ESP particulates are separated by virtue of _____ action.
a) Gravitational b) Electrostatic
c) Centrifugal d) Diffusion

2) Cyclonic Scubber is a type of _____.
a) Stack monitoring kit b) Dry collector
c) Wet collector d) Bag house filter

3) Which of the following is the largest sink for carbon dioxide gas?
a) Oceans b) Forests
c) Ice sheets d) Grasslands

4) Concentration of pollutants in stack emissions can be measured by _____.
a) High volume sampler b) Stack monitoring kit
c) Thermometer d) Hygrometer

5) As per CPCB, the permissible nighttime noise limit in educational areas is _____.
a) 55 dB(A) b) 65 dB(A)
c) 40 dB(A) d) 85 dB(A)

6) Which of the following is a psychological effect of noise pollution?
a) Cancer b) Asthma
c) Anxiety and stress d) Diabetes

7) Prolonged exposure to high noise levels can lead to _____.
a) Improved hearing b) Hearing loss
c) Enhanced concentration d) Better sleep

8) Radioactive element emission in the atmosphere causes _____ effects in human beings.

a) Carcinogenic
b) Pulmonary
c) Allergic
d) Genetic

9) _____ is commonly found carcinogenic indoor pollutant.

a) Ozone
b) Radon
c) Both a) & b)
d) Uranium

10) What is high pressure area with sinking air also known as?

a) Anti-cyclone
b) Eddy zone
c) Cyclone
d) Richardson zone

11) When Environmental Lapse Rate equals to Adiabatic Lapse Rate and both the lines coincide, the environment is called _____.

a) Neutral
b) Unstable
c) Stable
d) Calm

12) _____ prevents upward movement of air pollutants if it exists in atmosphere.

a) DALR
b) Wind
c) Clouds
d) An inversion

13) If stack is having cross sectional area of 5 sq.m. then no. of traverse points shall be equal to _____.

a) 4
b) 20
c) 12
d) 30

14) Which of the following greenhouse gas is contributed by cattle farming?

a) Nitrous oxide
b) Methane
c) Carbon Monoxide
d) CFC

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Air and Noise Pollution and Control (CIVPEC - 02C)

Day & Date: Friday, 22-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) In section- I Q. No. 2 is compulsory and solve any two questions from the remaining. (Q. No. 3, 4 & 5)
2) In section- II Q. No. 6 is compulsory and solve any two questions from the remaining (Q. No. 7, 8, & 9)
3) Figures to the right indicates full marks.
4) Assume suitable data wherever needed & mention it clearly.

SECTION – I

Q.2 **a)** What are different zones of atmosphere? Explain with the help of neat graph. **05**

b) Explain the different sources of particulate matter. Illustrate with examples. **05**

Q.3 **a)** Explain the effects of SO_2 on man and plants. Give concentration values. **05**

b) What is meant by radiation inversion and subsidence inversion? Explain with sketch. **04**

Q.4 **a)** Give Gaussian dispersion model equation used for prediction of concentration of air pollutants. **04**

b) A factory uses 150000 litre of fuel oil per month. The exhaust gases from factory contain the following quantities of pollutant per ML per year: **05**

i) Particulate matter= 3 tonnes
ii) Sulphur dioxide= 59.7 tonnes
iii) Hydrocarbons= 0.37 tonnes
iv) Carbon monoxide= 0.5 tonnes. Determine the safe height of chimney required for safe dispersion of pollutants.

Q.5 **a)** Explain stack monitoring? Write in detail isokinetic sampling? **04**

b) A conventional cyclone with diameter 1 m handles 3m^3/sec of air carrying particles of density 2000 kg/m^3. Number of effective turns = 6. Determine cut size diameter (dpc) if $\mu = 1.80 \times 10^{-5}$kg/m.sec. (Note - treat it as a standard cyclone). **05**

SECTION – II

Q.6 **a)** Define air pollution index. Explain any one method of determining API with the help of illustrative example. **05**

b) A settling chamber is designed for removing 90 μ dia. Particles with 100% efficiency. The particulate matter density is 1200 kg/m^3. Depth and width of chamber is 2 m each. Determine: **05**

i) Length of chamber required without trays
ii) Length of chamber with 10 trays.

Q.7 **a)** An ESP with overall spacing of 0.23 cm and mean gas velocity 1.2 m/s has collector plate area of 6000 m^2 gives efficiency of 97% in treating 200 m3/s of gas. To achieve 98% and 99% efficiency. What should be plate area required? **05**

b) Explain the principle working of settling chamber. **04**

Q.8 **a)** Explain any two methods of controlling gaseous pollutants. **04**

b) Describe the impact of long-term exposure to high noise levels on children's learning and cognitive development. **05**

Q.9 Write short notes on following: **09**

a) Role of Noise Mapping and GIS in environmental noise assessment

b) Sources of noise

c) Instrumentation Requirements in noise

SLR-QH-260

Seat No.	

Set R

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Air and Noise Pollution and Control (CIVPEC - 02C)

Day & Date: Friday, 22-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) Concentration of pollutants in stack emissions can be measured by _____.
a) High volume sampler b) Stack monitoring kit
c) Thermometer d) Hygrometer

2) As per CPCB, the permissible nighttime noise limit in educational areas is _____.
a) 55 dB(A) b) 65 dB(A)
c) 40 dB(A) d) 85 dB(A)

3) Which of the following is a psychological effect of noise pollution?
a) Cancer b) Asthma
c) Anxiety and stress d) Diabetes

4) Prolonged exposure to high noise levels can lead to _____.
a) Improved hearing b) Hearing loss
c) Enhanced concentration d) Better sleep

5) Radioactive element emission in the atmosphere causes _____ effects in human beings.
a) Carcinogenic b) Pulmonary
c) Allergic d) Genetic

6) _____ is commonly found carcinogenic indoor pollutant.
a) Ozone b) Radon
c) Both a) & b) d) Uranium

7) What is high pressure area with sinking air also known as?
a) Anti-cyclone b) Eddy zone
c) Cyclone d) Richardson zone

8) When Environmental Lapse Rate equals to Adiabatic Lapse Rate and both the lines coincide, the environment is called _____.

a) Neutral b) Unstable
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9) _____ prevents upward movement of air pollutants if it exists in atmosphere.

a) DALR b) Wind
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10) If stack is having cross sectional area of 5 sq.m. then no. of traverse points shall be equal to _____.

a) 4 b) 20
c) 12 d) 30

11) Which of the following greenhouse gas is contributed by cattle farming?

a) Nitrous oxide b) Methane
c) Carbon Monoxide d) CFC

12) In ESP particulates are separated by virtue of _____ action.

a) Gravitational b) Electrostatic
c) Centrifugal d) Diffusion

13) Cyclonic Scubber is a type of _____.

a) Stack monitoring kit b) Dry collector
c) Wet collector d) Bag house filter

14) Which of the following is the largest sink for carbon dioxide gas?

a) Oceans b) Forests
c) Ice sheets d) Grasslands

Seat No.	

Set **R**

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Air and Noise Pollution and Control (CIVPEC - 02C)

Day & Date: Friday, 22-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) In section- I Q. No. 2 is compulsory and solve any two questions from the remaining. (Q. No. 3, 4 & 5)
2) In section- II Q. No. 6 is compulsory and solve any two questions from the remaining (Q. No. 7, 8, & 9)
3) Figures to the right indicates full marks.
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SECTION – I

Q.2 **a)** What are different zones of atmosphere? Explain with the help of neat graph. **05**

b) Explain the different sources of particulate matter. Illustrate with examples. **05**

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b) A conventional cyclone with diameter 1 m handles $3m^3$/sec of air carrying particles of density 2000 kg/m^3. Number of effective turns = 6. Determine cut size diameter (dpc) if $\mu = 1.80 \times 10^{-5}$kg/m.sec. (Note - treat it as a standard cyclone). **05**

SECTION – II

Q.6 **a)** Define air pollution index. Explain any one method of determining API with the help of illustrative example. **05**

b) A settling chamber is designed for removing 90 μ dia. Particles with 100% efficiency. The particulate matter density is 1200 kg/m^3. Depth and width of chamber is 2 m each. Determine: **05**

i) Length of chamber required without trays

ii) Length of chamber with 10 trays.

Q.7 **a)** An ESP with overall spacing of 0.23 cm and mean gas velocity 1.2 m/s has collector plate area of 6000 m^2 gives efficiency of 97% in treating 200 m3/s of gas. To achieve 98% and 99% efficiency. What should be plate area required? **05**

b) Explain the principle working of settling chamber. **04**

Q.8 **a)** Explain any two methods of controlling gaseous pollutants. **04**

b) Describe the impact of long-term exposure to high noise levels on children's learning and cognitive development. **05**

Q.9 Write short notes on following: **09**

a) Role of Noise Mapping and GIS in environmental noise assessment

b) Sources of noise

c) Instrumentation Requirements in noise

Seat No.	

Set S

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Air and Noise Pollution and Control (CIVPEC - 02C)

Day & Date: Friday, 22-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark
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3) Figures to the right indicates full marks.
4) Assume suitable data wherever needed and mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) If stack is having cross sectional area of 5 sq.m. then no. of traverse points shall be equal to _____.
a) 4 b) 20
c) 12 d) 30

2) Which of the following greenhouse gas is contributed by cattle farming?
a) Nitrous oxide b) Methane
c) Carbon Monoxide d) CFC

3) In ESP particulates are separated by virtue of _____ action.
a) Gravitational b) Electrostatic
c) Centrifugal d) Diffusion

4) Cyclonic Scubber is a type of _____.
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c) Wet collector d) Bag house filter

5) Which of the following is the largest sink for carbon dioxide gas?
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6) Concentration of pollutants in stack emissions can be measured by _____.
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9) Prolonged exposure to high noise levels can lead to _____.
a) Improved hearing b) Hearing loss
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a) Anti-cyclone b) Eddy zone
c) Cyclone d) Richardson zone

13) When Environmental Lapse Rate equals to Adiabatic Lapse Rate and both the lines coincide, the environment is called _____.
a) Neutral b) Unstable
c) Stable d) Calm

14) _____ prevents upward movement of air pollutants if it exists in atmosphere.
a) DALR b) Wind
c) Clouds d) An inversion

Seat No.	

Set **S**

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Air and Noise Pollution and Control (CIVPEC - 02C)

Day & Date: Friday, 22-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) In section- I Q. No. 2 is compulsory and solve any two questions from the remaining. (Q. No. 3, 4 & 5)
2) In section- II Q. No. 6 is compulsory and solve any two questions from the remaining (Q. No. 7, 8, & 9)
3) Figures to the right indicates full marks.
4) Assume suitable data wherever needed & mention it clearly.

SECTION – I

Q.2 **a)** What are different zones of atmosphere? Explain with the help of neat graph. **05**

b) Explain the different sources of particulate matter. Illustrate with examples. **05**

Q.3 **a)** Explain the effects of SO_2 on man and plants. Give concentration values. **05**

b) What is meant by radiation inversion and subsidence inversion? Explain with sketch. **04**

Q.4 **a)** Give Gaussian dispersion model equation used for prediction of concentration of air pollutants. **04**

b) A factory uses 150000 litre of fuel oil per month. The exhaust gases from factory contain the following quantities of pollutant per ML per year: **05**

i) Particulate matter= 3 tonnes
ii) Sulphur dioxide= 59.7 tonnes
iii) Hydrocarbons= 0.37 tonnes
iv) Carbon monoxide= 0.5 tonnes. Determine the safe height of chimney required for safe dispersion of pollutants.

Q.5 **a)** Explain stack monitoring? Write in detail isokinetic sampling? **04**

b) A conventional cyclone with diameter 1 m handles 3m^3/sec of air carrying particles of density 2000 kg/m^3. Number of effective turns = 6. Determine cut size diameter (dpc) if $\mu = 1.80 \times 10^{-5}$kg/m.sec. (Note - treat it as a standard cyclone). **05**

SECTION – II

Q.6 **a)** Define air pollution index. Explain any one method of determining API with the help of illustrative example. **05**

b) A settling chamber is designed for removing 90 μ dia. Particles with 100% efficiency. The particulate matter density is 1200 kg/m^3. Depth and width of chamber is 2 m each. Determine: **05**

i) Length of chamber required without trays

ii) Length of chamber with 10 trays.

Q.7 **a)** An ESP with overall spacing of 0.23 cm and mean gas velocity 1.2 m/s has collector plate area of 6000 m^2 gives efficiency of 97% in treating 200 m3/s of gas. To achieve 98% and 99% efficiency. What should be plate area required? **05**

b) Explain the principle working of settling chamber. **04**

Q.8 **a)** Explain any two methods of controlling gaseous pollutants. **04**

b) Describe the impact of long-term exposure to high noise levels on children's learning and cognitive development. **05**

Q.9 **Write short notes on following:** **09**

a) Role of Noise Mapping and GIS in environmental noise assessment

b) Sources of noise

c) Instrumentation Requirements in noise

SLR-QH-262

Seat No.	

Set P

T.Y. (B.Tech.) (Civil Engineering) (Sem - II) (New) (CBCS)
Examination: March/April – 2026
Planning for Sustainable Development (CIVPEC - 03B)

Day & Date: Monday, 25-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Multiple Choice Questions. **14**

1) Sustainable development mainly aims at _____.
a) Industrial growth only
b) Economic profit only
c) Balancing present and future needs
d) Urban expansion

2) Environmental degradation directly affects _____.
a) Biodiversity only b) Poverty and quality of life
c) Industries only d) Technology only

3) One major principle of sustainable development is _____.
a) Unlimited consumption b) Intergenerational equity
c) Excessive industrialization d) Privatization

4) Resistance to sustainable development commonly occurs due to _____.
a) Economic interests b) Awareness
c) Education d) Research

5) Alternative approaches to sustainability include _____.
a) Green economy b) Circular economy
c) Eco-development d) All of the above

6) ICT in sustainable development helps in _____.
a) Resource monitoring
b) Communication and awareness
c) Smart management systems
d) All of the above

7) Innovation for sustainable development focuses on _____.
a) Environmental protection only
b) Economic growth only
c) Long-term sustainable solutions
d) None

8) Institutional theory mainly studies _____.
a) Natural resources
b) Social institutions and structures
c) Soil conservation
d) Marketing systems

9) Equity in sustainability means _____.
a) Equal industrial growth
b) Fair distribution of resources
c) Urbanization
d) Population growth

10) Governance for sustainable development requires _____.
a) Policy integration
b) Public participation
c) Accountability
d) All of the above

11) NITI Aayog is associated with _____.
a) Defense policy
b) Planning and policy development
c) Medical education
d) Banking regulation

12) MoEFCC stands for _____.
a) Ministry of Energy and Forest Climate Council
b) Ministry of Environment, Forest and Climate Change
c) Ministry of Ecology and Financial Climate Control
d) None

13) Research methods in sustainable development are used for _____.
a) Data analysis
b) Problem identification
c) Policy recommendations
d) All of the above

14) Capacity development for innovation mainly improves _____.
a) Technical and research skills
b) Pollution levels
c) Resource depletion
d) Deforestation

SLR-QH-262

Seat No.	

Set P

T.Y. (B.Tech.) (Civil Engineering) (Sem - II) (New) (CBCS)
Examination: March/April – 2026
Planning for Sustainable Development (CIVPEC - 03B)

Day & Date: Monday, 25-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever necessary and mention it clearly.
4) Use of non-programmable calculator is allowed.

Section – I

Q.2 Answer the following questions. **10**

a) Define sustainable development and explain its main principles.

b) Explain the role of ICT in promoting sustainable development.

Q.3 Answer any three of the following questions. **18**

a) Discuss the relationship between environmental degradation and poverty.

b) Explain the evolution of ideas related to sustainability.

c) Discuss strategies for promoting sustainable development.

d) Explain important current issues and debates related to sustainable development.

e) Describe innovation strategies used in environmental management.

SECTION – II

Q.4 Answer the following questions. **10**

a) Explain institutional theory and its role in sustainability.

b) Discuss governance for sustainable development.

Q.5 Answer any three of the following questions.

a) Explain societal transformations in sustainable development. **18**

b) Discuss equity and social justice in sustainability.

c) Explain policy responses to environmental degradation.

d) Describe the role of NITI Aayog and MoEFCC in sustainable development.

e) Explain research challenges and policy interventions in sustainable development.

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Civil Engineering) (Sem - II) (New) (CBCS)
Examination: March/April – 2026
Planning for Sustainable Development (CIVPEC - 03B)

Day & Date: Monday, 25-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Multiple Choice Questions. **14**

1) Institutional theory mainly studies _____.
a) Natural resources
b) Social institutions and structures
c) Soil conservation
d) Marketing systems

2) Equity in sustainability means _____.
a) Equal industrial growth b) Fair distribution of resources
c) Urbanization d) Population growth

3) Governance for sustainable development requires _____.
a) Policy integration b) Public participation
c) Accountability d) All of the above

4) NITI Aayog is associated with _____.
a) Defense policy
b) Planning and policy development
c) Medical education
d) Banking regulation

5) MoEFCC stands for _____.
a) Ministry of Energy and Forest Climate Council
b) Ministry of Environment, Forest and Climate Change
c) Ministry of Ecology and Financial Climate Control
d) None

6) Research methods in sustainable development are used for _____.
a) Data analysis b) Problem identification
c) Policy recommendations d) All of the above

7) Capacity development for innovation mainly improves _____.
a) Technical and research skills b) Pollution levels
c) Resource depletion d) Deforestation

8) Sustainable development mainly aims at _____.
a) Industrial growth only
b) Economic profit only
c) Balancing present and future needs
d) Urban expansion

9) Environmental degradation directly affects _____.
a) Biodiversity only b) Poverty and quality of life
c) Industries only d) Technology only

10) One major principle of sustainable development is _____.
a) Unlimited consumption b) Intergenerational equity
c) Excessive industrialization d) Privatization

11) Resistance to sustainable development commonly occurs due to _____.
a) Economic interests b) Awareness
c) Education d) Research

12) Alternative approaches to sustainability include _____.
a) Green economy b) Circular economy
c) Eco-development d) All of the above

13) ICT in sustainable development helps in _____.
a) Resource monitoring
b) Communication and awareness
c) Smart management systems
d) All of the above

14) Innovation for sustainable development focuses on _____.
a) Environmental protection only
b) Economic growth only
c) Long-term sustainable solutions
d) None

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Civil Engineering) (Sem - II) (New) (CBCS)
Examination: March/April – 2026
Planning for Sustainable Development (CIVPEC - 03B)

Day & Date: Monday, 25-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever necessary and mention it clearly.
4) Use of non-programmable calculator is allowed.

Section – I

Q.2 Answer the following questions. **10**

a) Define sustainable development and explain its main principles.

b) Explain the role of ICT in promoting sustainable development.

Q.3 Answer any three of the following questions. **18**

a) Discuss the relationship between environmental degradation and poverty.

b) Explain the evolution of ideas related to sustainability.

c) Discuss strategies for promoting sustainable development.

d) Explain important current issues and debates related to sustainable development.

e) Describe innovation strategies used in environmental management.

SECTION – II

Q.4 Answer the following questions. **10**

a) Explain institutional theory and its role in sustainability.

b) Discuss governance for sustainable development.

Q.5 Answer any three of the following questions.

a) Explain societal transformations in sustainable development. **18**

b) Discuss equity and social justice in sustainability.

c) Explain policy responses to environmental degradation.

d) Describe the role of NITI Aayog and MoEFCC in sustainable development.

e) Explain research challenges and policy interventions in sustainable development.

SLR-QH-262

Seat No.	

Set R

T.Y. (B.Tech.) (Civil Engineering) (Sem - II) (New) (CBCS)
Examination: March/April – 2026
Planning for Sustainable Development (CIVPEC - 03B)

Day & Date: Monday, 25-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Multiple Choice Questions. **14**

1) NITI Aayog is associated with _____.
a) Defense policy
b) Planning and policy development
c) Medical education
d) Banking regulation

2) MoEFCC stands for _____.
a) Ministry of Energy and Forest Climate Council
b) Ministry of Environment, Forest and Climate Change
c) Ministry of Ecology and Financial Climate Control
d) None

3) Research methods in sustainable development are used for _____.
a) Data analysis b) Problem identification
c) Policy recommendations d) All of the above

4) Capacity development for innovation mainly improves _____.
a) Technical and research skills b) Pollution levels
c) Resource depletion d) Deforestation

5) Sustainable development mainly aims at _____.
a) Industrial growth only
b) Economic profit only
c) Balancing present and future needs
d) Urban expansion

6) Environmental degradation directly affects _____.
a) Biodiversity only b) Poverty and quality of life
c) Industries only d) Technology only

7) One major principle of sustainable development is _____.
a) Unlimited consumption b) Intergenerational equity
c) Excessive industrialization d) Privatization

8) Resistance to sustainable development commonly occurs due to _____.
a) Economic interests b) Awareness
c) Education d) Research

9) Alternative approaches to sustainability include _____.
a) Green economy b) Circular economy
c) Eco-development d) All of the above

10) ICT in sustainable development helps in _____.
a) Resource monitoring
b) Communication and awareness
c) Smart management systems
d) All of the above

11) Innovation for sustainable development focuses on _____.
a) Environmental protection only
b) Economic growth only
c) Long-term sustainable solutions
d) None

12) Institutional theory mainly studies _____.
a) Natural resources
b) Social institutions and structures
c) Soil conservation
d) Marketing systems

13) Equity in sustainability means _____.
a) Equal industrial growth b) Fair distribution of resources
c) Urbanization d) Population growth

14) Governance for sustainable development requires _____.
a) Policy integration b) Public participation
c) Accountability d) All of the above

SLR-QH-262

Seat No.	

Set R

T.Y. (B.Tech.) (Civil Engineering) (Sem - II) (New) (CBCS)
Examination: March/April – 2026
Planning for Sustainable Development (CIVPEC - 03B)

Day & Date: Monday, 25-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever necessary and mention it clearly.
4) Use of non-programmable calculator is allowed.

Section – I

Q.2 Answer the following questions. **10**

a) Define sustainable development and explain its main principles.

b) Explain the role of ICT in promoting sustainable development.

Q.3 Answer any three of the following questions. **18**

a) Discuss the relationship between environmental degradation and poverty.

b) Explain the evolution of ideas related to sustainability.

c) Discuss strategies for promoting sustainable development.

d) Explain important current issues and debates related to sustainable development.

e) Describe innovation strategies used in environmental management.

SECTION – II

Q.4 Answer the following questions. **10**

a) Explain institutional theory and its role in sustainability.

b) Discuss governance for sustainable development.

Q.5 Answer any three of the following questions.

a) Explain societal transformations in sustainable development. **18**

b) Discuss equity and social justice in sustainability.

c) Explain policy responses to environmental degradation.

d) Describe the role of NITI Aayog and MoEFCC in sustainable development.

e) Explain research challenges and policy interventions in sustainable development.

Seat No.	

Set **S**

T.Y. (B.Tech.) (Civil Engineering) (Sem - II) (New) (CBCS)
Examination: March/April – 2026
Planning for Sustainable Development (CIVPEC - 03B)

Day & Date: Monday, 25-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Multiple Choice Questions. **14**

1) ICT in sustainable development helps in _____.
a) Resource monitoring
b) Communication and awareness
c) Smart management systems
d) All of the above

2) Innovation for sustainable development focuses on _____.
a) Environmental protection only
b) Economic growth only
c) Long-term sustainable solutions
d) None

3) Institutional theory mainly studies _____.
a) Natural resources
b) Social institutions and structures
c) Soil conservation
d) Marketing systems

4) Equity in sustainability means _____.
a) Equal industrial growth b) Fair distribution of resources
c) Urbanization d) Population growth

5) Governance for sustainable development requires _____.
a) Policy integration b) Public participation
c) Accountability d) All of the above

6) NITI Aayog is associated with _____.
a) Defense policy
b) Planning and policy development
c) Medical education
d) Banking regulation

7) MoEFCC stands for _____.
a) Ministry of Energy and Forest Climate Council
b) Ministry of Environment, Forest and Climate Change
c) Ministry of Ecology and Financial Climate Control
d) None

8) Research methods in sustainable development are used for _____.
a) Data analysis
b) Problem identification
c) Policy recommendations
d) All of the above

9) Capacity development for innovation mainly improves _____.
a) Technical and research skills
b) Pollution levels
c) Resource depletion
d) Deforestation

10) Sustainable development mainly aims at _____.
a) Industrial growth only
b) Economic profit only
c) Balancing present and future needs
d) Urban expansion

11) Environmental degradation directly affects _____.
a) Biodiversity only
b) Poverty and quality of life
c) Industries only
d) Technology only

12) One major principle of sustainable development is _____.
a) Unlimited consumption
b) Intergenerational equity
c) Excessive industrialization
d) Privatization

13) Resistance to sustainable development commonly occurs due to _____.
a) Economic interests
b) Awareness
c) Education
d) Research

14) Alternative approaches to sustainability include _____.
a) Green economy
b) Circular economy
c) Eco-development
d) All of the above

SLR-QH-262

Seat No.	

Set S

T.Y. (B.Tech.) (Civil Engineering) (Sem - II) (New) (CBCS)
Examination: March/April – 2026
Planning for Sustainable Development (CIVPEC - 03B)

Day & Date: Monday, 25-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever necessary and mention it clearly.
4) Use of non-programmable calculator is allowed.

Section – I

Q.2 Answer the following questions. **10**

a) Define sustainable development and explain its main principles.

b) Explain the role of ICT in promoting sustainable development.

Q.3 Answer any three of the following questions. **18**

a) Discuss the relationship between environmental degradation and poverty.

b) Explain the evolution of ideas related to sustainability.

c) Discuss strategies for promoting sustainable development.

d) Explain important current issues and debates related to sustainable development.

e) Describe innovation strategies used in environmental management.

SECTION – II

Q.4 Answer the following questions. **10**

a) Explain institutional theory and its role in sustainability.

b) Discuss governance for sustainable development.

Q.5 Answer any three of the following questions.

a) Explain societal transformations in sustainable development. **18**

b) Discuss equity and social justice in sustainability.

c) Explain policy responses to environmental degradation.

d) Describe the role of NITI Aayog and MoEFCC in sustainable development.

e) Explain research challenges and policy interventions in sustainable development.

SLR-QH-263

Seat No.	

Set P

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Earthquake Engineering (CIVPEC - 03C)

Day & Date: Monday, 25-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark
2) Don't forget to Mention question paper set (P/Q/R/S) on top on page.
3) Figures to the right indicates full marks.
4) Assume suitable data wherever needed and state them clearly.
5) Use of IS 1893(part-1): 2016 is permitted.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. (Each Two Marks) 14

1) The seismic wave which travels the fastest through the Earth?
a) Rayleigh's wave b) Secondary wave
c) Primary wave d) Love wave

2) In free undamped vibration, the amplitude of vibration _____.
a) Gradually decreases b) Gradually increases
c) Rapidly Becomes zero d) Remains constant

3) In a damped SDOF system under harmonic force, the steady-state response depends on _____.
a) Initial conditions
b) Frequency ratio and damping
c) Mass only
d) Time only

4) The magnification factor (dynamic amplification factor) represents _____.
a) Ratio of dynamic displacement to static displacement
b) Ratio of velocity to acceleration
c) Ratio of force to displacement
d) Ratio of mass to stiffness

5) In earthquake resistant design, the "strong column-weak beam" concept is used to _____.
a) Reduce building height
b) Ensure beams yield before columns
c) Increase column stiffness
d) Reduce foundation size

6) The base shear in a building due to earthquake depends on _____.

a) Seismic zone factor
b) Importance factor
c) Response reduction factor
d) All of the above

7) In earthquake resistant masonry construction, horizontal bands are provided to _____.

a) Increase building height
b) Reduce construction cost
c) Improve structural integrity and resistance
d) Increase dead load

Seat No.	

Set **P**

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Earthquake Engineering (CIVPEC - 03C)

Day & Date: Monday, 25-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 4 & Q. 6 are compulsory. Attempt any two questions from the remaining of each section.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever needed & mention it clearly.
4) Use of IS 1893(Part-I): 2016 is permitted.

SECTION – I

Q.2 Explain elastic rebound theory with neat sketches. **09**

Q.3 From first principle derive the governing differential equation for free vibration of undamped SDOF system. Obtain the general solution of this differential equation. Plot the graph if system is given initial displacement y_0. **09**

Q.4 Derive the governing differential equation of undamped forced vibration of a SDOF system subjected to harmonic loading. Also obtain the complete solution of differential equation and plot graph of magnification factor vs frequency ratio ‘r’. **10**

Q.5 Explain the concept of Duhamel’s integral for damped systems. Derive its expression. **09**

SECTION – II

Q.6 It is proposed to construct a R.C.C. four storied commercial building having plan dimensions as shown in Fig. 1 in zone III with following data. Determine the lateral forces and base shear. The all column sizes are 250 × 450 mm and beams sizes are 250 × 450 mm. The slab thickness is 140 mm and thickness of walls is 230 mm. The height of floor is 3.2 m and live load is 3.0 kN/m^2. IS 13920 will be used. The strata is hard. **10**

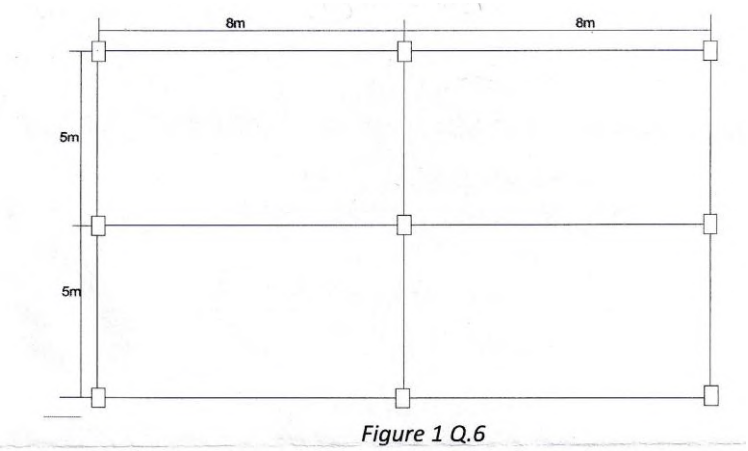

Figure 1 Q.6

Q.7 Explain the types of irregularities and their effects in the buildings during earthquakes? **09**

Q.8 Explain the strong column-weak beam concept. **09**

Q.9 Explain the importance of seismic bands in masonry structures. **09**

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Earthquake Engineering (CIVPEC - 03C)

Day & Date: Monday, 25-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark
2) Don't forget to Mention question paper set (P/Q/R/S) on top on page.
3) Figures to the right indicates full marks.
4) Assume suitable data wherever needed and state them clearly.
5) Use of IS 1893(part-1): 2016 is permitted.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. (Each Two Marks) 14

1) In earthquake resistant design, the "strong column-weak beam" concept is used to _____.
a) Reduce building height
b) Ensure beams yield before columns
c) Increase column stiffness
d) Reduce foundation size

2) The base shear in a building due to earthquake depends on _____.
a) Seismic zone factor b) Importance factor
c) Response reduction factor d) All of the above

3) In earthquake resistant masonry construction, horizontal bands are provided to _____.
a) Increase building height
b) Reduce construction cost
c) Improve structural integrity and resistance
d) Increase dead load

4) The seismic wave which travels the fastest through the Earth?
a) Rayleigh's wave b) Secondary wave
c) Primary wave d) Love wave

5) In free undamped vibration, the amplitude of vibration _____.
a) Gradually decreases b) Gradually increases
c) Rapidly Becomes zero d) Remains constant

6) In a damped SDOF system under harmonic force, the steady-state response depends on _____.

a) Initial conditions
b) Frequency ratio and damping
c) Mass only
d) Time only

7) The magnification factor (dynamic amplification factor) represents _____.

a) Ratio of dynamic displacement to static displacement
b) Ratio of velocity to acceleration
c) Ratio of force to displacement
d) Ratio of mass to stiffness

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Earthquake Engineering (CIVPEC - 03C)

Day & Date: Monday, 25-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 4 & Q. 6 are compulsory. Attempt any two questions from the remaining of each section.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever needed & mention it clearly.
4) Use of IS 1893(Part-I): 2016 is permitted.

SECTION – I

Q.2 Explain elastic rebound theory with neat sketches. **09**

Q.3 From first principle derive the governing differential equation for free vibration of undamped SDOF system. Obtain the general solution of this differential equation. Plot the graph if system is given initial displacement y_0. **09**

Q.4 Derive the governing differential equation of undamped forced vibration of a SDOF system subjected to harmonic loading. Also obtain the complete solution of differential equation and plot graph of magnification factor vs frequency ratio ‘r’. **10**

Q.5 Explain the concept of Duhamel’s integral for damped systems. Derive its expression. **09**

SECTION – II

Q.6 It is proposed to construct a R.C.C. four storied commercial building having plan dimensions as shown in Fig. 1 in zone III with following data. Determine the lateral forces and base shear. The all column sizes are 250 × 450 mm and beams sizes are 250 × 450 mm. The slab thickness is 140 mm and thickness of walls is 230 mm. The height of floor is 3.2 m and live load is 3.0 kN/m^2. IS 13920 will be used. The strata is hard. **10**

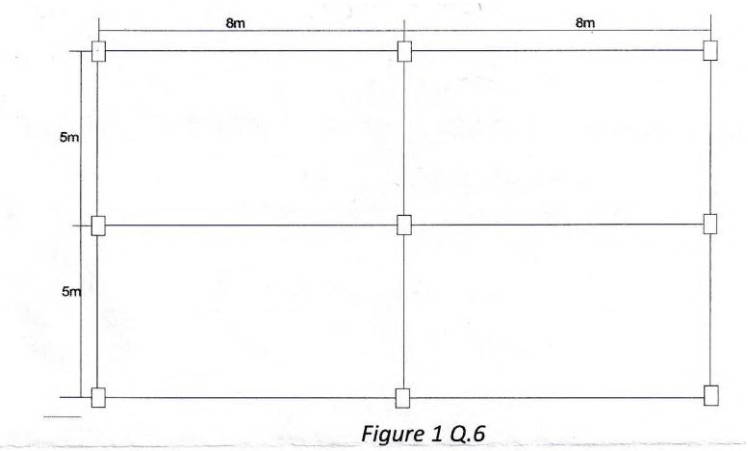

Figure 1 Q.6

Q.7 Explain the types of irregularities and their effects in the buildings during earthquakes? **09**

Q.8 Explain the strong column-weak beam concept. **09**

Q.9 Explain the importance of seismic bands in masonry structures. **09**

SLR-QH-263

Seat No.	

Set R

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Earthquake Engineering (CIVPEC - 03C)

Day & Date: Monday, 25-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark
2) Don't forget to Mention question paper set (P/Q/R/S) on top on page.
3) Figures to the right indicates full marks.
4) Assume suitable data wherever needed and state them clearly.
5) Use of IS 1893(part-1): 2016 is permitted.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. (Each Two Marks) 14

1) In a damped SDOF system under harmonic force, the steady-state response depends on _____.
a) Initial conditions
b) Frequency ratio and damping
c) Mass only
d) Time only

2) The magnification factor (dynamic amplification factor) represents _____.
a) Ratio of dynamic displacement to static displacement
b) Ratio of velocity to acceleration
c) Ratio of force to displacement
d) Ratio of mass to stiffness

3) In earthquake resistant design, the "strong column-weak beam" concept is used to _____.
a) Reduce building height
b) Ensure beams yield before columns
c) Increase column stiffness
d) Reduce foundation size

4) The base shear in a building due to earthquake depends on _____.
a) Seismic zone factor b) Importance factor
c) Response reduction factor d) All of the above

5) In earthquake resistant masonry construction, horizontal bands are provided to _____.

a) Increase building height
b) Reduce construction cost
c) Improve structural integrity and resistance
d) Increase dead load

6) The seismic wave which travels the fastest through the Earth?

a) Rayleigh's wave
b) Secondary wave
c) Primary wave
d) Love wave

7) In free undamped vibration, the amplitude of vibration _____.

a) Gradually decreases
b) Gradually increases
c) Rapidly Becomes zero
d) Remains constant

Seat No.	

Set **R**

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Earthquake Engineering (CIVPEC - 03C)

Day & Date: Monday, 25-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 4 & Q. 6 are compulsory. Attempt any two questions from the remaining of each section.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever needed & mention it clearly.
4) Use of IS 1893(Part-I): 2016 is permitted.

SECTION – I

Q.2 Explain elastic rebound theory with neat sketches. **09**

Q.3 From first principle derive the governing differential equation for free vibration of undamped SDOF system. Obtain the general solution of this differential equation. Plot the graph if system is given initial displacement y_0. **09**

Q.4 Derive the governing differential equation of undamped forced vibration of a SDOF system subjected to harmonic loading. Also obtain the complete solution of differential equation and plot graph of magnification factor vs frequency ratio ‘r’. **10**

Q.5 Explain the concept of Duhamel’s integral for damped systems. Derive its expression. **09**

SECTION – II

Q.6 It is proposed to construct a R.C.C. four storied commercial building having plan dimensions as shown in Fig. 1 in zone III with following data. Determine the lateral forces and base shear. The all column sizes are 250 × 450 mm and beams sizes are 250 × 450 mm. The slab thickness is 140 mm and thickness of walls is 230 mm. The height of floor is 3.2 m and live load is 3.0 kN/m^2. IS 13920 will be used. The strata is hard. **10**

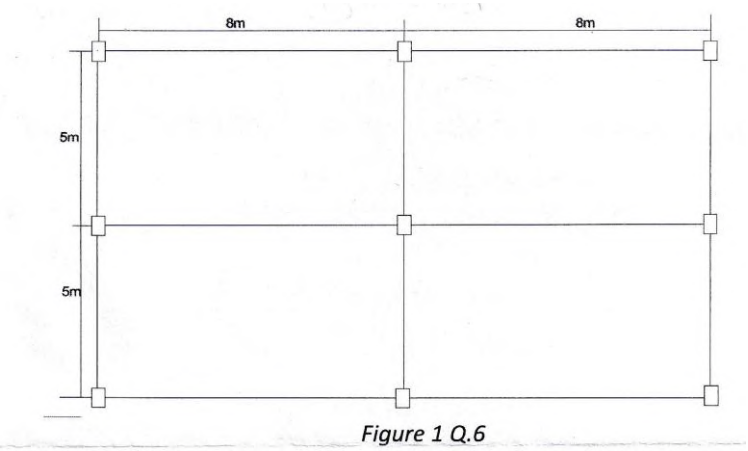

Figure 1 Q.6

Q.7 Explain the types of irregularities and their effects in the buildings during earthquakes? **09**

Q.8 Explain the strong column-weak beam concept. **09**

Q.9 Explain the importance of seismic bands in masonry structures. **09**

Seat No.	

Set **S**

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Earthquake Engineering (CIVPEC - 03C)

Day & Date: Monday, 25-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark
2) Don't forget to Mention question paper set (P/Q/R/S) on top on page.
3) Figures to the right indicates full marks.
4) Assume suitable data wherever needed and state them clearly.
5) Use of IS 1893(part-1): 2016 is permitted.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. (Each Two Marks) 14

1) In earthquake resistant masonry construction, horizontal bands are provided to _____.
a) Increase building height
b) Reduce construction cost
c) Improve structural integrity and resistance
d) Increase dead load

2) The seismic wave which travels the fastest through the Earth?
a) Rayleigh's wave b) Secondary wave
c) Primary wave d) Love wave

3) In free undamped vibration, the amplitude of vibration _____.
a) Gradually decreases b) Gradually increases
c) Rapidly Becomes zero d) Remains constant

4) In a damped SDOF system under harmonic force, the steady-state response depends on _____.
a) Initial conditions
b) Frequency ratio and damping
c) Mass only
d) Time only

5) The magnification factor (dynamic amplification factor) represents _____.
a) Ratio of dynamic displacement to static displacement
b) Ratio of velocity to acceleration
c) Ratio of force to displacement
d) Ratio of mass to stiffness

6) In earthquake resistant design, the “strong column-weak beam” concept is used to _____.

a) Reduce building height
b) Ensure beams yield before columns
c) Increase column stiffness
d) Reduce foundation size

7) The base shear in a building due to earthquake depends on _____.

a) Seismic zone factor
b) Importance factor
c) Response reduction factor
d) All of the above

Seat No.	

Set **S**

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Earthquake Engineering (CIVPEC - 03C)

Day & Date: Monday, 25-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 4 & Q. 6 are compulsory. Attempt any two questions from the remaining of each section.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever needed & mention it clearly.
4) Use of IS 1893(Part-I): 2016 is permitted.

SECTION – I

Q.2 Explain elastic rebound theory with neat sketches. **09**

Q.3 From first principle derive the governing differential equation for free vibration of undamped SDOF system. Obtain the general solution of this differential equation. Plot the graph if system is given initial displacement y_0. **09**

Q.4 Derive the governing differential equation of undamped forced vibration of a SDOF system subjected to harmonic loading. Also obtain the complete solution of differential equation and plot graph of magnification factor vs frequency ratio ‘r’. **10**

Q.5 Explain the concept of Duhamel’s integral for damped systems. Derive its expression. **09**

SECTION – II

Q.6 It is proposed to construct a R.C.C. four storied commercial building having plan dimensions as shown in Fig. 1 in zone III with following data. Determine the lateral forces and base shear. The all column sizes are 250 × 450 mm and beams sizes are 250 × 450 mm. The slab thickness is 140 mm and thickness of walls is 230 mm. The height of floor is 3.2 m and live load is 3.0 kN/m^2. IS 13920 will be used. The strata is hard. **10**

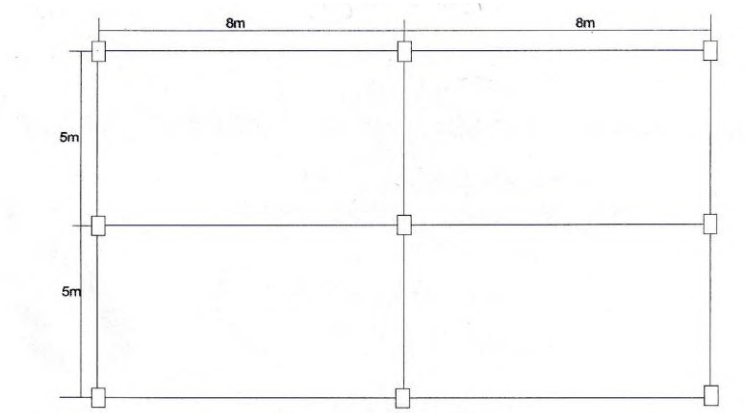

Figure 1 Q.6

Q.7 Explain the types of irregularities and their effects in the buildings during earthquakes? **09**

Q.8 Explain the strong column-weak beam concept. **09**

Q.9 Explain the importance of seismic bands in masonry structures. **09**

SLR-QH-264

Seat No.	

Set P

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Honors in Innovation and Design Engineering (Stage - I)
Civil Engineering System Analysis and Design (CIVHON-04A)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Solve following Multiple Choice Questions. **14**

1) Which of the following is the stakeholder of system?
a) Users b) Community
c) System Owner d) All

2) _____ models are that use the mathematics of decision making to choose a course of action, design or policy.
a) Prescriptive b) Descriptive
c) Analog d) Real

3) A _____ may be defined as deficiency, an unfulfilled requirement, lack of product that is necessary.
a) Supply b) Need
c) None d) All of these

4) Which of the following is not property desired MOE?
a) Appropriateness b) Measurability
c) Realistic d) Cost Saving

5) In _____ design, analysis & evaluation of alternative designs is done in details.
a) Conceptual b) Preliminary
c) Detailed d) None

6) _____ is termed as performance measure, simply an objective that stated in measurable terms.
a) Measure of Effectiveness b) Dimension
c) Planning d) None

7) The super systems are _____.
a) Higher level systems b) Lower level systems
c) Both d) None of these

8) _____ provides basis for predicting the need for proposed civil system.
a) Planning b) Need Assessment
c) Controlling d) None

9) Which of the following is tool for task of description?
a) Probability b) Statistics
c) Economics d) All of the above

10) From _____ perspective, the system inputs considered in system planning could have short term, moderate term & long term effects.
a) Temporal b) Operational
c) Phase d) None

11) Which of the following is classification of design?
a) Selection Design b) Configuration Design
c) Both of the above d) None of the above

12) _____ Models describe the amount of money needed to undertake specific action.
a) Demand b) Cost
c) Real d) Sup

13) _____ is set of components that work together for overall objectives.
a) System b) Goals
c) Objective d) None of these

14) In Preliminary Design, analysis & evaluation of design is done on _____ stage.
a) Detailed b) Conceptual
c) Multiple d) Preliminary

Seat No.	

Set | P

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Honors in Innovation and Design Engineering (Stage - I)
Civil Engineering System Analysis and Design (CIVHON-04A)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever needed and mention it clearly.
4) Use of non-programmable calculator is allowed.

Section – I

Q.2 Solve the following. (Any Four) **28**

a) Explain development of civil engineering system.

b) Explain concept of dimensions of MOEs.

c) Classify different models with examples.

d) Discuss the importance of system analysis in civil engineering with examples.

e) Explain hierarchy of desired outcomes: Values, Goals, and Objectives.

f) What are the phases of system development?

Section – II

Q.3 Solve the following. (Any Four) **28**

a) Explain the engineering design process in detail with sketches.

b) Describe the engineering design process in brief.

c) Explain Initial vs Recurring needs & Growing vs Sudden needs.

d) Explain classification of engineering design with examples.

e) Explain four planning levels in civil systems planning.

f) Explain application of system design.

SLR-QH-264

Seat No.	

Set Q

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Honors in Innovation and Design Engineering (Stage - I)
Civil Engineering System Analysis and Design (CIVHON-04A)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Solve following Multiple Choice Questions. **14**

1) _____ provides basis for predicting the need for proposed civil system.
a) Planning b) Need Assessment
c) Controlling d) None

2) Which of the following is tool for task of description?
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c) Objective d) None of these

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a) Detailed b) Conceptual
c) Multiple d) Preliminary

8) Which of the following is the stakeholder of system?
a) Users b) Community
c) System Owner d) All

9) _____ models are that use the mathematics of decision making to choose a course of action, design or policy.
a) Prescriptive b) Descriptive
c) Analog d) Real

10) A _____ may be defined as deficiency, an unfulfilled requirement, lack of product that is necessary.
a) Supply b) Need
c) None d) All of these

11) Which of the following is not property desired MOE?
a) Appropriateness b) Measurability
c) Realistic d) Cost Saving

12) In _____ design, analysis & evaluation of alternative designs is done in details.
a) Conceptual b) Preliminary
c) Detailed d) None

13) _____ is termed as performance measure, simply an objective that stated in measurable terms.
a) Measure of Effectiveness b) Dimension
c) Planning d) None

14) The super systems are _____.
a) Higher level systems b) Lower level systems
c) Both d) None of these

SLR-QH-264

Seat No.	

Set Q

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Honors in Innovation and Design Engineering (Stage - I)
Civil Engineering System Analysis and Design (CIVHON-04A)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever needed and mention it clearly.
4) Use of non-programmable calculator is allowed.

Section – I

Q.2 Solve the following. (Any Four) **28**

a) Explain development of civil engineering system.

b) Explain concept of dimensions of MOEs.

c) Classify different models with examples.

d) Discuss the importance of system analysis in civil engineering with examples.

e) Explain hierarchy of desired outcomes: Values, Goals, and Objectives.

f) What are the phases of system development?

Section – II

Q.3 Solve the following. (Any Four) **28**

a) Explain the engineering design process in detail with sketches.

b) Describe the engineering design process in brief.

c) Explain Initial vs Recurring needs & Growing vs Sudden needs.

d) Explain classification of engineering design with examples.

e) Explain four planning levels in civil systems planning.

f) Explain application of system design.

Seat No.	

Set R

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Honors in Innovation and Design Engineering (Stage - I)
Civil Engineering System Analysis and Design (CIVHON-04A)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Solve following Multiple Choice Questions. **14**

1) Which of the following is classification of design?
a) Selection Design b) Configuration Design
c) Both of the above d) None of the above

2) _____ Models describe the amount of money needed to undertake specific action.
a) Demand b) Cost
c) Real d) Sup

3) _____ is set of components that work together for overall objectives.
a) System b) Goals
c) Objective d) None of these

4) In Preliminary Design, analysis & evaluation of design is done on _____ stage.
a) Detailed b) Conceptual
c) Multiple d) Preliminary

5) Which of the following is the stakeholder of system?
a) Users b) Community
c) System Owner d) All

6) _____ models are that use the mathematics of decision making to choose a course of action, design or policy.
a) Prescriptive b) Descriptive
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7) A _____ may be defined as deficiency, an unfulfilled requirement, lack of product that is necessary.

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9) In _____ design, analysis & evaluation of alternative designs is done in details.

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a) Measure of Effectiveness b) Dimension
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12) _____ provides basis for predicting the need for proposed civil system.

a) Planning b) Need Assessment
c) Controlling d) None

13) Which of the following is tool for task of description?

a) Probability b) Statistics
c) Economics d) All of the above

14) From _____ perspective, the system inputs considered in system planning could have short term, moderate term & long term effects.

a) Temporal b) Operational
c) Phase d) None

Seat No.	

Set **R**

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Honors in Innovation and Design Engineering (Stage - I)
Civil Engineering System Analysis and Design (CIVHON-04A)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever needed and mention it clearly.
4) Use of non-programmable calculator is allowed.

Section – I

Q.2 Solve the following. (Any Four) **28**

a) Explain development of civil engineering system.

b) Explain concept of dimensions of MOEs.

c) Classify different models with examples.

d) Discuss the importance of system analysis in civil engineering with examples.

e) Explain hierarchy of desired outcomes: Values, Goals, and Objectives.

f) What are the phases of system development?

Section – II

Q.3 Solve the following. (Any Four) **28**

a) Explain the engineering design process in detail with sketches.

b) Describe the engineering design process in brief.

c) Explain Initial vs Recurring needs & Growing vs Sudden needs.

d) Explain classification of engineering design with examples.

e) Explain four planning levels in civil systems planning.

f) Explain application of system design.

SLR-QH-264

Seat No.	

Set S

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Honors in Innovation and Design Engineering (Stage - I)
Civil Engineering System Analysis and Design (CIVHON-04A)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Solve following Multiple Choice Questions. **14**

1) _____ is termed as performance measure, simply an objective that stated in measurable terms.
a) Measure of Effectiveness b) Dimension
c) Planning d) None

2) The super systems are _____.
a) Higher level systems b) Lower level systems
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SLR-QH-264

Seat No.	

Set S

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Honors in Innovation and Design Engineering (Stage - I)
Civil Engineering System Analysis and Design (CIVHON-04A)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever needed and mention it clearly.
4) Use of non-programmable calculator is allowed.

Section – I

Q.2 Solve the following. (Any Four) **28**

a) Explain development of civil engineering system.

b) Explain concept of dimensions of MOEs.

c) Classify different models with examples.

d) Discuss the importance of system analysis in civil engineering with examples.

e) Explain hierarchy of desired outcomes: Values, Goals, and Objectives.

f) What are the phases of system development?

Section – II

Q.3 Solve the following. (Any Four) **28**

a) Explain the engineering design process in detail with sketches.

b) Describe the engineering design process in brief.

c) Explain Initial vs Recurring needs & Growing vs Sudden needs.

d) Explain classification of engineering design with examples.

e) Explain four planning levels in civil systems planning.

f) Explain application of system design.

Seat No.	

Set P

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Honors in Infrastructure Engineering (Stage – I)
Bridge and Grade Separated Structures (CIVHON-04B)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) Pipe jacking involves moving _____ to the ground.
a) Box b) Pipe
c) Both a) and b) d) All of these

2) Launching girders for bridges involves the following steps _____.
a) Planning and Design b) Fabrication
c) Transportation to the Site d) All of these

3) Types of Bridge Bearings are _____.
a) Fixed Bearings b) Elastomeric Bearings
c) Pot Bearings d) All of these

4) Types of grade separated structures are _____.
a) Overpass b) Under pass
c) Flyover d) All of these

5) Abutment of Bridge is _____.
a) Foundation b) End pier
c) Bearing d) All of these

6) Steps involved in the Construction of Diaphragm Walls are _____.
- a) Excavation Preparation
- b) Slurry Trench
- c) Concrete Pouring
- d) All of these

7) Types of Bridge foundations are _____.
- a) Caisson Foundation
- b) Pile foundation
- c) Pier Foundation
- d) All of these

8) Ground improvement techniques are _____.
- a) Compaction
- b) Grouting
- c) Deep Soil Mixing
- d) All of these

9) _____ basic things you should wear to work site.
- a) Helmet, mask, boots, and the best clothes you have
- b) Helmet, mask, sandals, and casual clothes
- c) Helmet, mask, boots, and casual clothes
- d) None of these

10) Material handling is _____.
- a) Process of change of material
- b) Process of transporting, lifting, and placing various construction materials and equipment.
- c) Process of finding Quality of Construction Material.
- d) Process of finding Quantity of Construction Material.

11) Embankment construction refers to the _____.
- a) Process of Site Investigation
- b) Process of building raised structures made of compacted earth, rock, or other materials
- c) Process of Earthwork
- d) Process of Quality Control

12) According to straight line method of providing depreciation, the amount of depreciation _____.
- a) Remains constant each year
- b) Increase each year
- c) Decrease each year
- d) None of them

13) The main function of retaining walls at hill side is to _____.

a) Stabilize hillside
b) Control erosion
c) Reduce the grades of road
d) All are correct

14) _____ is the basis for PERT analysis.

a) An optimistic time
b) A pessimistic period of time
c) The date that is most likely
d) All options mentioned above

Seat No.	

Set **P**

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026

Honors in Infrastructure Engineering (Stage – I)
Bridge and Grade Separated Structures (CIVHON-04B)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicates full marks.
3) Assume suitable data if necessary and mention it clearly.
4) Draw neat sketches wherever necessary.

SECTION – I

Q.2 Attempt Any Two. **14**

a) Explain Hydraulic requirements of Bridge.

b) Explain various basic elements of Bridge.

c) Enlist and explain various types of *'Piling Techniques'.*

Q.3 Attempt Any Two. **14**

a) Discuss on process of 'Dewatering' in construction of bridge structure.

b) Explain, *'Strengthening of bridges'* in detail.

c) Enlist and explain various types of bearings used in bridges.

SECTION – II

Q.4 Attempt Any Two. **14**

a) Explain the Factors affecting selection of equipment and methods.

b) Explain various types of Ground Improvement Techniques in details.

c) Discuss on methods of calculation of depreciation cost of construction equipment.

Q.5 Attempt Any Two. **14**

a) Explain the concept of Maintenance management in construction projects.

b) The following table shows the list of activities and their Durations.
Calculate the project duration and critical path of the network.

Activity	Duration	Depends on
A	3	-
B	5	A
C	3	A
D	6	B,C
E	7	B
F	3	D,E

c) Enlist and explain various types of software available in project management.

Seat No.	

Set Q

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Honors in Infrastructure Engineering (Stage – I)
Bridge and Grade Separated Structures (CIVHON-04B)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) Ground improvement techniques are _____.
a) Compaction b) Grouting
c) Deep Soil Mixing d) All of these

2) _____ basic things you should wear to work site.
a) Helmet, mask, boots, and the best clothes you have
b) Helmet, mask, sandals, and casual clothes
c) Helmet, mask, boots, and casual clothes
d) None of these

3) Material handling is _____.
a) Process of change of material
b) Process of transporting, lifting, and placing various construction materials and equipment.
c) Process of finding Quality of Construction Material.
d) Process of finding Quantity of Construction Material.

4) Embankment construction refers to the _____.
   a) Process of Site Investigation
   b) Process of building raised structures made of compacted earth, rock, or other materials
   c) Process of Earthwork
   d) Process of Quality Control

5) According to straight line method of providing depreciation, the amount of depreciation _____.
   a) Remains constant each year
   b) Increase each year
   c) Decrease each year
   d) None of them

6) The main function of retaining walls at hill side is to _____.
   a) Stabilize hillside b) Control erosion
   c) Reduce the grades of road d) All are correct

7) _____ is the basis for PERT analysis.
   a) An optimistic time
   b) A pessimistic period of time
   c) The date that is most likely
   d) All options mentioned above

8) Pipe jacking involves moving _____ to the ground.
   a) Box b) Pipe
   c) Both a) and b) d) All of these

9) Launching girders for bridges involves the following steps _____.
   a) Planning and Design b) Fabrication
   c) Transportation to the Site d) All of these

10) Types of Bridge Bearings are _____.
   a) Fixed Bearings b) Elastomeric Bearings
   c) Pot Bearings d) All of these

11) Types of grade separated structures are _____.
   a) Overpass b) Under pass
   c) Flyover d) All of these

12) Abutment of Bridge is _____. ____

a) Foundation b) End pier
c) Bearing d) All of these

13) Steps involved in the Construction of Diaphragm Walls are _____.

a) Excavation Preparation b) Slurry Trench
c) Concrete Pouring d) All of these

14) Types of Bridge foundations are _____.

a) Caisson Foundation b) Pile foundation
c) Pier Foundation d) All of these

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026

Honors in Infrastructure Engineering (Stage – I)
Bridge and Grade Separated Structures (CIVHON-04B)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicates full marks.
3) Assume suitable data if necessary and mention it clearly.
4) Draw neat sketches wherever necessary.

SECTION – I

Q.2 Attempt Any Two. **14**

a) Explain Hydraulic requirements of Bridge.

b) Explain various basic elements of Bridge.

c) Enlist and explain various types of *'Piling Techniques'.*

Q.3 Attempt Any Two. **14**

a) Discuss on process of 'Dewatering' in construction of bridge structure.

b) Explain, *'Strengthening of bridges'* in detail.

c) Enlist and explain various types of bearings used in bridges.

SECTION – II

Q.4 Attempt Any Two. **14**

a) Explain the Factors affecting selection of equipment and methods.

b) Explain various types of Ground Improvement Techniques in details.

c) Discuss on methods of calculation of depreciation cost of construction equipment.

Q.5 Attempt Any Two. **14**

a) Explain the concept of Maintenance management in construction projects.

b) The following table shows the list of activities and their Durations.
Calculate the project duration and critical path of the network.

Activity	Duration	Depends on
A	3	-
B	5	A
C	3	A
D	6	B,C
E	7	B
F	3	D,E

c) Enlist and explain various types of software available in project management.

Seat No.	

Set R

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Honors in Infrastructure Engineering (Stage – I)
Bridge and Grade Separated Structures (CIVHON-04B)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) Embankment construction refers to the _____.
a) Process of Site Investigation
b) Process of building raised structures made of compacted earth, rock, or other materials
c) Process of Earthwork
d) Process of Quality Control

2) According to straight line method of providing depreciation, the amount of depreciation _____.
a) Remains constant each year
b) Increase each year
c) Decrease each year
d) None of them

3) The main function of retaining walls at hill side is to _____.
a) Stabilize hillside b) Control erosion
c) Reduce the grades of road d) All are correct

4) _____ is the basis for PERT analysis.
- a) An optimistic time
- b) A pessimistic period of time
- c) The date that is most likely
- d) All options mentioned above

5) Pipe jacking involves moving _____ to the ground.
- a) Box
- b) Pipe
- c) Both a) and b)
- d) All of these

6) Launching girders for bridges involves the following steps _____.
- a) Planning and Design
- b) Fabrication
- c) Transportation to the Site
- d) All of these

7) Types of Bridge Bearings are _____.
- a) Fixed Bearings
- b) Elastomeric Bearings
- c) Pot Bearings
- d) All of these

8) Types of grade separated structures are _____.
- a) Overpass
- b) Under pass
- c) Flyover
- d) All of these

9) Abutment of Bridge is _____.
- a) Foundation
- b) End pier
- c) Bearing
- d) All of these

____

10) Steps involved in the Construction of Diaphragm Walls are _____.
- a) Excavation Preparation
- b) Slurry Trench
- c) Concrete Pouring
- d) All of these

11) Types of Bridge foundations are _____.
- a) Caisson Foundation
- b) Pile foundation
- c) Pier Foundation
- d) All of these

12) Ground improvement techniques are _____.
- a) Compaction
- b) Grouting
- c) Deep Soil Mixing
- d) All of these

13) _____ basic things you should wear to work site.

a) Helmet, mask, boots, and the best clothes you have
b) Helmet, mask, sandals, and casual clothes
c) Helmet, mask, boots, and casual clothes
d) None of these

14) Material handling is _____.

a) Process of change of material
b) Process of transporting, lifting, and placing various construction materials and equipment.
c) Process of finding Quality of Construction Material.
d) Process of finding Quantity of Construction Material.

Seat No.	

Set **R**

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026

Honors in Infrastructure Engineering (Stage – I)
Bridge and Grade Separated Structures (CIVHON-04B)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicates full marks.
3) Assume suitable data if necessary and mention it clearly.
4) Draw neat sketches wherever necessary.

SECTION – I

Q.2 Attempt Any Two. **14**

a) Explain Hydraulic requirements of Bridge.

b) Explain various basic elements of Bridge.

c) Enlist and explain various types of *'Piling Techniques'.*

Q.3 Attempt Any Two. **14**

a) Discuss on process of 'Dewatering' in construction of bridge structure.

b) Explain, *'Strengthening of bridges'* in detail.

c) Enlist and explain various types of bearings used in bridges.

SECTION – II

Q.4 Attempt Any Two. **14**

a) Explain the Factors affecting selection of equipment and methods.

b) Explain various types of Ground Improvement Techniques in details.

c) Discuss on methods of calculation of depreciation cost of construction equipment.

Q.5 Attempt Any Two. **14**

a) Explain the concept of Maintenance management in construction projects.

b) The following table shows the list of activities and their Durations.
Calculate the project duration and critical path of the network.

Activity	Duration	Depends on
A	3	-
B	5	A
C	3	A
D	6	B,C
E	7	B
F	3	D,E

c) Enlist and explain various types of software available in project management.

Seat No.	

Set | **S**

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Honors in Infrastructure Engineering (Stage – I)
Bridge and Grade Separated Structures (CIVHON-04B)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) Steps involved in the Construction of Diaphragm Walls are _____.
a) Excavation Preparation b) Slurry Trench
c) Concrete Pouring d) All of these

2) Types of Bridge foundations are _____.
a) Caisson Foundation b) Pile foundation
c) Pier Foundation d) All of these

3) Ground improvement techniques are _____.
a) Compaction b) Grouting
c) Deep Soil Mixing d) All of these

4) _____ basic things you should wear to work site.
a) Helmet, mask, boots, and the best clothes you have
b) Helmet, mask, sandals, and casual clothes
c) Helmet, mask, boots, and casual clothes
d) None of these

5) Material handling is _____.
   a) Process of change of material
   b) Process of transporting, lifting, and placing various construction materials and equipment.
   c) Process of finding Quality of Construction Material.
   d) Process of finding Quantity of Construction Material.

6) Embankment construction refers to the _____.
   a) Process of Site Investigation
   b) Process of building raised structures made of compacted earth, rock, or other materials
   c) Process of Earthwork
   d) Process of Quality Control

7) According to straight line method of providing depreciation, the amount of depreciation _____.
   a) Remains constant each year
   b) Increase each year
   c) Decrease each year
   d) None of them

8) The main function of retaining walls at hill side is to _____.
   a) Stabilize hillside
   b) Control erosion
   c) Reduce the grades of road
   d) All are correct

9) _____ is the basis for PERT analysis.
   a) An optimistic time
   b) A pessimistic period of time
   c) The date that is most likely
   d) All options mentioned above

10) Pipe jacking involves moving _____ to the ground.
   a) Box
   b) Pipe
   c) Both a) and b)
   d) All of these

11) Launching girders for bridges involves the following steps _____.
   a) Planning and Design
   b) Fabrication
   c) Transportation to the Site
   d) All of these

12) Types of Bridge Bearings are _____.

a) Fixed Bearings
b) Elastomeric Bearings
c) Pot Bearings
d) All of these

13) Types of grade separated structures are _____.

a) Overpass
b) Under pass
c) Flyover
d) All of these

14) Abutment of Bridge is _____.

a) Foundation
b) End pier
c) Bearing
d) All of these

____

Seat No.	

Set **S**

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026

Honors in Infrastructure Engineering (Stage – I)
Bridge and Grade Separated Structures (CIVHON-04B)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicates full marks.
3) Assume suitable data if necessary and mention it clearly.
4) Draw neat sketches wherever necessary.

SECTION – I

Q.2 Attempt Any Two. **14**

a) Explain Hydraulic requirements of Bridge.

b) Explain various basic elements of Bridge.

c) Enlist and explain various types of *'Piling Techniques'.*

Q.3 Attempt Any Two. **14**

a) Discuss on process of 'Dewatering' in construction of bridge structure.

b) Explain, *'Strengthening of bridges'* in detail.

c) Enlist and explain various types of bearings used in bridges.

SECTION – II

Q.4 Attempt Any Two. **14**

a) Explain the Factors affecting selection of equipment and methods.

b) Explain various types of Ground Improvement Techniques in details.

c) Discuss on methods of calculation of depreciation cost of construction equipment.

Q.5 Attempt Any Two. **14**

a) Explain the concept of Maintenance management in construction projects.

b) The following table shows the list of activities and their Durations.
Calculate the project duration and critical path of the network.

Activity	Duration	Depends on
A	3	-
B	5	A
C	3	A
D	6	B,C
E	7	B
F	3	D,E

c) Enlist and explain various types of software available in project management.

SLR-QH-267

Seat No.	

Set P

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Honors in Railway Infrastructure (Stage - I)
High Speed Railway Infrastructure (CIVHON-04D)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) As per UIC, high-speed rail on new lines generally operates above ____.
a) 160 km/h b) 200 km/h
c) 250 km/h d) 300 km/h

2) The main limitation of High Speed Rail is _____.
a) Low capacity b) High initial capital cost
c) Low safety d) Slow travel

3) Standard gauge adopted for Mumbai-Ahmedabad HSR corridor is _____.
a) 1676 mm b) 1520 mm
c) 1435 mm d) 1000 mm

4) Cant deficiency occurs when _____.
a) Provided cant > equilibrium cant
b) Provided cant < equilibrium cant
c) Cant = zero
d) Train is stationary

5) Level crossings in High Speed Rail are _____.
a) Allowed b) Restricted
c) Completely eliminated d) Temporary

6) Rail pads are provided to _____.
a) Increase speed b) Provide elasticity
c) Reduce track width d) Increase cant

7) Ballastless track is also known as _____.
a) Loose track b) Slab track
c) Mixed track d) Flexible track

8) Geotextiles are mainly used for _____.
a) Increasing friction b) Separation and filtration
c) Decoration d) Reducing cant

9) Track tolerances for high-speed routes are _____.
a) Same as conventional b) More relaxed
c) Much stricter d) Not required

10) Ballast cleaning improves _____.
a) Signaling b) Drainage and stability
c) Station design d) Ticket booking

11) High Speed Recording Car is used to measure _____.
a) Passenger count b) Track geometry
c) Ticket rates d) Platform height

12) WINALC system is used for _____.
a) Train scheduling b) Guiding tamping machines
c) Signaling d) Electrification

13) Selection of HSR system depends mainly on _____.
a) Political factors only
b) Passenger demand and terrain
c) Train color
d) Station type

14) Transition curve is provided to _____.
a) Increase curvature
b) Gradually introduce curvature and cant
c) Reduce speed
d) Eliminate gradient

SLR-QH-267

Seat No.	

Set P

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Honors in Railway Infrastructure (Stage - I)
High Speed Railway Infrastructure (CIVHON-04D)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Solve any two main questions from section-I and any two main questions from Section-II.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary and state it clearly.

SECTION – I

Q.2 Solve the following questions. **14**

a) Define High Speed Rail as per International Union of Railways (UIC) and explain the classification criteria of High Speed systems.

b) Discuss the need for High Speed Rail corridors in India with reference to the Mumbai-Ahmedabad corridor feasibility study.

Q.3 Solve the following questions. **14**

a) Explain track gauge, cant, cant deficiency and cant excess in High Speed Rail design.

b) Discuss transition curves and superelevation ramps for High Speed tracks.

Q.4 Solve the following questions. **14**

a) Explain the design considerations for tunnels and bridges in High Speed Rail systems.

b) Describe rails, sleepers, fastening systems and stiffness requirements of High Speed track.

SECTION – II

Q.5 Solve the following questions. **14**

a) Compare ballast track and ballastless (slab) track used in High Speed Rail.

b) Discuss operating conditions and special features of High Speed rolling stock.

Q.6 Solve the following questions. **14**

a) Explain the life cycle of High Speed track components and importance of life cycle costing.

b) Discuss standard track tolerances and danger limits for High Speed Rail on standard gauge.

Q.7 Solve the following questions. **14**

a) Explain track geometry measurement through transfer function for High Speed track.

b) Describe the working and applications of the UFM 160 multifunctional recording car.

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Honors in Railway Infrastructure (Stage - I)
High Speed Railway Infrastructure (CIVHON-04D)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) Geotextiles are mainly used for _____.
a) Increasing friction b) Separation and filtration
c) Decoration d) Reducing cant

2) Track tolerances for high-speed routes are _____.
a) Same as conventional b) More relaxed
c) Much stricter d) Not required

3) Ballast cleaning improves _____.
a) Signaling b) Drainage and stability
c) Station design d) Ticket booking

4) High Speed Recording Car is used to measure _____.
a) Passenger count b) Track geometry
c) Ticket rates d) Platform height

5) WINALC system is used for _____.
a) Train scheduling b) Guiding tamping machines
c) Signaling d) Electrification

6) Selection of HSR system depends mainly on _____.
a) Political factors only
b) Passenger demand and terrain
c) Train color
d) Station type

7) Transition curve is provided to _____.
a) Increase curvature
b) Gradually introduce curvature and cant
c) Reduce speed
d) Eliminate gradient

8) As per UIC, high-speed rail on new lines generally operates above ____.
a) 160 km/h
b) 200 km/h
c) 250 km/h
d) 300 km/h

9) The main limitation of High Speed Rail is _____.
a) Low capacity
b) High initial capital cost
c) Low safety
d) Slow travel

10) Standard gauge adopted for Mumbai-Ahmedabad HSR corridor is _____.
a) 1676 mm
b) 1520 mm
c) 1435 mm
d) 1000 mm

11) Cant deficiency occurs when _____.
a) Provided cant > equilibrium cant
b) Provided cant < equilibrium cant
c) Cant = zero
d) Train is stationary

12) Level crossings in High Speed Rail are _____.
a) Allowed
b) Restricted
c) Completely eliminated
d) Temporary

13) Rail pads are provided to _____.
a) Increase speed
b) Provide elasticity
c) Reduce track width
d) Increase cant

14) Ballastless track is also known as _____.
a) Loose track
b) Slab track
c) Mixed track
d) Flexible track

SLR-QH-267

Seat No.	

Set Q

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Honors in Railway Infrastructure (Stage - I)
High Speed Railway Infrastructure (CIVHON-04D)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Solve any two main questions from section-I and any two main questions from Section-II.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary and state it clearly.

SECTION – I

Q.2 Solve the following questions. **14**

a) Define High Speed Rail as per International Union of Railways (UIC) and explain the classification criteria of High Speed systems.

b) Discuss the need for High Speed Rail corridors in India with reference to the Mumbai-Ahmedabad corridor feasibility study.

Q.3 Solve the following questions. **14**

a) Explain track gauge, cant, cant deficiency and cant excess in High Speed Rail design.

b) Discuss transition curves and superelevation ramps for High Speed tracks.

Q.4 Solve the following questions. **14**

a) Explain the design considerations for tunnels and bridges in High Speed Rail systems.

b) Describe rails, sleepers, fastening systems and stiffness requirements of High Speed track.

SECTION – II

Q.5 Solve the following questions. **14**

a) Compare ballast track and ballastless (slab) track used in High Speed Rail.

b) Discuss operating conditions and special features of High Speed rolling stock.

Q.6 Solve the following questions. **14**

a) Explain the life cycle of High Speed track components and importance of life cycle costing.

b) Discuss standard track tolerances and danger limits for High Speed Rail on standard gauge.

Q.7 Solve the following questions. **14**

a) Explain track geometry measurement through transfer function for High Speed track.

b) Describe the working and applications of the UFM 160 multifunctional recording car.

Seat No.	

Set **R**

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Honors in Railway Infrastructure (Stage - I)
High Speed Railway Infrastructure (CIVHON-04D)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) High Speed Recording Car is used to measure _____.
a) Passenger count b) Track geometry
c) Ticket rates d) Platform height

2) WINALC system is used for _____.
a) Train scheduling b) Guiding tamping machines
c) Signaling d) Electrification

3) Selection of HSR system depends mainly on _____.
a) Political factors only
b) Passenger demand and terrain
c) Train color
d) Station type

4) Transition curve is provided to _____.
a) Increase curvature
b) Gradually introduce curvature and cant
c) Reduce speed
d) Eliminate gradient

5) As per UIC, high-speed rail on new lines generally operates above ____.
a) 160 km/h b) 200 km/h
c) 250 km/h d) 300 km/h

6) The main limitation of High Speed Rail is _____.
a) Low capacity b) High initial capital cost
c) Low safety d) Slow travel

7) Standard gauge adopted for Mumbai-Ahmedabad HSR corridor is _____.
a) 1676 mm b) 1520 mm
c) 1435 mm d) 1000 mm

8) Cant deficiency occurs when _____.
a) Provided cant > equilibrium cant
b) Provided cant < equilibrium cant
c) Cant = zero
d) Train is stationary

9) Level crossings in High Speed Rail are _____.
a) Allowed b) Restricted
c) Completely eliminated d) Temporary

10) Rail pads are provided to _____.
a) Increase speed b) Provide elasticity
c) Reduce track width d) Increase cant

11) Ballastless track is also known as _____.
a) Loose track b) Slab track
c) Mixed track d) Flexible track

12) Geotextiles are mainly used for _____.
a) Increasing friction b) Separation and filtration
c) Decoration d) Reducing cant

13) Track tolerances for high-speed routes are _____.
a) Same as conventional b) More relaxed
c) Much stricter d) Not required

14) Ballast cleaning improves _____.
a) Signaling b) Drainage and stability
c) Station design d) Ticket booking

SLR-QH-267

Seat No.	

Set R

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Honors in Railway Infrastructure (Stage - I)
High Speed Railway Infrastructure (CIVHON-04D)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Solve any two main questions from section-I and any two main questions from Section-II.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary and state it clearly.

SECTION – I

Q.2 Solve the following questions. **14**

a) Define High Speed Rail as per International Union of Railways (UIC) and explain the classification criteria of High Speed systems.

b) Discuss the need for High Speed Rail corridors in India with reference to the Mumbai-Ahmedabad corridor feasibility study.

Q.3 Solve the following questions. **14**

a) Explain track gauge, cant, cant deficiency and cant excess in High Speed Rail design.

b) Discuss transition curves and superelevation ramps for High Speed tracks.

Q.4 Solve the following questions. **14**

a) Explain the design considerations for tunnels and bridges in High Speed Rail systems.

b) Describe rails, sleepers, fastening systems and stiffness requirements of High Speed track.

SECTION – II

Q.5 Solve the following questions. **14**

a) Compare ballast track and ballastless (slab) track used in High Speed Rail.

b) Discuss operating conditions and special features of High Speed rolling stock.

Q.6 Solve the following questions. **14**

a) Explain the life cycle of High Speed track components and importance of life cycle costing.

b) Discuss standard track tolerances and danger limits for High Speed Rail on standard gauge.

Q.7 Solve the following questions. **14**

a) Explain track geometry measurement through transfer function for High Speed track.

b) Describe the working and applications of the UFM 160 multifunctional recording car.

SLR-QH-267

Seat No.		Set	S

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Honors in Railway Infrastructure (Stage - I)
High Speed Railway Infrastructure (CIVHON-04D)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) Rail pads are provided to _____.
a) Increase speed b) Provide elasticity
c) Reduce track width d) Increase cant

2) Ballastless track is also known as _____.
a) Loose track b) Slab track
c) Mixed track d) Flexible track

3) Geotextiles are mainly used for _____.
a) Increasing friction b) Separation and filtration
c) Decoration d) Reducing cant

4) Track tolerances for high-speed routes are _____.
a) Same as conventional b) More relaxed
c) Much stricter d) Not required

5) Ballast cleaning improves _____.
a) Signaling b) Drainage and stability
c) Station design d) Ticket booking

6) High Speed Recording Car is used to measure _____.
a) Passenger count b) Track geometry
c) Ticket rates d) Platform height

7) WINALC system is used for _____.
a) Train scheduling b) Guiding tamping machines
c) Signaling d) Electrification

8) Selection of HSR system depends mainly on _____.
a) Political factors only
b) Passenger demand and terrain
c) Train color
d) Station type

9) Transition curve is provided to _____.
a) Increase curvature
b) Gradually introduce curvature and cant
c) Reduce speed
d) Eliminate gradient

10) As per UIC, high-speed rail on new lines generally operates above ____.
a) 160 km/h b) 200 km/h
c) 250 km/h d) 300 km/h

11) The main limitation of High Speed Rail is _____.
a) Low capacity b) High initial capital cost
c) Low safety d) Slow travel

12) Standard gauge adopted for Mumbai-Ahmedabad HSR corridor is _____.
a) 1676 mm b) 1520 mm
c) 1435 mm d) 1000 mm

13) Cant deficiency occurs when _____.
a) Provided cant > equilibrium cant
b) Provided cant < equilibrium cant
c) Cant = zero
d) Train is stationary

14) Level crossings in High Speed Rail are _____.
a) Allowed b) Restricted
c) Completely eliminated d) Temporary

SLR-QH-267

Seat No.	

Set S

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SLR-QH-268

Seat No.	

Set P

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (Old) (CBCS)
Examination: March/April – 2026
Foundation Engineering (BTN01601)

Day & Date: Friday, 15-05-2026 Max. Marks: 70
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MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) One of the purposes of Soil exploration is _____.
a) To understand the behaviour of the structure
b) To estimate the load coming on the soil
c) To find the quantity and quality of water
d) To determine basic properties of soil

2) The angle of Shear Resistance $\Phi > 36^o$, then the type of failure in soil is _____.
a) General Shear Failure b) Local Shear Failure
c) Punching Shear Failure d) None

3) Load increments applied in 'Plate Load Test' is _____.
a) 1/20 of the estimated ultimate bearing capacity
b) 1/15 of the estimated ultimate bearing capacity
c) 1/10 of the estimated ultimate bearing capacity
d) 1/5 of the estimated ultimate bearing capacity

4) These types soils are those appear to be strong and stable in their natural state, but which rapidly consolidate under wetting, generating large and often unexpected settlements.
a) Weak/Compressible soil b) Collapsible soil
c) Corrosive Soil d) None

5) A strip footing of width 1m is resting on a soft clay strata at depth of 1m. The angle of internal friction is zero, and cohesion is $20\ \text{kN/m}^2$. The water table is at a great depth, the ultimate bearing capacity of soil according to Terzaghi's equation is _____.
a) $120\ \text{kN/m}^2$ b) $114\ \text{kN/m}^2$
c) $57\ \text{kN/m}^2$ d) None

6) Bearing capacity can be evaluated by Skempton's method in case of _____.
a) Cohesive soil b) Cohesionless soil
c) C - Φ soil d) Rocks

7) Terzaghi's bearing capacity factors depends on _____.
a) Cohesion of soil b) Φ of soil
c) Permeability of soil d) None

8) A combined footing is generally used when _____.
a) No. of columns is two and they are spaced close to each other
b) No. of columns is two and they are spaced far apart
c) No. of columns is more than two and they are spaced far apart
d) There is only one column

9) Piles used to anchor down structures subjected to uplift due to hydrostatic pressure or overturning moments, are called _____.
a) Anchor piles b) Fender piles
c) Tension piles d) Bearing piles

10) Under reamed piles are generally _____.
a) Driven piles b) Bored piles
c) Precast piles d) None of the above

11) The bottom plug-in foundation well is usually made of _____.
a) Brick masonry b) Reinforced cement concrete
c) Cement concrete d) None of the above

12) Caisson disease is associated with _____.
a) The workers working on sinking of open well foundations
b) The workers working on sinking of pneumatic caisson
c) The tilting of caissons and wells during their sinking
d) None of the above

13) In stability analysis, the term mobilized shear strength is referred to as _____.
a) Shear strength b) Maximum shear stress
c) Applied shear stress d) None

14) For cantilever sheet pile supporting clayey soil having $c = 25\ \text{kPa}$, pressure intensity at the top of wall is _____.
a) 0 b) $-25\ \text{kPa}$
c) $-50\ \text{kPa}$ d) None

SLR-QH-268

Seat No.	

Set P

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (Old) (CBCS)
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Foundation Engineering (BTN01601)

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SECTION – I

Q.2 **a)** Distinguish between undisturbed and disturbed sample of soil. What are the tests Conducted on these samples in the laboratory. **04**

b) A sampling tube has inner diameter 70mm and that of cutting edge is equal to 68mm. Their outer diameters are 72mm and 74mm respectively. Determine the inside clearance, outside clearance and area ratio of the sampler. This tube is pushed at bottom of a bore hole to a distance of 550mm and length of sample covered is 80mm. Find the recovery ratio. **06**

Q.3 **a)** Explain the different modes of shear failure with the help of neat sketches. **04**

b) A circular footing is resting on a stiff saturated clay with $\text{c} = 125\ \text{kN/m}^2$. The depth of foundation is 1.8m. Determine the diameter of footing. Take safe load on footing as 800kN and factor of safety is 2.5. The bulk unit weight of soil is $20\ \text{kN/m}^3$. Take $\Phi = 0, \text{N}_\text{c} = 5.7, \text{N}_\text{q} = 1, \text{N}_\Upsilon = 0$. **05**

Q.4 **a)** Write a note on standard penetration test and its corrections. **05**

b) Determine the immediate settlement of a footing $3\text{m} \times 3\ \text{m}$ resting on a sandy soil with $\text{Es} = 45000\ \text{kN/m}^2$ and $\mu = 0.3$. Footing carries a load of $2000\ \text{kN}$. Assume $\text{Iw} = 0.82$. **04**

Q.5 **a)** Enlist ground improvement techniques. Explain any one in detail with its suitability. **05**

b) What is collapsible soil? What the precautions are of be taken before starting of construction in collapsible soil? **04**

SECTION – II

Q.6 **a)** Explain different types of shallow foundations with neat sketches. **05**

b) Explain Feld's rule and find group efficiency for 9 piles and 16 piles using this rule. **05**

Q.7 **a)** Mention the situations where pile foundation is necessary and explain the classification of piles based on their functions. **04**

b) In a 16 pile group, the pile diameter is $450\ \mathrm{mm}$ and $\mathrm{c/c}$ spacing of the square group is $1.5\ \mathrm{m}, \mathrm{c} = 50\ \mathrm{kN/m^2}$, determine whether the failure would occur with the pile acting individually or as group? Neglect bearing at tip of the pile. All piles are $10\ \mathrm{m}$ long. Take $\alpha = 0.7$ and $\mathrm{FOS} = 2.5$. Also find safe allowable load. **05**

Q.8 **a)** What are the types of slope failure? Explain with neat sketches. **05**

b) Draw a neat sketch of well foundation. Explain its various parts **04**

Q.9 **a)** Write a note on Taylor's Stability Charts. **04**

b) Calculate the factor of safety with respect to cohesion of clay, slope laid at 1 in 2 to a length of $11\mathrm{m}$. If the angle of internal friction $\Phi = 10^0$, Taylors stability number $0.064, \mathrm{c} = 20\mathrm{kN/m^2}$ and unit weight $19\mathrm{kN/m^3}$. Determine the critical height of slope in this soil. **05**

SLR-QH-268

Seat No.	

Set Q

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (Old) (CBCS)
Examination: March/April – 2026
Foundation Engineering (BTN01601)

Day & Date: Friday, 15-05-2026 Max. Marks: 70
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MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) A combined footing is generally used when _____.
a) No. of columns is two and they are spaced close to each other
b) No. of columns is two and they are spaced far apart
c) No. of columns is more than two and they are spaced far apart
d) There is only one column

2) Piles used to anchor down structures subjected to uplift due to hydrostatic pressure or overturning moments, are called _____.
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3) Under reamed piles are generally _____.
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SLR-QH-268

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Set Q

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SECTION – I

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Set R

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SLR-QH-268

Seat No.	

Set R

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SLR-QH-268

Seat No.	

Set S

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Day & Date: Friday, 15-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) Bearing capacity can be evaluated by Skempton's method in case of _____.
a) Cohesive soil b) Cohesionless soil
c) C - Φ soil d) Rocks

2) Terzaghi's bearing capacity factors depends on _____.
a) Cohesion of soil b) Φ of soil
c) Permeability of soil d) None

3) A combined footing is generally used when _____.
a) No. of columns is two and they are spaced close to each other
b) No. of columns is two and they are spaced far apart
c) No. of columns is more than two and they are spaced far apart
d) There is only one column

4) Piles used to anchor down structures subjected to uplift due to hydrostatic pressure or overturning moments, are called _____.
a) Anchor piles b) Fender piles
c) Tension piles d) Bearing piles

5) Under reamed piles are generally _____.
a) Driven piles b) Bored piles
c) Precast piles d) None of the above

6) The bottom plug-in foundation well is usually made of _____.
a) Brick masonry b) Reinforced cement concrete
c) Cement concrete d) None of the above

7) Caisson disease is associated with _____.
- a) The workers working on sinking of open well foundations
- b) The workers working on sinking of pneumatic caisson
- c) The tilting of caissons and wells during their sinking
- d) None of the above

8) In stability analysis, the term mobilized shear strength is referred to as _____.
- a) Shear strength
- b) Maximum shear stress
- c) Applied shear stress
- d) None

9) For cantilever sheet pile supporting clayey soil having $\mathrm{c} = 25\ \mathrm{kPa}$, pressure intensity at the top of wall is _____.
- a) 0
- b) $-25\ \mathrm{kPa}$
- c) $-50\ \mathrm{kPa}$
- d) None

10) One of the purposes of Soil exploration is _____.
- a) To understand the behaviour of the structure
- b) To estimate the load coming on the soil
- c) To find the quantity and quality of water
- d) To determine basic properties of soil

11) The angle of Shear Resistance $\Phi > 36^{o}$, then the type of failure in soil is _____.
- a) General Shear Failure
- b) Local Shear Failure
- c) Punching Shear Failure
- d) None

12) Load increments applied in 'Plate Load Test' is _____.
- a) 1/20 of the estimated ultimate bearing capacity
- b) 1/15 of the estimated ultimate bearing capacity
- c) 1/10 of the estimated ultimate bearing capacity
- d) 1/5 of the estimated ultimate bearing capacity

13) These types soils are those appear to be strong and stable in their natural state, but which rapidly consolidate under wetting, generating large and often unexpected settlements.
- a) Weak/Compressible soil
- b) Collapsible soil
- c) Corrosive Soil
- d) None

14) A strip footing of width $1\mathrm{m}$ is resting on a soft clay strata at depth of $1\mathrm{m}$. The angle of internal friction is zero, and cohesion is $20\ \mathrm{kN/m^2}$. The water table is at a great depth, the ultimate bearing capacity of soil according to Terzaghi's equation is _____.
- a) $120\ \mathrm{kN/m^2}$
- b) $114\ \mathrm{kN/m^2}$
- c) $57\ \mathrm{kN/m^2}$
- d) None

SLR-QH-268

Seat No.	

Set S

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (Old) (CBCS)
Examination: March/April – 2026
Foundation Engineering (BTN01601)

Day & Date: Friday, 15-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q.2 is compulsory; answer any two from remaining question from Section - I.
2) Q.6 is compulsory; answer any two from remaining question from Section - II.
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SECTION – I

Q.2 **a)** Distinguish between undisturbed and disturbed sample of soil. What are the tests Conducted on these samples in the laboratory. **04**

b) A sampling tube has inner diameter 70mm and that of cutting edge is equal to 68mm. Their outer diameters are 72mm and 74mm respectively. Determine the inside clearance, outside clearance and area ratio of the sampler. This tube is pushed at bottom of a bore hole to a distance of 550mm and length of sample covered is 80mm. Find the recovery ratio. **06**

Q.3 **a)** Explain the different modes of shear failure with the help of neat sketches. **04**

b) A circular footing is resting on a stiff saturated clay with $\text{c} = 125\ \text{kN/m}^2$. The depth of foundation is 1.8m. Determine the diameter of footing. Take safe load on footing as 800kN and factor of safety is 2.5. The bulk unit weight of soil is $20\ \text{kN/m}^3$. Take $\Phi = 0, \text{N}_\text{c} = 5.7, \text{N}_\text{q} = 1, \text{N}_\Upsilon = 0$. **05**

Q.4 **a)** Write a note on standard penetration test and its corrections. **05**

b) Determine the immediate settlement of a footing $3\text{m} \times 3\ \text{m}$ resting on a sandy soil with $\text{Es} = 45000\ \text{kN/m}^2$ and $\mu = 0.3$. Footing carries a load of $2000\ \text{kN}$. Assume $\text{Iw} = 0.82$. **04**

Q.5 **a)** Enlist ground improvement techniques. Explain any one in detail with its suitability. **05**

b) What is collapsible soil? What the precautions are of be taken before starting of construction in collapsible soil? **04**

SECTION – II

Q.6 **a)** Explain different types of shallow foundations with neat sketches. **05**

b) Explain Feld's rule and find group efficiency for 9 piles and 16 piles using this rule. **05**

Q.7 **a)** Mention the situations where pile foundation is necessary and explain the classification of piles based on their functions. **04**

b) In a 16 pile group, the pile diameter is $450\ \mathrm{mm}$ and $\mathrm{c/c}$ spacing of the square group is $1.5\ \mathrm{m}, \mathrm{c} = 50\ \mathrm{kN/m^2}$, determine whether the failure would occur with the pile acting individually or as group? Neglect bearing at tip of the pile. All piles are $10\ \mathrm{m}$ long. Take $\alpha = 0.7$ and $\mathrm{FOS} = 2.5$. Also find safe allowable load. **05**

Q.8 **a)** What are the types of slope failure? Explain with neat sketches. **05**

b) Draw a neat sketch of well foundation. Explain its various parts **04**

Q.9 **a)** Write a note on Taylor's Stability Charts. **04**

b) Calculate the factor of safety with respect to cohesion of clay, slope laid at 1 in 2 to a length of $11\mathrm{m}$. If the angle of internal friction $\Phi = 10^0$, Taylors stability number $0.064, \mathrm{c} = 20\mathrm{kN/m^2}$ and unit weight $19\mathrm{kN/m^3}$. Determine the critical height of slope in this soil. **05**

SLR-QH-269

Seat No.	

Set P

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (Old) (CBCS)
Examination: March/April – 2026
Hydraulic Structures & Water Power Engineering (BTN01602)

Day & Date: Monday, 18-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Choose the correct Answer. 14

1) The 'useful storage' in a dam reservoir is the volume of water stored between _____.
a) Minimum and maximum reservoir level
b) Minimum and normal reservoir levels
c) Normal and maximum reservoir levels
d) None of the above

2) A hydel power project has been envisaged to serve the water supply and irrigation needs of the area at its inception stage. The dam reservoir, so constructed, will be known as _____.
a) Multiple reservoir b) Single purpose reservoir
c) Both (a) & (b) d) None of the above

3) The most economical type of arch dam in general is of _____.
a) constant radius type b) variable radius type
c) constant angle type d) None of these

4) Transverse joint in concrete gravity dams is the _____.
a) horizontal construction joints at each lift height
b) vertical construction joints full of height and width
c) diagonal construction joints for torsion
d) None of the above

5) The most preferred soil for the central impervious core of a zoned embankment type of an earthen dam is _____.
a) highly impervious clay b) highly previous gravel
c) coarse sand d) clay mixed with fine sand

6) A rock toe and a horizontal filter is provided on the downstream base of an earthen dam in order to _____.
a) prevent piping action in the dam body
b) prevents piping action in the dam foundation
c) to reduce the seepage quantity by blocking its flow
d) to collect and drain out the seepage flow

7) The effective length of an ogee spillway will be different from its actual length, in case of _____.
a) gated spillway
b) ungated spillway
c) both gated as well as ungated spillway
d) None of these

8) The value of Khosla's safe exit gradient for usually met alluvial river soils of our country, is _____.
a) 0 b) 1
c) ∞ d) 1/4 to 1/6

9) The safety of a hydraulic structure founded on previous foundation can be ensured _____.
a) by providing sufficient length of its concrete floor
b) by providing sufficient depth of its concrete floor
c) by providing a downstream cutoff of some reasonable depth
d) All of the above

10) The canal constructed to bypass the excess water entering a canal, is called a _____.
a) Canal module b) Canal siphon
c) Canal escape d) Canal regulator

11) Lining of irrigation channels _____.
a) increase water logging b) increase channel cross section
c) increase command area d) increase chances of breaching

12) Aggrading rivers are _____.
a) silting rivers b) scouring rivers
c) rivers in regime d) meandering rivers

13) The minimum power, which a hydro-power plant can generate throughout the year, is called _____.
a) power plant capacity b) power plant load
c) firm power d) water power

14) Pondage requirement in a hydropower plant includes the need _____.
a) to balance the varying demand
b) to compensate for wastage and spillage
c) to balance short time fluctuations in the flow
d) All of these

Seat No.		Set	P

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (Old) (CBCS)
Examination: March/April – 2026
Hydraulic Structures & Water Power Engineering (BTN01602)

Day & Date: Monday, 18-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q.3 is compulsory; answer any two from remaining question from Section - I.
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Section – I

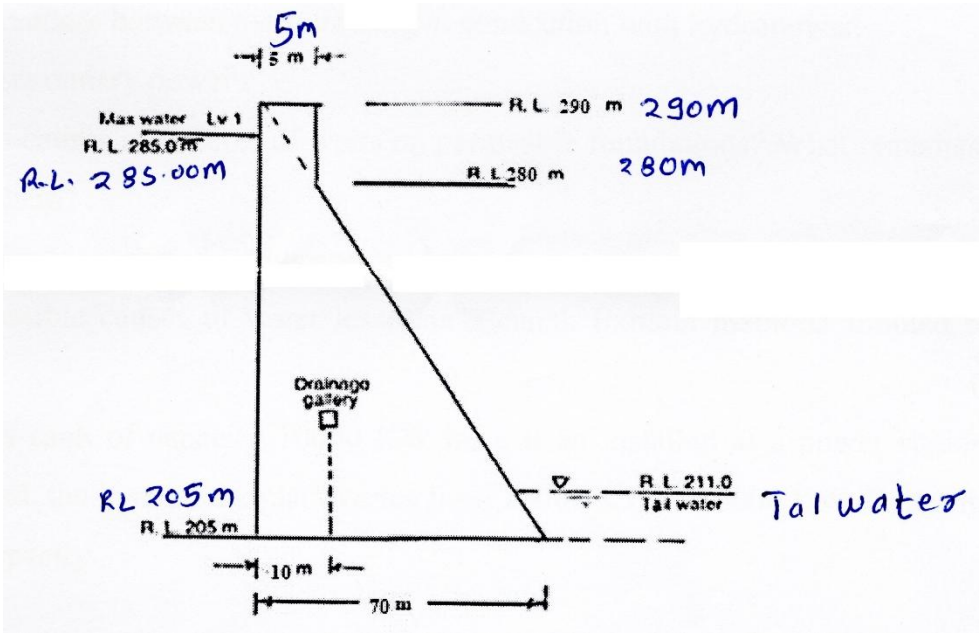
Q.2 **a)** Enlist the factors on which rate of silting of an impounding reservoir depends. Explain what is trap efficiency of a reservoir? **04**

b) Discuss the reservoir sedimentation phenomenon. What are the factors affecting reservoir sedimentation? **05**

Q.3 Figure shows the section of a gravity dam (non overflow portion) built of concrete. Calculate (neglecting earthquake effects), **10**

i) The maximum vertical stresses at toe and heel of the dam
ii) The major principal stresses at the toe of the dam

Assume unit weight of concrete = 25 kN/m^2. Allowable compressive stress in concrete = 2500 kN/m^2. Allowable shear stress in concrete = 420 kN/m^2. Assume that reservoir is full of water upto M.W.L.



Q.4 **a)** Draw a cross section of a 'Zoned Embankment type Earth Dam' and discuss the significance of each component. **05**

b) For a homogeneous earth dam 52 m high and 2 m free board, a flow net was constructed and following results were obtained. Number of potential drops = 30, Number of flow channels = 5. The dam has horizontal filter of 50 m length at its downstream end. Calculate the seepage discharge per meter length of the dam. Assume coefficient of permeability of the dam material as 3×10^{-3} cm/sec. **04**

Q.5 **a)** Determine the discharge over a Chute spillway with 'Ogee Crest' using the following data: Length of spillway is 250 m, Height of spillway crest in front of at upstream approach channels is 10 m. Width of approach channel is 250 m and depth of water over spillway crest is 5 m. (C/Cd =1) **04**

b) Explain elementary profile of a gravity dam. Also explain its dimensions and how the profile is modified into Practical Profile? **05**

Section – II

Q.6 **a)** State the fundamental difference between Khosla's theory and Bligh's creep theory for seepage below a weir. **04**

b) Explain high, low and medium river training works. **05**

Q.7 **a)** Explain with neat sketches the different types of 'spurs' which are commonly used for controlling and training Indian rivers. **05**

b) Define and differentiate between the following in connection with hydropower. **04**

- Firm power and secondary power

Q.8 **a)** Enlist main causes of failures of weirs on permeable foundations. What remedies would you suggest to prevent them? **05**

b) Write short notes on watershed canals and contour canals. **04**

Q.9 **a)** Enlist possible causes of water losses in a canal. Explain methods adopted for reducing such losses. **05**

b) Three generators each of capacity 10000 KW have been installed at a power station. During a certain period of load, the load on the plant varies from 15000 KW to 30000 KW. Determine: **05**

i) Total installed capacity
ii) Load factor
iii) Plant factor
iv) Utilization factor

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (Old) (CBCS)
Examination: March/April – 2026
Hydraulic Structures & Water Power Engineering (BTN01602)

Day & Date: Monday, 18-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Choose the correct Answer. **14**

1) The value of Khosla's safe exit gradient for usually met alluvial river soils of our country, is _____.
a) 0 b) 1
c) ∞ d) 1/4 to 1/6

2) The safety of a hydraulic structure founded on previous foundation can be ensured _____.
a) by providing sufficient length of its concrete floor
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d) All of the above

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4) Lining of irrigation channels _____.
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c) increase command area d) increase chances of breaching

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c) rivers in regime d) meandering rivers

6) The minimum power, which a hydro-power plant can generate throughout the year, is called _____.
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7) Pondage requirement in a hydropower plant includes the need _____.
   a) to balance the varying demand
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9) A hydel power project has been envisaged to serve the water supply and irrigation needs of the area at its inception stage. The dam reservoir, so constructed, will be known as _____.
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13) A rock toe and a horizontal filter is provided on the downstream base of an earthen dam in order to _____.
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Seat No.		Set	Q

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (Old) (CBCS)
Examination: March/April – 2026
Hydraulic Structures & Water Power Engineering (BTN01602)

Day & Date: Monday, 18-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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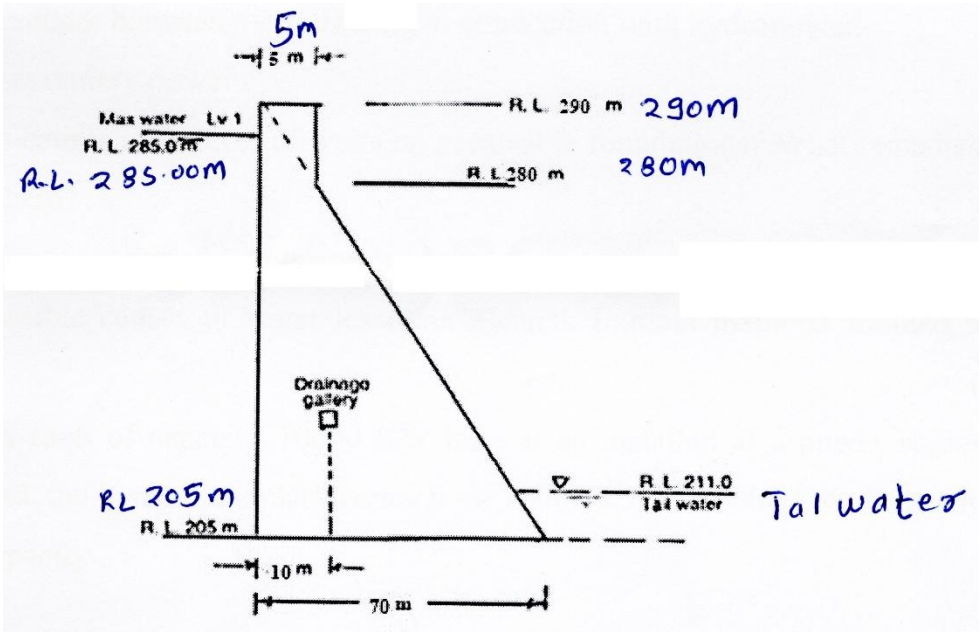

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Section – II

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Seat No.	

Set R

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (Old) (CBCS)
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Hydraulic Structures & Water Power Engineering (BTN01602)

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Duration: 30 Minutes Marks:14

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Seat No.		Set	R

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (Old) (CBCS)
Examination: March/April – 2026
Hydraulic Structures & Water Power Engineering (BTN01602)

Day & Date: Monday, 18-05-2026 Max. Marks: 56
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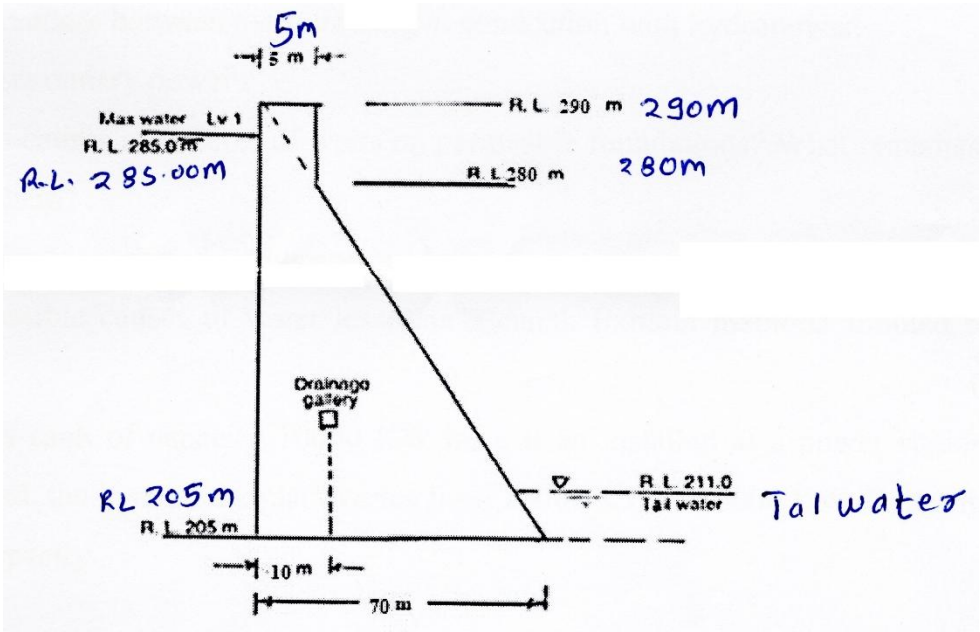

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iii) Plant factor
iv) Utilization factor

SLR-QH-269

Seat No.		Set	S

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (Old) (CBCS)
Examination: March/April – 2026
Hydraulic Structures & Water Power Engineering (BTN01602)

Day & Date: Monday, 18-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) A rock toe and a horizontal filter is provided on the downstream base of an earthen dam in order to _____.
a) prevent piping action in the dam body
b) prevents piping action in the dam foundation
c) to reduce the seepage quantity by blocking its flow
d) to collect and drain out the seepage flow

2) The effective length of an ogee spillway will be different from its actual length, in case of _____.
a) gated spillway
b) ungated spillway
c) both gated as well as ungated spillway
d) None of these

3) The value of Khosla's safe exit gradient for usually met alluvial river soils of our country, is _____.
a) 0 b) 1
c) ∞ d) 1/4 to 1/6

4) The safety of a hydraulic structure founded on previous foundation can be ensured _____.
a) by providing sufficient length of its concrete floor
b) by providing sufficient depth of its concrete floor
c) by providing a downstream cutoff of some reasonable depth
d) All of the above

5) The canal constructed to bypass the excess water entering a canal, is called a _____.
a) Canal module b) Canal siphon
c) Canal escape d) Canal regulator

6) Lining of irrigation channels _____.
a) increase water logging b) increase channel cross section
c) increase command area d) increase chances of breaching

7) Aggrading rivers are _____.
a) silting rivers b) scouring rivers
c) rivers in regime d) meandering rivers

8) The minimum power, which a hydro-power plant can generate throughout the year, is called _____.
a) power plant capacity b) power plant load
c) firm power d) water power

9) Pondage requirement in a hydropower plant includes the need _____.
a) to balance the varying demand
b) to compensate for wastage and spillage
c) to balance short time fluctuations in the flow
d) All of these

10) The 'useful storage' in a dam reservoir is the volume of water stored between _____.
a) Minimum and maximum reservoir level
b) Minimum and normal reservoir levels
c) Normal and maximum reservoir levels
d) None of the above

11) A hydel power project has been envisaged to serve the water supply and irrigation needs of the area at its inception stage. The dam reservoir, so constructed, will be known as _____.
a) Multiple reservoir b) Single purpose reservoir
c) Both (a) & (b) d) None of the above

12) The most economical type of arch dam in general is of _____.
a) constant radius type b) variable radius type
c) constant angle type d) None of these

13) Transverse joint in concrete gravity dams is the _____.
a) horizontal construction joints at each lift height
b) vertical construction joints full of height and width
c) diagonal construction joints for torsion
d) None of the above

14) The most preferred soil for the central impervious core of a zoned embankment type of an earthen dam is _____.
a) highly impervious clay b) highly previous gravel
c) coarse sand d) clay mixed with fine sand

Seat No.		Set	S

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (Old) (CBCS)
Examination: March/April – 2026
Hydraulic Structures & Water Power Engineering (BTN01602)

Day & Date: Monday, 18-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q.3 is compulsory; answer any two from remaining question from Section - I.
2) Q.9 is compulsory; answer any two from remaining question from Section - II.
3) Assume suitable data if necessary and state it clearly.
4) Figures to right indicates full marks.

Section – I

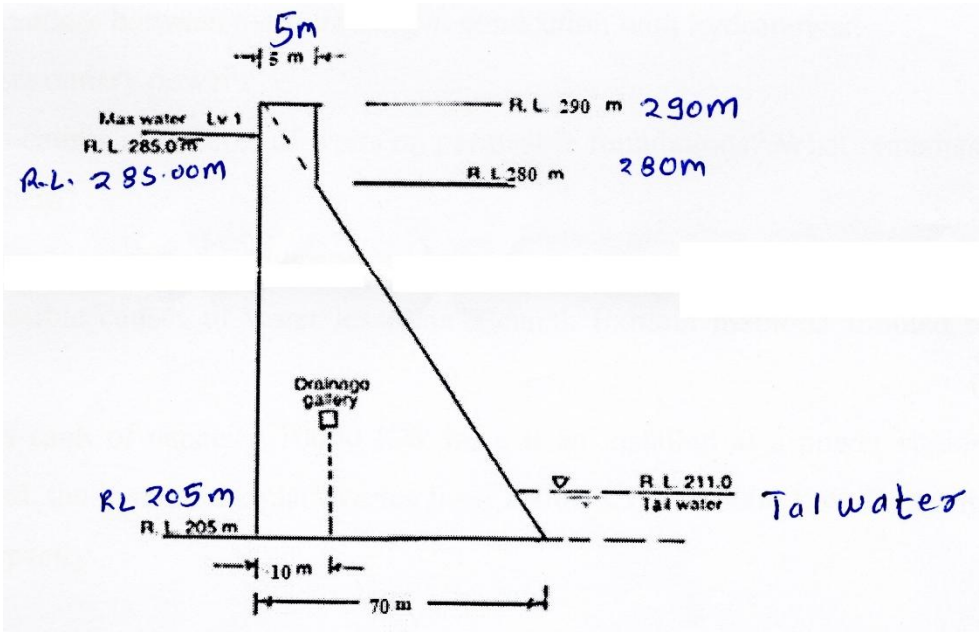
Q.2 **a)** Enlist the factors on which rate of silting of an impounding reservoir depends. Explain what is trap efficiency of a reservoir? **04**

b) Discuss the reservoir sedimentation phenomenon. What are the factors affecting reservoir sedimentation? **05**

Q.3 Figure shows the section of a gravity dam (non overflow portion) built of concrete. Calculate (neglecting earthquake effects), **10**

i) The maximum vertical stresses at toe and heel of the dam
ii) The major principal stresses at the toe of the dam

Assume unit weight of concrete = 25 kN/m^2. Allowable compressive stress in concrete = 2500 kN/m^2. Allowable shear stress in concrete = 420 kN/m^2. Assume that reservoir is full of water upto M.W.L.



Q.4 **a)** Draw a cross section of a 'Zoned Embankment type Earth Dam' and discuss the significance of each component. **05**

b) For a homogeneous earth dam 52 m high and 2 m free board, a flow net was constructed and following results were obtained. Number of potential drops = 30, Number of flow channels = 5. The dam has horizontal filter of 50 m length at its downstream end. Calculate the seepage discharge per meter length of the dam. Assume coefficient of permeability of the dam material as 3×10^{-3} cm/sec. **04**

Q.5 **a)** Determine the discharge over a Chute spillway with 'Ogee Crest' using the following data: Length of spillway is 250 m, Height of spillway crest in front of at upstream approach channels is 10 m. Width of approach channel is 250 m and depth of water over spillway crest is 5 m. (C/Cd =1) **04**

b) Explain elementary profile of a gravity dam. Also explain its dimensions and how the profile is modified into Practical Profile? **05**

Section – II

Q.6 **a)** State the fundamental difference between Khosla's theory and Bligh's creep theory for seepage below a weir. **04**

b) Explain high, low and medium river training works. **05**

Q.7 **a)** Explain with neat sketches the different types of 'spurs' which are commonly used for controlling and training Indian rivers. **05**

b) Define and differentiate between the following in connection with hydropower. **04**

- Firm power and secondary power

Q.8 **a)** Enlist main causes of failures of weirs on permeable foundations. What remedies would you suggest to prevent them? **05**

b) Write short notes on watershed canals and contour canals. **04**

Q.9 **a)** Enlist possible causes of water losses in a canal. Explain methods adopted for reducing such losses. **05**

b) Three generators each of capacity 10000 KW have been installed at a power station. During a certain period of load, the load on the plant varies from 15000 KW to 30000 KW. Determine: **05**

i) Total installed capacity
ii) Load factor
iii) Plant factor
iv) Utilization factor

SLR-QH-271

Seat No.	

Set P

T. Y. (B.Tech.) (Civil Engineering) (Semester - II) (Old) (CBCS)
Examination: March/April – 2026
Structural Dynamics (BTN01609)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternative from the options. 14

1) The frequency of a system in damped vibration is _____.
a) Always less than the natural frequency
b) Always more than the natural frequency
c) Equal to the natural frequency
d) Zero

2) Resonance occurs when the frequency of the exciting force is _____.
a) Equal to the natural frequency
b) Half the natural frequency
c) Double the natural frequency
d) Zero

3) The Damping Ratio (ζ) is given by _____.
a) c/cc b) cc/c
c) k/m d) m/k

4) The unit of stiffness (k) in the M-K-S system is _____.
a) N/m b) N-m
c) N/s d) N-s/m

5) Damping in a system is a mechanism primarily for _____.
a) Storing energy b) Dissipating energy
c) Increasing frequency d) Increasing amplitude

6) An impulsive force is characterized by a _____.
a) Long duration and small magnitude
b) Long duration and large magnitude
c) Short duration and large magnitude
d) Short duration and small magnitude

7) Duhamel's integral is used to find the response of a system subjected to _____.
a) Harmonic loading only
b) Free vibration only
c) General, arbitrary dynamic loading
d) Static loading

8) The number of independent coordinates required to define the configuration of a system is known as _____.
a) Mode Shapes
b) Degrees of Freedom (DOF)
c) Natural Frequencies
d) Stiffness

9) A system that vibrates without any external exciting force is said to be in _____.
a) Forced vibration
b) Damped vibration
c) Free vibration
d) Resonance

10) The Logarithmic Decrement (δ) is used to measure _____.
a) Stiffness
b) Damping
c) Mass
d) Natural Frequency

11) The Orthogonality principle states that the mode shapes are orthogonal with respect to the _____.
a) Mass matrix only
b) Stiffness matrix only
c) Both mass and stiffness matrices
d) Damping matrix only

12) Rayleigh's method is used to determine an approximate value of the _____.
a) Fundamental natural frequency
b) Second natural frequency
c) Damping ratio
d) Forced response

13) For an underdamped system, the damping ratio (ζ) is _____.
a) $\zeta = 1$
b) $\zeta > 1$
c) $\zeta < 1$
d) $\zeta = 0$

14) A cantilever beam vibrating in flexure is an example of a _____.
a) Single-Degree-of-Freedom system
b) Two-Degree-of-Freedom system
c) Distributed Parameter system
d) Rigid body

SLR-QH-271

Seat No.		Set	P

T. Y. (B.Tech.) (Civil Engineering) (Semester - II) (Old) (CBCS)
Examination: March/April – 2026
Structural Dynamics (BTN01609)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if required.

Section – I

Q.2 Attempt the following. (Any Two) **14**

a) A single-degree-of-freedom system consists of a mass of 20 kg, a spring of stiffness 35 kN/m, and a dashpot with a damping coefficient of 150 N-s/m. Find:
i) Damping ratio (ζ)
ii) Natural frequency (ω_n)
iii) Damped natural frequency (ω_d)
iv) State whether the system is underdamped, critically damped, or overdamped.

b) Derive the equation of motion for an undamped SDOF system subjected to a harmonic load $F(t) = F_0 \sin(\omega t)$. Find the complete solution (transient and steady-state) and discuss the condition of resonance.

c) Define Damping. Explain in detail any two types of damping (e.g., Viscous Damping, Coulomb/Dry-Friction Damping) with their characteristics.

Q.3 Attempt the following. (Any Two) **14**

a) Define Transmissibility Ratio (TR). Derive the expression for motion transmissibility (TR) for a damped SDOF system subjected to support motion $y(t) = Y_0 \sin(\omega t)$. Plot the TR vs. frequency ratio (r) for various damping ratios (ζ).

b) What is a periodic load? Explain how Fourier series can be used to represent a general periodic load and how the response of an SDOF system to such a load is determined.

c) Derive the Duhamel's Integral (convolution integral) for the response of an SDOF system to a general dynamic loading $\$p(t)\$$.

Section – II

Q.4 Attempt the following. (Any Two) **14**

a) For the two-storey shear building shown, formulate the mass matrix [M] and stiffness matrix [K]. Determine the natural frequencies and corresponding mode shapes. Assume $m_1=m_2=m$ and $k_1=k_2=k$.

b) State and prove the Orthogonality Principle for the mode shapes of an MDOF system. What is the significance of this principle in structural dynamics?

c) Explain the procedure of Static Condensation. Why is it used in the dynamic analysis of MDOF systems?

Q.5 Attempt the following. (Any Two) **14**

a) Explain the Mode Superposition Method for finding the dynamic response of an MDOF system. How does it simplify the analysis compared to solving the coupled equations directly? (Numerical solution not required).

b) Derive the partial differential equation (PDE) governing the free flexural (transverse) vibrations of a uniform beam. State the assumptions made.

c) Explain the following methods for finding the fundamental natural frequency of a discrete system:

i) Rayleigh's Method

ii) Dunkerly's Method

Seat No.	

Set **Q**

T. Y. (B.Tech.) (Civil Engineering) (Semester - II) (Old) (CBCS)
Examination: March/April – 2026
Structural Dynamics (BTN01609)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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4) Assume suitable data if required.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) The number of independent coordinates required to define the configuration of a system is known as _____.
a) Mode Shapes b) Degrees of Freedom (DOF)
c) Natural Frequencies d) Stiffness

2) A system that vibrates without any external exciting force is said to be in _____.
a) Forced vibration b) Damped vibration
c) Free vibration d) Resonance

3) The Logarithmic Decrement (δ) is used to measure _____.
a) Stiffness b) Damping
c) Mass d) Natural Frequency

4) The Orthogonality principle states that the mode shapes are orthogonal with respect to the _____.
a) Mass matrix only
b) Stiffness matrix only
c) Both mass and stiffness matrices
d) Damping matrix only

5) Rayleigh's method is used to determine an approximate value of the _____.
a) Fundamental natural frequency
b) Second natural frequency
c) Damping ratio
d) Forced response

6) For an underdamped system, the damping ratio (ζ) is _____.
a) $\zeta = 1$ b) $\zeta > 1$
c) $\zeta < 1$ d) $\zeta = 0$

7) A cantilever beam vibrating in flexure is an example of a _____.
a) Single-Degree-of-Freedom system
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b) Half the natural frequency
c) Double the natural frequency
d) Zero

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a) c/cc b) cc/c
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a) N/m b) N-m
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12) Damping in a system is a mechanism primarily for _____.
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c) Increasing frequency d) Increasing amplitude

13) An impulsive force is characterized by a _____.
a) Long duration and small magnitude
b) Long duration and large magnitude
c) Short duration and large magnitude
d) Short duration and small magnitude

14) Duhamel's integral is used to find the response of a system subjected to _____.
a) Harmonic loading only
b) Free vibration only
c) General, arbitrary dynamic loading
d) Static loading

SLR-QH-271

Seat No.	

Set Q

T. Y. (B.Tech.) (Civil Engineering) (Semester - II) (Old) (CBCS)
Examination: March/April – 2026
Structural Dynamics (BTN01609)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
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Section – I

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- iv) State whether the system is underdamped, critically damped, or overdamped.

b) Derive the equation of motion for an undamped SDOF system subjected to a harmonic load $F(t) = F_0 \sin(\omega t)$. Find the complete solution (transient and steady-state) and discuss the condition of resonance.

c) Define Damping. Explain in detail any two types of damping (e.g., Viscous Damping, Coulomb/Dry-Friction Damping) with their characteristics.

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a) Define Transmissibility Ratio (TR). Derive the expression for motion transmissibility (TR) for a damped SDOF system subjected to support motion $y(t) = Y_0 \sin(\omega t)$. Plot the TR vs. frequency ratio (r) for various damping ratios (ζ).

b) What is a periodic load? Explain how Fourier series can be used to represent a general periodic load and how the response of an SDOF system to such a load is determined.

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Section – II

Q.4 Attempt the following. (Any Two) **14**

a) For the two-storey shear building shown, formulate the mass matrix [M] and stiffness matrix [K]. Determine the natural frequencies and corresponding mode shapes. Assume $m_1=m_2=m$ and $k_1=k_2=k$.

b) State and prove the Orthogonality Principle for the mode shapes of an MDOF system. What is the significance of this principle in structural dynamics?

c) Explain the procedure of Static Condensation. Why is it used in the dynamic analysis of MDOF systems?

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a) Explain the Mode Superposition Method for finding the dynamic response of an MDOF system. How does it simplify the analysis compared to solving the coupled equations directly? (Numerical solution not required).

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c) Explain the following methods for finding the fundamental natural frequency of a discrete system:

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SLR-QH-271

Seat No.	

Set R

T. Y. (B.Tech.) (Civil Engineering) (Semester - II) (Old) (CBCS)
Examination: March/April – 2026
Structural Dynamics (BTN01609)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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b) Stiffness matrix only
c) Both mass and stiffness matrices
d) Damping matrix only

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d) Forced response

3) For an underdamped system, the damping ratio (ζ) is _____.
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- b) Long duration and large magnitude
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- b) Damping
- c) Mass
- d) Natural Frequency

SLR-QH-271

Seat No.		Set	R

T. Y. (B.Tech.) (Civil Engineering) (Semester - II) (Old) (CBCS)
Examination: March/April – 2026
Structural Dynamics (BTN01609)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
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Section – I

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c) Define Damping. Explain in detail any two types of damping (e.g., Viscous Damping, Coulomb/Dry-Friction Damping) with their characteristics.

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c) Derive the Duhamel's Integral (convolution integral) for the response of an SDOF system to a general dynamic loading $\$p(t)\$$.

Section – II

Q.4 Attempt the following. (Any Two) **14**

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c) Explain the procedure of Static Condensation. Why is it used in the dynamic analysis of MDOF systems?

Q.5 Attempt the following. (Any Two) **14**

a) Explain the Mode Superposition Method for finding the dynamic response of an MDOF system. How does it simplify the analysis compared to solving the coupled equations directly? (Numerical solution not required).

b) Derive the partial differential equation (PDE) governing the free flexural (transverse) vibrations of a uniform beam. State the assumptions made.

c) Explain the following methods for finding the fundamental natural frequency of a discrete system:

i) Rayleigh's Method

ii) Dunkerly's Method

Seat No.	

Set **S**

T. Y. (B.Tech.) (Civil Engineering) (Semester - II) (Old) (CBCS)
Examination: March/April – 2026
Structural Dynamics (BTN01609)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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4) Assume suitable data if required.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) An impulsive force is characterized by a _____.
a) Long duration and small magnitude
b) Long duration and large magnitude
c) Short duration and large magnitude
d) Short duration and small magnitude

2) Duhamel's integral is used to find the response of a system subjected to _____.
a) Harmonic loading only
b) Free vibration only
c) General, arbitrary dynamic loading
d) Static loading

3) The number of independent coordinates required to define the configuration of a system is known as _____.
a) Mode Shapes b) Degrees of Freedom (DOF)
c) Natural Frequencies d) Stiffness

4) A system that vibrates without any external exciting force is said to be in _____.
a) Forced vibration b) Damped vibration
c) Free vibration d) Resonance

5) The Logarithmic Decrement (δ) is used to measure _____.
a) Stiffness b) Damping
c) Mass d) Natural Frequency

6) The Orthogonality principle states that the mode shapes are orthogonal with respect to the _____.
   a) Mass matrix only
   b) Stiffness matrix only
   c) Both mass and stiffness matrices
   d) Damping matrix only

7) Rayleigh's method is used to determine an approximate value of the _____.
   a) Fundamental natural frequency
   b) Second natural frequency
   c) Damping ratio
   d) Forced response

8) For an underdamped system, the damping ratio (ζ) is _____.
   a) $\zeta = 1$ b) $\zeta > 1$
   c) $\zeta < 1$ d) $\zeta = 0$

9) A cantilever beam vibrating in flexure is an example of a _____.
   a) Single-Degree-of-Freedom system
   b) Two-Degree-of-Freedom system
   c) Distributed Parameter system
   d) Rigid body

10) The frequency of a system in damped vibration is _____.
   a) Always less than the natural frequency
   b) Always more than the natural frequency
   c) Equal to the natural frequency
   d) Zero

11) Resonance occurs when the frequency of the exciting force is _____.
   a) Equal to the natural frequency
   b) Half the natural frequency
   c) Double the natural frequency
   d) Zero

12) The Damping Ratio (ζ) is given by _____.
   a) c/cc b) cc/c
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13) The unit of stiffness (k) in the M-K-S system is _____.
   a) N/m b) N-m
   c) N/s d) N-s/m

14) Damping in a system is a mechanism primarily for _____.
   a) Storing energy b) Dissipating energy
   c) Increasing frequency d) Increasing amplitude

SLR-QH-271

Seat No.		Set	S

T. Y. (B.Tech.) (Civil Engineering) (Semester - II) (Old) (CBCS)
Examination: March/April – 2026
Structural Dynamics (BTN01609)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if required.

Section – I

Q.2 Attempt the following. (Any Two) **14**

a) A single-degree-of-freedom system consists of a mass of 20 kg, a spring of stiffness 35 kN/m, and a dashpot with a damping coefficient of 150 N-s/m. Find:
i) Damping ratio (ζ)
ii) Natural frequency (ω_n)
iii) Damped natural frequency (ω_d)
iv) State whether the system is underdamped, critically damped, or overdamped.

b) Derive the equation of motion for an undamped SDOF system subjected to a harmonic load $F(t) = F_0 \sin(\omega t)$. Find the complete solution (transient and steady-state) and discuss the condition of resonance.

c) Define Damping. Explain in detail any two types of damping (e.g., Viscous Damping, Coulomb/Dry-Friction Damping) with their characteristics.

Q.3 Attempt the following. (Any Two) **14**

a) Define Transmissibility Ratio (TR). Derive the expression for motion transmissibility (TR) for a damped SDOF system subjected to support motion $y(t) = Y_0 \sin(\omega t)$. Plot the TR vs. frequency ratio (r) for various damping ratios (ζ).

b) What is a periodic load? Explain how Fourier series can be used to represent a general periodic load and how the response of an SDOF system to such a load is determined.

c) Derive the Duhamel's Integral (convolution integral) for the response of an SDOF system to a general dynamic loading $\$p(t)\$$.

Section – II

Q.4 Attempt the following. (Any Two) **14**

a) For the two-storey shear building shown, formulate the mass matrix [M] and stiffness matrix [K]. Determine the natural frequencies and corresponding mode shapes. Assume $m_1=m_2=m$ and $k_1=k_2=k$.

b) State and prove the Orthogonality Principle for the mode shapes of an MDOF system. What is the significance of this principle in structural dynamics?

c) Explain the procedure of Static Condensation. Why is it used in the dynamic analysis of MDOF systems?

Q.5 Attempt the following. (Any Two) **14**

a) Explain the Mode Superposition Method for finding the dynamic response of an MDOF system. How does it simplify the analysis compared to solving the coupled equations directly? (Numerical solution not required).

b) Derive the partial differential equation (PDE) governing the free flexural (transverse) vibrations of a uniform beam. State the assumptions made.

c) Explain the following methods for finding the fundamental natural frequency of a discrete system:

i) Rayleigh's Method

ii) Dunkerly's Method

SLR-QH-272

Seat No.	

Set P

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (Old) (CBCS)
Examination: March/April – 2026
Design of Bridges (BTN01610)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) Total load of class AA wheeled is _____.
a) 700kN b) 400kN
c) 554kN d) 332kN

2) Braking force is assumed to act along the line parallel to roadway & _____ above it.
a) 1.2m b) 1.5m
c) 1.8m d) 2.0m

3) The ground contact length of the track of IRC class AA loading is _____.
a) 3.6m b) 4.57m
c) 3.5m d) None of these

4) For small bridges, with open foundations, the economical span is approximately equal to _____ times height of Pier.
a) 2.0 b) 1.2
c) 1.0 d) 1.5

5) _____ is the minimum grade of concrete for prestressed concrete bridges.
a) M-30 b) M-20
c) M-40 d) M-25

6) The minimum width of carriage way for a single lane bridge is _____.
a) 4.25m b) 6m
c) 10m d) 7.5m

7) For spans greater than 9m, impact factor for Tracked vehicle is _____.
a) 10% b) 20%
c) 25% d) 15%

8) Guideline for the design of bridge foundation are available in IRC bridge code section _____.
a) I b) III
c) V d) VII

9) Span is called as economical span when _____.
a) Cost of substructure should be equal to cost of superstructure
b) Cost of substructure should be greater than Cost of superstructure
c) Cost of substructure should be less than Cost of superstructure
d) Does not depend on cost

10) Simply supported span requires _____.
a) Fixed bearing at both ends
b) Expansion bearing at both ends
c) Fixed bearing at one end and expansion bearing at the other
d) Either a or b, both are correct

11) Continuous girder requires _____.
a) Fixed bearing on all supports
b) Expansion bearing on all supports
c) Expansion bearing on all support except at one
d) Fixed bearing on all support except at one

12) The pier cap or abutment cap should be of minimum _____concrete.
a) M20 grade b) M25 grade
c) M30 grade d) None one of these

13) Solid deck slab is adopted for spans _____.
a) more than 8 m b) more than 20 m
c) less than 8 m d) between 10-25 m

14) Following is not type of Expansion bearing _____.
a) Sliding plate beam b) Steel roller-cum-rocker bearing
c) Elastomeric bearing d) Rocker bearing

Seat No.	

Set | P

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (Old) (CBCS)
Examination: March/April – 2026
Design of Bridges (BTN01610)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Question No. 2 is compulsory in section I, and solve any two questions from the remaining.
2) Question No. 6 is compulsory in section II, and solve any two questions from the remaining
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary and mention it clearly.

Section – I

Q.2 Design a solid deck slab for Two lane bridge with following data: **10**
a) Effective span – 5 m
b) Carriage way width – 7.5 m
c) Kerb – 600 × 275 on both side
d) Live load – IRC Class AA tracked
e) Wearing coat – 100 mm thick
f) Use M-25 concrete and Fe- 415 steel
g) Use $\alpha = 2.64$

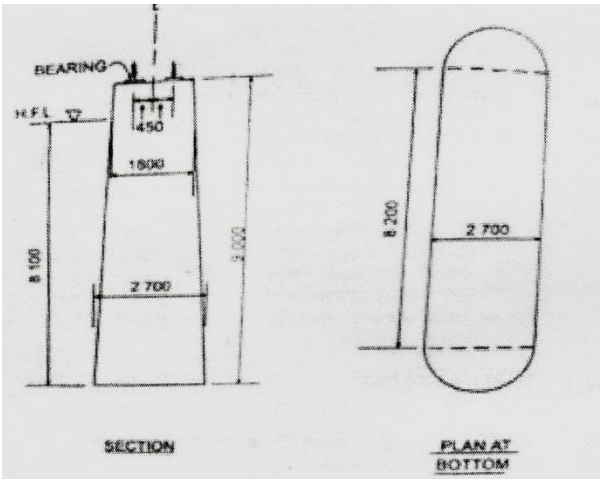
Q.3 Answer the following.
a) What are the investigations need to be carried out for bridge across a river? **05**
b) Give the detail classification of Bridges. **04**

Q.4 A RCC 'T' beam type bridge having deck slab of 200 mm thick, wearing coat of 100 mm thick, four longitudinal girders and five cross girders. Design the exterior longitudinal girder. **09**
Use following additional data:
a) Carriage way width –10 m
b) Span of bridge – 16 m
c) Live Load – IRC class AA Tracked
d) Kerb – 600 mm wide, 400 mm deep
e) Web thickness for Longitudinal and cross girder – 300 mm
f) Longitudinal Girder spacing – 300 mm
g) Use M-25 concrete and Fe-415 steel

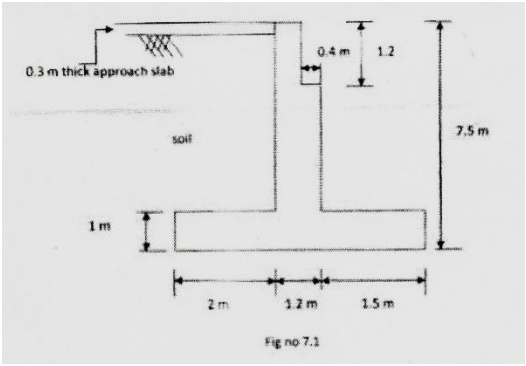
Q.5 Answer the following.
a) Write a note on components of bridges. **05**
b) Describe the effective width method of analysis of deck slab. **04**

Section – II

Q.6 Verify the adequacy of pier for the following data: **10**
Superstructure: 21.3 span
Reaction due to live load on the one span – 900 KN
Maximum mean velocity of current – 3.6 m/sec
Material for pier: M20 grade concrete
Live load: IRC Class AA Tracked



Q.7 Verify the suitability of abutment as shown in the fig 7.1. **09**
Use following data:
Density of soil – 18 kN/m^3,
Friction angle of soil $(\emptyset) = 30°$
Coefficient of friction – 0.5,
Live load reaction at bearing – 500 kN,
DL reaction from super structure – 2200 kN



Q.8 **a)** Design an elastomeric unreinforced bearing pad for following data. **05**
Vertical load (sustained) = 200 KN
Vertical load (dynamic) = 40 KN
Horizontal force (H) = 60 KN
Modulus of rigidity of elastomer (G) = 1 N/mm^2
Friction coefficient = 0.3

b) Write a note on expansion joints. **04**

Q.9 Write a note on following. (Any Three) **09**

a) Cantilever method of construction

b) Erection methods for Bridges

c) Types of bridge inspection

d) Functions of bearing

SLR-QH-272

Seat No.	

Set Q

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (Old) (CBCS)
Examination: March/April – 2026
Design of Bridges (BTN01610)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) Guideline for the design of bridge foundation are available in IRC bridge code section _____.
a) I b) III
c) V d) VII

2) Span is called as economical span when _____.
a) Cost of substructure should be equal to cost of superstructure
b) Cost of substructure should be greater than Cost of superstructure
c) Cost of substructure should be less than Cost of superstructure
d) Does not depend on cost

3) Simply supported span requires _____.
a) Fixed bearing at both ends
b) Expansion bearing at both ends
c) Fixed bearing at one end and expansion bearing at the other
d) Either a or b, both are correct

4) Continuous girder requires _____.
a) Fixed bearing on all supports
b) Expansion bearing on all supports
c) Expansion bearing on all support except at one
d) Fixed bearing on all support except at one

5) The pier cap or abutment cap should be of minimum _____concrete.
a) M20 grade b) M25 grade
c) M30 grade d) None one of these

6) Solid deck slab is adopted for spans _____.
a) more than 8 m b) more than 20 m
c) less than 8 m d) between 10-25 m

7) Following is not type of Expansion bearing _____.
a) Sliding plate beam b) Steel roller-cum-rocker bearing
c) Elastomeric bearing d) Rocker bearing

8) Total load of class AA wheeled is _____.
a) 700kN b) 400kN
c) 554kN d) 332kN

9) Braking force is assumed to act along the line parallel to roadway & _____ above it.
a) 1.2m b) 1.5m
c) 1.8m d) 2.0m

10) The ground contact length of the track of IRC class AA loading is _____.
a) 3.6m b) 4.57m
c) 3.5m d) None of these

11) For small bridges, with open foundations, the economical span is approximately equal to _____ times height of Pier.
a) 2.0 b) 1.2
c) 1.0 d) 1.5

12) _____ is the minimum grade of concrete for prestressed concrete bridges.
a) M-30 b) M-20
c) M-40 d) M-25

13) The minimum width of carriage way for a single lane bridge is _____.
a) 4.25m b) 6m
c) 10m d) 7.5m

14) For spans greater than 9m, impact factor for Tracked vehicle is _____.
a) 10% b) 20%
c) 25% d) 15%

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (Old) (CBCS)
Examination: March/April – 2026
Design of Bridges (BTN01610)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Question No. 2 is compulsory in section I, and solve any two questions from the remaining.
2) Question No. 6 is compulsory in section II, and solve any two questions from the remaining
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary and mention it clearly.

Section – I

Q.2 Design a solid deck slab for Two lane bridge with following data: **10**
a) Effective span – 5 m
b) Carriage way width – 7.5 m
c) Kerb – 600 × 275 on both side
d) Live load – IRC Class AA tracked
e) Wearing coat – 100 mm thick
f) Use M-25 concrete and Fe- 415 steel
g) Use $\alpha = 2.64$

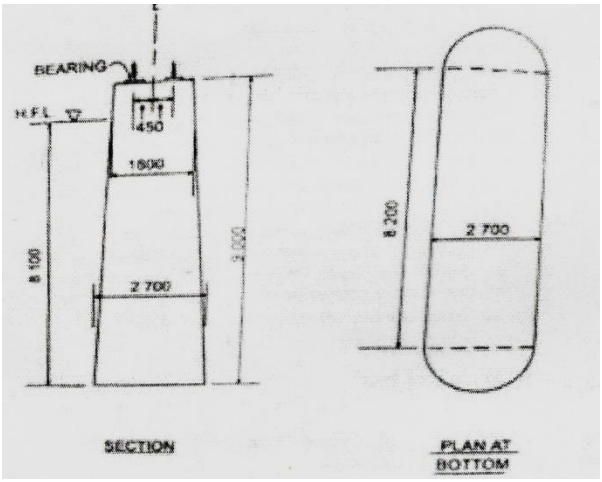
Q.3 Answer the following.
a) What are the investigations need to be carried out for bridge across a river? **05**
b) Give the detail classification of Bridges. **04**

Q.4 A RCC 'T' beam type bridge having deck slab of 200 mm thick, wearing coat of 100 mm thick, four longitudinal girders and five cross girders. Design the exterior longitudinal girder. **09**
Use following additional data:
a) Carriage way width –10 m
b) Span of bridge – 16 m
c) Live Load – IRC class AA Tracked
d) Kerb – 600 mm wide, 400 mm deep
e) Web thickness for Longitudinal and cross girder – 300 mm
f) Longitudinal Girder spacing – 300 mm
g) Use M-25 concrete and Fe-415 steel

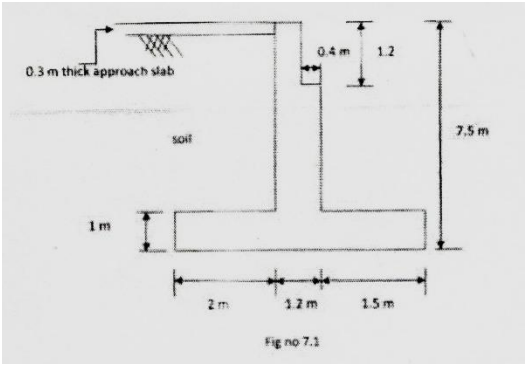
Q.5 Answer the following.
a) Write a note on components of bridges. **05**
b) Describe the effective width method of analysis of deck slab. **04**

Section – II

Q.6 Verify the adequacy of pier for the following data: **10**
Superstructure: 21.3 span
Reaction due to live load on the one span – 900 KN
Maximum mean velocity of current – 3.6 m/sec
Material for pier: M20 grade concrete
Live load: IRC Class AA Tracked



Q.7 Verify the suitability of abutment as shown in the fig 7.1. **09**
Use following data:
Density of soil – 18 kN/m^3,
Friction angle of soil $(\emptyset) = 30°$
Coefficient of friction – 0.5,
Live load reaction at bearing – 500 kN,
DL reaction from super structure – 2200 kN



Q.8 **a)** Design an elastomeric unreinforced bearing pad for following data. **05**
Vertical load (sustained) = 200 KN
Vertical load (dynamic) = 40 KN
Horizontal force (H) = 60 KN
Modulus of rigidity of elastomer (G) = 1 N/mm^2
Friction coefficient = 0.3

b) Write a note on expansion joints. **04**

Q.9 Write a note on following. (Any Three) **09**

a) Cantilever method of construction

b) Erection methods for Bridges

c) Types of bridge inspection

d) Functions of bearing

SLR-QH-272

Seat No.	

Set R

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (Old) (CBCS)
Examination: March/April – 2026
Design of Bridges (BTN01610)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) Continuous girder requires _____.
a) Fixed bearing on all supports
b) Expansion bearing on all supports
c) Expansion bearing on all support except at one
d) Fixed bearing on all support except at one

2) The pier cap or abutment cap should be of minimum _____concrete.
a) M20 grade b) M25 grade
c) M30 grade d) None one of these

3) Solid deck slab is adopted for spans _____.
a) more than 8 m b) more than 20 m
c) less than 8 m d) between 10-25 m

4) Following is not type of Expansion bearing _____.
a) Sliding plate beam b) Steel roller-cum-rocker bearing
c) Elastomeric bearing d) Rocker bearing

5) Total load of class AA wheeled is _____.
a) 700kN b) 400kN
c) 554kN d) 332kN

6) Braking force is assumed to act along the line parallel to roadway & _____ above it.
a) 1.2m b) 1.5m
c) 1.8m d) 2.0m

7) The ground contact length of the track of IRC class AA loading is _____.
a) 3.6m b) 4.57m
c) 3.5m d) None of these

8) For small bridges, with open foundations, the economical span is approximately equal to _____ times height of Pier.
a) 2.0 b) 1.2
c) 1.0 d) 1.5

9) _____ is the minimum grade of concrete for prestressed concrete bridges.
a) M-30 b) M-20
c) M-40 d) M-25

10) The minimum width of carriage way for a single lane bridge is _____.
a) 4.25m b) 6m
c) 10m d) 7.5m

11) For spans greater than 9m, impact factor for Tracked vehicle is _____.
a) 10% b) 20%
c) 25% d) 15%

12) Guideline for the design of bridge foundation are available in IRC bridge code section _____.
a) I b) III
c) V d) VII

13) Span is called as economical span when _____.
a) Cost of substructure should be equal to cost of superstructure
b) Cost of substructure should be greater than Cost of superstructure
c) Cost of substructure should be less than Cost of superstructure
d) Does not depend on cost

14) Simply supported span requires _____.
a) Fixed bearing at both ends
b) Expansion bearing at both ends
c) Fixed bearing at one end and expansion bearing at the other
d) Either a or b, both are correct

Seat No.	

Set **R**

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (Old) (CBCS)
Examination: March/April – 2026
Design of Bridges (BTN01610)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Question No. 2 is compulsory in section I, and solve any two questions from the remaining.
2) Question No. 6 is compulsory in section II, and solve any two questions from the remaining
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary and mention it clearly.

Section – I

Q.2 Design a solid deck slab for Two lane bridge with following data: **10**
a) Effective span – 5 m
b) Carriage way width – 7.5 m
c) Kerb – 600 × 275 on both side
d) Live load – IRC Class AA tracked
e) Wearing coat – 100 mm thick
f) Use M-25 concrete and Fe- 415 steel
g) Use $\alpha = 2.64$

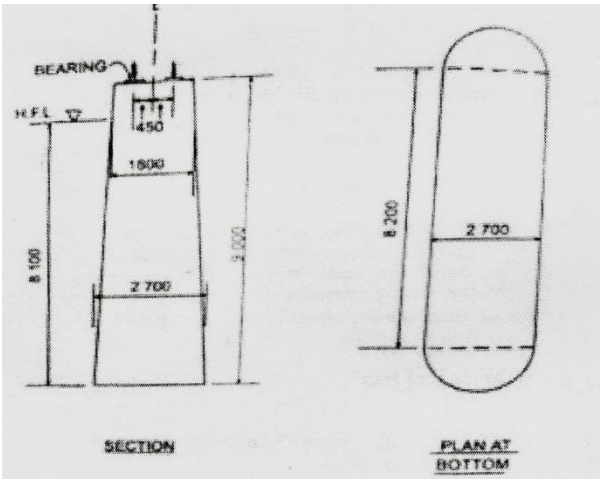
Q.3 Answer the following.
a) What are the investigations need to be carried out for bridge across a river? **05**
b) Give the detail classification of Bridges. **04**

Q.4 A RCC 'T' beam type bridge having deck slab of 200 mm thick, wearing coat of 100 mm thick, four longitudinal girders and five cross girders. Design the exterior longitudinal girder. **09**
Use following additional data:
a) Carriage way width –10 m
b) Span of bridge – 16 m
c) Live Load – IRC class AA Tracked
d) Kerb – 600 mm wide, 400 mm deep
e) Web thickness for Longitudinal and cross girder – 300 mm
f) Longitudinal Girder spacing – 300 mm
g) Use M-25 concrete and Fe-415 steel

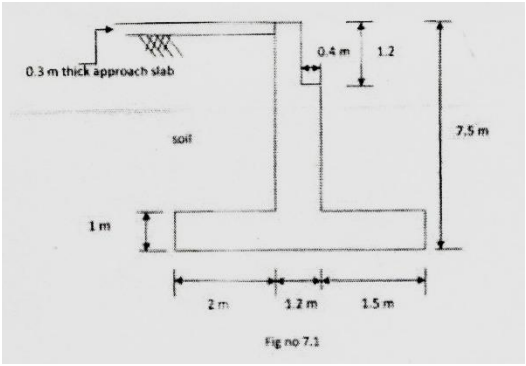
Q.5 Answer the following.
a) Write a note on components of bridges. **05**
b) Describe the effective width method of analysis of deck slab. **04**

Section – II

Q.6 Verify the adequacy of pier for the following data: **10**
Superstructure: 21.3 span
Reaction due to live load on the one span – 900 KN
Maximum mean velocity of current – 3.6 m/sec
Material for pier: M20 grade concrete
Live load: IRC Class AA Tracked



Q.7 Verify the suitability of abutment as shown in the fig 7.1. **09**
Use following data:
Density of soil – 18 kN/m^3,
Friction angle of soil $(\emptyset) = 30°$
Coefficient of friction – 0.5,
Live load reaction at bearing – 500 kN,
DL reaction from super structure – 2200 kN



Q.8 **a)** Design an elastomeric unreinforced bearing pad for following data. **05**
Vertical load (sustained) = 200 KN
Vertical load (dynamic) = 40 KN
Horizontal force (H) = 60 KN
Modulus of rigidity of elastomer (G) = 1 N/mm^2
Friction coefficient = 0.3

b) Write a note on expansion joints. **04**

Q.9 Write a note on following. (Any Three) **09**

a) Cantilever method of construction

b) Erection methods for Bridges

c) Types of bridge inspection

d) Functions of bearing

SLR-QH-272

Seat No.	

Set S

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (Old) (CBCS)
Examination: March/April – 2026
Design of Bridges (BTN01610)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) The minimum width of carriage way for a single lane bridge is _____.
a) 4.25m b) 6m
c) 10m d) 7.5m

2) For spans greater than 9m, impact factor for Tracked vehicle is _____.
a) 10% b) 20%
c) 25% d) 15%

3) Guideline for the design of bridge foundation are available in IRC bridge code section _____.
a) I b) III
c) V d) VII

4) Span is called as economical span when _____.
a) Cost of substructure should be equal to cost of superstructure
b) Cost of substructure should be greater than Cost of superstructure
c) Cost of substructure should be less than Cost of superstructure
d) Does not depend on cost

5) Simply supported span requires _____.
a) Fixed bearing at both ends
b) Expansion bearing at both ends
c) Fixed bearing at one end and expansion bearing at the other
d) Either a or b, both are correct

6) Continuous girder requires _____.
a) Fixed bearing on all supports
b) Expansion bearing on all supports
c) Expansion bearing on all support except at one
d) Fixed bearing on all support except at one

7) The pier cap or abutment cap should be of minimum _____concrete.
a) M20 grade
b) M25 grade
c) M30 grade
d) None one of these

8) Solid deck slab is adopted for spans _____.
a) more than 8 m
b) more than 20 m
c) less than 8 m
d) between 10-25 m

9) Following is not type of Expansion bearing _____.
a) Sliding plate beam
b) Steel roller-cum-rocker bearing
c) Elastomeric bearing
d) Rocker bearing

10) Total load of class AA wheeled is _____.
a) 700kN
b) 400kN
c) 554kN
d) 332kN

11) Braking force is assumed to act along the line parallel to roadway & _____ above it.
a) 1.2m
b) 1.5m
c) 1.8m
d) 2.0m

12) The ground contact length of the track of IRC class AA loading is _____.
a) 3.6m
b) 4.57m
c) 3.5m
d) None of these

13) For small bridges, with open foundations, the economical span is approximately equal to _____ times height of Pier.
a) 2.0
b) 1.2
c) 1.0
d) 1.5

14) _____ is the minimum grade of concrete for prestressed concrete bridges.
a) M-30
b) M-20
c) M-40
d) M-25

Seat No.	

Set **S**

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (Old) (CBCS)
Examination: March/April – 2026
Design of Bridges (BTN01610)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Question No. 2 is compulsory in section I, and solve any two questions from the remaining.
2) Question No. 6 is compulsory in section II, and solve any two questions from the remaining
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary and mention it clearly.

Section – I

Q.2 Design a solid deck slab for Two lane bridge with following data: **10**
a) Effective span – 5 m
b) Carriage way width – 7.5 m
c) Kerb – 600 × 275 on both side
d) Live load – IRC Class AA tracked
e) Wearing coat – 100 mm thick
f) Use M-25 concrete and Fe- 415 steel
g) Use $\alpha = 2.64$

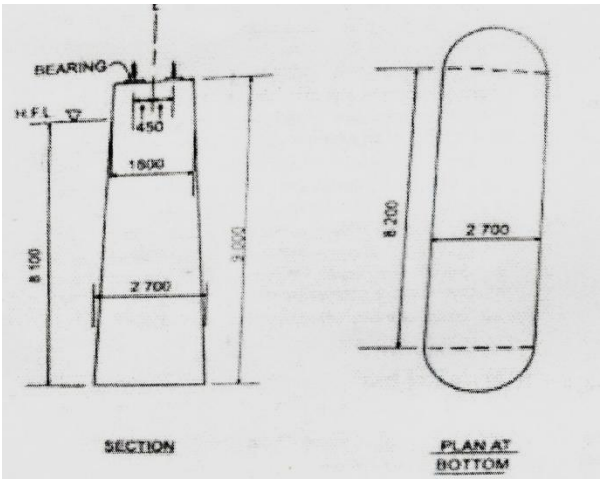
Q.3 Answer the following.
a) What are the investigations need to be carried out for bridge across a river? **05**
b) Give the detail classification of Bridges. **04**

Q.4 A RCC 'T' beam type bridge having deck slab of 200 mm thick, wearing coat of 100 mm thick, four longitudinal girders and five cross girders. Design the exterior longitudinal girder. **09**
Use following additional data:
a) Carriage way width –10 m
b) Span of bridge – 16 m
c) Live Load – IRC class AA Tracked
d) Kerb – 600 mm wide, 400 mm deep
e) Web thickness for Longitudinal and cross girder – 300 mm
f) Longitudinal Girder spacing – 300 mm
g) Use M-25 concrete and Fe-415 steel

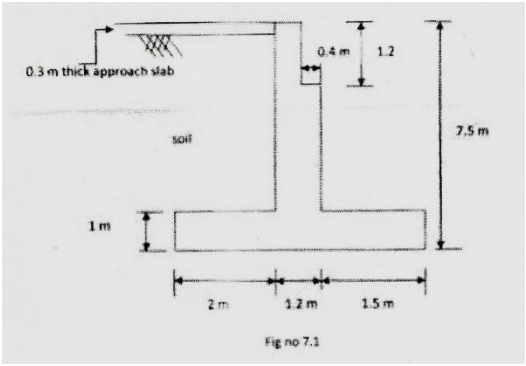
Q.5 Answer the following.
a) Write a note on components of bridges. **05**
b) Describe the effective width method of analysis of deck slab. **04**

Section – II

Q.6 Verify the adequacy of pier for the following data: **10**
Superstructure: 21.3 span
Reaction due to live load on the one span – 900 KN
Maximum mean velocity of current – 3.6 m/sec
Material for pier: M20 grade concrete
Live load: IRC Class AA Tracked



Q.7 Verify the suitability of abutment as shown in the fig 7.1. **09**
Use following data:
Density of soil – 18 kN/m^3,
Friction angle of soil $(\emptyset) = 30°$
Coefficient of friction – 0.5,
Live load reaction at bearing – 500 kN,
DL reaction from super structure – 2200 kN



Q.8 **a)** Design an elastomeric unreinforced bearing pad for following data. **05**
Vertical load (sustained) = 200 KN
Vertical load (dynamic) = 40 KN
Horizontal force (H) = 60 KN
Modulus of rigidity of elastomer (G) = 1 N/mm^2
Friction coefficient = 0.3

b) Write a note on expansion joints. **04**

Q.9 Write a note on following. (Any Three) **09**

a) Cantilever method of construction

b) Erection methods for Bridges

c) Types of bridge inspection

d) Functions of bearing

SLR-QH-278

Seat No.	

Set P

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (Old) (CBCS)
Examination: March/April – 2026
Advanced Concrete Technology (BTN01616)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Multiple Choice Questions. **14**

1) Which of the following materials is commonly used as an additive in blended cement?
a) Silica fume b) Coal
c) Gypsum d) Bentonite

2) Which of the following factors can increase the rate of hydration in cement?
a) Lower temperature
b) Higher water-cement ratio
c) Presence of pozzolanic materials
d) Higher temperature

3) Which of the following is a common issue when using crushed sand in concrete?
a) Higher water demand b) Improved workability
c) Reduced water absorption d) Lower strength

4) Mass concrete is defined as concrete with a large volume, typically used in _____.
a) Thin structural elements like beams and slabs
b) Large structural elements like dams and foundations
c) Decorative concrete elements
d) High-rise building facades

5) Which of the following is NOT an advantage of sprayed concrete?
a) Ability to apply to complex shapes
b) Faster application than traditional casting
c) Lower cost of materials
d) Can be applied in thin layers with high strength

6) The primary types of sprayed concrete are _____.
a) Wet mix and dry mix
b) Low strength and high strength
c) Cement-based and polymer-based
d) Precast and cast-in-situ

7) What is a key characteristic of ferro-cement construction?
a) It uses large structural steel beams
b) It has low material strength compared to conventional concrete
c) It involves dense layers of wire mesh and small steel bars for reinforcement
d) It is only used for decorative purposes

8) Which type of pump is typically used for pumping concrete?
a) Hydraulic piston pump
b) Centrifugal pump
c) Gear pump
d) Concrete pump with twin cylinders or a peristaltic pump

9) The main ingredient that is often added to High-Strength Concrete (HSC) to reduce its water-cement ratio is _____.
a) Super plasticizer b) Fly ash
c) Silica fume d) Air-entraining agent

10) What is the primary advantage of using steel fibers in concrete?
a) Improved ductility and control of cracking
b) Lower cost of concrete
c) Reduced workability
d) Increased permeability

11) Self-Compacting Concrete (SCC) is characterized by _____.
a) High strength and low workability
b) High workability and ability to flow without vibration
c) Low water-cement ratio
d) Reduced permeability due to excess water

12) One of the main challenges of using Recycled Concrete Aggregate (RCA) in new concrete is _____.
a) Increased workability
b) Increased porosity and reduced strength
c) Improved durability
d) Decreased water absorption

13) In which type of construction is mass concrete primarily used?

a) Pavements
b) Skyscrapers
c) Dams, foundations, and other large structures
d) Road curbs

14) The hydration of cement is primarily a _____.

a) Physical process
b) Chemical process
c) Biological process
d) Physical and biological process

Seat No.	

Set | P

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (Old) (CBCS)
Examination: March/April – 2026
Advanced Concrete Technology (BTN01616)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) In section- I Q. No. 2 is compulsory and solve any two questions from the remaining. (Q. No. 3, 4 & 5)
2) In section- II Q. No. 6 is compulsory and solve any two questions from the remaining (Q. No. 7, 8, & 9)
3) Figures to the right indicates full marks.
4) Assume suitable data wherever needed & mention it clearly.

SECTION – I

Q.2 Solve Any Two. **08**

a) Explain briefly heat of hydration process occurred in the cement.

b) Write a note bogues compound of cement.

c) Explain in detail blended cement.

Q.3 Solve Any Two question. **10**

a) Explain the effect using admixture in the concrete.

b) Compare the effects of pulverized fuel ash, ground granulated blast furnace slag, and silica fume on the following properties, of concrete:
i) Workability
ii) Durability
iii) Strength development

c) Explain admixture, super plasticizer, plasticizers, accelerator and retarder.

Q.4 Solve Any Two question. **10**

a) How does particle size of aggregates influence the properties of concrete?

b) Write a short note on placing and compaction of concrete.

c) Explain the effect of impermeability and particle size on concrete.

Q.5 Solve Any One question. **10**

a) Solve any Two.
i) What are the key benefits of using high-performance concrete in construction?
ii) What is the effect of using lightweight aggregates on the compressive strength and workability of concrete?
iii) Compare the advantages of high-performance concrete and fiber-reinforced concrete

b) Solve any Two.

i) What are the primary factors that influence the curing process of high-strength concrete?

ii) How does the addition of fibers to concrete influence its compressive strength?

iii) Compare and contrast the properties, advantages, and limitations of high-performance concrete and high-strength concrete.

SECTION - II

Q.6 Solve Any Two question. **08**

a) Short note on Sprayed Concrete.

b) Short note on Sustainable Concrete.

c) Define ferro-cement concrete. What materials are typically used in its production?

Q.7 Solve Any Two question. **10**

a) What are the common methods of transporting RMC from the plant to the construction site?

b) Short note on Ready Mix Concrete and its applications to the construction industries.

c) What is ready mix concrete? Explain the working of RMC plant in detail.

Q.8 Solve Any Two question. **10**

a) What measures should be taken to ensure the quality of concrete at a construction site?

b) What are the causes for deterioration & distress in structures? Describe each cause.

c) Why and when NDT Test are performed, explain with its application.

Q.9 Solve Any One question. **10**

a) What are the main advantages of using roller compacted concrete over conventional concrete in construction?

b) What is mix design? Write down design steps of concrete mix design using IS 10262:2009 methods.

SLR-QH-278

Seat No.	

Set Q

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (Old) (CBCS)
Examination: March/April – 2026
Advanced Concrete Technology (BTN01616)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 70
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4) Assume suitable data wherever needed and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Multiple Choice Questions. **14**

1) Which type of pump is typically used for pumping concrete?
a) Hydraulic piston pump
b) Centrifugal pump
c) Gear pump
d) Concrete pump with twin cylinders or a peristaltic pump

2) The main ingredient that is often added to High-Strength Concrete (HSC) to reduce its water-cement ratio is _____.
a) Super plasticizer b) Fly ash
c) Silica fume d) Air-entraining agent

3) What is the primary advantage of using steel fibers in concrete?
a) Improved ductility and control of cracking
b) Lower cost of concrete
c) Reduced workability
d) Increased permeability

4) Self-Compacting Concrete (SCC) is characterized by _____.
a) High strength and low workability
b) High workability and ability to flow without vibration
c) Low water-cement ratio
d) Reduced permeability due to excess water

5) One of the main challenges of using Recycled Concrete Aggregate (RCA) in new concrete is _____.
a) Increased workability
b) Increased porosity and reduced strength
c) Improved durability
d) Decreased water absorption

6) In which type of construction is mass concrete primarily used?
a) Pavements
b) Skyscrapers
c) Dams, foundations, and other large structures
d) Road curbs

7) The hydration of cement is primarily a _____.
a) Physical process
b) Chemical process
c) Biological process
d) Physical and biological process

8) Which of the following materials is commonly used as an additive in blended cement?
a) Silica fume
b) Coal
c) Gypsum
d) Bentonite

9) Which of the following factors can increase the rate of hydration in cement?
a) Lower temperature
b) Higher water-cement ratio
c) Presence of pozzolanic materials
d) Higher temperature

10) Which of the following is a common issue when using crushed sand in concrete?
a) Higher water demand
b) Improved workability
c) Reduced water absorption
d) Lower strength

11) Mass concrete is defined as concrete with a large volume, typically used in _____.
a) Thin structural elements like beams and slabs
b) Large structural elements like dams and foundations
c) Decorative concrete elements
d) High-rise building facades

12) Which of the following is NOT an advantage of sprayed concrete?
a) Ability to apply to complex shapes
b) Faster application than traditional casting
c) Lower cost of materials
d) Can be applied in thin layers with high strength

13) The primary types of sprayed concrete are _____.
a) Wet mix and dry mix
b) Low strength and high strength
c) Cement-based and polymer-based
d) Precast and cast-in-situ

14) What is a key characteristic of ferro-cement construction?
a) It uses large structural steel beams
b) It has low material strength compared to conventional concrete
c) It involves dense layers of wire mesh and small steel bars for reinforcement
d) It is only used for decorative purposes

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (Old) (CBCS)
Examination: March/April – 2026
Advanced Concrete Technology (BTN01616)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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3) Figures to the right indicates full marks.
4) Assume suitable data wherever needed & mention it clearly.

SECTION – I

Q.2 Solve Any Two. **08**

a) Explain briefly heat of hydration process occurred in the cement.

b) Write a note bogues compound of cement.

c) Explain in detail blended cement.

Q.3 Solve Any Two question. **10**

a) Explain the effect using admixture in the concrete.

b) Compare the effects of pulverized fuel ash, ground granulated blast furnace slag, and silica fume on the following properties, of concrete:
i) Workability
ii) Durability
iii) Strength development

c) Explain admixture, super plasticizer, plasticizers, accelerator and retarder.

Q.4 Solve Any Two question. **10**

a) How does particle size of aggregates influence the properties of concrete?

b) Write a short note on placing and compaction of concrete.

c) Explain the effect of impermeability and particle size on concrete.

Q.5 Solve Any One question. **10**

a) Solve any Two.
i) What are the key benefits of using high-performance concrete in construction?
ii) What is the effect of using lightweight aggregates on the compressive strength and workability of concrete?
iii) Compare the advantages of high-performance concrete and fiber-reinforced concrete

b) Solve any Two.

i) What are the primary factors that influence the curing process of high-strength concrete?

ii) How does the addition of fibers to concrete influence its compressive strength?

iii) Compare and contrast the properties, advantages, and limitations of high-performance concrete and high-strength concrete.

SECTION - II

Q.6 Solve Any Two question. **08**

a) Short note on Sprayed Concrete.

b) Short note on Sustainable Concrete.

c) Define ferro-cement concrete. What materials are typically used in its production?

Q.7 Solve Any Two question. **10**

a) What are the common methods of transporting RMC from the plant to the construction site?

b) Short note on Ready Mix Concrete and its applications to the construction industries.

c) What is ready mix concrete? Explain the working of RMC plant in detail.

Q.8 Solve Any Two question. **10**

a) What measures should be taken to ensure the quality of concrete at a construction site?

b) What are the causes for deterioration & distress in structures? Describe each cause.

c) Why and when NDT Test are performed, explain with its application.

Q.9 Solve Any One question. **10**

a) What are the main advantages of using roller compacted concrete over conventional concrete in construction?

b) What is mix design? Write down design steps of concrete mix design using IS 10262:2009 methods.

SLR-QH-278

Seat No.	

Set R

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (Old) (CBCS)
Examination: March/April – 2026
Advanced Concrete Technology (BTN01616)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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4) Assume suitable data wherever needed and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Multiple Choice Questions. 14

1) Self-Compacting Concrete (SCC) is characterized by _____.
a) High strength and low workability
b) High workability and ability to flow without vibration
c) Low water-cement ratio
d) Reduced permeability due to excess water

2) One of the main challenges of using Recycled Concrete Aggregate (RCA) in new concrete is _____.
a) Increased workability
b) Increased porosity and reduced strength
c) Improved durability
d) Decreased water absorption

3) In which type of construction is mass concrete primarily used?
a) Pavements
b) Skyscrapers
c) Dams, foundations, and other large structures
d) Road curbs

4) The hydration of cement is primarily a _____.
a) Physical process b) Chemical process
c) Biological process d) Physical and biological process

5) Which of the following materials is commonly used as an additive in blended cement?
a) Silica fume b) Coal
c) Gypsum d) Bentonite

6) Which of the following factors can increase the rate of hydration in cement?
a) Lower temperature
b) Higher water-cement ratio
c) Presence of pozzolanic materials
d) Higher temperature

7) Which of the following is a common issue when using crushed sand in concrete?
a) Higher water demand
b) Improved workability
c) Reduced water absorption
d) Lower strength

8) Mass concrete is defined as concrete with a large volume, typically used in _____.
a) Thin structural elements like beams and slabs
b) Large structural elements like dams and foundations
c) Decorative concrete elements
d) High-rise building facades

9) Which of the following is NOT an advantage of sprayed concrete?
a) Ability to apply to complex shapes
b) Faster application than traditional casting
c) Lower cost of materials
d) Can be applied in thin layers with high strength

10) The primary types of sprayed concrete are _____.
a) Wet mix and dry mix
b) Low strength and high strength
c) Cement-based and polymer-based
d) Precast and cast-in-situ

11) What is a key characteristic of ferro-cement construction?
a) It uses large structural steel beams
b) It has low material strength compared to conventional concrete
c) It involves dense layers of wire mesh and small steel bars for reinforcement
d) It is only used for decorative purposes

12) Which type of pump is typically used for pumping concrete?
a) Hydraulic piston pump
b) Centrifugal pump
c) Gear pump
d) Concrete pump with twin cylinders or a peristaltic pump

13) The main ingredient that is often added to High-Strength Concrete (HSC) to reduce its water-cement ratio is _____.
a) Super plasticizer
b) Fly ash
c) Silica fume
d) Air-entraining agent

14) What is the primary advantage of using steel fibers in concrete?

a) Improved ductility and control of cracking
b) Lower cost of concrete
c) Reduced workability
d) Increased permeability

Seat No.	

Set **R**

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (Old) (CBCS)
Examination: March/April – 2026
Advanced Concrete Technology (BTN01616)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) In section- I Q. No. 2 is compulsory and solve any two questions from the remaining. (Q. No. 3, 4 & 5)
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3) Figures to the right indicates full marks.
4) Assume suitable data wherever needed & mention it clearly.

SECTION – I

Q.2 Solve Any Two. **08**

a) Explain briefly heat of hydration process occurred in the cement.

b) Write a note bogues compound of cement.

c) Explain in detail blended cement.

Q.3 Solve Any Two question. **10**

a) Explain the effect using admixture in the concrete.

b) Compare the effects of pulverized fuel ash, ground granulated blast furnace slag, and silica fume on the following properties, of concrete:
i) Workability
ii) Durability
iii) Strength development

c) Explain admixture, super plasticizer, plasticizers, accelerator and retarder.

Q.4 Solve Any Two question. **10**

a) How does particle size of aggregates influence the properties of concrete?

b) Write a short note on placing and compaction of concrete.

c) Explain the effect of impermeability and particle size on concrete.

Q.5 Solve Any One question. **10**

a) Solve any Two.
i) What are the key benefits of using high-performance concrete in construction?
ii) What is the effect of using lightweight aggregates on the compressive strength and workability of concrete?
iii) Compare the advantages of high-performance concrete and fiber-reinforced concrete

b) Solve any Two.

i) What are the primary factors that influence the curing process of high-strength concrete?

ii) How does the addition of fibers to concrete influence its compressive strength?

iii) Compare and contrast the properties, advantages, and limitations of high-performance concrete and high-strength concrete.

SECTION - II

Q.6 Solve Any Two question. **08**

a) Short note on Sprayed Concrete.

b) Short note on Sustainable Concrete.

c) Define ferro-cement concrete. What materials are typically used in its production?

Q.7 Solve Any Two question. **10**

a) What are the common methods of transporting RMC from the plant to the construction site?

b) Short note on Ready Mix Concrete and its applications to the construction industries.

c) What is ready mix concrete? Explain the working of RMC plant in detail.

Q.8 Solve Any Two question. **10**

a) What measures should be taken to ensure the quality of concrete at a construction site?

b) What are the causes for deterioration & distress in structures? Describe each cause.

c) Why and when NDT Test are performed, explain with its application.

Q.9 Solve Any One question. **10**

a) What are the main advantages of using roller compacted concrete over conventional concrete in construction?

b) What is mix design? Write down design steps of concrete mix design using IS 10262:2009 methods.

SLR-QH-278

Seat No.		Set	S

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (Old) (CBCS)
Examination: March/April – 2026
Advanced Concrete Technology (BTN01616)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 70
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MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Multiple Choice Questions. **14**

1) The primary types of sprayed concrete are _____.
a) Wet mix and dry mix
b) Low strength and high strength
c) Cement-based and polymer-based
d) Precast and cast-in-situ

2) What is a key characteristic of ferro-cement construction?
a) It uses large structural steel beams
b) It has low material strength compared to conventional concrete
c) It involves dense layers of wire mesh and small steel bars for reinforcement
d) It is only used for decorative purposes

3) Which type of pump is typically used for pumping concrete?
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b) Centrifugal pump
c) Gear pump
d) Concrete pump with twin cylinders or a peristaltic pump

4) The main ingredient that is often added to High-Strength Concrete (HSC) to reduce its water-cement ratio is _____.
a) Super plasticizer b) Fly ash
c) Silica fume d) Air-entraining agent

5) What is the primary advantage of using steel fibers in concrete?
a) Improved ductility and control of cracking
b) Lower cost of concrete
c) Reduced workability
d) Increased permeability

6) Self-Compacting Concrete (SCC) is characterized by _____.
a) High strength and low workability
b) High workability and ability to flow without vibration
c) Low water-cement ratio
d) Reduced permeability due to excess water

7) One of the main challenges of using Recycled Concrete Aggregate (RCA) in new concrete is _____.
a) Increased workability
b) Increased porosity and reduced strength
c) Improved durability
d) Decreased water absorption

8) In which type of construction is mass concrete primarily used?
a) Pavements
b) Skyscrapers
c) Dams, foundations, and other large structures
d) Road curbs

9) The hydration of cement is primarily a _____.
a) Physical process b) Chemical process
c) Biological process d) Physical and biological process

10) Which of the following materials is commonly used as an additive in blended cement?
a) Silica fume b) Coal
c) Gypsum d) Bentonite

11) Which of the following factors can increase the rate of hydration in cement?
a) Lower temperature
b) Higher water-cement ratio
c) Presence of pozzolanic materials
d) Higher temperature

12) Which of the following is a common issue when using crushed sand in concrete?
a) Higher water demand b) Improved workability
c) Reduced water absorption d) Lower strength

13) Mass concrete is defined as concrete with a large volume, typically used in _____.

a) Thin structural elements like beams and slabs
b) Large structural elements like dams and foundations
c) Decorative concrete elements
d) High-rise building facades

14) Which of the following is NOT an advantage of sprayed concrete?

a) Ability to apply to complex shapes
b) Faster application than traditional casting
c) Lower cost of materials
d) Can be applied in thin layers with high strength

SLR-QH-278

Seat No.	

Set S

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (Old) (CBCS)
Examination: March/April – 2026
Advanced Concrete Technology (BTN01616)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) In section- I Q. No. 2 is compulsory and solve any two questions from the remaining. (Q. No. 3, 4 & 5)
2) In section- II Q. No. 6 is compulsory and solve any two questions from the remaining (Q. No. 7, 8, & 9)
3) Figures to the right indicates full marks.
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SECTION – I

Q.2 Solve Any Two. **08**

a) Explain briefly heat of hydration process occurred in the cement.

b) Write a note bogues compound of cement.

c) Explain in detail blended cement.

Q.3 Solve Any Two question. **10**

a) Explain the effect using admixture in the concrete.

b) Compare the effects of pulverized fuel ash, ground granulated blast furnace slag, and silica fume on the following properties, of concrete:
i) Workability
ii) Durability
iii) Strength development

c) Explain admixture, super plasticizer, plasticizers, accelerator and retarder.

Q.4 Solve Any Two question. **10**

a) How does particle size of aggregates influence the properties of concrete?

b) Write a short note on placing and compaction of concrete.

c) Explain the effect of impermeability and particle size on concrete.

Q.5 Solve Any One question. **10**

a) Solve any Two.
i) What are the key benefits of using high-performance concrete in construction?
ii) What is the effect of using lightweight aggregates on the compressive strength and workability of concrete?
iii) Compare the advantages of high-performance concrete and fiber-reinforced concrete

b) Solve any Two.

i) What are the primary factors that influence the curing process of high-strength concrete?

ii) How does the addition of fibers to concrete influence its compressive strength?

iii) Compare and contrast the properties, advantages, and limitations of high-performance concrete and high-strength concrete.

SECTION - II

Q.6 Solve Any Two question. **08**

a) Short note on Sprayed Concrete.

b) Short note on Sustainable Concrete.

c) Define ferro-cement concrete. What materials are typically used in its production?

Q.7 Solve Any Two question. **10**

a) What are the common methods of transporting RMC from the plant to the construction site?

b) Short note on Ready Mix Concrete and its applications to the construction industries.

c) What is ready mix concrete? Explain the working of RMC plant in detail.

Q.8 Solve Any Two question. **10**

a) What measures should be taken to ensure the quality of concrete at a construction site?

b) What are the causes for deterioration & distress in structures? Describe each cause.

c) Why and when NDT Test are performed, explain with its application.

Q.9 Solve Any One question. **10**

a) What are the main advantages of using roller compacted concrete over conventional concrete in construction?

b) What is mix design? Write down design steps of concrete mix design using IS 10262:2009 methods.

SLR-QH-279

Seat No.	

Set P

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (Old) (CBCS)
Examination: March/April – 2026
Open Channel Flow & River Hydraulics (BTN01617)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Specific force represents the sum of pressure force and _____.
a) Datum head
b) Momentum flux per unit weight
c) Momentum flux and datum head
d) None

2) The ratio of inertia force and gravitational force is called as _____.
a) Reynolds number b) Stokes number
c) Froude's number d) Euler's number

3) Hydraulic jump is an example of _____.
a) Gradually varied flow b) Rapidly varied flow
c) Spatially varied flow d) None

4) Extreme condition of meanders is called as _____.
a) Leave b) Spurs
c) Cut-off d) Island

5) River gauge is used to measure _____.
a) Still level b) Water level
c) Turbulence d) Current

6) The dimension of kinematic viscosity is _____.
a) $L^{-1}T^{-1}$ b) $L^{2}T^{-1}$
c) $L^{-3}T^{-3}$ d) $L^{-2}T^{-3}$

7) Shield's diagram is a plot of non-dimensional shear stress (τC) against _____.

a) Relative depth
b) Shear Reynold's number
c) Hydraulic radius
d) Reynold's number

8) The flow in open channel may be characterized as turbulant when _____.

a) Re<500
b) Re>2000
c) Re>4000
d) 500<Re>2000

9) For the trapezoidal section _____.

a) Shape is of half hexagon
b) Depth of flow equal to half bed width
c) Side slope equal to 45°
d) None

10) The momentum correction factor, is given as _____.

a) $1/V^2A\int V^3 \cdot dA$
b) $1/VA\int V \cdot dA$
c) $1/V^3A\int V^2 \cdot dA$
d) $1/V^2A\int V^2 \cdot dA$

11) Hydraulic model and corresponding prototype should have _____.

a) Geometric similitude
b) Kinematic similitude
c) Dynamic similitude
d) All the above

12) If the Froude's number is 2.4 then the jump is known as _____.

a) Steady
b) Oscillating
c) Undular
d) Weak

13) The maximum velocity in open channel occurs at _____.

a) At the free surface
b) Near the channel bottom
c) Little below the free surface
d) None

14) Whose theory was the first to provide semi-theoretical analysis of the problem of incipient condition of bed motion?

a) Lacey's theory
b) Kennedy's theory
c) Shield's theory
d) Strickler's equation

Seat No.	

Set **P**

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (Old) (CBCS)
Examination: March/April – 2026
Open Channel Flow & River Hydraulics (BTN01617)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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

SECTION – I

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

a) Derive an expression for the depth of flow after the jump in a rectangular channel in terms of the depth before the jump.

b) Define Hydraulic jump and classify it on the basis of Froude's number.

c) A 3.2 m wide rectangular channel conveys 14 m^3/s of water with velocity 5.0 m/s. State if there is formation of hydraulic jump. If yes, calculate height, length and strength of Jump and what is loss of energy per kg of water.

d) Find the rate of and conveyance for a rectangular channel 7.4 m wide for uniform flow at depth of 3.0 m. The channel is having bed slope as 1/1000. Take n=0.015.

e) What do you understand by most economical channel section? Derive most economical rectangular channel section.

Q.3 Attempt the following. (Any Two) **12**

a) A discharge of 800 m^3/s flows down a spillway and then passes on a 55 m wide concrete apron (n=0.012). The velocity of water at the toe of spillway is 10 m/s. A tail water depth of 4.40 m causes a hydraulic jump.
Determine:
i) Depth before the jump
ii) Length of jump
iii) Energy loss in jump
iv) Specific force at the toe

b) Show that for a most economical trapezoidal section: Half of top width = Length of one of sloping side, and hydraulic mean depth = half the depth of flow.

c) Derive the equation for loss of energy through a Hydraulic Jump.

SECTION – II

Q.4 Attempt the following. (Any Four) **16**

a) Derive ‘Reynold’s model law’ and state giving examples where it can be used.

b) A model of water meter is tested in 90 mm diameter pipe. The discharge was 50 lit/sec and pressure difference is 0.10 N/mm^2. What will be the discharge in pipe of 500 mm diameter pipe and what will be the pressure.

c) Differentiate between Kennedy's theory and Lacey's theory for channel design.

d) Write short notes on
i) Levee
ii) Guide banks

e) Draw a neat sketch of current meter and explain its working in details.

Q.5 Attempt the following. (Any Two) **12**

a) Write the objectives of river training work in detail.

b) Design a channel section by using 'Kennedy's Theory' from following data:
i) discharge = 28 cumecs
ii) Kutter's (N = 0.0024)
iii) m = 1, side slope 0.5:1, B/D = 7.6. Also find Bed slope.

c) A spillway 7.0 m high and 150 m long discharges 2100 m3/sec, under a head of 4.0 m. If 1:16 model of spill way is to be constructed, find the dimensions of model, head over the model and discharge through the model.

SLR-QH-279

Seat No.	

Set Q

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (Old) (CBCS)
Examination: March/April – 2026
Open Channel Flow & River Hydraulics (BTN01617)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) The flow in open channel may be characterized as turbulant when _____.
a) Re<500 b) Re>2000
c) Re>4000 d) 500<Re>2000

2) For the trapezoidal section _____.
a) Shape is of half hexagon
b) Depth of flow equal to half bed width
c) Side slope equal to 45°
d) None

3) The momentum correction factor, is given as _____.
a) $1/V^2A\int V^3 \cdot dA$ b) $1/VA\int V \cdot dA$
c) $1/V^3A\int V^2 \cdot dA$ d) $1/V^2A\int V^2 \cdot dA$

4) Hydraulic model and corresponding prototype should have _____.
a) Geometric similitude b) Kinematic similitude
c) Dynamic similitude d) All the above

5) If the Froude's number is 2.4 then the jump is known as _____.
a) Steady b) Oscillating
c) Undular d) Weak

6) The maximum velocity in open channel occurs at _____.
a) At the free surface b) Near the channel bottom
c) Little below the free surface d) None

7) Whose theory was the first to provide semi-theoretical analysis of the problem of incipient condition of bed motion?

a) Lacey's theory
b) Kennedy's theory
c) Shield's theory
d) Strickler's equation

8) Specific force represents the sum of pressure force and _____.

a) Datum head
b) Momentum flux per unit weight
c) Momentum flux and datum head
d) None

9) The ratio of inertia force and gravitational force is called as _____.

a) Reynolds number
b) Stokes number
c) Froude's number
d) Euler's number

10) Hydraulic jump is an example of _____.

a) Gradually varied flow
b) Rapidly varied flow
c) Spatially varied flow
d) None

11) Extreme condition of meanders is called as _____.

a) Leave
b) Spurs
c) Cut-off
d) Island

12) River gauge is used to measure _____.

a) Still level
b) Water level
c) Turbulence
d) Current

13) The dimension of kinematic viscosity is _____.

a) $L^{-1}T^{-1}$
b) $L^{2}T^{-1}$
c) $L^{-3}T^{-3}$
d) $L^{-2}T^{-3}$

14) Shield's diagram is a plot of non-dimensional shear stress (τC) against _____.

a) Relative depth
b) Shear Reynold's number
c) Hydraulic radius
d) Reynold's number

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (Old) (CBCS)
Examination: March/April – 2026
Open Channel Flow & River Hydraulics (BTN01617)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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

SECTION – I

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

a) Derive an expression for the depth of flow after the jump in a rectangular channel in terms of the depth before the jump.

b) Define Hydraulic jump and classify it on the basis of Froude's number.

c) A 3.2 m wide rectangular channel conveys 14 m^3/s of water with velocity 5.0 m/s. State if there is formation of hydraulic jump. If yes, calculate height, length and strength of Jump and what is loss of energy per kg of water.

d) Find the rate of and conveyance for a rectangular channel 7.4 m wide for uniform flow at depth of 3.0 m. The channel is having bed slope as 1/1000. Take n=0.015.

e) What do you understand by most economical channel section? Derive most economical rectangular channel section.

Q.3 Attempt the following. (Any Two) **12**

a) A discharge of 800 m^3/s flows down a spillway and then passes on a 55 m wide concrete apron (n=0.012). The velocity of water at the toe of spillway is 10 m/s. A tail water depth of 4.40 m causes a hydraulic jump.
Determine:
i) Depth before the jump
ii) Length of jump
iii) Energy loss in jump
iv) Specific force at the toe

b) Show that for a most economical trapezoidal section: Half of top width = Length of one of sloping side, and hydraulic mean depth = half the depth of flow.

c) Derive the equation for loss of energy through a Hydraulic Jump.

SECTION – II

Q.4 Attempt the following. (Any Four) **16**

a) Derive ‘Reynold’s model law’ and state giving examples where it can be used.

b) A model of water meter is tested in 90 mm diameter pipe. The discharge was 50 lit/sec and pressure difference is 0.10 N/mm^2. What will be the discharge in pipe of 500 mm diameter pipe and what will be the pressure.

c) Differentiate between Kennedy's theory and Lacey's theory for channel design.

d) Write short notes on
i) Levee
ii) Guide banks

e) Draw a neat sketch of current meter and explain its working in details.

Q.5 Attempt the following. (Any Two) **12**

a) Write the objectives of river training work in detail.

b) Design a channel section by using 'Kennedy's Theory' from following data:
i) discharge = 28 cumecs
ii) Kutter's (N = 0.0024)
iii) m = 1, side slope 0.5:1, B/D = 7.6. Also find Bed slope.

c) A spillway 7.0 m high and 150 m long discharges 2100 m3/sec, under a head of 4.0 m. If 1:16 model of spill way is to be constructed, find the dimensions of model, head over the model and discharge through the model.

SLR-QH-279

Seat No.	

Set R

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (Old) (CBCS)
Examination: March/April – 2026
Open Channel Flow & River Hydraulics (BTN01617)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Hydraulic model and corresponding prototype should have _____.
a) Geometric similitude b) Kinematic similitude
c) Dynamic similitude d) All the above

2) If the Froude's number is 2.4 then the jump is known as _____.
a) Steady b) Oscillating
c) Undular d) Weak

3) The maximum velocity in open channel occurs at _____.
a) At the free surface b) Near the channel bottom
c) Little below the free surface d) None

4) Whose theory was the first to provide semi-theoretical analysis of the problem of incipient condition of bed motion?
a) Lacey's theory b) Kennedy's theory
c) Shield's theory d) Strickler's equation

5) Specific force represents the sum of pressure force and _____.
a) Datum head
b) Momentum flux per unit weight
c) Momentum flux and datum head
d) None

6) The ratio of inertia force and gravitational force is called as _____.
a) Reynolds number b) Stokes number
c) Froude's number d) Euler's number

7) Hydraulic jump is an example of _____.
a) Gradually varied flow b) Rapidly varied flow
c) Spatially varied flow d) None

8) Extreme condition of meanders is called as _____.
a) Leave b) Spurs
c) Cut-off d) Island

9) River gauge is used to measure _____.
a) Still level b) Water level
c) Turbulence d) Current

10) The dimension of kinematic viscosity is _____.
a) $L^{-1}T^{-1}$ b) $L^{2}T^{-1}$
c) $L^{-3}T^{-3}$ d) $L^{-2}T^{-3}$

11) Shield's diagram is a plot of non-dimensional shear stress (τC) against _____.
a) Relative depth b) Shear Reynold's number
c) Hydraulic radius d) Reynold's number

12) The flow in open channel may be characterized as turbulant when _____.
a) Re<500 b) Re>2000
c) Re>4000 d) 500<Re>2000

13) For the trapezoidal section _____.
a) Shape is of half hexagon
b) Depth of flow equal to half bed width
c) Side slope equal to 45°
d) None

14) The momentum correction factor, is given as _____.
a) $1/\mathrm{V}^2\mathrm{A}\int \mathrm{V}^3 \cdot \mathrm{dA}$ b) $1/\mathrm{VA}\int \mathrm{V} \cdot \mathrm{dA}$
c) $1/\mathrm{V}^3\mathrm{A}\int \mathrm{V}^2 \cdot \mathrm{dA}$ d) $1/\mathrm{V}^2\mathrm{A}\int \mathrm{V}^2 \cdot \mathrm{dA}$

Seat No.	

Set **R**

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (Old) (CBCS)
Examination: March/April – 2026
Open Channel Flow & River Hydraulics (BTN01617)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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

SECTION – I

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

a) Derive an expression for the depth of flow after the jump in a rectangular channel in terms of the depth before the jump.

b) Define Hydraulic jump and classify it on the basis of Froude's number.

c) A 3.2 m wide rectangular channel conveys 14 m^3/s of water with velocity 5.0 m/s. State if there is formation of hydraulic jump. If yes, calculate height, length and strength of Jump and what is loss of energy per kg of water.

d) Find the rate of and conveyance for a rectangular channel 7.4 m wide for uniform flow at depth of 3.0 m. The channel is having bed slope as 1/1000. Take n=0.015.

e) What do you understand by most economical channel section? Derive most economical rectangular channel section.

Q.3 Attempt the following. (Any Two) **12**

a) A discharge of 800 m^3/s flows down a spillway and then passes on a 55 m wide concrete apron (n=0.012). The velocity of water at the toe of spillway is 10 m/s. A tail water depth of 4.40 m causes a hydraulic jump.
Determine:
i) Depth before the jump
ii) Length of jump
iii) Energy loss in jump
iv) Specific force at the toe

b) Show that for a most economical trapezoidal section: Half of top width = Length of one of sloping side, and hydraulic mean depth = half the depth of flow.

c) Derive the equation for loss of energy through a Hydraulic Jump.

SECTION – II

Q.4 Attempt the following. (Any Four) **16**

a) Derive ‘Reynold’s model law’ and state giving examples where it can be used.

b) A model of water meter is tested in 90 mm diameter pipe. The discharge was 50 lit/sec and pressure difference is 0.10 N/mm^2. What will be the discharge in pipe of 500 mm diameter pipe and what will be the pressure.

c) Differentiate between Kennedy's theory and Lacey's theory for channel design.

d) Write short notes on
i) Levee
ii) Guide banks

e) Draw a neat sketch of current meter and explain its working in details.

Q.5 Attempt the following. (Any Two) **12**

a) Write the objectives of river training work in detail.

b) Design a channel section by using 'Kennedy's Theory' from following data:
i) discharge = 28 cumecs
ii) Kutter's (N = 0.0024)
iii) m = 1, side slope 0.5:1, B/D = 7.6. Also find Bed slope.

c) A spillway 7.0 m high and 150 m long discharges 2100 m3/sec, under a head of 4.0 m. If 1:16 model of spill way is to be constructed, find the dimensions of model, head over the model and discharge through the model.

SLR-QH-279

Seat No.		Set	S

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (Old) (CBCS)
Examination: March/April – 2026
Open Channel Flow & River Hydraulics (BTN01617)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) The dimension of kinematic viscosity is _____.
a) $L^{-1}T^{-1}$ b) $L^{2}T^{-1}$
c) $L^{-3}T^{-3}$ d) $L^{-2}T^{-3}$

2) Shield's diagram is a plot of non-dimensional shear stress (τC) against _____.
a) Relative depth b) Shear Reynold's number
c) Hydraulic radius d) Reynold's number

3) The flow in open channel may be characterized as turbulant when _____.
a) Re<500 b) Re>2000
c) Re>4000 d) 500<Re>2000

4) For the trapezoidal section _____.
a) Shape is of half hexagon
b) Depth of flow equal to half bed width
c) Side slope equal to 45°
d) None

5) The momentum correction factor, is given as _____.
a) $1/\mathrm{V}^2\mathrm{A}\int \mathrm{V}^3 \cdot \mathrm{dA}$ b) $1/\mathrm{VA}\int \mathrm{V} \cdot \mathrm{dA}$
c) $1/\mathrm{V}^3\mathrm{A}\int \mathrm{V}^2 \cdot \mathrm{dA}$ d) $1/\mathrm{V}^2\mathrm{A}\int \mathrm{V}^2 \cdot \mathrm{dA}$

6) Hydraulic model and corresponding prototype should have _____.
a) Geometric similitude b) Kinematic similitude
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7) If the Froude's number is 2.4 then the jump is known as _____.
a) Steady b) Oscillating
c) Undular d) Weak

8) The maximum velocity in open channel occurs at _____.
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9) Whose theory was the first to provide semi-theoretical analysis of the problem of incipient condition of bed motion?
a) Lacey's theory b) Kennedy's theory
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10) Specific force represents the sum of pressure force and _____.
a) Datum head
b) Momentum flux per unit weight
c) Momentum flux and datum head
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11) The ratio of inertia force and gravitational force is called as _____.
a) Reynolds number b) Stokes number
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12) Hydraulic jump is an example of _____.
a) Gradually varied flow b) Rapidly varied flow
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13) Extreme condition of meanders is called as _____.
a) Leave b) Spurs
c) Cut-off d) Island

14) River gauge is used to measure _____.
a) Still level b) Water level
c) Turbulence d) Current

Seat No.	

Set **S**

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (Old) (CBCS)
Examination: March/April – 2026
Open Channel Flow & River Hydraulics (BTN01617)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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

SECTION – I

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

a) Derive an expression for the depth of flow after the jump in a rectangular channel in terms of the depth before the jump.

b) Define Hydraulic jump and classify it on the basis of Froude's number.

c) A 3.2 m wide rectangular channel conveys 14 m^3/s of water with velocity 5.0 m/s. State if there is formation of hydraulic jump. If yes, calculate height, length and strength of Jump and what is loss of energy per kg of water.

d) Find the rate of and conveyance for a rectangular channel 7.4 m wide for uniform flow at depth of 3.0 m. The channel is having bed slope as 1/1000. Take n=0.015.

e) What do you understand by most economical channel section? Derive most economical rectangular channel section.

Q.3 Attempt the following. (Any Two) **12**

a) A discharge of 800 m^3/s flows down a spillway and then passes on a 55 m wide concrete apron (n=0.012). The velocity of water at the toe of spillway is 10 m/s. A tail water depth of 4.40 m causes a hydraulic jump.
Determine:
i) Depth before the jump
ii) Length of jump
iii) Energy loss in jump
iv) Specific force at the toe

b) Show that for a most economical trapezoidal section: Half of top width = Length of one of sloping side, and hydraulic mean depth = half the depth of flow.

c) Derive the equation for loss of energy through a Hydraulic Jump.

SECTION – II

Q.4 Attempt the following. (Any Four) **16**

a) Derive ‘Reynold’s model law’ and state giving examples where it can be used.

b) A model of water meter is tested in 90 mm diameter pipe. The discharge was 50 lit/sec and pressure difference is 0.10 N/mm^2. What will be the discharge in pipe of 500 mm diameter pipe and what will be the pressure.

c) Differentiate between Kennedy's theory and Lacey's theory for channel design.

d) Write short notes on
i) Levee
ii) Guide banks

e) Draw a neat sketch of current meter and explain its working in details.

Q.5 Attempt the following. (Any Two) **12**

a) Write the objectives of river training work in detail.

b) Design a channel section by using 'Kennedy's Theory' from following data:
i) discharge = 28 cumecs
ii) Kutter's (N = 0.0024)
iii) m = 1, side slope 0.5:1, B/D = 7.6. Also find Bed slope.

c) A spillway 7.0 m high and 150 m long discharges 2100 m3/sec, under a head of 4.0 m. If 1:16 model of spill way is to be constructed, find the dimensions of model, head over the model and discharge through the model.

SLR-QH-280

Seat No.	

Set P

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (Old) (CBCS)
Examination: March/April – 2026
Solid and Hazardous Waste Management (BTN01618)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top on page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answers from the given options. 14

1) Importment aspect in the implementation of sanitary landfill includes _____.
a) site selection
b) land filling methods
c) movement & control of land fill gases & leachate
d) All the above

2) Household hazardous waste include batteries & _____.
a) Radioactive waste b) Food waste
c) Leachate d) Nail polish

3) What is recovered in magnetic separation?
a) Ferrous material b) Non-ferrous material
c) Heat d) None

4) Indore method of composting is _____.
a) aerobic method b) anaerobic method
c) both a) and b) d) none

5) Hazardous biomedical wastes are generated in _____.
a) Hospitals
b) Biological research facilities
c) Industrial biological conversion process
d) All of above

6) The final functional element in solid waste management system is _____.
a) transfer & transportation b) collection
c) processing & recovery d) disposal

7) Problem of solid waste disposal can be reduced through _____.
a) Recycling b) lesser pollution
c) Population control d) None of above

8) The aerobic method of mechanical composting as practiced in India is called _____.
a) Bangalore method b) Nagpur method
c) Bhopal method d) Indore method

9) Bio-medical waste consists of _____.
a) Solid waste b) Liquid waste
c) Both a) & b) d) None

10) The Pyrolysis process of SWM _____ in nature.
a) Endothermic b) Exothermic
c) Heterothermic d) None of the above

11) MRF's term in SWM is used for _____.
a) Major relief funds b) Material Recovery Facilities
c) Minimum Raw Food d) None of the above

12) Recovery of energy in the form of heat is obtained from _____.
a) combustion process b) sanitary land filling
c) anaerobic process d) none of these

13) The average per capita generation of MSW in Indian cities _____.
a) 0.4-0.6 kg/day b) 1-2 kg/day
c) 2-3 kg/day d) 0.8-1.5 kg/day

14) Composting process is affected due to _____.
a) Temperature b) Moisture content
c) C/N ratio d) All the above

Seat No.	

Set **P**

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (Old) (CBCS)
Examination: March/April – 2026
Solid and Hazardous Waste Management (BTN01618)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Question no. 2 is compulsory in section I, and solve any two questions from the remaining.
2) Question no. 6 is compulsory in section II, and solve any two questions from the remaining
3) Figures to the right indicates full marks.

SECTION – I

Q.2 **a)** Estimate the moisture content of solid waste sample of 100 kg using the following data. **06**

Sr. No.	Component	% by Mass	% by M.C.
1	Food waste	16	65
2	Paper	36	08
3	Cardboards	05	05
4	Plastic	10	02
5	Grass	12	55
6	Wood	08	04
7	Metals	13	03

b) Explain hauled container and stationary container method for collection for solid waste with sketch. **04**

Q.3 **a)** Explain with flow diagram functional outline of the refuse. **05**

b) Illustrate the Economic aspect of refuse collection and transport. **04**

Q.4 **a)** Discuss the concept of bio-medical and hazardous waste management. **05**

b) Explain Windrows method of composting. **04**

Q.5 **a)** Explain Indore method and Bangalore method. **05**

b) Enumerate the factors affecting composting process. **04**

SECTION – II

Q.6	**a)**	Define hazardous waste? State and Explain characteristic of hazardous waste.	**06**
	b)	Explain in detail Natural and man-made hazard.	**04**
Q.7	**a)**	Explain with sketch components of land fill.	**04**
	b)	Explain site selection criteria for site selection of the engineered land fill.	**05**
Q.8	**a)**	Discuss the procedure of Leachate control.	**04**
	b)	What are the different factors affecting site selection of hazardous waste.	**05**
Q.9	**a)**	Explain in brief how you will minimize the damage due to natural hazard.	**04**
	b)	Explain “status of solid waste management in India”.	**05**

SLR-QH-280

Seat No.	

Set Q

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (Old) (CBCS)
Examination: March/April – 2026
Solid and Hazardous Waste Management (BTN01618)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top on page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answers from the given options. 14

1) The aerobic method of mechanical composting as practiced in India is called _____.
a) Bangalore method b) Nagpur method
c) Bhopal method d) Indore method

2) Bio-medical waste consists of _____.
a) Solid waste b) Liquid waste
c) Both a) & b) d) None

3) The Pyrolysis process of SWM _____ in nature.
a) Endothermic b) Exothermic
c) Heterothermic d) None of the above

4) MRF's term in SWM is used for _____.
a) Major relief funds b) Material Recovery Facilities
c) Minimum Raw Food d) None of the above

5) Recovery of energy in the form of heat is obtained from _____.
a) combustion process b) sanitary land filling
c) anaerobic process d) none of these

6) The average per capita generation of MSW in Indian cities _____.
a) 0.4-0.6 kg/day b) 1-2 kg/day
c) 2-3 kg/day d) 0.8-1.5 kg/day

7) Composting process is affected due to _____.
a) Temperature b) Moisture content
c) C/N ratio d) All the above

8) Importment aspect in the implementation of sanitary landfill includes _____.
   a) site selection
   b) land filling methods
   c) movement & control of land fill gases & leachate
   d) All the above

9) Household hazardous waste include batteries & _____.
   a) Radioactive waste b) Food waste
   c) Leachate d) Nail polish

10) What is recovered in magnetic separation?
   a) Ferrous material b) Non-ferrous material
   c) Heat d) None

11) Indore method of composting is _____.
   a) aerobic method b) anaerobic method
   c) both a) and b) d) none

12) Hazardous biomedical wastes are generated in _____.
   a) Hospitals
   b) Biological research facilities
   c) Industrial biological conversion process
   d) All of above

13) The final functional element in solid waste management system is _____.
   a) transfer & transportation b) collection
   c) processing & recovery d) disposal

14) Problem of solid waste disposal can be reduced through _____.
   a) Recycling b) lesser pollution
   c) Population control d) None of above

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (Old) (CBCS)
Examination: March/April – 2026
Solid and Hazardous Waste Management (BTN01618)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Question no. 2 is compulsory in section I, and solve any two questions from the remaining.
2) Question no. 6 is compulsory in section II, and solve any two questions from the remaining
3) Figures to the right indicates full marks.

SECTION – I

Q.2 **a)** Estimate the moisture content of solid waste sample of 100 kg using the following data. **06**

Sr. No.	Component	% by Mass	% by M.C.
1	Food waste	16	65
2	Paper	36	08
3	Cardboards	05	05
4	Plastic	10	02
5	Grass	12	55
6	Wood	08	04
7	Metals	13	03

b) Explain hauled container and stationary container method for collection for solid waste with sketch. **04**

Q.3 **a)** Explain with flow diagram functional outline of the refuse. **05**

b) Illustrate the Economic aspect of refuse collection and transport. **04**

Q.4 **a)** Discuss the concept of bio-medical and hazardous waste management. **05**

b) Explain Windrows method of composting. **04**

Q.5 **a)** Explain Indore method and Bangalore method. **05**

b) Enumerate the factors affecting composting process. **04**

SECTION – II

Q.6	**a)**	Define hazardous waste? State and Explain characteristic of hazardous waste.	**06**
	b)	Explain in detail Natural and man-made hazard.	**04**
Q.7	**a)**	Explain with sketch components of land fill.	**04**
	b)	Explain site selection criteria for site selection of the engineered land fill.	**05**
Q.8	**a)**	Discuss the procedure of Leachate control.	**04**
	b)	What are the different factors affecting site selection of hazardous waste.	**05**
Q.9	**a)**	Explain in brief how you will minimize the damage due to natural hazard.	**04**
	b)	Explain “status of solid waste management in India”.	**05**

Seat No.	

Set R

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (Old) (CBCS)
Examination: March/April – 2026
Solid and Hazardous Waste Management (BTN01618)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top on page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answers from the given options. 14

1) MRF's term in SWM is used for _____.
a) Major relief funds b) Material Recovery Facilities
c) Minimum Raw Food d) None of the above

2) Recovery of energy in the form of heat is obtained from _____.
a) combustion process b) sanitary land filling
c) anaerobic process d) none of these

3) The average per capita generation of MSW in Indian cities _____.
a) 0.4-0.6 kg/day b) 1-2 kg/day
c) 2-3 kg/day d) 0.8-1.5 kg/day

4) Composting process is affected due to _____.
a) Temperature b) Moisture content
c) C/N ratio d) All the above

5) Importment aspect in the implementation of sanitary landfill includes _____.
a) site selection
b) land filling methods
c) movement & control of land fill gases & leachate
d) All the above

6) Household hazardous waste include batteries & _____.
a) Radioactive waste b) Food waste
c) Leachate d) Nail polish

7) What is recovered in magnetic separation?
a) Ferrous material b) Non-ferrous material
c) Heat d) None

8) Indore method of composting is _____.
a) aerobic method b) anaerobic method
c) both a) and b) d) none

9) Hazardous biomedical wastes are generated in _____.
a) Hospitals
b) Biological research facilities
c) Industrial biological conversion process
d) All of above

10) The final functional element in solid waste management system is _____.
a) transfer & transportation b) collection
c) processing & recovery d) disposal

11) Problem of solid waste disposal can be reduced through _____.
a) Recycling b) lesser pollution
c) Population control d) None of above

12) The aerobic method of mechanical composting as practiced in India is called _____.
a) Bangalore method b) Nagpur method
c) Bhopal method d) Indore method

13) Bio-medical waste consists of _____.
a) Solid waste b) Liquid waste
c) Both a) & b) d) None

14) The Pyrolysis process of SWM _____ in nature.
a) Endothermic b) Exothermic
c) Heterothermic d) None of the above

Seat No.	

Set **R**

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (Old) (CBCS)
Examination: March/April – 2026
Solid and Hazardous Waste Management (BTN01618)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Question no. 2 is compulsory in section I, and solve any two questions from the remaining.
2) Question no. 6 is compulsory in section II, and solve any two questions from the remaining
3) Figures to the right indicates full marks.

SECTION – I

Q.2 **a)** Estimate the moisture content of solid waste sample of 100 kg using the following data. **06**

Sr. No.	Component	% by Mass	% by M.C.
1	Food waste	16	65
2	Paper	36	08
3	Cardboards	05	05
4	Plastic	10	02
5	Grass	12	55
6	Wood	08	04
7	Metals	13	03

b) Explain hauled container and stationary container method for collection for solid waste with sketch. **04**

Q.3 **a)** Explain with flow diagram functional outline of the refuse. **05**

b) Illustrate the Economic aspect of refuse collection and transport. **04**

Q.4 **a)** Discuss the concept of bio-medical and hazardous waste management. **05**

b) Explain Windrows method of composting. **04**

Q.5 **a)** Explain Indore method and Bangalore method. **05**

b) Enumerate the factors affecting composting process. **04**

SECTION – II

Q.6	**a)**	Define hazardous waste? State and Explain characteristic of hazardous waste.	**06**
	b)	Explain in detail Natural and man-made hazard.	**04**
Q.7	**a)**	Explain with sketch components of land fill.	**04**
	b)	Explain site selection criteria for site selection of the engineered land fill.	**05**
Q.8	**a)**	Discuss the procedure of Leachate control.	**04**
	b)	What are the different factors affecting site selection of hazardous waste.	**05**
Q.9	**a)**	Explain in brief how you will minimize the damage due to natural hazard.	**04**
	b)	Explain “status of solid waste management in India”.	**05**

SLR-QH-280

Seat No.	

Set S

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (Old) (CBCS)
Examination: March/April – 2026
Solid and Hazardous Waste Management (BTN01618)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top on page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answers from the given options. 14

1) The final functional element in solid waste management system is _____.
a) transfer & transportation b) collection
c) processing & recovery d) disposal

2) Problem of solid waste disposal can be reduced through _____.
a) Recycling b) lesser pollution
c) Population control d) None of above

3) The aerobic method of mechanical composting as practiced in India is called _____.
a) Bangalore method b) Nagpur method
c) Bhopal method d) Indore method

4) Bio-medical waste consists of _____.
a) Solid waste b) Liquid waste
c) Both a) & b) d) None

5) The Pyrolysis process of SWM _____ in nature.
a) Endothermic b) Exothermic
c) Heterothermic d) None of the above

6) MRF's term in SWM is used for _____.
a) Major relief funds b) Material Recovery Facilities
c) Minimum Raw Food d) None of the above

7) Recovery of energy in the form of heat is obtained from _____.
a) combustion process b) sanitary land filling
c) anaerobic process d) none of these

8) The average per capita generation of MSW in Indian cities _____.
a) 0.4-0.6 kg/day
b) 1-2 kg/day
c) 2-3 kg/day
d) 0.8-1.5 kg/day

9) Composting process is affected due to _____.
a) Temperature
b) Moisture content
c) C/N ratio
d) All the above

10) Importment aspect in the implementation of sanitary landfill includes _____.
a) site selection
b) land filling methods
c) movement & control of land fill gases & leachate
d) All the above

11) Household hazardous waste include batteries & _____.
a) Radioactive waste
b) Food waste
c) Leachate
d) Nail polish

12) What is recovered in magnetic separation?
a) Ferrous material
b) Non-ferrous material
c) Heat
d) None

13) Indore method of composting is _____.
a) aerobic method
b) anaerobic method
c) both a) and b)
d) none

14) Hazardous biomedical wastes are generated in _____.
a) Hospitals
b) Biological research facilities
c) Industrial biological conversion process
d) All of above

SLR-QH-280

Seat No.	

Set S

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (Old) (CBCS)
Examination: March/April – 2026
Solid and Hazardous Waste Management (BTN01618)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Question no. 2 is compulsory in section I, and solve any two questions from the remaining.
2) Question no. 6 is compulsory in section II, and solve any two questions from the remaining
3) Figures to the right indicates full marks.

SECTION – I

Q.2 a) Estimate the moisture content of solid waste sample of 100 kg using the following data. **06**

Sr. No.	Component	% by Mass	% by M.C.
1	Food waste	16	65
2	Paper	36	08
3	Cardboards	05	05
4	Plastic	10	02
5	Grass	12	55
6	Wood	08	04
7	Metals	13	03

b) Explain hauled container and stationary container method for collection for solid waste with sketch. **04**

Q.3 a) Explain with flow diagram functional outline of the refuse. **05**

b) Illustrate the Economic aspect of refuse collection and transport. **04**

Q.4 a) Discuss the concept of bio-medical and hazardous waste management. **05**

b) Explain Windrows method of composting. **04**

Q.5 a) Explain Indore method and Bangalore method. **05**

b) Enumerate the factors affecting composting process. **04**

SECTION – II

Q.6	**a)**	Define hazardous waste? State and Explain characteristic of hazardous waste.	**06**
	b)	Explain in detail Natural and man-made hazard.	**04**
Q.7	**a)**	Explain with sketch components of land fill.	**04**
	b)	Explain site selection criteria for site selection of the engineered land fill.	**05**
Q.8	**a)**	Discuss the procedure of Leachate control.	**04**
	b)	What are the different factors affecting site selection of hazardous waste.	**05**
Q.9	**a)**	Explain in brief how you will minimize the damage due to natural hazard.	**04**
	b)	Explain “status of solid waste management in India”.	**05**

SLR-QH-282

Seat No.	

Set P

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (Old) (CBCS)
Examination: March/April – 2026
Design of Concrete Structures - II (BTN01603)

Day & Date: Friday, 22-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions:1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book) Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) While solving MCQ, IS 456-2000, IS 3370 & IS 1343 are not allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Alternative from the option and rewrite the sentence. **14**

1) For stairs spanning horizontally, the minimum waist slab provided is _____. **01**

a) 10 cm b) 8 cm
c) 6 cm d) 12 cm

2) In case of footing, the critical section for BM occurs _____. **01**

a) At a distance of 'd/2' from face of column
b) At a distance of 'd' from face of column
c) At the face of the column
d) None of the above

3) Total pressure on the vertical face of a retaining wall of height h acts parallel to free surface and from the base at a distance of _____. **01**

a) h/4 b) h/3
c) h/2 d) 2h/3

4) The weight of a foundation is assumed as _____. **01**

a) 5% of wall weight b) 7% of wall weight
c) 10% of column weight d) 12% of wall weight

5) The stability of a retaining wall is checked for which of the following condition _____. **01**

a) Overturning about toe b) Overturning about heal
c) Both of these d) None of the above

6) For thickness of slab upto 100 mm in case of water tank the minimum percentage of reinforcement should be _____. **01**

a) 0.1 b) 0.2
c) 0.3 d) 0.4

7) Prestressing losses in post-tensioned and pre-tensioned beams are respectively _____. **01**

a) 15% and 20% b) 20% and 15%
c) 18% and 15% d) 20% and 20%

8) The simplest method of analysis of bursting tensile forces in anchorage zone is _____. **01**

a) Magnel method b) Guyons method
c) Balton method d) None

9) Friction loss depends upon _____. **01**

a) type of jack b) type of anchorage
c) type of tendons d) type of jack and anchorage

10) Which of the following is a disadvantage of fressyinet system of post tensioning _____. **01**

a) Projection of Plug left in the concrete
b) safeguarding of wires is economical
c) stresses in the wires are not similar
d) Rapid attainment of stretching force

11) A simply supported concrete beam prestressed with a force of 2500 KN is designed by load balancing concept for an effective span of 10 m & carry total load of 40 kN/m, the central dip of the cable profile is _____. **02**

a) 100 mm b) 200 mm
c) 300 mm d) 400 mm

12) A rectangular prestressed beam 150 mm wide and 300mm deep is used over a effective span of 10m and the cable with zero eccentricity at the supports, linearly varying to 50mm at the centre carries an effective prestressing force of 500kn $(Z = 225 \times 104)$. Evaluate stress due to prestressing? **02**

a) 22.2 N/mm^2 b) 42.2 N/mm^2
c) 32.2 N/mm^2 d) 52.2 N/mm^2

SLR-QH-282

Seat No.	

Set P

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (Old) (CBCS)
Examination: March/April – 2026
Design of Concrete Structures - II (BTN01603)

Day & Date: Friday, 22-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 2 and Q. No. 6 are compulsory.
2) Solve any two from Q. No. 3 to Q. No. 5 and Q. No. 7 to Q. No. 9 questions from each section.
3) Use of IS 456, IS 1343 and IS 3370 part IV and non-programmable calculator is allowed.
4) Draw neat sketch's where required and assume suitable data if required and state it clearly.

SECTION – I

Q.2 Design the dog-legged type staircase for a residential building using following data: floor to floor height = 3.2 m, No. of flight per floor = 2, size of steps =175 mm riser and 250 mm tread, live load is 3 kN/m^2 and assume width of stair as 1.0 m. Use M20 concrete and Fe 415 steel. The stair is supported at top and bottom risers by beam spanning parallel with risers at the landing slab on either side. **08**

Q.3 A square column 420 mm × 420 mm carries an axial load of 1400 kN. Design square footing to support the column. The SBC of soil is 200 kN/m^2. Use M20 concrete and Fe 415 steel. Sketch the reinforcement details. **10**

Q.4 Design the stem slab of a cantilever retaining wall, if the overall height is 5.5m. SBC of soil is 200 kN/m^2, angle of repose of the soil is 30° and unit weight of soil 18 kN/m^3, width of the slab base is 3.2 m, toe projection is 0.6 m. Use M 25 concrete and Fe 500 steel. **10**

Q.5 Design a circular water tank having capacity 4 lakh liters, rests on firm ground is free at top and bottom is fixed. The depth of water is 3.3 m. Assume the free board of 0.3m. Use M30 grade of concrete and Fe415 steel. Solve by IS code method. **10**

SECTION – II

Q.6 A Prestressed concrete beam 400 mm × 650 mm in section has a span of 8 m & is subjected to udl of 8 kN/m including self-weight of the beam & point load of 190 KN at centre. The prestressing tendons are located at an eccentricity of 125 mm from soffit of the beam. Determine the extreme stresses in concrete at the mid span section. Solve by following method: Stress concept method, strength concept method & load balancing method. Take prestressing force 1275 KN. **08**

Q.7 A post tensioned concrete beam 250 mm × 400 mm has a span of 12m. The beam is prestressed by steel wires of area 350 mm^2 provided at uniform eccentricity of 60 mm with an initial prestress of 1150 N/mm^2. Determine the percentage loss of stress in the wires. Take $E_s = 210\ kN/mm^2$, $E_c = 35\ kN/mm^2$, Ultimate creep strain $= 22\times10^{-6}$ mm/mm per N/mm^2, Shrinkage of concrete $= 215\times10^{-6}$, Relaxation of steel stress = 5% of the initial stress. Anchorage Slip = 1.25 mm, Friction coefficient for wave effect K = 0.0015. **10**

Q.8 Design PSC I section for the following data: **10**
Span = 20m
Superimposed load = 35 kN/m
Cube strength of concrete at 28 days = 30 kN/m^2
Safe stress in concrete at transfer = 0.5 fck,
Allowable tensile stress in concrete = $0.129(fck)^{1/2}$
Safe stress in steel = 40% of ultimate stress,
Total loss of stress = 18%,
Ultimate stress in steel = 1350 mpa,
Safe stress in concrete at service = 0.4 fck

Q.9 A PSC beam is 400 mm × 800 mm deep. Determine the horizontal, vertical, shear & principal stresses. The tendons are placed at an eccentricity of 100 mm. The anchor plate is 300 mm deep & 200 mm wide. Take P = 1000 KN. Design the end block by Magnel method for x/d = 0.75, take Kq = 0.251 and Kz = −2.47 **10**

SLR-QH-282

Seat No.	

Set Q

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (Old) (CBCS)
Examination: March/April – 2026
Design of Concrete Structures - II (BTN01603)

Day & Date: Friday, 22-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions:1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book) Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
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4) While solving MCQ, IS 456-2000, IS 3370 & IS 1343 are not allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Alternative from the option and rewrite the sentence. **14**

1) For thickness of slab upto 100 mm in case of water tank the minimum percentage of reinforcement should be _____. **01**
a) 0.1 b) 0.2
c) 0.3 d) 0.4

2) Prestressing losses in post-tensioned and pre-tensioned beams are respectively _____. **01**
a) 15% and 20% b) 20% and 15%
c) 18% and 15% d) 20% and 20%

3) The simplest method of analysis of bursting tensile forces in anchorage zone is _____. **01**
a) Magnel method b) Guyons method
c) Balton method d) None

4) Friction loss depends upon _____. **01**
a) type of jack b) type of anchorage
c) type of tendons d) type of jack and anchorage

5) Which of the following is a disadvantage of fressyinet system of post tensioning _____. **01**
a) Projection of Plug left in the concrete
b) safeguarding of wires is economical
c) stresses in the wires are not similar
d) Rapid attainment of stretching force

6) For stairs spanning horizontally, the minimum waist slab provided is _____. **01**

a) 10 cm b) 8 cm
c) 6 cm d) 12 cm

7) In case of footing, the critical section for BM occurs _____. **01**

a) At a distance of 'd/2' from face of column
b) At a distance of 'd' from face of column
c) At the face of the column
d) None of the above

8) Total pressure on the vertical face of a retaining wall of height h acts parallel to free surface and from the base at a distance of _____. **01**

a) h/4 b) h/3
c) h/2 d) 2h/3

9) The weight of a foundation is assumed as _____. **01**

a) 5% of wall weight b) 7% of wall weight
c) 10% of column weight d) 12% of wall weight

10) The stability of a retaining wall is checked for which of the following condition _____. **01**

a) Overturning about toe b) Overturning about heal
c) Both of these d) None of the above

11) A simply supported concrete beam prestressed with a force of 2500 KN is designed by load balancing concept for an effective span of 10 m & carry total load of 40 kN/m, the central dip of the cable profile is _____. **02**

a) 100 mm b) 200 mm
c) 300 mm d) 400 mm

12) A rectangular prestressed beam 150 mm wide and 300mm deep is used over a effective span of 10m and the cable with zero eccentricity at the supports, linearly varying to 50mm at the centre carries an effective prestressing force of 500kn ($Z = 225 \times 104$). Evaluate stress due to prestressing? **02**

a) 22.2 N/mm^2 b) 42.2 N/mm^2
c) 32.2 N/mm^2 d) 52.2 N/mm^2

SLR-QH-282

Seat No.	

Set Q

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (Old) (CBCS)
Examination: March/April – 2026
Design of Concrete Structures - II (BTN01603)

Day & Date: Friday, 22-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 2 and Q. No. 6 are compulsory.
2) Solve any two from Q. No. 3 to Q. No. 5 and Q. No. 7 to Q. No. 9 questions from each section.
3) Use of IS 456, IS 1343 and IS 3370 part IV and non-programmable calculator is allowed.
4) Draw neat sketch's where required and assume suitable data if required and state it clearly.

SECTION – I

Q.2 Design the dog-legged type staircase for a residential building using following data: floor to floor height = 3.2 m, No. of flight per floor = 2, size of steps =175 mm riser and 250 mm tread, live load is 3 kN/m^2 and assume width of stair as 1.0 m. Use M20 concrete and Fe 415 steel. The stair is supported at top and bottom risers by beam spanning parallel with risers at the landing slab on either side. **08**

Q.3 A square column 420 mm × 420 mm carries an axial load of 1400 kN. Design square footing to support the column. The SBC of soil is 200 kN/m^2. Use M20 concrete and Fe 415 steel. Sketch the reinforcement details. **10**

Q.4 Design the stem slab of a cantilever retaining wall, if the overall height is 5.5m. SBC of soil is 200 kN/m^2, angle of repose of the soil is 30° and unit weight of soil 18 kN/m^3, width of the slab base is 3.2 m, toe projection is 0.6 m. Use M 25 concrete and Fe 500 steel. **10**

Q.5 Design a circular water tank having capacity 4 lakh liters, rests on firm ground is free at top and bottom is fixed. The depth of water is 3.3 m. Assume the free board of 0.3m. Use M30 grade of concrete and Fe415 steel. Solve by IS code method. **10**

SECTION – II

Q.6 A Prestressed concrete beam 400 mm × 650 mm in section has a span of 8 m & is subjected to udl of 8 kN/m including self-weight of the beam & point load of 190 KN at centre. The prestressing tendons are located at an eccentricity of 125 mm from soffit of the beam. Determine the extreme stresses in concrete at the mid span section. Solve by following method: Stress concept method, strength concept method & load balancing method. Take prestressing force 1275 KN. **08**

Q.7 A post tensioned concrete beam 250 mm × 400 mm has a span of 12m. The beam is prestressed by steel wires of area 350 mm^2 provided at uniform eccentricity of 60 mm with an initial prestress of 1150 N/mm^2. Determine the percentage loss of stress in the wires. Take $E_s = 210\ kN/mm^2$, $E_c = 35\ kN/mm^2$, Ultimate creep strain $= 22\times10^{-6}$ mm/mm per N/mm^2, Shrinkage of concrete $= 215\times10^{-6}$, Relaxation of steel stress = 5% of the initial stress. Anchorage Slip = 1.25 mm, Friction coefficient for wave effect K = 0.0015. **10**

Q.8 Design PSC I section for the following data: **10**
Span = 20m
Superimposed load = 35 kN/m
Cube strength of concrete at 28 days = 30 kN/m^2
Safe stress in concrete at transfer = 0.5 fck,
Allowable tensile stress in concrete = $0.129(fck)^{1/2}$
Safe stress in steel = 40% of ultimate stress,
Total loss of stress = 18%,
Ultimate stress in steel = 1350 mpa,
Safe stress in concrete at service = 0.4 fck

Q.9 A PSC beam is 400 mm × 800 mm deep. Determine the horizontal, vertical, shear & principal stresses. The tendons are placed at an eccentricity of 100 mm. The anchor plate is 300 mm deep & 200 mm wide. Take P = 1000 KN. Design the end block by Magnel method for x/d = 0.75, take Kq = 0.251 and Kz = −2.47 **10**

Seat No.	

Set **R**

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (Old) (CBCS)
Examination: March/April – 2026
Design of Concrete Structures - II (BTN01603)

Day & Date: Friday, 22-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions:1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book) Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) While solving MCQ, IS 456-2000, IS 3370 & IS 1343 are not allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Alternative from the option and rewrite the sentence. **14**

1) Friction loss depends upon _____. **01**
a) type of jack b) type of anchorage
c) type of tendons d) type of jack and anchorage

2) Which of the following is a disadvantage of fressyinet system of post tensioning _____. **01**
a) Projection of Plug left in the concrete
b) safeguarding of wires is economical
c) stresses in the wires are not similar
d) Rapid attainment of stretching force

3) For stairs spanning horizontally, the minimum waist slab provided is _____. **01**
a) 10 cm b) 8 cm
c) 6 cm d) 12 cm

4) In case of footing, the critical section for BM occurs _____. **01**
a) At a distance of 'd/2' from face of column
b) At a distance of 'd' from face of column
c) At the face of the column
d) None of the above

5) Total pressure on the vertical face of a retaining wall of height h acts parallel to free surface and from the base at a distance of _____. **01**
a) h/4 b) h/3
c) h/2 d) 2h/3

6) The weight of a foundation is assumed as _____. **01**

a) 5% of wall weight b) 7% of wall weight
c) 10% of column weight d) 12% of wall weight

7) The stability of a retaining wall is checked for which of the following condition _____. **01**

a) Overturning about toe b) Overturning about heal
c) Both of these d) None of the above

8) For thickness of slab upto 100 mm in case of water tank the minimum percentage of reinforcement should be _____. **01**

a) 0.1 b) 0.2
c) 0.3 d) 0.4

9) Prestressing losses in post-tensioned and pre-tensioned beams are respectively _____. **01**

a) 15% and 20% b) 20% and 15%
c) 18% and 15% d) 20% and 20%

10) The simplest method of analysis of bursting tensile forces in anchorage zone is _____. **01**

a) Magnel method b) Guyons method
c) Balton method d) None

11) A simply supported concrete beam prestressed with a force of 2500 KN is designed by load balancing concept for an effective span of 10 m & carry total load of 40 kN/m, the central dip of the cable profile is _____. **02**

a) 100 mm b) 200 mm
c) 300 mm d) 400 mm

12) A rectangular prestressed beam 150 mm wide and 300mm deep is used over a effective span of 10m and the cable with zero eccentricity at the supports, linearly varying to 50mm at the centre carries an effective prestressing force of 500kn $(Z = 225 \times 104)$. Evaluate stress due to prestressing? **02**

a) 22.2 N/mm^2 b) 42.2 N/mm^2
c) 32.2 N/mm^2 d) 52.2 N/mm^2

SLR-QH-282

Seat No.	

Set R

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (Old) (CBCS)
Examination: March/April – 2026
Design of Concrete Structures - II (BTN01603)

Day & Date: Friday, 22-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 2 and Q. No. 6 are compulsory.
2) Solve any two from Q. No. 3 to Q. No. 5 and Q. No. 7 to Q. No. 9 questions from each section.
3) Use of IS 456, IS 1343 and IS 3370 part IV and non-programmable calculator is allowed.
4) Draw neat sketch's where required and assume suitable data if required and state it clearly.

SECTION – I

Q.2 Design the dog-legged type staircase for a residential building using following data: floor to floor height = 3.2 m, No. of flight per floor = 2, size of steps =175 mm riser and 250 mm tread, live load is 3 kN/m^2 and assume width of stair as 1.0 m. Use M20 concrete and Fe 415 steel. The stair is supported at top and bottom risers by beam spanning parallel with risers at the landing slab on either side. **08**

Q.3 A square column 420 mm × 420 mm carries an axial load of 1400 kN. Design square footing to support the column. The SBC of soil is 200 kN/m^2. Use M20 concrete and Fe 415 steel. Sketch the reinforcement details. **10**

Q.4 Design the stem slab of a cantilever retaining wall, if the overall height is 5.5m. SBC of soil is 200 kN/m^2, angle of repose of the soil is 30° and unit weight of soil 18 kN/m^3, width of the slab base is 3.2 m, toe projection is 0.6 m. Use M 25 concrete and Fe 500 steel. **10**

Q.5 Design a circular water tank having capacity 4 lakh liters, rests on firm ground is free at top and bottom is fixed. The depth of water is 3.3 m. Assume the free board of 0.3m. Use M30 grade of concrete and Fe415 steel. Solve by IS code method. **10**

SECTION – II

Q.6 A Prestressed concrete beam 400 mm × 650 mm in section has a span of 8 m & is subjected to udl of 8 kN/m including self-weight of the beam & point load of 190 KN at centre. The prestressing tendons are located at an eccentricity of 125 mm from soffit of the beam. Determine the extreme stresses in concrete at the mid span section. Solve by following method: Stress concept method, strength concept method & load balancing method. Take prestressing force 1275 KN. **08**

Q.7 A post tensioned concrete beam 250 mm × 400 mm has a span of 12m. The beam is prestressed by steel wires of area 350 mm^2 provided at uniform eccentricity of 60 mm with an initial prestress of 1150 N/mm^2. Determine the percentage loss of stress in the wires. Take $E_s = 210\ kN/mm^2$, $E_c = 35\ kN/mm^2$, Ultimate creep strain $= 22\times10^{-6}$ mm/mm per N/mm^2, Shrinkage of concrete $= 215\times10^{-6}$, Relaxation of steel stress = 5% of the initial stress. Anchorage Slip = 1.25 mm, Friction coefficient for wave effect K = 0.0015. **10**

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Ultimate stress in steel = 1350 mpa,
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Q.9 A PSC beam is 400 mm × 800 mm deep. Determine the horizontal, vertical, shear & principal stresses. The tendons are placed at an eccentricity of 100 mm. The anchor plate is 300 mm deep & 200 mm wide. Take P = 1000 KN. Design the end block by Magnel method for x/d = 0.75, take Kq = 0.251 and Kz = −2.47 **10**

SLR-QH-282

Seat No.		Set	S

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (Old) (CBCS)
Examination: March/April – 2026
Design of Concrete Structures - II (BTN01603)

Day & Date: Friday, 22-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions:1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book) Each question carries one mark.
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3) Figures to the right indicates full marks.
4) While solving MCQ, IS 456-2000, IS 3370 & IS 1343 are not allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Alternative from the option and rewrite the sentence. **14**

1) Total pressure on the vertical face of a retaining wall of height h acts parallel to free surface and from the base at a distance of _____. **01**

a) h/4 b) h/3
c) h/2 d) 2h/3

2) The weight of a foundation is assumed as _____. **01**

a) 5% of wall weight b) 7% of wall weight
c) 10% of column weight d) 12% of wall weight

3) The stability of a retaining wall is checked for which of the following condition _____. **01**

a) Overturning about toe b) Overturning about heal
c) Both of these d) None of the above

4) For thickness of slab upto 100 mm in case of water tank the minimum percentage of reinforcement should be _____. **01**

a) 0.1 b) 0.2
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5) Prestressing losses in post-tensioned and pre-tensioned beams are respectively _____. **01**

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a) Magnel method
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b) 200 mm
c) 300 mm
d) 400 mm

12) A rectangular prestressed beam 150 mm wide and 300mm deep is used over a effective span of 10m and the cable with zero eccentricity at the supports, linearly varying to 50mm at the centre carries an effective prestressing force of 500kn $(Z = 225 \times 104)$. Evaluate stress due to prestressing? **02**

a) 22.2 N/mm^2
b) 42.2 N/mm^2
c) 32.2 N/mm^2
d) 52.2 N/mm^2

SLR-QH-282

Seat No.	

Set S

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (Old) (CBCS)
Examination: March/April – 2026
Design of Concrete Structures - II (BTN01603)

Day & Date: Friday, 22-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 2 and Q. No. 6 are compulsory.
2) Solve any two from Q. No. 3 to Q. No. 5 and Q. No. 7 to Q. No. 9 questions from each section.
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4) Draw neat sketch's where required and assume suitable data if required and state it clearly.

SECTION – I

Q.2 Design the dog-legged type staircase for a residential building using following data: floor to floor height = 3.2 m, No. of flight per floor = 2, size of steps =175 mm riser and 250 mm tread, live load is 3 kN/m^2 and assume width of stair as 1.0 m. Use M20 concrete and Fe 415 steel. The stair is supported at top and bottom risers by beam spanning parallel with risers at the landing slab on either side. **08**

Q.3 A square column 420 mm × 420 mm carries an axial load of 1400 kN. Design square footing to support the column. The SBC of soil is 200 kN/m^2. Use M20 concrete and Fe 415 steel. Sketch the reinforcement details. **10**

Q.4 Design the stem slab of a cantilever retaining wall, if the overall height is 5.5m. SBC of soil is 200 kN/m^2, angle of repose of the soil is 30° and unit weight of soil 18 kN/m^3, width of the slab base is 3.2 m, toe projection is 0.6 m. Use M 25 concrete and Fe 500 steel. **10**

Q.5 Design a circular water tank having capacity 4 lakh liters, rests on firm ground is free at top and bottom is fixed. The depth of water is 3.3 m. Assume the free board of 0.3m. Use M30 grade of concrete and Fe415 steel. Solve by IS code method. **10**

SECTION – II

Q.6 A Prestressed concrete beam 400 mm × 650 mm in section has a span of 8 m & is subjected to udl of 8 kN/m including self-weight of the beam & point load of 190 KN at centre. The prestressing tendons are located at an eccentricity of 125 mm from soffit of the beam. Determine the extreme stresses in concrete at the mid span section. Solve by following method: Stress concept method, strength concept method & load balancing method. Take prestressing force 1275 KN. **08**

Q.7 A post tensioned concrete beam 250 mm × 400 mm has a span of 12m. The beam is prestressed by steel wires of area 350 mm^2 provided at uniform eccentricity of 60 mm with an initial prestress of 1150 N/mm^2. Determine the percentage loss of stress in the wires. Take $E_s = 210\ kN/mm^2$, $E_c = 35\ kN/mm^2$, Ultimate creep strain $= 22\times10^{-6}$ mm/mm per N/mm^2, Shrinkage of concrete $= 215\times10^{-6}$, Relaxation of steel stress = 5% of the initial stress. Anchorage Slip = 1.25 mm, Friction coefficient for wave effect K = 0.0015. **10**

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Safe stress in concrete at service = 0.4 fck

Q.9 A PSC beam is 400 mm × 800 mm deep. Determine the horizontal, vertical, shear & principal stresses. The tendons are placed at an eccentricity of 100 mm. The anchor plate is 300 mm deep & 200 mm wide. Take P = 1000 KN. Design the end block by Magnel method for x/d = 0.75, take Kq = 0.251 and Kz = −2.47 **10**

SLR-QH-283

Seat No.	

Set P

T. Y. (B.Tech.) (Civil Engineering) (Semester - II) (Old) (CBCS)
Examination: March/April – 2026
Principles of Management and Quantitative Techniques
(BTN01604)

Day & Date: Monday, 25-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) An Enterprise is a group of People with _____.
a) Common goal b) Separate goal for each
c) Multiple goals d) Two or More goals

2) Hungarian method is suitable for _____.
a) Graphical Problem b) Transportation Model
c) Simplex Problem d) Assignment Model

3) _____ -means one employee getting orders and instructions from one supervisor.
a) Order b) Remuneration
c) Discipline d) Unity of command

4) Row wise and column wise difference between second lowest cell and lowest cell in VAM method is _____.
a) Set up cost b) Capital cost
c) Penalty d) Derived cell

5) Graphical method to solve the linear programming problem is commonly used if we have _____.
a) Number of decision variables are two
b) Number of decent variables are three
c) Number of decision variables are four
d) Number of decision variables is one

6) Dual of the Dual is _____.
a) Primal b) Dual
c) Zero d) Infinity

7) When total supply is not equals to total demand, the transportation problem is called _____.
a) Simple b) Balanced
c) Equated d) Unbalanced

8) Pure strategy games are those in which both players ____.
a) Play more than one strategy
b) Play with one strategy throughout
c) Don't play with saddle point
d) employ free strategies every time

9) 'Decision Tree' technique used to solve problems of 'Decision under _____'.
a) Certainty b) Risk
c) Uncertainty d) Conflict

10) Lean Construction includes _____.
a) Adding Value Added Things
b) Removing non-value-added Things
c) Minimizing the waste
d) All the above

11) EOQ decreases when the Ordering cost of item _____.
a) Increases b) Decreases
c) Zero d) None of these

12) 'Moderate inventory control' is sufficient for _____.
a) A class items b) B class items
c) C Class items d) All of these

13) _____ problem is a special problem of LPP.
a) Queuing b) Transportation
c) Simulation d) Decision Tree

14) If primal is maximize $30X_1 + 40X_2$; subjected to $6X_1 + 12X_2 \leq 16$; and $8X_1 + 5X_2 \leq 12$; $X_1, X_2 \geq 0$, Then objective function of the dual as _____.
a) Minimize $6Y_1 + 8Y_2$ b) Maximize $6Y_1 - 8Y_2$
c) Minimize $16Y_1 + 12Y_2$ d) Minimize $12Y_1 + 5Y_2$

Seat No.	

Set **P**

T. Y. (B.Tech.) (Civil Engineering) (Semester - II) (Old) (CBCS)
Examination: March/April – 2026
Principles of Management and Quantitative Techniques
(BTN01604)

Day & Date: Monday, 25-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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

Section – I

Q.2 Solve any three of following. **24**

a) Using Graphical method, Solve
Maximize $Z = 2X_1 + 3X_2$
Subject to, $X_1 + X_2 \leq 30$;
$X_1 - X_2 \geq 0$;
$X_2 \geq 3$;
$0 \leq X_1 \leq 20$;
$0 \leq X_2 \leq 12$;

b) Determine the optimal strategy & value of game.

		Player B		
		I	II	III
Player A	I	6	5	2
	II	-1	1	-2
	III	4	9	6

c) Determine the decision under Maximin and Laplace criteria for the following process.

Alternatives	States of nature (product demand)			
	High (₹)	Moderate (₹)	Low (₹)	Nil (₹)
Expand	50,000	25,000	-25,000	-45,000
Construct	70,000	30,000	-40,000	-80,000
Subcontract	30,000	15,000	-1,000	-10,000

d) Discuss 14 Principles of modern Management.

e) Write a note on “Work sampling & Lean Constructions”.

Q.3 Write a note. (Any One) **04**

a) Centralization & Decentration

b) Decision Tree

Section – II

Q.4 Attempt the following. (Any Three) **24**

a) Find The A-Class, B-Class And C-Class Material, for following and draw the Graph with ABC Analysis.

Item ID	Annual Consumption in unit	Unit Price in Rs
1	700	50
2	2400	30
3	150	100
4	60	220
5	3800	15
6	4000	5
7	6000	2
8	300	35
9	30	80
10	2900	4

b) What is Break-Even Analysis? Explain with an example. How it is important for material management?

c) A cycle brand ‘X’ has demanded 9000 units per year. The cost of one procurement is Rs.100 and the holding cost per unit is Rs.2.4 per year. The replacement is instantaneous and no shortage are allowed.
Determine
i) Economic lot size
ii) Number of orders per year
iii) Time between orders
iv) Total cost per year if the cost of one cycle is Rs.300

d) What are quality control charts? What are the different pattern indications in quality control charts?

e) Write a note on the ERP system.

Q.5 Write a note. (Any One) **04**

a) Five major functional modules of ERP

b) Various types of inventory costs

Seat No.	

Set **Q**

T. Y. (B.Tech.) (Civil Engineering) (Semester - II) (Old) (CBCS)
Examination: March/April – 2026
Principles of Management and Quantitative Techniques
(BTN01604)

Day & Date: Monday, 25-05-2026 Max. Marks: 70
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a) Primal
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d) Infinity

14) When total supply is not equals to total demand, the transportation problem is called _____.

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b) Balanced
c) Equated
d) Unbalanced

Seat No.	

Set **Q**

T. Y. (B.Tech.) (Civil Engineering) (Semester - II) (Old) (CBCS)
Examination: March/April – 2026
Principles of Management and Quantitative Techniques
(BTN01604)

Day & Date: Monday, 25-05-2026 Max. Marks: 56
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d) Discuss 14 Principles of modern Management.

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Section – II

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Determine
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d) What are quality control charts? What are the different pattern indications in quality control charts?

e) Write a note on the ERP system.

Q.5 Write a note. (Any One) **04**

a) Five major functional modules of ERP

b) Various types of inventory costs

Seat No.	

Set R

T. Y. (B.Tech.) (Civil Engineering) (Semester - II) (Old) (CBCS)
Examination: March/April – 2026
Principles of Management and Quantitative Techniques
(BTN01604)

Day & Date: Monday, 25-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) EOQ decreases when the Ordering cost of item _____.
a) Increases b) Decreases
c) Zero d) None of these

2) 'Moderate inventory control' is sufficient for _____.
a) A class items b) B class items
c) C Class items d) All of these

3) _____ problem is a special problem of LPP.
a) Queuing b) Transportation
c) Simulation d) Decision Tree

4) If primal is maximize $30X_1 + 40X_2$; subjected to $6X_1 + 12X_2 \leq 16$; and $8X_1 + 5X_2 \leq 12$; $X_1, X_2 \geq 0$, Then objective function of the dual as _____.
a) Minimize $6Y_1 + 8Y_2$ b) Maximize $6Y_1 - 8Y_2$
c) Minimize $16Y_1 + 12Y_2$ d) Minimize $12Y_1 + 5Y_2$

5) An Enterprise is a group of People with _____.
a) Common goal b) Separate goal for each
c) Multiple goals d) Two or More goals

6) Hungarian method is suitable for _____.
a) Graphical Problem b) Transportation Model
c) Simplex Problem d) Assignment Model

7) _____ -means one employee getting orders and instructions from one supervisor.

a) Order
b) Remuneration
c) Discipline
d) Unity of command

8) Row wise and column wise difference between second lowest cell and lowest cell in VAM method is _____.

a) Set up cost
b) Capital cost
c) Penalty
d) Derived cell

9) Graphical method to solve the linear programming problem is commonly used if we have _____.

a) Number of decision variables are two
b) Number of decent variables are three
c) Number of decision variables are four
d) Number of decision variables is one

10) Dual of the Dual is _____.

a) Primal
b) Dual
c) Zero
d) Infinity

11) When total supply is not equals to total demand, the transportation problem is called _____.

a) Simple
b) Balanced
c) Equated
d) Unbalanced

12) Pure strategy games are those in which both players ____.

a) Play more than one strategy
b) Play with one strategy throughout
c) Don't play with saddle point
d) employ free strategies every time

13) 'Decision Tree' technique used to solve problems of 'Decision under _____'.

a) Certainty
b) Risk
c) Uncertainty
d) Conflict

14) Lean Construction includes _____.

a) Adding Value Added Things
b) Removing non-value-added Things
c) Minimizing the waste
d) All the above

SLR-QH-283

Seat No.	

Set R

T. Y. (B.Tech.) (Civil Engineering) (Semester - II) (Old) (CBCS)
Examination: March/April – 2026
Principles of Management and Quantitative Techniques
(BTN01604)

Day & Date: Monday, 25-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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

Section – I

Q.2 Solve any three of following. **24**

a) Using Graphical method, Solve
Maximize $Z = 2X_1 + 3X_2$
Subject to, $X_1 + X_2 \leq 30$;
$X_1 - X_2 \geq 0$;
$X_2 \geq 3$;
$0 \leq X_1 \leq 20$;
$0 \leq X_2 \leq 12$;

b) Determine the optimal strategy & value of game.

		Player B		
		I	II	III
Player A	I	6	5	2
	II	-1	1	-2
	III	4	9	6

c) Determine the decision under Maximin and Laplace criteria for the following process.

Alternatives	States of nature (product demand)			
	High (₹)	Moderate (₹)	Low (₹)	Nil (₹)
Expand	50,000	25,000	-25,000	-45,000
Construct	70,000	30,000	-40,000	-80,000
Subcontract	30,000	15,000	-1,000	-10,000

d) Discuss 14 Principles of modern Management.

e) Write a note on “Work sampling & Lean Constructions”.

Q.3 Write a note. (Any One) **04**

a) Centralization & Decentration

b) Decision Tree

Section – II

Q.4 Attempt the following. (Any Three) **24**

a) Find The A-Class, B-Class And C-Class Material, for following and draw the Graph with ABC Analysis.

Item ID	Annual Consumption in unit	Unit Price in Rs
1	700	50
2	2400	30
3	150	100
4	60	220
5	3800	15
6	4000	5
7	6000	2
8	300	35
9	30	80
10	2900	4

b) What is Break-Even Analysis? Explain with an example. How it is important for material management?

c) A cycle brand ‘X’ has demanded 9000 units per year. The cost of one procurement is Rs.100 and the holding cost per unit is Rs.2.4 per year. The replacement is instantaneous and no shortage are allowed.
Determine
i) Economic lot size
ii) Number of orders per year
iii) Time between orders
iv) Total cost per year if the cost of one cycle is Rs.300

d) What are quality control charts? What are the different pattern indications in quality control charts?

e) Write a note on the ERP system.

Q.5 Write a note. (Any One) **04**

a) Five major functional modules of ERP

b) Various types of inventory costs

Seat No.	

Set S

T. Y. (B.Tech.) (Civil Engineering) (Semester - II) (Old) (CBCS)
Examination: March/April – 2026
Principles of Management and Quantitative Techniques
(BTN01604)

Day & Date: Monday, 25-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

Duration: 30 Minutes Marks:14

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

1) Dual of the Dual is _____.
a) Primal b) Dual
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2) When total supply is not equals to total demand, the transportation problem is called _____.
a) Simple b) Balanced
c) Equated d) Unbalanced

3) Pure strategy games are those in which both players ____.
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b) Play with one strategy throughout
c) Don't play with saddle point
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4) 'Decision Tree' technique used to solve problems of 'Decision under _____'.
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5) Lean Construction includes _____.
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d) All the above

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7) 'Moderate inventory control' is sufficient for _____.
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a) Queuing b) Transportation
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9) If primal is maximize $30X_1 + 40X_2$; subjected to $6X_1 + 12X_2 \leq 16$; and $8X_1 + 5X_2 \leq 12$; $X_1, X_2 \geq 0$, Then objective function of the dual as _____.
a) Minimize $6Y_1 + 8Y_2$ b) Maximize $6Y_1 - 8Y_2$
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c) Simplex Problem d) Assignment Model

12) _____ -means one employee getting orders and instructions from one supervisor.
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c) Discipline d) Unity of command

13) Row wise and column wise difference between second lowest cell and lowest cell in VAM method is _____.
a) Set up cost b) Capital cost
c) Penalty d) Derived cell

14) Graphical method to solve the linear programming problem is commonly used if we have _____.
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b) Number of decent variables are three
c) Number of decision variables are four
d) Number of decision variables is one

SLR-QH-283

Seat No.	

Set S

T. Y. (B.Tech.) (Civil Engineering) (Semester - II) (Old) (CBCS)
Examination: March/April – 2026
Principles of Management and Quantitative Techniques
(BTN01604)

Day & Date: Monday, 25-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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

Section – I

Q.2 Solve any three of following. **24**

a) Using Graphical method, Solve
Maximize $Z = 2X_1 + 3X_2$
Subject to, $X_1 + X_2 \leq 30$;
$X_1 - X_2 \geq 0$;
$X_2 \geq 3$;
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b) Determine the optimal strategy & value of game.

		Player B		
		I	II	III
Player A	I	6	5	2
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	III	4	9	6

c) Determine the decision under Maximin and Laplace criteria for the following process.

Alternatives	States of nature (product demand)			
	High (₹)	Moderate (₹)	Low (₹)	Nil (₹)
Expand	50,000	25,000	-25,000	-45,000
Construct	70,000	30,000	-40,000	-80,000
Subcontract	30,000	15,000	-1,000	-10,000

d) Discuss 14 Principles of modern Management.

e) Write a note on “Work sampling & Lean Constructions”.

Q.3 Write a note. (Any One) **04**

a) Centralization & Decentration

b) Decision Tree

Section – II

Q.4 Attempt the following. (Any Three) **24**

a) Find The A-Class, B-Class And C-Class Material, for following and draw the Graph with ABC Analysis.

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1	700	50
2	2400	30
3	150	100
4	60	220
5	3800	15
6	4000	5
7	6000	2
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9	30	80
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b) What is Break-Even Analysis? Explain with an example. How it is important for material management?

c) A cycle brand ‘X’ has demanded 9000 units per year. The cost of one procurement is Rs.100 and the holding cost per unit is Rs.2.4 per year. The replacement is instantaneous and no shortage are allowed.
Determine
i) Economic lot size
ii) Number of orders per year
iii) Time between orders
iv) Total cost per year if the cost of one cycle is Rs.300

d) What are quality control charts? What are the different pattern indications in quality control charts?

e) Write a note on the ERP system.

Q.5 Write a note. (Any One) **04**

a) Five major functional modules of ERP

b) Various types of inventory costs

SLR-QH-284

Seat No.	

Set P

T. Y. (B.Tech.) (Civil Engineering) (Semester - II) (Old) (CBCS)
Examination: March/April – 2026
Railway, Airport and Harbour Engineering (BTN01605)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) Bearing plates are used to fix _____.
a) Flat footed rails to the wooden sleepers
b) Double headed rails to the wooden sleepers
c) Bull headed rails to the wooden sleepers
d) Flat footed rails to the cast iron sleepers

2) Coning of wheels _____.
a) Prevent lateral movement of wheels
b) Provide smooth running of trains
c) Avoid excessive wear of inner faces of rail
d) All of the above

3) A scissors cross over consists of one diamond and _____.
a) One turn out b) Two turn outs
c) Three turn outs d) Four turn outs

4) Which of the following is not a component of the rail?
a) Ballast b) Foot
c) Web d) Head

5) The standard length of rail of BG and MG track is _____.
a) 13 & 12 m b) 12 & 12m
c) 12 & 13m d) None of the above

6) The gradient on which an additional engine is required to negotiate the gradient, is called _____.
a) Momentum gradient b) Pusher gradient
c) Ruling gradient d) Steep gradient

7) Which of the following is the most used ballast on Indian railways?
a) Coal ash ballast
b) Brickbat ballast
c) Broken stone ballast
d) Sand ballast

8) As per ICAO recommendation, minimum width of safety area for instrumental runway should be _____.
a) 78 m
b) 150 m
c) 300 m
d) 450 m

9) As per ICAO, for A, B, and C type of airports, maximum effective, transverse and longitudinal grades in percentage respectively are _____.
a) 1.0, 1.5 and 1.5
b) 1.0, 1.5 and 2.0
c) 1.5, 1.5 and 2.0
d) 2.0, 2.0 and 2.0

10) As per ICAO recommendation, the rate of change of longitudinal gradient per 30 m length of vertical curve for A and B type of airports is limited to a maximum of _____.
a) 0.1%
b) 0.2%
c) 0.3%
d) 0.4%

11) Assertion A: The ratio of arriving and departing aircrafts influences the airport capacity: Reason R: Landing operation is generally given priority over-the taking off operation. Select your answer based on the coding system given below _____.
a) Both A and R are true and R is the correct explanation of A
b) Both A and R are true and R is not the correct explanation of A
c) A is true but R is false
d) A is false but R is true

12) Assertion A: Depth and width required at the entrance to a harbour are more than those required in the channel. Reason R: The entrance to a harbour is usually more exposed to waves as compared to the harbour itself. Select your answer based on the coding system given below _____.
a) Both A and R are true and R is the correct explanation of A
b) Both A and R are true but R is not the correct explanation of A
c) A is true but R is false
d) A is false but R is true

13) When a ship floats at its designed water line, the vertical distance from water line to the bottom of the ship is known as _____.
a) Beam
b) Depth
c) Freeboard
d) Draft

14) The maximum harbour depth below lowest low water is generally equal to _____.

i) Loaded draft + 1.2 m when bottom is rock
ii) Loaded draft + 1.8 m when bottom is soft
iii) Loaded draft + 1.2 m when bottom is soft
iv) Loaded draft + 1.8 m when bottom is rock

of these statements:

a) i) and ii) are correct
b) i) and iii) are correct
c) ii) and iv) are correct
d) iii) and iv) are correct

Seat No.	

Set **P**

T. Y. (B.Tech.) (Civil Engineering) (Semester - II) (Old) (CBCS)
Examination: March/April – 2026
Railway, Airport and Harbour Engineering (BTN01605)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever needed & mention it clearly.

SECTION – I

Q.2 Solve Any Two questions. **08**

a) Explain different types of gauges on railway track.

b) Explain creep of rail and factors affecting on creep of rail.

c) Explain Advantages and disadvantages of coning of wheel.

Q.3 Answer Any One question. **06**

a) A train having 20 wagons weighing 18 tonnes each is to run at a speed of 50 kmph. The tractive effort of 2-8-2 locomotives with 22.5 tonnes load on each driving axle is 15 tonnes. The weight of locomotives is 120 tonnes Rolling resistance of wagons and locomotives are 2.5kg/tonne and 3.5 kg/tone. The resistance which depends on speed is 2.65 tonnes. Find out steepest gradient for this condition. Coefficient of friction is 1/6.

b) Define permanent way with neat sketch. Explain each component of permanent way.

Q.4 Answer Any Two questions. **10**

a) Explain various methods and steps for the construction and maintenance of railway track.

b) Explain detailed note on mono rail and metro rail.

c) What is the need of providing super elevation on curves of railway tracks?

d) Write a short note on Modern Indian Railways

SECTION – II

Q.5 Answer Any Two questions. **10**

a) Calculate the actual length of the runway from the following data Airport elevation: R. L. 100 Airport reference temperature : 28°C, Basic length of runway 600 m, Highest point along the length: R.L 98.2 Lowest point along the length R.L.95.2, Check the total correction for elevation plus temperature as per ICAO.

b) Draw cross-section of Airport showing all component parts and explain it in detail.

c) Explain site selection criteria for airport engineering.

Q.6 Answer Any Two questions. **10**

a) A taxiway is to be designed for operating an aircraft which has following characteristics.
Determine turning radius of taxiway
i) Wheel base-17.70 m
ii) Tread of main loading gear-6.62 m
iii) Turning speed-40kmph
iv) Coefficient of friction between tyre and pavement surface-0.13 and width of taxiway – 22.5m.

b) The data for the hottest month of year is the year of maximum daily temperature is 43.72°C and mean of average daily temperature is 20.32°C then what is the airport reference temperature?

c) Write a note on Runway configuration with its types.

Q.7 Answer Any Three questions. **12**

a) Write short note on different types of break water with neat sketches.

b) What are the factors to be considered while selecting site for harbor?

c) What are fenders? Why are they used? Describe various types of fenders with sketches.

d) Write a note on Geometric design of taxiway.

Seat No.	

Set **Q**

T. Y. (B.Tech.) (Civil Engineering) (Semester - II) (Old) (CBCS)
Examination: March/April – 2026
Railway, Airport and Harbour Engineering (BTN01605)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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1) As per ICAO recommendation, minimum width of safety area for instrumental runway should be _____.
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a) 1.0, 1.5 and 1.5 b) 1.0, 1.5 and 2.0
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6) When a ship floats at its designed water line, the vertical distance from water line to the bottom of the ship is known as _____.

a) Beam
b) Depth
c) Freeboard
d) Draft

7) The maximum harbour depth below lowest low water is generally equal to _____.

i) Loaded draft + 1.2 m when bottom is rock
ii) Loaded draft + 1.8 m when bottom is soft
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of these statements:

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d) iii) and iv) are correct

8) Bearing plates are used to fix _____.

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SLR-QH-284

Seat No.	

Set Q

T. Y. (B.Tech.) (Civil Engineering) (Semester - II) (Old) (CBCS)
Examination: March/April – 2026
Railway, Airport and Harbour Engineering (BTN01605)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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SECTION – I

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SECTION – II

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a) Write short note on different types of break water with neat sketches.

b) What are the factors to be considered while selecting site for harbor?

c) What are fenders? Why are they used? Describe various types of fenders with sketches.

d) Write a note on Geometric design of taxiway.

Seat No.	

Set R

T. Y. (B.Tech.) (Civil Engineering) (Semester - II) (Old) (CBCS)
Examination: March/April – 2026
Railway, Airport and Harbour Engineering (BTN01605)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 70
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Duration: 30 Minutes Marks:14

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3) When a ship floats at its designed water line, the vertical distance from water line to the bottom of the ship is known as _____.
a) Beam b) Depth
c) Freeboard d) Draft

4) The maximum harbour depth below lowest low water is generally equal to _____.

i) Loaded draft + 1.2 m when bottom is rock
ii) Loaded draft + 1.8 m when bottom is soft
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of these statements:

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b) Double headed rails to the wooden sleepers
c) Bull headed rails to the wooden sleepers
d) Flat footed rails to the cast iron sleepers

6) Coning of wheels _____.

a) Prevent lateral movement of wheels
b) Provide smooth running of trains
c) Avoid excessive wear of inner faces of rail
d) All of the above

7) A scissors cross over consists of one diamond and _____.

a) One turn out
b) Two turn outs
c) Three turn outs
d) Four turn outs

8) Which of the following is not a component of the rail?

a) Ballast
b) Foot
c) Web
d) Head

9) The standard length of rail of BG and MG track is _____.

a) 13 & 12 m
b) 12 & 12m
c) 12 & 13m
d) None of the above

10) The gradient on which an additional engine is required to negotiate the gradient, is called _____.

a) Momentum gradient
b) Pusher gradient
c) Ruling gradient
d) Steep gradient

11) Which of the following is the most used ballast on Indian railways?

a) Coal ash ballast
b) Brickbat ballast
c) Broken stone ballast
d) Sand ballast

12) As per ICAO recommendation, minimum width of safety area for instrumental runway should be _____.

a) 78 m
b) 150 m
c) 300 m
d) 450 m

13) As per ICAO, for A, B, and C type of airports, maximum effective, transverse and longitudinal grades in percentage respectively are _____.

a) 1.0, 1.5 and 1.5
b) 1.0, 1.5 and 2.0
c) 1.5, 1.5 and 2.0
d) 2.0, 2.0 and 2.0

14) As per ICAO recommendation, the rate of change of longitudinal gradient per 30 m length of vertical curve for A and B type of airports is limited to a maximum of _____.

a) 0.1%
b) 0.2%
c) 0.3%
d) 0.4%

Seat No.	

Set **R**

T. Y. (B.Tech.) (Civil Engineering) (Semester - II) (Old) (CBCS)
Examination: March/April – 2026
Railway, Airport and Harbour Engineering (BTN01605)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever needed & mention it clearly.

SECTION – I

Q.2 Solve Any Two questions. **08**

a) Explain different types of gauges on railway track.

b) Explain creep of rail and factors affecting on creep of rail.

c) Explain Advantages and disadvantages of coning of wheel.

Q.3 Answer Any One question. **06**

a) A train having 20 wagons weighing 18 tonnes each is to run at a speed of 50 kmph. The tractive effort of 2-8-2 locomotives with 22.5 tonnes load on each driving axle is 15 tonnes. The weight of locomotives is 120 tonnes Rolling resistance of wagons and locomotives are 2.5kg/tonne and 3.5 kg/tone. The resistance which depends on speed is 2.65 tonnes. Find out steepest gradient for this condition. Coefficient of friction is 1/6.

b) Define permanent way with neat sketch. Explain each component of permanent way.

Q.4 Answer Any Two questions. **10**

a) Explain various methods and steps for the construction and maintenance of railway track.

b) Explain detailed note on mono rail and metro rail.

c) What is the need of providing super elevation on curves of railway tracks?

d) Write a short note on Modern Indian Railways

SECTION – II

Q.5 Answer Any Two questions. **10**

a) Calculate the actual length of the runway from the following data Airport elevation: R. L. 100 Airport reference temperature : 28°C, Basic length of runway 600 m, Highest point along the length: R.L 98.2 Lowest point along the length R.L.95.2, Check the total correction for elevation plus temperature as per ICAO.

b) Draw cross-section of Airport showing all component parts and explain it in detail.

c) Explain site selection criteria for airport engineering.

Q.6 Answer Any Two questions. **10**

a) A taxiway is to be designed for operating an aircraft which has following characteristics.
Determine turning radius of taxiway
i) Wheel base-17.70 m
ii) Tread of main loading gear-6.62 m
iii) Turning speed-40kmph
iv) Coefficient of friction between tyre and pavement surface-0.13 and width of taxiway – 22.5m.

b) The data for the hottest month of year is the year of maximum daily temperature is 43.72°C and mean of average daily temperature is 20.32°C then what is the airport reference temperature?

c) Write a note on Runway configuration with its types.

Q.7 Answer Any Three questions. **12**

a) Write short note on different types of break water with neat sketches.

b) What are the factors to be considered while selecting site for harbor?

c) What are fenders? Why are they used? Describe various types of fenders with sketches.

d) Write a note on Geometric design of taxiway.

Seat No.	

Set S

T. Y. (B.Tech.) (Civil Engineering) (Semester - II) (Old) (CBCS)
Examination: March/April – 2026
Railway, Airport and Harbour Engineering (BTN01605)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) The gradient on which an additional engine is required to negotiate the gradient, is called _____.
a) Momentum gradient b) Pusher gradient
c) Ruling gradient d) Steep gradient ___

2) Which of the following is the most used ballast on Indian railways?
a) Coal ash ballast b) Brickbat ballast
c) Broken stone ballast d) Sand ballast

3) As per ICAO recommendation, minimum width of safety area for instrumental runway should be _____.
a) 78 m b) 150 m
c) 300 m d) 450 m

4) As per ICAO, for A, B, and C type of airports, maximum effective, transverse and longitudinal grades in percentage respectively are _____.
a) 1.0, 1.5 and 1.5 b) 1.0, 1.5 and 2.0
c) 1.5, 1.5 and 2.0 d) 2.0, 2.0 and 2.0

5) As per ICAO recommendation, the rate of change of longitudinal gradient per 30 m length of vertical curve for A and B type of airports is limited to a maximum of _____.
a) 0.1% b) 0.2%
c) 0.3% d) 0.4%

6) Assertion A: The ratio of arriving and departing aircrafts influences the airport capacity: Reason R: Landing operation is generally given priority over-the taking off operation. Select your answer based on the coding system given below _____.

a) Both A and R are true and R is the correct explanation of A
b) Both A and R are true and R is not the correct explanation of A
c) A is true but R is false
d) A is false but R is true

7) Assertion A: Depth and width required at the entrance to a harbour are more than those required in the channel. Reason R: The entrance to a harbour is usually more exposed to waves as compared to the harbour itself. Select your answer based on the coding system given below _____.

a) Both A and R are true and R is the correct explanation of A
b) Both A and R are true but R is not the correct explanation of A
c) A is true but R is false
d) A is false but R is true

8) When a ship floats at its designed water line, the vertical distance from water line to the bottom of the ship is known as _____.

a) Beam
b) Depth
c) Freeboard
d) Draft

9) The maximum harbour depth below lowest low water is generally equal to _____.

i) Loaded draft + 1.2 m when bottom is rock
ii) Loaded draft + 1.8 m when bottom is soft
iii) Loaded draft + 1.2 m when bottom is soft
iv) Loaded draft + 1.8 m when bottom is rock

of these statements:

a) i) and ii) are correct
b) i) and iii) are correct
c) ii) and iv) are correct
d) iii) and iv) are correct

10) Bearing plates are used to fix _____.

a) Flat footed rails to the wooden sleepers
b) Double headed rails to the wooden sleepers
c) Bull headed rails to the wooden sleepers
d) Flat footed rails to the cast iron sleepers

11) Coning of wheels _____.

a) Prevent lateral movement of wheels
b) Provide smooth running of trains
c) Avoid excessive wear of inner faces of rail
d) All of the above

12) A scissors cross over consists of one diamond and _____.

a) One turn out
b) Two turn outs
c) Three turn outs
d) Four turn outs

13) Which of the following is not a component of the rail?

a) Ballast
b) Foot
c) Web
d) Head

14) The standard length of rail of BG and MG track is _____.

a) 13 & 12 m
b) 12 & 12m
c) 12 & 13m
d) None of the above

SLR-QH-284

Seat No.	

Set S

T. Y. (B.Tech.) (Civil Engineering) (Semester - II) (Old) (CBCS)
Examination: March/April – 2026
Railway, Airport and Harbour Engineering (BTN01605)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
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3) Assume suitable data wherever needed & mention it clearly.

SECTION – I

Q.2 Solve Any Two questions. **08**

a) Explain different types of gauges on railway track.

b) Explain creep of rail and factors affecting on creep of rail.

c) Explain Advantages and disadvantages of coning of wheel.

Q.3 Answer Any One question. **06**

a) A train having 20 wagons weighing 18 tonnes each is to run at a speed of 50 kmph. The tractive effort of 2-8-2 locomotives with 22.5 tonnes load on each driving axle is 15 tonnes. The weight of locomotives is 120 tonnes Rolling resistance of wagons and locomotives are 2.5kg/tonne and 3.5 kg/tone. The resistance which depends on speed is 2.65 tonnes. Find out steepest gradient for this condition. Coefficient of friction is 1/6.

b) Define permanent way with neat sketch. Explain each component of permanent way.

Q.4 Answer Any Two questions. **10**

a) Explain various methods and steps for the construction and maintenance of railway track.

b) Explain detailed note on mono rail and metro rail.

c) What is the need of providing super elevation on curves of railway tracks?

d) Write a short note on Modern Indian Railways

SECTION – II

Q.5 Answer Any Two questions. **10**

a) Calculate the actual length of the runway from the following data Airport elevation: R. L. 100 Airport reference temperature : 28°C, Basic length of runway 600 m, Highest point along the length: R.L 98.2 Lowest point along the length R.L.95.2, Check the total correction for elevation plus temperature as per ICAO.

b) Draw cross-section of Airport showing all component parts and explain it in detail.

c) Explain site selection criteria for airport engineering.

Q.6 Answer Any Two questions. **10**

a) A taxiway is to be designed for operating an aircraft which has following characteristics.
Determine turning radius of taxiway
i) Wheel base-17.70 m
ii) Tread of main loading gear-6.62 m
iii) Turning speed-40kmph
iv) Coefficient of friction between tyre and pavement surface-0.13 and width of taxiway – 22.5m.

b) The data for the hottest month of year is the year of maximum daily temperature is 43.72°C and mean of average daily temperature is 20.32°C then what is the airport reference temperature?

c) Write a note on Runway configuration with its types.

Q.7 Answer Any Three questions. **12**

a) Write short note on different types of break water with neat sketches.

b) What are the factors to be considered while selecting site for harbor?

c) What are fenders? Why are they used? Describe various types of fenders with sketches.

d) Write a note on Geometric design of taxiway.

SLR-QH-286

Seat No.	

Set P

T. Y. (B.Tech.) (Civil Engineering) (Semester - II) (Old) (CBCS)
Examination: March/April – 2026
Roads and Highway Project Development (BTN01621)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions (if necessary and state them clearly).

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose correct alternative from the given options. 14

1) The planning, design and construction of either a network of new roads or road link is called _____.
a) Highway project b) Highway estimate
c) Highway interlinking d) Highway design

2) The New highway project is divided into how many stages?
a) One b) Two
c) Three d) Four

3) _____ is an assessment of the overall appeal of the product or service being proposed.
a) Concept testing
b) Product/service feasibility analysis
c) Test marketing
d) Usability testing

4) Which of the following will come under the manual method of road survey?
a) GIS
b) Walking and windshield survey
c) Walking survey
d) Windshield survey

5) Which of the following is included in the road project survey report?
a) Location b) Terrain
c) Slope d) Gradient

6) The most important factor that is required for road geometric is _____.
- a) SSD
- b) OSD
- c) ISD
- d) Speed of vehicle

7) The extra width of pavement is provided on _____.
- a) Horizontal curve
- b) Width of pavement
- c) Length of pavement
- d) Super elevation

8) What is included in an Impact assessment?
- a) A detailed assessment of the planned project and selected alternatives compared to the baseline conditions
- b) Qualitative descriptions measuring high, medium and low impacts
- c) Quantitative descriptions such as indicating the cubic metres of water withdrawn, sewage produced, and pollutants released
- d) All of the above

9) EIA is _____ and _____ environmental impacts.
- a) beneficial and adverse
- b) social and benefit
- c) adverse and economical
- d) None of above

10) Scoping is procedure of environmental issues _____.
- a) Identifying
- b) Impact
- c) Physical impact
- d) Attributes

11) Which of the following is prepared first during estimate?
- a) Schedule of rates
- b) Rate analysis
- c) Detailed cost estimate
- d) Detailed project

12) The name of the work and project details is managed under which category of DPR?
- a) Executive summary
- b) Background
- c) Roadway details
- d) General details

13) In soils having the same values of plasticity index, if the liquid limit is increased, then _____.
- a) Compressibility and permeability decrease & dry strength Increases
- b) Compressibility, permeability, & dry strength decrease
- c) Compressibility, permeability, & dry strength increase
- d) Compressibility and permeability increase & dry strength Decreases

14) Select the correct statement.
- a) More the value of group index, less thickness of pavement will be required
- b) More the value of CBR, greater thickness of pavement will be required
- c) Minimum and maximum values of group index can be 0 and 20 respectively
- d) All of the above

Seat No.		Set	P

T. Y. (B.Tech.) (Civil Engineering) (Semester - II) (Old) (CBCS)
Examination: March/April – 2026
Roads and Highway Project Development (BTN01621)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever necessary.

SECTION – I

Q.2 Solve Any Two. **14**

a) Define feasibility. Write Scope of feasibility.

b) Briefly explain the engineering surveys needed for locating a new highway.

c) What is the importance of studying behaviour of soil as a highway material.

Q.3 Solve Any Two. **14**

a) List the various traffic engineering studies. Mention the objectives and important of each study.

b) Give an account of the importance of development as against Environment protection.

c) List the various geometric elements to be considered in highway design. Explain One in details.

SECTION – II

Q.4 Solve Any Two. **14**

a) Enumerate the various design factors controlling the Horizontal alignment of highways.

b) Describe the various components of process of EIA.

c) Which type of drawing required for DPR Project explain any one in details.

Q.5 Solve Any Two. **14**

a) Write Note on a
- i) Estimate
- ii) BOQ
- iii) Tender
- iv) Contract
- v) Tender Evaluation
- vi) EIA
- vii) DPR

b) Explain the important functions of highway embankment and subgrade in the performance of highway pavement?

c) Write explanatory notes on the following types of bituminous pavement layers:
- i) Stone matrix mix
- ii) Slurry seal
- iii) Micro surfacing

Seat No.	

Set **Q**

T. Y. (B.Tech.) (Civil Engineering) (Semester - II) (Old) (CBCS)
Examination: March/April – 2026
Roads and Highway Project Development (BTN01621)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions (if necessary and state them clearly).

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose correct alternative from the given options. 14

1) What is included in an Impact assessment?
a) A detailed assessment of the planned project and selected alternatives compared to the baseline conditions
b) Qualitative descriptions measuring high, medium and low impacts
c) Quantitative descriptions such as indicating the cubic metres of water withdrawn, sewage produced, and pollutants released
d) All of the above

2) EIA is _____ and _____ environmental impacts.
a) beneficial and adverse b) social and benefit
c) adverse and economical d) None of above

3) Scoping is procedure of environmental issues _____.
a) Identifying b) Impact
c) Physical impact d) Attributes

4) Which of the following is prepared first during estimate?
a) Schedule of rates b) Rate analysis
c) Detailed cost estimate d) Detailed project

5) The name of the work and project details is managed under which category of DPR?
a) Executive summary b) Background
c) Roadway details d) General details

6) In soils having the same values of plasticity index, if the liquid limit is increased, then _____.
   a) Compressibility and permeability decrease & dry strength Increases
   b) Compressibility, permeability, & dry strength decrease
   c) Compressibility, permeability, & dry strength increase
   d) Compressibility and permeability increase & dry strength Decreases

7) Select the correct statement.
   a) More the value of group index, less thickness of pavement will be required
   b) More the value of CBR, greater thickness of pavement will be required
   c) Minimum and maximum values of group index can be 0 and 20 respectively
   d) All of the above

8) The planning, design and construction of either a network of new roads or road link is called _____.
   a) Highway project
   b) Highway estimate
   c) Highway interlinking
   d) Highway design

9) The New highway project is divided into how many stages?
   a) One
   b) Two
   c) Three
   d) Four

10) _____ is an assessment of the overall appeal of the product or service being proposed.
   a) Concept testing
   b) Product/service feasibility analysis
   c) Test marketing
   d) Usability testing

11) Which of the following will come under the manual method of road survey?
   a) GIS
   b) Walking and windshield survey
   c) Walking survey
   d) Windshield survey

12) Which of the following is included in the road project survey report?
   a) Location
   b) Terrain
   c) Slope
   d) Gradient

13) The most important factor that is required for road geometric is _____.
   a) SSD
   b) OSD
   c) ISD
   d) Speed of vehicle

14) The extra width of pavement is provided on _____.

a) Horizontal curve
b) Width of pavement
c) Length of pavement
d) Super elevation

Seat No.	

Set **Q**

T. Y. (B.Tech.) (Civil Engineering) (Semester - II) (Old) (CBCS)
Examination: March/April – 2026
Roads and Highway Project Development (BTN01621)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever necessary.

SECTION – I

Q.2 Solve Any Two. **14**

a) Define feasibility. Write Scope of feasibility.

b) Briefly explain the engineering surveys needed for locating a new highway.

c) What is the importance of studying behaviour of soil as a highway material.

Q.3 Solve Any Two. **14**

a) List the various traffic engineering studies. Mention the objectives and important of each study.

b) Give an account of the importance of development as against Environment protection.

c) List the various geometric elements to be considered in highway design. Explain One in details.

SECTION – II

Q.4 Solve Any Two. **14**

a) Enumerate the various design factors controlling the Horizontal alignment of highways.

b) Describe the various components of process of EIA.

c) Which type of drawing required for DPR Project explain any one in details.

Q.5 Solve Any Two. **14**

a) Write Note on a
- i) Estimate
- ii) BOQ
- iii) Tender
- iv) Contract
- v) Tender Evaluation
- vi) EIA
- vii) DPR

b) Explain the important functions of highway embankment and subgrade in the performance of highway pavement?

c) Write explanatory notes on the following types of bituminous pavement layers:
- i) Stone matrix mix
- ii) Slurry seal
- iii) Micro surfacing

Seat No.	

Set | R

T. Y. (B.Tech.) (Civil Engineering) (Semester - II) (Old) (CBCS)
Examination: March/April – 2026
Roads and Highway Project Development (BTN01621)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions (if necessary and state them clearly).

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose correct alternative from the given options. 14

1) Which of the following is prepared first during estimate?
a) Schedule of rates b) Rate analysis
c) Detailed cost estimate d) Detailed project

2) The name of the work and project details is managed under which category of DPR?
a) Executive summary b) Background
c) Roadway details d) General details

3) In soils having the same values of plasticity index, if the liquid limit is increased, then _____.
a) Compressibility and permeability decrease & dry strength Increases
b) Compressibility, permeability, & dry strength decrease
c) Compressibility, permeability, & dry strength increase
d) Compressibility and permeability increase & dry strength Decreases

4) Select the correct statement.
a) More the value of group index, less thickness of pavement will be required
b) More the value of CBR, greater thickness of pavement will be required
c) Minimum and maximum values of group index can be 0 and 20 respectively
d) All of the above

5) The planning, design and construction of either a network of new roads or road link is called _____.
a) Highway project b) Highway estimate
c) Highway interlinking d) Highway design

6) The New highway project is divided into how many stages?
a) One b) Two
c) Three d) Four

7) _____ is an assessment of the overall appeal of the product or service being proposed.
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b) Product/service feasibility analysis
c) Test marketing
d) Usability testing

8) Which of the following will come under the manual method of road survey?
a) GIS
b) Walking and windshield survey
c) Walking survey
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9) Which of the following is included in the road project survey report?
a) Location b) Terrain
c) Slope d) Gradient

10) The most important factor that is required for road geometric is _____.
a) SSD b) OSD
c) ISD d) Speed of vehicle

11) The extra width of pavement is provided on _____.
a) Horizontal curve b) Width of pavement
c) Length of pavement d) Super elevation

12) What is included in an Impact assessment?
a) A detailed assessment of the planned project and selected alternatives compared to the baseline conditions
b) Qualitative descriptions measuring high, medium and low impacts
c) Quantitative descriptions such as indicating the cubic metres of water withdrawn, sewage produced, and pollutants released
d) All of the above

13) EIA is _____ and _____ environmental impacts.
a) beneficial and adverse b) social and benefit
c) adverse and economical d) None of above

14) Scoping is procedure of environmental issues _____.
a) Identifying b) Impact
c) Physical impact d) Attributes

Seat No.	

Set **R**

T. Y. (B.Tech.) (Civil Engineering) (Semester - II) (Old) (CBCS)
Examination: March/April – 2026
Roads and Highway Project Development (BTN01621)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
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3) Assume suitable data wherever necessary.

SECTION – I

Q.2 Solve Any Two. **14**

a) Define feasibility. Write Scope of feasibility.

b) Briefly explain the engineering surveys needed for locating a new highway.

c) What is the importance of studying behaviour of soil as a highway material.

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a) List the various traffic engineering studies. Mention the objectives and important of each study.

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SECTION – II

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b) Explain the important functions of highway embankment and subgrade in the performance of highway pavement?

c) Write explanatory notes on the following types of bituminous pavement layers:
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- ii) Slurry seal
- iii) Micro surfacing

Seat No.		Set	S

T. Y. (B.Tech.) (Civil Engineering) (Semester - II) (Old) (CBCS)
Examination: March/April – 2026
Roads and Highway Project Development (BTN01621)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

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MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose correct alternative from the given options. 14

1) The most important factor that is required for road geometric is _____.
a) SSD b) OSD
c) ISD d) Speed of vehicle

2) The extra width of pavement is provided on _____.
a) Horizontal curve b) Width of pavement
c) Length of pavement d) Super elevation

3) What is included in an Impact assessment?
a) A detailed assessment of the planned project and selected alternatives compared to the baseline conditions
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   a) More the value of group index, less thickness of pavement will be required
   b) More the value of CBR, greater thickness of pavement will be required
   c) Minimum and maximum values of group index can be 0 and 20 respectively
   d) All of the above

10) The planning, design and construction of either a network of new roads or road link is called _____.
   a) Highway project
   b) Highway estimate
   c) Highway interlinking
   d) Highway design

11) The New highway project is divided into how many stages?
   a) One
   b) Two
   c) Three
   d) Four

12) _____ is an assessment of the overall appeal of the product or service being proposed.
   a) Concept testing
   b) Product/service feasibility analysis
   c) Test marketing
   d) Usability testing

13) Which of the following will come under the manual method of road survey?
   a) GIS
   b) Walking and windshield survey
   c) Walking survey
   d) Windshield survey

14) Which of the following is included in the road project survey report?
   a) Location
   b) Terrain
   c) Slope
   d) Gradient

Seat No.		Set	S

T. Y. (B.Tech.) (Civil Engineering) (Semester - II) (Old) (CBCS)
Examination: March/April – 2026
Roads and Highway Project Development (BTN01621)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever necessary.

SECTION – I

Q.2 Solve Any Two. **14**

a) Define feasibility. Write Scope of feasibility.

b) Briefly explain the engineering surveys needed for locating a new highway.

c) What is the importance of studying behaviour of soil as a highway material.

Q.3 Solve Any Two. **14**

a) List the various traffic engineering studies. Mention the objectives and important of each study.

b) Give an account of the importance of development as against Environment protection.

c) List the various geometric elements to be considered in highway design. Explain One in details.

SECTION – II

Q.4 Solve Any Two. **14**

a) Enumerate the various design factors controlling the Horizontal alignment of highways.

b) Describe the various components of process of EIA.

c) Which type of drawing required for DPR Project explain any one in details.

Q.5 Solve Any Two. **14**

a) Write Note on a
- i) Estimate
- ii) BOQ
- iii) Tender
- iv) Contract
- v) Tender Evaluation
- vi) EIA
- vii) DPR

b) Explain the important functions of highway embankment and subgrade in the performance of highway pavement?

c) Write explanatory notes on the following types of bituminous pavement layers:
- i) Stone matrix mix
- ii) Slurry seal
- iii) Micro surfacing

SLR-QH-287

Seat No.		Set	P

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (Old) (CBCS)
Examination: March/April – 2026
Sustainable Materials and Green Buildings (BTN01622)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions (if necessary and state them clearly).

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) Composite cements have _____ (percent by weight) proportion of flyash in it.
a) 10-20 b) 15-35
c) 20-40 d) 50-70

2) Sustainable forestry practices involve _____.
a) Clear-cutting old-growth forests
b) Planting monoculture tree plantations
c) Selective logging and reforestation
d) Using chemical pesticides and fertilizers extensively

3) Which of the following materials is considered a sustainable alternative to traditional plastics?
a) Polyethylene b) Polystyrene
c) Bioplastics d) PVC

4) What is the primary advantage of using recycled materials in manufacturing?
a) Increased cost
b) Reduced environmental impact
c) Limited availability
d) Lower quality

5) Which certification is commonly used to identify wood products sourced from sustainably managed forests?
a) FSC b) ISO
c) EPA d) FDA

6) Which of the following materials is commonly used as a sustainable alternative to traditional insulation materials like fiberglass?

a) Styrofoam
b) Mineral wool
c) Spray foam
d) Cellulose

7) Which certification is associated with sustainable textile production and ensures that environmental and social criteria are met throughout the manufacturing process?

a) LEED
b) GOTS
c) BREEAM
d) ISO 14001

8) Which of the following materials is commonly used in sustainable packaging as an alternative to conventional plastic wrap?

a) Polyethylene terephthalate (PET)
b) Beeswax wrap
c) Polypropylene
d) PVC film

9) What is the primary purpose of incorporating passive solar design strategies in green buildings?

a) To reduce reliance on mechanical heating and cooling systems
b) To increase energy consumption
c) To maximize artificial lighting
d) To minimize natural ventilation

10) Which of the following building certifications is widely recognized as a benchmark for green building design and construction?

a) LEED
b) ISO 9001
c) BREEAM
d) OHSAS 18001

11) Which of the following features contributes to the thermal comfort of occupants in a green building?

a) Poor insulation
b) Single-pane windows
c) High-performance glazing
d) Lack of shading devices

12) Which of the following strategies can help reduce water consumption in green buildings?

a) Installing water-intensive landscaping
b) Using inefficient plumbing fixtures
c) Implementing rainwater harvesting systems
d) Increasing irrigation demand

13) Which of the following materials is commonly used for insulation in green buildings due to its high R-value and renewable nature?

a) Fiberglass
b) Spray foam
c) Mineral wool
d) Recycled concrete

14) Which of the following certifications focuses specifically on evaluating the sustainability of interior spaces within buildings?

a) LEED for Homes
b) WELL Building Standard
c) Green Globes
d) ENERGY STAR

Seat No.	

Set **P**

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (Old) (CBCS)
Examination: March/April – 2026
Sustainable Materials and Green Buildings (BTN01622)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

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

Section – I

Q.2	**a)**	Inspect cost-effectiveness of using fly ash bricks in construction projects, considering factors such as material cost, labour, and long-term maintenance.	**05**
	b)	What is sustainability? Explain pillars of sustainability with a neat diagram. Discuss interaction between pillars in the sustainability.	**05**
Q.3	**a)**	Explain benefits of Nano technology in cement concrete used in conventional RCC building.	**05**
	b)	Elucidate four dimensions of Sustainability in detail.	**04**
Q.4	**a)**	Demonstrate any four applications of Cement fibre board in construction work.	**05**
	b)	Provide characteristics and application of Fly ash bricks in detail.	**04**
Q.5	**a)**	Analyse how do green buildings incorporate energy storage solutions to optimize the utilization of renewable energy sources such as solar and wind power.	**05**
	b)	Elucidate applications of cement fibre board in green building.	**04**

Section – II

Q.6	**a)**	What is GRIHA? Explain various sections allocated in the GRIHA in detail.	**05**
	b)	Stipulate LEED in sustainability, and explain importance of various sections allocated in the LEED.	**05**

Q.7	**a)**	Explain 5 R's and their applications in constructing Green Buildings.	**05**
	b)	Discuss numerous applications of sustainable technology in 'Building Stock Management'.	**04**
Q.8	**a)**	Justify emergency backup systems, such as generators or uninterruptible power supplies (UPS), integrated into an electrical system are able to provide reliable power during outages or emergencies.	**05**
	b)	Discuss the contribution of effective water system design to overall building sustainability and energy efficiency, particularly in terms of reducing water heating costs and wastewater treatment.	**04**
Q.9	**a)**	Analyse the role do thermostats, controls, and automation systems play in optimizing the operation of cooling and heating systems and minimizing energy consumption.	**05**
	b)	Explain any four considerations for selecting and specifying low-energy materials in building projects.	**04**

SLR-QH-287

Seat No.	

Set Q

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (Old) (CBCS)
Examination: March/April – 2026
Sustainable Materials and Green Buildings (BTN01622)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions (if necessary and state them clearly).

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) Which of the following materials is commonly used in sustainable packaging as an alternative to conventional plastic wrap?
a) Polyethylene terephthalate (PET)
b) Beeswax wrap
c) Polypropylene
d) PVC film

2) What is the primary purpose of incorporating passive solar design strategies in green buildings?
a) To reduce reliance on mechanical heating and cooling systems
b) To increase energy consumption
c) To maximize artificial lighting
d) To minimize natural ventilation

3) Which of the following building certifications is widely recognized as a benchmark for green building design and construction?
a) LEED b) ISO 9001
c) BREEAM d) OHSAS 18001

4) Which of the following features contributes to the thermal comfort of occupants in a green building?
a) Poor insulation
b) Single-pane windows
c) High-performance glazing
d) Lack of shading devices

5) Which of the following strategies can help reduce water consumption in green buildings?
a) Installing water-intensive landscaping
b) Using inefficient plumbing fixtures
c) Implementing rainwater harvesting systems
d) Increasing irrigation demand

6) Which of the following materials is commonly used for insulation in green buildings due to its high R-value and renewable nature?
a) Fiberglass
b) Spray foam
c) Mineral wool
d) Recycled concrete

7) Which of the following certifications focuses specifically on evaluating the sustainability of interior spaces within buildings?
a) LEED for Homes
b) WELL Building Standard
c) Green Globes
d) ENERGY STAR

8) Composite cements have _____ (percent by weight) proportion of flyash in it.
a) 10-20
b) 15-35
c) 20-40
d) 50-70

9) Sustainable forestry practices involve _____.
a) Clear-cutting old-growth forests
b) Planting monoculture tree plantations
c) Selective logging and reforestation
d) Using chemical pesticides and fertilizers extensively

10) Which of the following materials is considered a sustainable alternative to traditional plastics?
a) Polyethylene
b) Polystyrene
c) Bioplastics
d) PVC

11) What is the primary advantage of using recycled materials in manufacturing?
a) Increased cost
b) Reduced environmental impact
c) Limited availability
d) Lower quality

12) Which certification is commonly used to identify wood products sourced from sustainably managed forests?
a) FSC
b) ISO
c) EPA
d) FDA

13) Which of the following materials is commonly used as a sustainable alternative to traditional insulation materials like fiberglass?
a) Styrofoam
b) Mineral wool
c) Spray foam
d) Cellulose

14) Which certification is associated with sustainable textile production and ensures that environmental and social criteria are met throughout the manufacturing process?

a) LEED
b) GOTS
c) BREEAM
d) ISO 14001

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (Old) (CBCS)
Examination: March/April – 2026
Sustainable Materials and Green Buildings (BTN01622)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

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

Section – I

Q.2	**a)**	Inspect cost-effectiveness of using fly ash bricks in construction projects, considering factors such as material cost, labour, and long-term maintenance.	**05**
	b)	What is sustainability? Explain pillars of sustainability with a neat diagram. Discuss interaction between pillars in the sustainability.	**05**
Q.3	**a)**	Explain benefits of Nano technology in cement concrete used in conventional RCC building.	**05**
	b)	Elucidate four dimensions of Sustainability in detail.	**04**
Q.4	**a)**	Demonstrate any four applications of Cement fibre board in construction work.	**05**
	b)	Provide characteristics and application of Fly ash bricks in detail.	**04**
Q.5	**a)**	Analyse how do green buildings incorporate energy storage solutions to optimize the utilization of renewable energy sources such as solar and wind power.	**05**
	b)	Elucidate applications of cement fibre board in green building.	**04**

Section – II

Q.6	**a)**	What is GRIHA? Explain various sections allocated in the GRIHA in detail.	**05**
	b)	Stipulate LEED in sustainability, and explain importance of various sections allocated in the LEED.	**05**

Q.7	**a)**	Explain 5 R's and their applications in constructing Green Buildings.	**05**
	b)	Discuss numerous applications of sustainable technology in 'Building Stock Management'.	**04**
Q.8	**a)**	Justify emergency backup systems, such as generators or uninterruptible power supplies (UPS), integrated into an electrical system are able to provide reliable power during outages or emergencies.	**05**
	b)	Discuss the contribution of effective water system design to overall building sustainability and energy efficiency, particularly in terms of reducing water heating costs and wastewater treatment.	**04**
Q.9	**a)**	Analyse the role do thermostats, controls, and automation systems play in optimizing the operation of cooling and heating systems and minimizing energy consumption.	**05**
	b)	Explain any four considerations for selecting and specifying low-energy materials in building projects.	**04**

Seat No.	

Set **R**

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (Old) (CBCS)
Examination: March/April – 2026
Sustainable Materials and Green Buildings (BTN01622)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions (if necessary and state them clearly).

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) Which of the following features contributes to the thermal comfort of occupants in a green building?
a) Poor insulation
b) Single-pane windows
c) High-performance glazing
d) Lack of shading devices

2) Which of the following strategies can help reduce water consumption in green buildings?
a) Installing water-intensive landscaping
b) Using inefficient plumbing fixtures
c) Implementing rainwater harvesting systems
d) Increasing irrigation demand

3) Which of the following materials is commonly used for insulation in green buildings due to its high R-value and renewable nature?
a) Fiberglass b) Spray foam
c) Mineral wool d) Recycled concrete

4) Which of the following certifications focuses specifically on evaluating the sustainability of interior spaces within buildings?
a) LEED for Homes b) WELL Building Standard
c) Green Globes d) ENERGY STAR

5) Composite cements have _____ (percent by weight) proportion of flyash in it.
a) 10-20 b) 15-35
c) 20-40 d) 50-70

6) Sustainable forestry practices involve _____.
   a) Clear-cutting old-growth forests
   b) Planting monoculture tree plantations
   c) Selective logging and reforestation
   d) Using chemical pesticides and fertilizers extensively

7) Which of the following materials is considered a sustainable alternative to traditional plastics?
   a) Polyethylene
   b) Polystyrene
   c) Bioplastics
   d) PVC

8) What is the primary advantage of using recycled materials in manufacturing?
   a) Increased cost
   b) Reduced environmental impact
   c) Limited availability
   d) Lower quality

9) Which certification is commonly used to identify wood products sourced from sustainably managed forests?
   a) FSC
   b) ISO
   c) EPA
   d) FDA

10) Which of the following materials is commonly used as a sustainable alternative to traditional insulation materials like fiberglass?
   a) Styrofoam
   b) Mineral wool
   c) Spray foam
   d) Cellulose

11) Which certification is associated with sustainable textile production and ensures that environmental and social criteria are met throughout the manufacturing process?
   a) LEED
   b) GOTS
   c) BREEAM
   d) ISO 14001

12) Which of the following materials is commonly used in sustainable packaging as an alternative to conventional plastic wrap?
   a) Polyethylene terephthalate (PET)
   b) Beeswax wrap
   c) Polypropylene
   d) PVC film

13) What is the primary purpose of incorporating passive solar design strategies in green buildings?
   a) To reduce reliance on mechanical heating and cooling systems
   b) To increase energy consumption
   c) To maximize artificial lighting
   d) To minimize natural ventilation

14) Which of the following building certifications is widely recognized as a benchmark for green building design and construction?

a) LEED
b) ISO 9001
c) BREEAM
d) OHSAS 18001

SLR-QH-287

Seat No.	

Set R

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (Old) (CBCS)
Examination: March/April – 2026
Sustainable Materials and Green Buildings (BTN01622)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

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

Section – I

Q.2	**a)**	Inspect cost-effectiveness of using fly ash bricks in construction projects, considering factors such as material cost, labour, and long-term maintenance.	**05**
	b)	What is sustainability? Explain pillars of sustainability with a neat diagram. Discuss interaction between pillars in the sustainability.	**05**
Q.3	**a)**	Explain benefits of Nano technology in cement concrete used in conventional RCC building.	**05**
	b)	Elucidate four dimensions of Sustainability in detail.	**04**
Q.4	**a)**	Demonstrate any four applications of Cement fibre board in construction work.	**05**
	b)	Provide characteristics and application of Fly ash bricks in detail.	**04**
Q.5	**a)**	Analyse how do green buildings incorporate energy storage solutions to optimize the utilization of renewable energy sources such as solar and wind power.	**05**
	b)	Elucidate applications of cement fibre board in green building.	**04**

Section – II

Q.6	**a)**	What is GRIHA? Explain various sections allocated in the GRIHA in detail.	**05**
	b)	Stipulate LEED in sustainability, and explain importance of various sections allocated in the LEED.	**05**

Q.7	**a)**	Explain 5 R's and their applications in constructing Green Buildings.	**05**
	b)	Discuss numerous applications of sustainable technology in 'Building Stock Management'.	**04**
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Q.9	**a)**	Analyse the role do thermostats, controls, and automation systems play in optimizing the operation of cooling and heating systems and minimizing energy consumption.	**05**
	b)	Explain any four considerations for selecting and specifying low-energy materials in building projects.	**04**

Seat No.		Set	S

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (Old) (CBCS)
Examination: March/April – 2026
Sustainable Materials and Green Buildings (BTN01622)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions (if necessary and state them clearly).

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) Which of the following materials is commonly used as a sustainable alternative to traditional insulation materials like fiberglass?
a) Styrofoam b) Mineral wool
c) Spray foam d) Cellulose

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d) PVC film

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c) Implementing rainwater harvesting systems
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d) Recycled concrete

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10) Composite cements have _____ (percent by weight) proportion of flyash in it.
a) 10-20
b) 15-35
c) 20-40
d) 50-70

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a) Clear-cutting old-growth forests
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13) What is the primary advantage of using recycled materials in manufacturing?
a) Increased cost
b) Reduced environmental impact
c) Limited availability
d) Lower quality

14) Which certification is commonly used to identify wood products sourced from sustainably managed forests?

a) FSC
b) ISO
c) EPA
d) FDA

Seat No.	

Set **S**

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (Old) (CBCS)
Examination: March/April – 2026
Sustainable Materials and Green Buildings (BTN01622)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

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

Section – I

Q.2	**a)**	Inspect cost-effectiveness of using fly ash bricks in construction projects, considering factors such as material cost, labour, and long-term maintenance.	**05**
	b)	What is sustainability? Explain pillars of sustainability with a neat diagram. Discuss interaction between pillars in the sustainability.	**05**
Q.3	**a)**	Explain benefits of Nano technology in cement concrete used in conventional RCC building.	**05**
	b)	Elucidate four dimensions of Sustainability in detail.	**04**
Q.4	**a)**	Demonstrate any four applications of Cement fibre board in construction work.	**05**
	b)	Provide characteristics and application of Fly ash bricks in detail.	**04**
Q.5	**a)**	Analyse how do green buildings incorporate energy storage solutions to optimize the utilization of renewable energy sources such as solar and wind power.	**05**
	b)	Elucidate applications of cement fibre board in green building.	**04**

Section – II

Q.6	**a)**	What is GRIHA? Explain various sections allocated in the GRIHA in detail.	**05**
	b)	Stipulate LEED in sustainability, and explain importance of various sections allocated in the LEED.	**05**

Q.7	**a)**	Explain 5 R's and their applications in constructing Green Buildings.	**05**
	b)	Discuss numerous applications of sustainable technology in 'Building Stock Management'.	**04**
Q.8	**a)**	Justify emergency backup systems, such as generators or uninterruptible power supplies (UPS), integrated into an electrical system are able to provide reliable power during outages or emergencies.	**05**
	b)	Discuss the contribution of effective water system design to overall building sustainability and energy efficiency, particularly in terms of reducing water heating costs and wastewater treatment.	**04**
Q.9	**a)**	Analyse the role do thermostats, controls, and automation systems play in optimizing the operation of cooling and heating systems and minimizing energy consumption.	**05**
	b)	Explain any four considerations for selecting and specifying low-energy materials in building projects.	**04**

SLR-QH-288

Seat No.		Set	P

T. Y. (B.Tech.) (Civil Engineering) (Semester - II) (Old) (CBCS)
Examination: March/April – 2026
Engineering System Design Optimization (BTN01623)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions (if necessary and state them clearly).

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) Which of the following is specialized method for optimization?
a) Integer programming b) Geometric programming
c) Simulated Annealing d) All of these

2) Which of the following is not Fibonacci number?
a) 4 b) 21
c) 55 d) 13

3) Following method of optimization belongs to bracketing method _____.
a) Exhaustive Search Method b) Golden Section Method
c) Newton Raphson Method d) Bisection Method

4) The maximization or minimization of a quantity is the ____.
a) Goal of management science
b) The decision for decision analysis
c) The constraint of operation research
d) The objective of linear programming

5) The Newton - Raphson method fails if _____.
a) $f'(x_0) = 0$ b) $f''(x_0) = 0$
c) $f(x_0) = 0$ d) $f'''(x_0) = 0$

6) Gradient based method is _____.
a) Newton Raphson method b) Bisection method
c) Both 'a' and 'b' d) None of these

7) Processes involved in Genetic Algorithm are _____.
a) Selection
b) Mutation
c) Cross over
d) All of these

8) In which of the following case is application of optimization is not used?
a) Maximize discharge through pipe
b) Minimize the cost of construction
c) Calculation of shear force in beam
d) None of these

9) Unidirectional search is _____.
a) Converting multivariable problem to single variable problem
b) Funding optimized solution
c) Both ‘a’ and ‘b’
d) None of these

10) In linear programming, the solution is based on _____.
a) Tensile properties
b) Strain properties
c) Elementary properties
d) Shear properties

11) What is liner programming?
a) Constrained optimization technique
b) Technique for economic allocation of limited resources
c) Mathematical technique
d) All of these

12) While solving a linear programming model graphically, the area bounded by the constraints is called _____.
a) Feasible region
b) Infeasible region
c) Unbounded solution
d) Non bounded solution

13) When the optimization problem cost functions are differentiable, the problem is referred to as _____.
a) Rough
b) Non smooth
c) Smooth
d) Non-Rough

14) Which of the following field is which optimization is used?
a) Finance
b) Demand and Supply
c) Airline
d) All of these

Seat No.	

Set **P**

T. Y. (B.Tech.) (Civil Engineering) (Semester - II) (Old) (CBCS)
Examination: March/April – 2026
Engineering System Design Optimization (BTN01623)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever necessary.

Section – I

Q.2 Answer the following. (Any Two) **12**

a) Enlist and explain various types of Optimization Algorithm.

b) Explain in detail various applications of optimization.

c) Enlist and explain various steps involved in the formulation of any optimization problem.

Q.3 Answer the following. (Any Two) **08**

a) Write the detailed Algorithm for the Exhaustive Search Method.

b) Optimize the given function $f(x) = x^2 + \frac{54}{x}$ using Exhaustive Search Method.
Take $a = 0 \quad b = 10 \quad n = 50$

c) Optimize the given function using "Fibonacci Search Method".
$f(x) = x^2 + \frac{20}{x}$
$a = 0.4 \quad b = 6.5 \quad n = 3$ and $k = 2$

Q.4 Answer the following. (Any Two) **08**

a) Optimize the given function using unidirectional search method for the function.
$f(x) = 2{x_1}^2 + {x_2}^2 - 2x_1x_2 + 4$ where $x^{(0)} = (1,1)\ s = (2,3)$ and $E = 10^{-3}$

b) Optimize the given function using Powell's conjugate direction method
$f(x) = {x_1}^2 - 2{x_2}^2 + 2$ where $x^{(0)} = (2,1)\ \ s_1 = (1,0)\ s_2 = (0,1)$ & $E = 10^{-3}$

c) Perform an optimization search using steepest descent method where.
$f(x) = {x_1}^2 - 2x_1x_2 - {x_2}^2 \quad x^{(0)} = (1,1)$ & $E = 10^{-3}$

Section – II

Q.5 Answer the following. (Any Two) **12**

a) Optimize the objective function
$z = 5x + 7y$ subjected to
$3x + 2y \leq 12$
$2x + 3y \leq 13$
$x, y \geq 0$ By Graphical Method.

b) Explain limitations of Linear programming.

c) Optimize the function
$f(x) = {x_1}^2 - 2x_1x_2 - {x_2}^2$
using Geometric Programming.

Q.6 Answer the following. (Any Two) **08**

a) Explain in concept of Genetic Algorithm.

b) Explain similarities between Genetic Algorithm & Traditional Method.

c) Write a computer program for Newton Raphson method.

Q.7 Answer the following. (Any Two) **08**

a) What are various fast reanalysis techniques?

b) Explain the concept of multilevel optimization.

c) What are the techniques to reduce the size of the optimization problem?

SLR-QH-288

Seat No.	

Set Q

T. Y. (B.Tech.) (Civil Engineering) (Semester - II) (Old) (CBCS)
Examination: March/April – 2026
Engineering System Design Optimization (BTN01623)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions (if necessary and state them clearly).

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) In which of the following case is application of optimization is not used?
a) Maximize discharge through pipe
b) Minimize the cost of construction
c) Calculation of shear force in beam
d) None of these

2) Unidirectional search is _____.
a) Converting multivariable problem to single variable problem
b) Funding optimized solution
c) Both 'a' and 'b'
d) None of these

3) In linear programming, the solution is based on _____.
a) Tensile properties b) Strain properties
c) Elementary properties d) Shear properties

4) What is liner programming?
a) Constrained optimization technique
b) Technique for economic allocation of limited resources
c) Mathematical technique
d) All of these

5) While solving a linear programming model graphically, the area bounded by the constraints is called _____.
a) Feasible region b) Infeasible region
c) Unbounded solution d) Non bounded solution

6) When the optimization problem cost functions are differentiable, the problem is referred to as _____.
a) Rough b) Non smooth
c) Smooth d) Non-Rough

7) Which of the following field is which optimization is used?
a) Finance b) Demand and Supply
c) Airline d) All of these

8) Which of the following is specialized method for optimization?
a) Integer programming b) Geometric programming
c) Simulated Annealing d) All of these

9) Which of the following is not Fibonacci number?
a) 4 b) 21
c) 55 d) 13

10) Following method of optimization belongs to bracketing method _____.
a) Exhaustive Search Method b) Golden Section Method
c) Newton Raphson Method d) Bisection Method

11) The maximization or minimization of a quantity is the ____.
a) Goal of management science
b) The decision for decision analysis
c) The constraint of operation research
d) The objective of linear programming

12) The Newton - Raphson method fails if _____.
a) $f'(x_0) = 0$ b) $f''(x_0) = 0$
c) $f(x_0) = 0$ d) $f'''(x_0) = 0$

13) Gradient based method is _____.
a) Newton Raphson method b) Bisection method
c) Both ‘a’ and ‘b’ d) None of these

14) Processes involved in Genetic Algorithm are _____.
a) Selection b) Mutation
c) Cross over d) All of these

Seat No.	

Set **Q**

T. Y. (B.Tech.) (Civil Engineering) (Semester - II) (Old) (CBCS)
Examination: March/April – 2026
Engineering System Design Optimization (BTN01623)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever necessary.

Section – I

Q.2 Answer the following. (Any Two) **12**

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b) Explain in detail various applications of optimization.

c) Enlist and explain various steps involved in the formulation of any optimization problem.

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b) Optimize the given function $f(x) = x^2 + \frac{54}{x}$ using Exhaustive Search Method.
Take $a = 0 \quad b = 10 \quad n = 50$

c) Optimize the given function using "Fibonacci Search Method".
$f(x) = x^2 + \frac{20}{x}$
$a = 0.4 \quad b = 6.5 \quad n = 3$ and $k = 2$

Q.4 Answer the following. (Any Two) **08**

a) Optimize the given function using unidirectional search method for the function.
$f(x) = 2{x_1}^2 + {x_2}^2 - 2x_1x_2 + 4$ where $x^{(0)} = (1,1)\ s = (2,3)$ and $E = 10^{-3}$

b) Optimize the given function using Powell's conjugate direction method
$f(x) = {x_1}^2 - 2{x_2}^2 + 2$ where $x^{(0)} = (2,1)\ \ s_1 = (1,0)\ s_2 = (0,1)$ & $E = 10^{-3}$

c) Perform an optimization search using steepest descent method where.
$f(x) = {x_1}^2 - 2x_1x_2 - {x_2}^2 \quad x^{(0)} = (1,1)$ & $E = 10^{-3}$

Section – II

Q.5 Answer the following. (Any Two) **12**

a) Optimize the objective function
$z = 5x + 7y$ subjected to
$3x + 2y \leq 12$
$2x + 3y \leq 13$
$x, y \geq 0$ By Graphical Method.

b) Explain limitations of Linear programming.

c) Optimize the function
$f(x) = {x_1}^2 - 2x_1x_2 - {x_2}^2$
using Geometric Programming.

Q.6 Answer the following. (Any Two) **08**

a) Explain in concept of Genetic Algorithm.

b) Explain similarities between Genetic Algorithm & Traditional Method.

c) Write a computer program for Newton Raphson method.

Q.7 Answer the following. (Any Two) **08**

a) What are various fast reanalysis techniques?

b) Explain the concept of multilevel optimization.

c) What are the techniques to reduce the size of the optimization problem?

Seat No.	

Set R

T. Y. (B.Tech.) (Civil Engineering) (Semester - II) (Old) (CBCS)
Examination: March/April – 2026
Engineering System Design Optimization (BTN01623)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions (if necessary and state them clearly).

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) What is liner programming?
a) Constrained optimization technique
b) Technique for economic allocation of limited resources
c) Mathematical technique
d) All of these

2) While solving a linear programming model graphically, the area bounded by the constraints is called _____.
a) Feasible region b) Infeasible region
c) Unbounded solution d) Non bounded solution

3) When the optimization problem cost functions are differentiable, the problem is referred to as _____.
a) Rough b) Non smooth
c) Smooth d) Non-Rough

4) Which of the following field is which optimization is used?
a) Finance b) Demand and Supply
c) Airline d) All of these

5) Which of the following is specialized method for optimization?
a) Integer programming b) Geometric programming
c) Simulated Annealing d) All of these

6) Which of the following is not Fibonacci number?
a) 4 b) 21
c) 55 d) 13

7) Following method of optimization belongs to bracketing method _____.
   a) Exhaustive Search Method b) Golden Section Method
   c) Newton Raphson Method d) Bisection Method

8) The maximization or minimization of a quantity is the ____.
   a) Goal of management science
   b) The decision for decision analysis
   c) The constraint of operation research
   d) The objective of linear programming

9) The Newton - Raphson method fails if _____.
   a) $f'(x_0) = 0$ b) $f''(x_0) = 0$
   c) $f(x_0) = 0$ d) $f'''(x_0) = 0$

10) Gradient based method is _____.
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12) In which of the following case is application of optimization is not used?
   a) Maximize discharge through pipe
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13) Unidirectional search is _____.
   a) Converting multivariable problem to single variable problem
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   d) None of these

14) In linear programming, the solution is based on _____.
   a) Tensile properties b) Strain properties
   c) Elementary properties d) Shear properties

Seat No.	

Set **R**

T. Y. (B.Tech.) (Civil Engineering) (Semester - II) (Old) (CBCS)
Examination: March/April – 2026
Engineering System Design Optimization (BTN01623)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever necessary.

Section – I

Q.2 Answer the following. (Any Two) **12**

a) Enlist and explain various types of Optimization Algorithm.

b) Explain in detail various applications of optimization.

c) Enlist and explain various steps involved in the formulation of any optimization problem.

Q.3 Answer the following. (Any Two) **08**

a) Write the detailed Algorithm for the Exhaustive Search Method.

b) Optimize the given function $f(x) = x^2 + \frac{54}{x}$ using Exhaustive Search Method.
Take $a = 0 \quad b = 10 \quad n = 50$

c) Optimize the given function using "Fibonacci Search Method".
$f(x) = x^2 + \frac{20}{x}$
$a = 0.4 \quad b = 6.5 \quad n = 3$ and $k = 2$

Q.4 Answer the following. (Any Two) **08**

a) Optimize the given function using unidirectional search method for the function.
$f(x) = 2{x_1}^2 + {x_2}^2 - 2x_1x_2 + 4$ where $x^{(0)} = (1,1)\ s = (2,3)$ and $E = 10^{-3}$

b) Optimize the given function using Powell's conjugate direction method
$f(x) = {x_1}^2 - 2{x_2}^2 + 2$ where $x^{(0)} = (2,1)\ \ s_1 = (1,0)\ s_2 = (0,1)$ & $E = 10^{-3}$

c) Perform an optimization search using steepest descent method where.
$f(x) = {x_1}^2 - 2x_1x_2 - {x_2}^2 \quad x^{(0)} = (1,1)$ & $E = 10^{-3}$

Section – II

Q.5 Answer the following. (Any Two) **12**

a) Optimize the objective function
$z = 5x + 7y$ subjected to
$3x + 2y \leq 12$
$2x + 3y \leq 13$
$x, y \geq 0$ By Graphical Method.

b) Explain limitations of Linear programming.

c) Optimize the function
$f(x) = {x_1}^2 - 2x_1x_2 - {x_2}^2$
using Geometric Programming.

Q.6 Answer the following. (Any Two) **08**

a) Explain in concept of Genetic Algorithm.

b) Explain similarities between Genetic Algorithm & Traditional Method.

c) Write a computer program for Newton Raphson method.

Q.7 Answer the following. (Any Two) **08**

a) What are various fast reanalysis techniques?

b) Explain the concept of multilevel optimization.

c) What are the techniques to reduce the size of the optimization problem?

Seat No.	

Set **S**

T. Y. (B.Tech.) (Civil Engineering) (Semester - II) (Old) (CBCS)
Examination: March/April – 2026
Engineering System Design Optimization (BTN01623)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions (if necessary and state them clearly).

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) Gradient based method is _____.
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c) Both 'a' and 'b' d) None of these

2) Processes involved in Genetic Algorithm are _____.
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3) In which of the following case is application of optimization is not used?
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c) Calculation of shear force in beam
d) None of these

4) Unidirectional search is _____.
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c) Both 'a' and 'b'
d) None of these

5) In linear programming, the solution is based on _____.
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6) What is liner programming?
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a) 4
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12) Following method of optimization belongs to bracketing method _____.
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c) Newton Raphson Method
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13) The maximization or minimization of a quantity is the ____.
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b) The decision for decision analysis
c) The constraint of operation research
d) The objective of linear programming

14) The Newton - Raphson method fails if _____.
a) $f'(x_0) = 0$
b) $f''(x_0) = 0$
c) $f(x_0) = 0$
d) $f'''(x_0) = 0$

Seat No.	

Set **S**

T. Y. (B.Tech.) (Civil Engineering) (Semester - II) (Old) (CBCS)
Examination: March/April – 2026
Engineering System Design Optimization (BTN01623)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever necessary.

Section – I

Q.2 Answer the following. (Any Two) **12**

a) Enlist and explain various types of Optimization Algorithm.

b) Explain in detail various applications of optimization.

c) Enlist and explain various steps involved in the formulation of any optimization problem.

Q.3 Answer the following. (Any Two) **08**

a) Write the detailed Algorithm for the Exhaustive Search Method.

b) Optimize the given function $f(x) = x^2 + \frac{54}{x}$ using Exhaustive Search Method.
Take $a = 0 \quad b = 10 \quad n = 50$

c) Optimize the given function using "Fibonacci Search Method".
$f(x) = x^2 + \frac{20}{x}$
$a = 0.4 \quad b = 6.5 \quad n = 3$ and $k = 2$

Q.4 Answer the following. (Any Two) **08**

a) Optimize the given function using unidirectional search method for the function.
$f(x) = 2{x_1}^2 + {x_2}^2 - 2x_1x_2 + 4$ where $x^{(0)} = (1,1)\ s = (2,3)$ and $E = 10^{-3}$

b) Optimize the given function using Powell's conjugate direction method
$f(x) = {x_1}^2 - 2{x_2}^2 + 2$ where $x^{(0)} = (2,1)\ \ s_1 = (1,0)\ s_2 = (0,1)$ & $E = 10^{-3}$

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$f(x) = {x_1}^2 - 2x_1x_2 - {x_2}^2 \quad x^{(0)} = (1,1)$ & $E = 10^{-3}$

Section – II

Q.5 Answer the following. (Any Two) **12**

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$z = 5x + 7y$ subjected to
$3x + 2y \leq 12$
$2x + 3y \leq 13$
$x, y \geq 0$ By Graphical Method.

b) Explain limitations of Linear programming.

c) Optimize the function
$f(x) = {x_1}^2 - 2x_1x_2 - {x_2}^2$
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Q.6 Answer the following. (Any Two) **08**

a) Explain in concept of Genetic Algorithm.

b) Explain similarities between Genetic Algorithm & Traditional Method.

c) Write a computer program for Newton Raphson method.

Q.7 Answer the following. (Any Two) **08**

a) What are various fast reanalysis techniques?

b) Explain the concept of multilevel optimization.

c) What are the techniques to reduce the size of the optimization problem?

SLR-QH-289

Seat No.	

Set P

Fourth. Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April - 2026
Estimating, Costing and Valuation (BTN01701)

Day & Date: Saturday, 02-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) The Tile Skirting is measured in _____.
a) Cub.m b) Sq.m.
c) Running Metres d) None of these

2) The excavation exceeding 1.5 m in width and 10 sq.m. in plan area with a depth not exceeding 30 cm, is termed as _____.
a) Excavation b) Surface dressing
c) Cutting d) Surface excavation

3) In normal circumstances, minimum period before striking vertical formwork of columns, beams shall be _____.
a) 16-24 Hr. b) 7 days
c) 14 days d) 21 days

4) In rate analysis, salary of technical personnel engaged for the work are covered in _____.
a) Labour cost b) General overheads
c) Job overheads d) Contingencies

5) During the execution of project, structural modifications are required or addition work is added for construction, the estimate for additional work is called _____.
a) Preliminary estimate b) Supplementary estimate
c) Revised estimate d) Detailed estimate

6) We prepare revised estimate against the original estimate due to change in _____.
   a) the rate of material or change in specification of materials
   b) change in structural drawing
   c) additional items
   d) All the above

7) If rise and tread of a step is 0.15m and 0.25m respectively, then the volume (in cubic meter) of 9 number of steps of 1 m length be recorded in measurement sheet shall be _____.
   a) 0.3375 b) 0.337
   c) 0.34 d) 0.33

8) Earnest money is paid to enable the Government to ensure that a tenderer does not _____.
   a) back out of his tender before its acceptance
   b) refuse to execute the work after it has been awarded to him
   c) compromise with quality of work
   d) a or b

9) For labour component the escalation rise will be payable based on _____.
   a) Increase in the minimum wages of unskilled male mazdoor
   b) Increase in the actual wages of unskilled male mazdoor
   c) Increase in the minimum wages of skilled male mazdoor
   d) Increase in the actual wages of skilled male mazdoor

10) 'Money received today is more worth than money received in future' is based on which of the following term _____.
   a) Time Value of money b) Storage Value of Money
   c) Time Machine d) Cash Value of Machine

11) The net present value (NPV) is _____.
   a) equal to the sum of the present values of all cash flows
   b) equal to the sum of returns
   c) equal to the sum of all cash flows
   d) None of the above

12) The value at the end of utility of property but without dismantling is known as _____.
   a) Scrap Value b) Salvage value
   c) Market value d) Book value

13) Following is not the purpose of Valuation _____.
   a) For submission to financial agency/bank while borrowing loan
   b) For preparing tender documents
   c) For income tax/wealth tax assessment
   d) For compensation after the land acquisition

14) Valuation of the properties which perform non profitable community functions is done by _____.

a) Rental method
b) Land and building method
c) Direct comparison method
d) Profit based method

Seat No.	

Set **P**

Fourth. Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April - 2026
Estimating, Costing and Valuation (BTN01701)

Day & Date: Saturday, 02-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. 2 is compulsory; answer any two remaining questions from Section – I.
2) Q. 6 is compulsory; answer any two from remaining questions from Section – II.
3) Figures to the right indicate full marks.
4) Assume additional data if required and mention it clearly.

Section – I

Q.2 **a)** Calculate the quantity of concrete for slab as shown in attached drawing. **08**

b) Also prepare an Abstract sheet for these items by assuming suitable market rates according to economical year 2023-24. **04**

Q.3 **a)** Define Specification for building, explain types of specifications. **04**

b) Write the detailed specifications for Concrete Lined Canal. **04**

Q.4 **a)** What is the Rate analysis? Explain the factors affecting rate analysis. **04**

b) Curry out rate analysis for external painting with water base colour. **04**

Q.5 **a)** Define estimation of building and its types. **04**

b) Write a thumb rule for amount of steel required for construction of building. **04**

Section – II

Q.6 **a)** Prepare a tender notice for the work of construction of a Zilha Parishad Primary School for First to Fourth class with a capacity of 40 students per class. Make suitable assumptions for required data. **08**

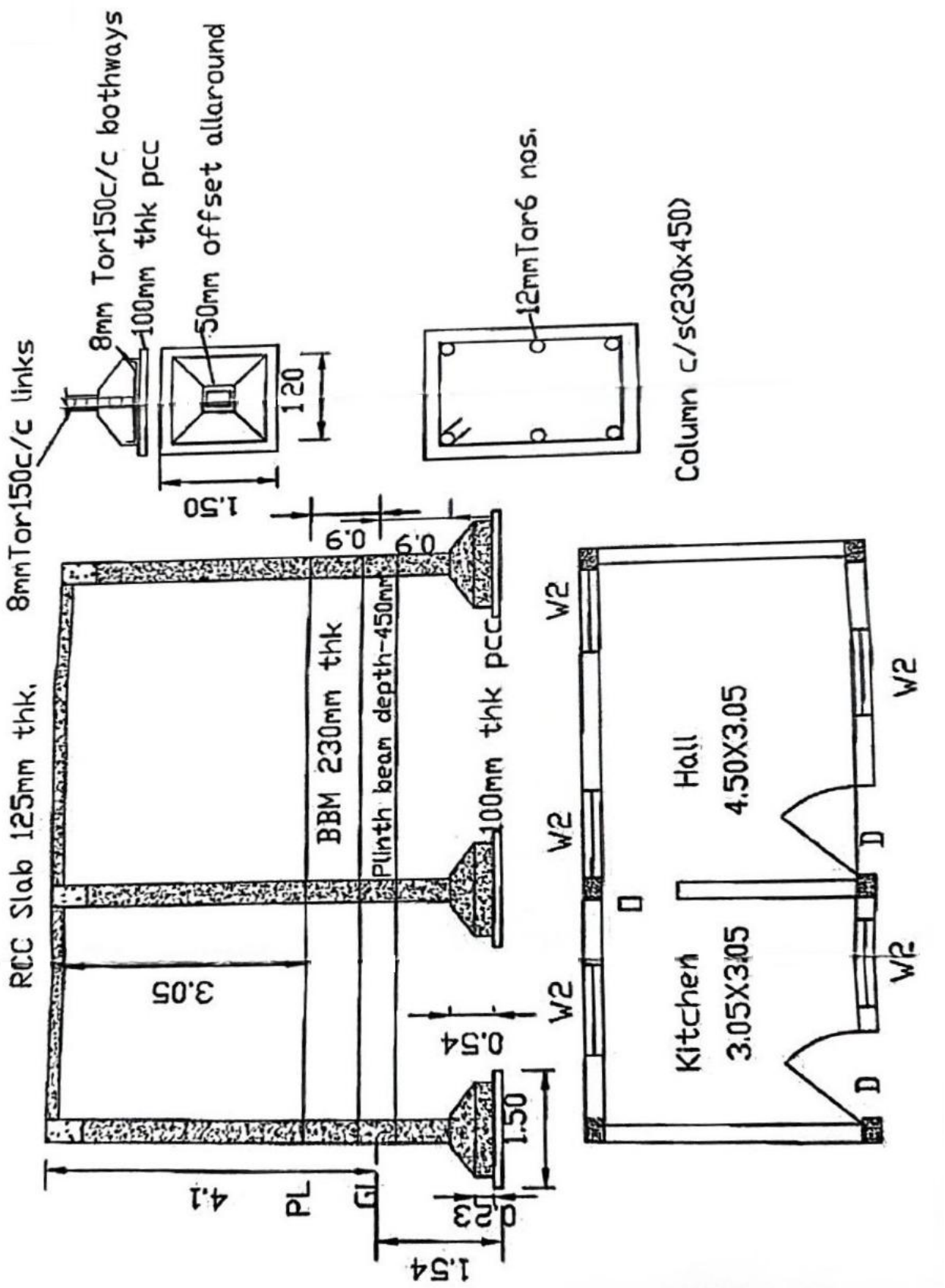
b) Write a short note on BOT and BOOT projects with suitable example. **04**

Q.7 **a)** Explain following Acts **04**
i) The Indian Easement Act, 1882
ii) The Indian Contract Act, 1872

b) Write a note on Turn Key Contract with its advantages and disadvantages. **04**

Q.8	**a)**	Explain different types of values - Scrap value, Potential value, distress value.	**04**
	b)	Compare following methods of calculating depreciation. Straight line method & Double Declining Balance method.	**04**
Q.9	**a)**	Explain development method of land valuation.	**04**
	b)	Calculate Years Purchase for a property with a useful life of 35 years if rate of interest is 4.5 % per year. Assume rate of interest for sinking fund as 3.5%	**04**

Q.2 a & b


8mm Tor150c/c bothways
100mm thk pcc
50mm offset allaround
120
1.50
12mmTor6 nos.
Column c/s(230x450)
8mmTor150c/c links
RCC Slab 125mm thk.
0.9
0.9
BBM 230mm thk
Plinth beam depth-450mm
100mm thk pcc
W2
W2
W2
W2
W2
Hall
4.50X3.05
Kitchen
3.05X3.05
D
D
D
3.05
0.54
1.50
4.1
PL
GL
0.3
1.54

Seat No.	

Set **Q**

Fourth. Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April - 2026
Estimating, Costing and Valuation (BTN01701)

Day & Date: Saturday, 02-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) Earnest money is paid to enable the Government to ensure that a tenderer does not _____.
a) back out of his tender before its acceptance
b) refuse to execute the work after it has been awarded to him
c) compromise with quality of work
d) a or b

2) For labour component the escalation rise will be payable based on _____.
a) Increase in the minimum wages of unskilled male mazdoor
b) Increase in the actual wages of unskilled male mazdoor
c) Increase in the minimum wages of skilled male mazdoor
d) Increase in the actual wages of skilled male mazdoor

3) 'Money received today is more worth than money received in future' is based on which of the following term _____.
a) Time Value of money b) Storage Value of Money
c) Time Machine d) Cash Value of Machine

4) The net present value (NPV) is _____.
a) equal to the sum of the present values of all cash flows
b) equal to the sum of returns
c) equal to the sum of all cash flows
d) None of the above

5) The value at the end of utility of property but without dismantling is known as _____.
a) Scrap Value b) Salvage value
c) Market value d) Book value

6) Following is not the purpose of Valuation _____.
   a) For submission to financial agency/bank while borrowing loan
   b) For preparing tender documents
   c) For income tax/wealth tax assessment
   d) For compensation after the land acquisition

7) Valuation of the properties which perform non profitable community functions is done by _____.
   a) Rental method
   b) Land and building method
   c) Direct comparison method
   d) Profit based method

8) The Tile Skirting is measured in _____.
   a) Cub.m
   b) Sq.m.
   c) Running Metres
   d) None of these

9) The excavation exceeding 1.5 m in width and 10 sq.m. in plan area with a depth not exceeding 30 cm, is termed as _____.
   a) Excavation
   b) Surface dressing
   c) Cutting
   d) Surface excavation

10) In normal circumstances, minimum period before striking vertical formwork of columns, beams shall be _____.
   a) 16-24 Hr.
   b) 7 days
   c) 14 days
   d) 21 days

11) In rate analysis, salary of technical personnel engaged for the work are covered in _____.
   a) Labour cost
   b) General overheads
   c) Job overheads
   d) Contingencies

12) During the execution of project, structural modifications are required or addition work is added for construction, the estimate for additional work is called _____.
   a) Preliminary estimate
   b) Supplementary estimate
   c) Revised estimate
   d) Detailed estimate

13) We prepare revised estimate against the original estimate due to change in _____.
   a) the rate of material or change in specification of materials
   b) change in structural drawing
   c) additional items
   d) All the above

14) If rise and tread of a step is 0.15m and 0.25m respectively, then the volume (in cubic meter) of 9 number of steps of 1 m length be recorded in measurement sheet shall be _____.

a) 0.3375 b) 0.337

c) 0.34 d) 0.33

Seat No.	

Set **Q**

Fourth. Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April - 2026
Estimating, Costing and Valuation (BTN01701)

Day & Date: Saturday, 02-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. 2 is compulsory; answer any two remaining questions from Section – I.
2) Q. 6 is compulsory; answer any two from remaining questions from Section – II.
3) Figures to the right indicate full marks.
4) Assume additional data if required and mention it clearly.

Section – I

Q.2 **a)** Calculate the quantity of concrete for slab as shown in attached drawing. **08**

b) Also prepare an Abstract sheet for these items by assuming suitable market rates according to economical year 2023-24. **04**

Q.3 **a)** Define Specification for building, explain types of specifications. **04**

b) Write the detailed specifications for Concrete Lined Canal. **04**

Q.4 **a)** What is the Rate analysis? Explain the factors affecting rate analysis. **04**

b) Curry out rate analysis for external painting with water base colour. **04**

Q.5 **a)** Define estimation of building and its types. **04**

b) Write a thumb rule for amount of steel required for construction of building. **04**

Section – II

Q.6 **a)** Prepare a tender notice for the work of construction of a Zilha Parishad Primary School for First to Fourth class with a capacity of 40 students per class. Make suitable assumptions for required data. **08**

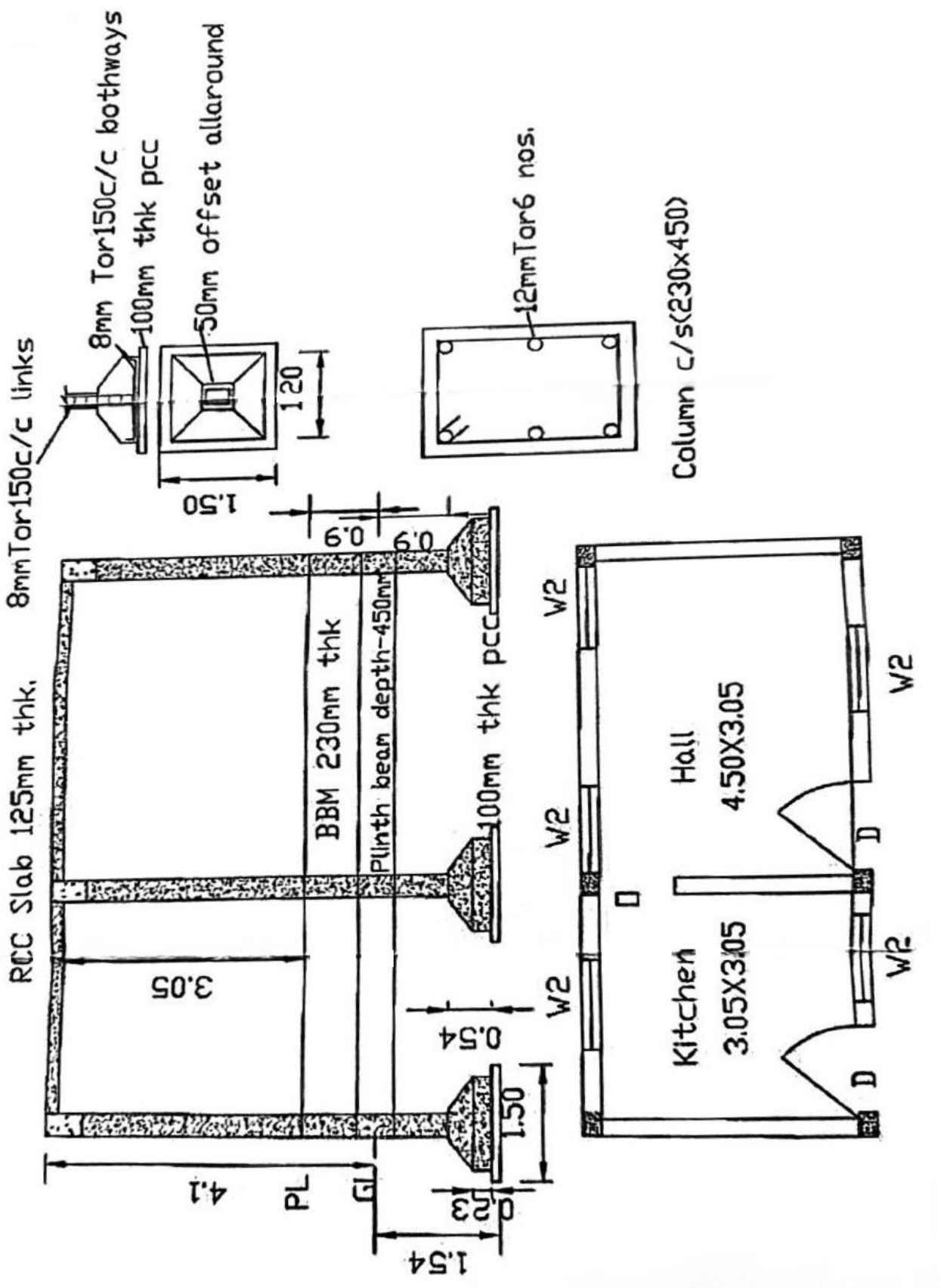
b) Write a short note on BOT and BOOT projects with suitable example. **04**

Q.7 **a)** Explain following Acts **04**
i) The Indian Easement Act, 1882
ii) The Indian Contract Act, 1872

b) Write a note on Turn Key Contract with its advantages and disadvantages. **04**

Q.8	**a)**	Explain different types of values - Scrap value, Potential value, distress value.	**04**
	b)	Compare following methods of calculating depreciation. Straight line method & Double Declining Balance method.	**04**
Q.9	**a)**	Explain development method of land valuation.	**04**
	b)	Calculate Years Purchase for a property with a useful life of 35 years if rate of interest is 4.5 % per year. Assume rate of interest for sinking fund as 3.5%	**04**

Q.2 a & b


8mm Tor150c/c bothways
100mm thk pcc
50mm offset allaround
120
1.50
12mmTor6 nos.
Column c/s(230x450)
8mmTor150c/c links
RCC Slab 125mm thk.
0.9
0.9
BBM 230mm thk
Plinth beam depth-450mm
100mm thk pcc
W2
W2
W2
W2
W2
Hall
4.50X3.05
Kitchen
3.05X3.05
D
D
D
3.05
0.54
1.50
4.1
PL
GL
0.3
1.54

Seat No.	

Set **R**

Fourth. Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April - 2026
Estimating, Costing and Valuation (BTN01701)

Day & Date: Saturday, 02-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) The net present value (NPV) is _____.
a) equal to the sum of the present values of all cash flows
b) equal to the sum of returns
c) equal to the sum of all cash flows
d) None of the above

2) The value at the end of utility of property but without dismantling is known as _____.
a) Scrap Value b) Salvage value
c) Market value d) Book value

3) Following is not the purpose of Valuation _____.
a) For submission to financial agency/bank while borrowing loan
b) For preparing tender documents
c) For income tax/wealth tax assessment
d) For compensation after the land acquisition

4) Valuation of the properties which perform non profitable community functions is done by _____.
a) Rental method
b) Land and building method
c) Direct comparison method
d) Profit based method

5) The Tile Skirting is measured in _____.
a) Cub.m b) Sq.m.
c) Running Metres d) None of these

6) The excavation exceeding 1.5 m in width and 10 sq.m. in plan area with a depth not exceeding 30 cm, is termed as _____.
a) Excavation b) Surface dressing
c) Cutting d) Surface excavation

7) In normal circumstances, minimum period before striking vertical formwork of columns, beams shall be _____.
a) 16-24 Hr. b) 7 days
c) 14 days d) 21 days

8) In rate analysis, salary of technical personnel engaged for the work are covered in _____.
a) Labour cost b) General overheads
c) Job overheads d) Contingencies

9) During the execution of project, structural modifications are required or addition work is added for construction, the estimate for additional work is called _____.
a) Preliminary estimate b) Supplementary estimate
c) Revised estimate d) Detailed estimate

10) We prepare revised estimate against the original estimate due to change in _____.
a) the rate of material or change in specification of materials
b) change in structural drawing
c) additional items
d) All the above

11) If rise and tread of a step is 0.15m and 0.25m respectively, then the volume (in cubic meter) of 9 number of steps of 1 m length be recorded in measurement sheet shall be _____.
a) 0.3375 b) 0.337
c) 0.34 d) 0.33

12) Earnest money is paid to enable the Government to ensure that a tenderer does not _____.
a) back out of his tender before its acceptance
b) refuse to execute the work after it has been awarded to him
c) compromise with quality of work
d) a or b

13) For labour component the escalation rise will be payable based on _____.
a) Increase in the minimum wages of unskilled male mazdoor
b) Increase in the actual wages of unskilled male mazdoor
c) Increase in the minimum wages of skilled male mazdoor
d) Increase in the actual wages of skilled male mazdoor

14) 'Money received today is more worth than money received in future' is based on which of the following term _____.

a) Time Value of money
b) Storage Value of Money
c) Time Machine
d) Cash Value of Machine

Seat No.	

Set **R**

Fourth. Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April - 2026
Estimating, Costing and Valuation (BTN01701)

Day & Date: Saturday, 02-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. 2 is compulsory; answer any two remaining questions from Section – I.
2) Q. 6 is compulsory; answer any two from remaining questions from Section – II.
3) Figures to the right indicate full marks.
4) Assume additional data if required and mention it clearly.

Section – I

Q.2 **a)** Calculate the quantity of concrete for slab as shown in attached drawing. **08**

b) Also prepare an Abstract sheet for these items by assuming suitable market rates according to economical year 2023-24. **04**

Q.3 **a)** Define Specification for building, explain types of specifications. **04**

b) Write the detailed specifications for Concrete Lined Canal. **04**

Q.4 **a)** What is the Rate analysis? Explain the factors affecting rate analysis. **04**

b) Curry out rate analysis for external painting with water base colour. **04**

Q.5 **a)** Define estimation of building and its types. **04**

b) Write a thumb rule for amount of steel required for construction of building. **04**

Section – II

Q.6 **a)** Prepare a tender notice for the work of construction of a Zilha Parishad Primary School for First to Fourth class with a capacity of 40 students per class. Make suitable assumptions for required data. **08**

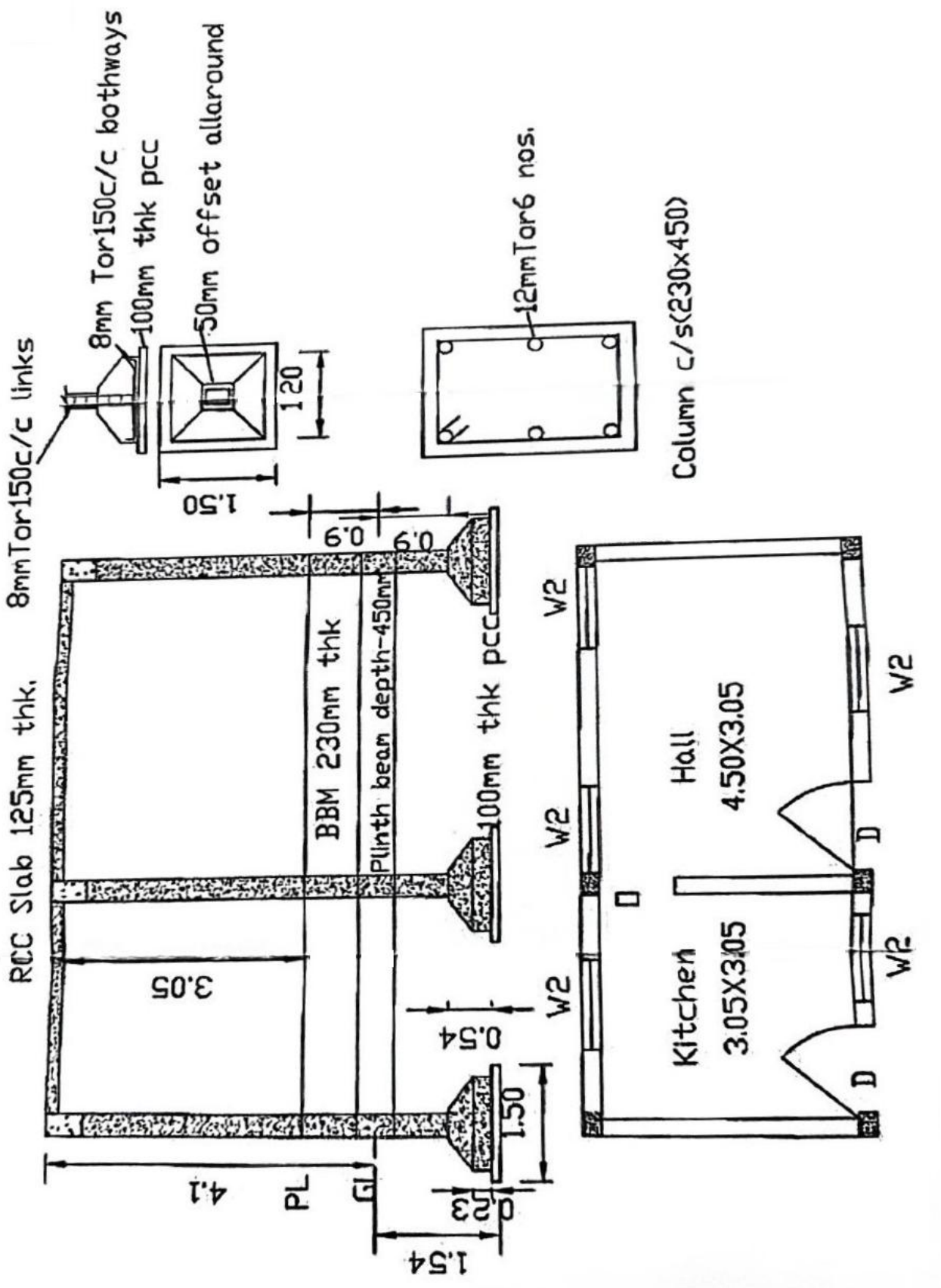
b) Write a short note on BOT and BOOT projects with suitable example. **04**

Q.7 **a)** Explain following Acts **04**
i) The Indian Easement Act, 1882
ii) The Indian Contract Act, 1872

b) Write a note on Turn Key Contract with its advantages and disadvantages. **04**

Q.8	**a)**	Explain different types of values - Scrap value, Potential value, distress value.	**04**
	b)	Compare following methods of calculating depreciation. Straight line method & Double Declining Balance method.	**04**
Q.9	**a)**	Explain development method of land valuation.	**04**
	b)	Calculate Years Purchase for a property with a useful life of 35 years if rate of interest is 4.5 % per year. Assume rate of interest for sinking fund as 3.5%	**04**

Q.2 a & b


RCC Slab 125mm thk.
8mmTor150c/c links
8mm Tor150c/c bothways
100mm thk pcc
50mm offset allaround
120
1.50
0.9
0.9
BBM 230mm thk
Plinth beam depth-450mm
100mm thk pcc
3.05
0.54
1.50
4.1
PL
GL
1.54
12mmTor6 nos.
Column c/s(230x450)
W2
W2
W2
W2
W2
D
D
D
Hall
4.50X3.05
Kitchen
3.05X3.05

Seat No.	

Set **S**

Fourth. Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April - 2026
Estimating, Costing and Valuation (BTN01701)

Day & Date: Saturday, 02-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

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

Duration: 30 Minutes Marks:14

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

1) We prepare revised estimate against the original estimate due to change in _____.
a) the rate of material or change in specification of materials
b) change in structural drawing
c) additional items
d) All the above

2) If rise and tread of a step is 0.15m and 0.25m respectively, then the volume (in cubic meter) of 9 number of steps of 1 m length be recorded in measurement sheet shall be _____.
a) 0.3375 b) 0.337
c) 0.34 d) 0.33

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b) refuse to execute the work after it has been awarded to him
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5) 'Money received today is more worth than money received in future' is based on which of the following term _____.
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10) The Tile Skirting is measured in _____.
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c) Running Metres
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c) Cutting
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12) In normal circumstances, minimum period before striking vertical formwork of columns, beams shall be _____.
a) 16-24 Hr.
b) 7 days
c) 14 days
d) 21 days

13) In rate analysis, salary of technical personnel engaged for the work are covered in _____.
a) Labour cost
b) General overheads
c) Job overheads
d) Contingencies

14) During the execution of project, structural modifications are required or addition work is added for construction, the estimate for additional work is called _____.

a) Preliminary estimate
b) Supplementary estimate
c) Revised estimate
d) Detailed estimate

SLR-QH-289

Seat No.		Set	S

Fourth. Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April - 2026
Estimating, Costing and Valuation (BTN01701)

Day & Date: Saturday, 02-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. 2 is compulsory; answer any two remaining questions from Section – I.
2) Q. 6 is compulsory; answer any two from remaining questions from Section – II.
3) Figures to the right indicate full marks.
4) Assume additional data if required and mention it clearly.

Section – I

Q.2 **a)** Calculate the quantity of concrete for slab as shown in attached drawing. **08**

b) Also prepare an Abstract sheet for these items by assuming suitable market rates according to economical year 2023-24. **04**

Q.3 **a)** Define Specification for building, explain types of specifications. **04**

b) Write the detailed specifications for Concrete Lined Canal. **04**

Q.4 **a)** What is the Rate analysis? Explain the factors affecting rate analysis. **04**

b) Curry out rate analysis for external painting with water base colour. **04**

Q.5 **a)** Define estimation of building and its types. **04**

b) Write a thumb rule for amount of steel required for construction of building. **04**

Section – II

Q.6 **a)** Prepare a tender notice for the work of construction of a Zilha Parishad Primary School for First to Fourth class with a capacity of 40 students per class. Make suitable assumptions for required data. **08**

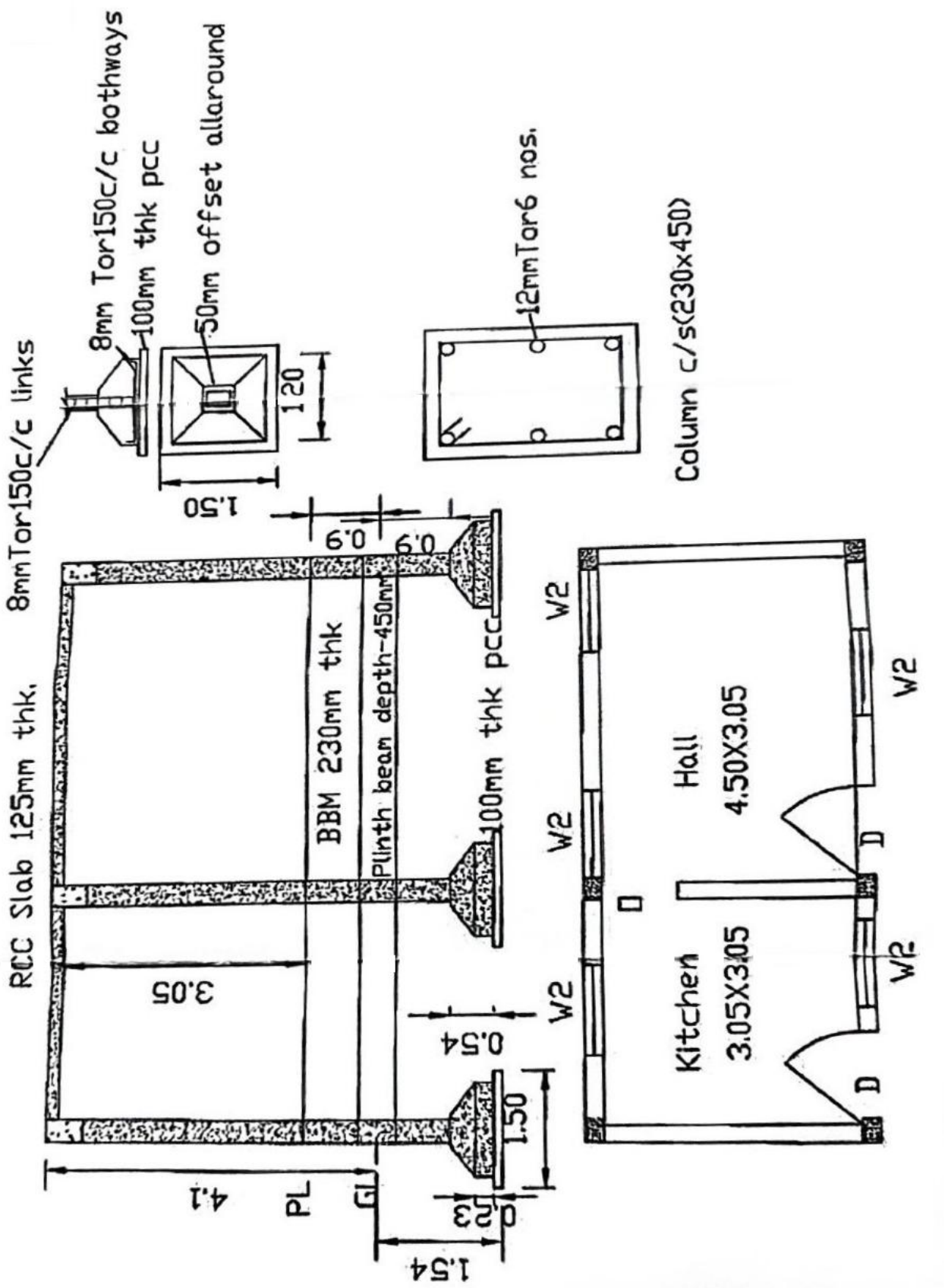
b) Write a short note on BOT and BOOT projects with suitable example. **04**

Q.7 **a)** Explain following Acts **04**
i) The Indian Easement Act, 1882
ii) The Indian Contract Act, 1872

b) Write a note on Turn Key Contract with its advantages and disadvantages. **04**

Q.8	**a)**	Explain different types of values - Scrap value, Potential value, distress value.	**04**
	b)	Compare following methods of calculating depreciation. Straight line method & Double Declining Balance method.	**04**
Q.9	**a)**	Explain development method of land valuation.	**04**
	b)	Calculate Years Purchase for a property with a useful life of 35 years if rate of interest is 4.5 % per year. Assume rate of interest for sinking fund as 3.5%	**04**

Q.2 a & b


8mm Tor150c/c bothways
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0.9
BBM 230mm thk
Plinth beam depth-450mm
100mm thk pcc
W2
W2
W2
W2
W2
Hall
4.50X3.05
Kitchen
3.05X3.05
D
D
D
3.05
0.54
1.50
4.1
PL
GL
0.3
1.54

SLR-QH-290

Seat No.	

Set P

Fourth. Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Earthquake Engineering (BTN01702)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) One of the following is not effect of an earthquake _____.
a) Volcano b) Landslide
c) Movement of plates d) Tsunami

2) Energy released during an earthquake is indicated by_____.
a) Intensity b) Magnitude
c) Eargs d) Joules

3) Which of the following is not a damping case?
a) Viscous damping b) Critical damping
c) Under critical damping d) Over critical damping

4) Body waves consist of the _____.
a) P waves only b) S waves only
c) P and S waves only d) Surface waves

5) Which of the following forces is not acting on the vibrating body?
a) Elastic force b) Inertia force
c) Damping force d) Virtual force

6) Degrees of freedom is _____.
a) No of independent coordinates to the geometry of vibrating body
b) Kinematic unknown
c) Static unknown
d) Unknown displacements

7) Epicentral distance is _____.
   a) Distance from epicenter to seismological centre
   b) Distance from hypocenter to seismological centre
   c) Distance from focus to seismological centre
   d) Distance from the origin of the earth

8) Importance factor, depending upon the functional use of the structures, characterized by _____.
   a) hazardous consequences of its failure
   b) post-earthquake functional needs
   c) historical value or economic importance
   d) All the above

9) Response reduction factor depends on _____.
   a) characteristic of ductile or brittle deformations
   b) functional use of the structures
   c) rock or soil sites
   d) All the above

10) Fundamental natural period of vibration for moment resisting frame building without brick infill panel may be estimated using building _____.
   a) Height only
   b) Base dimension only
   c) Height and base dimensions
   d) All the above

11) The basic factors contributing to the proper seismic behavior of a building _____.
   a) Simplicity
   b) Symmetry
   c) Ductility and transfer of the lateral loads
   d) All the above

12) Torsional effects in the buildings are produced due to _____.
   a) lack of symmetry in columns
   b) lack of symmetry in walls
   c) irregularity in the elevation
   d) All the above

13) Buildings are classified as having a "soft story" if that level is less than the following percent as stiff as the average stiffness of the three floors above it.
   a) 70 %
   b) 80 %
   c) 60 %
   d) None of the above

14) The response of structural to ground vibrations is a function of _____.
   a) nature of foundation soil
   b) material, form, size
   c) mode of construction of structures
   d) All the above

SLR-QH-290

Seat No.	

Set P

Fourth. Y. (B.Tech.) (Civil Engineering) (Sem- I) (New) (CBCS)
Examination: March/April - 2026
Earthquake Engineering (BTN01702)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 2 & 6 are compulsory. Solve any two questions from the remaining questions of each Section.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever needed and mention it clearly.
4) Use of IS 1893:2016 is allowed.

Section – I

Q.2 **a)** Discuss Reservoir Induced Seismicity. **04**

b) Differentiate between P waves and S Waves. **04**

Q.3 Derive solution for the governing differential equation of undamped free vibration for SDOF System. **10**

Q.4 Derive solution for the governing differential equation of undamped SDOF System subjected to sinusoidal loading. **10**

Q.5 **Write Short note on any two.** **10**

a) Internal Structure of Earth

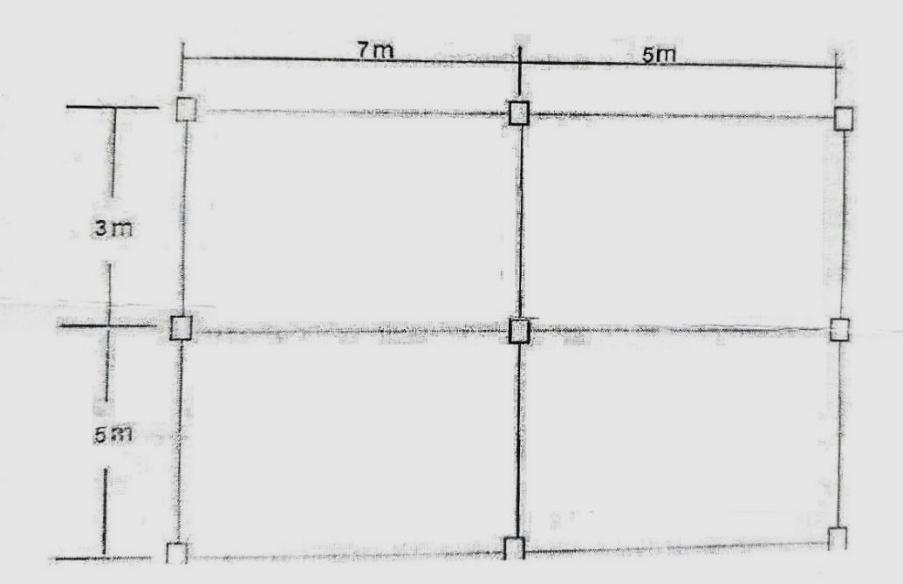
b) Response spectrum Analysis

c) Seismograph

d) Duhamal's Integral

Section – II

Q.6 It is proposed to construct a R.C.C. three storied commercial building having plan dimensions as shown in fig. 1 in zone II with following data. Determine the lateral forces and bases hear. The all-column sizes are 300 × 450 mm and beams sizes are 230 × 450 mm. The slab thickness is 120 mm and thickness of walls is 230 mm. The height of floor is 3.2 m and live load is 4.0 kN/m^2. IS 13920 provisions will not be used. The strata is medium. **12**



Q.7 Discuss the factors required for accessing **08**

a) The lateral design forces

b) The design response spectrum

Q.8 State the explain Specially confining reinforcement with suitable sketches. **08**

Q.9 Describe the various earthquake resistant features that can be introduced in Masonry building to make it earthquake resistant. **08**

SLR-QH-290

Seat No.	

Set Q

Fourth. Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Earthquake Engineering (BTN01702)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries two marks.
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MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Importance factor, depending upon the functional use of the structures, characterized by _____.
a) hazardous consequences of its failure
b) post-earthquake functional needs
c) historical value or economic importance
d) All the above

2) Response reduction factor depends on _____.
a) characteristic of ductile or brittle deformations
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3) Fundamental natural period of vibration for moment resisting frame building without brick infill panel may be estimated using building _____.
a) Height only b) Base dimension only
c) Height and base dimensions d) All the above

4) The basic factors contributing to the proper seismic behavior of a building _____.
a) Simplicity
b) Symmetry
c) Ductility and transfer of the lateral loads
d) All the above

5) Torsional effects in the buildings are produced due to _____.
a) lack of symmetry in columns
b) lack of symmetry in walls
c) irregularity in the elevation
d) All the above

6) Buildings are classified as having a "soft story" if that level is less than the following percent as stiff as the average stiffness of the three floors above it.
a) 70 % b) 80 %
c) 60 % d) None of the above

7) The response of structural to ground vibrations is a function of _____.
a) nature of foundation soil
b) material, form, size
c) mode of construction of structures
d) All the above

8) One of the following is not effect of an earthquake _____.
a) Volcano b) Landslide
c) Movement of plates d) Tsunami

9) Energy released during an earthquake is indicated by_____.
a) Intensity b) Magnitude
c) Eargs d) Joules

10) Which of the following is not a damping case?
a) Viscous damping b) Critical damping
c) Under critical damping d) Over critical damping

11) Body waves consist of the _____.
a) P waves only b) S waves only
c) P and S waves only d) Surface waves

12) Which of the following forces is not acting on the vibrating body?
a) Elastic force b) Inertia force
c) Damping force d) Virtual force

13) Degrees of freedom is _____.
a) No of independent coordinates to the geometry of vibrating body
b) Kinematic unknown
c) Static unknown
d) Unknown displacements

14) Epicentral distance is _____.
a) Distance from epicenter to seismological centre
b) Distance from hypocenter to seismological centre
c) Distance from focus to seismological centre
d) Distance from the origin of the earth

SLR-QH-290

Seat No.	

Set Q

Fourth. Y. (B.Tech.) (Civil Engineering) (Sem- I) (New) (CBCS)
Examination: March/April - 2026
Earthquake Engineering (BTN01702)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 2 & 6 are compulsory. Solve any two questions from the remaining questions of each Section.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever needed and mention it clearly.
4) Use of IS 1893:2016 is allowed.

Section – I

Q.2 **a)** Discuss Reservoir Induced Seismicity. **04**

b) Differentiate between P waves and S Waves. **04**

Q.3 Derive solution for the governing differential equation of undamped free vibration for SDOF System. **10**

Q.4 Derive solution for the governing differential equation of undamped SDOF System subjected to sinusoidal loading. **10**

Q.5 **Write Short note on any two.** **10**

a) Internal Structure of Earth

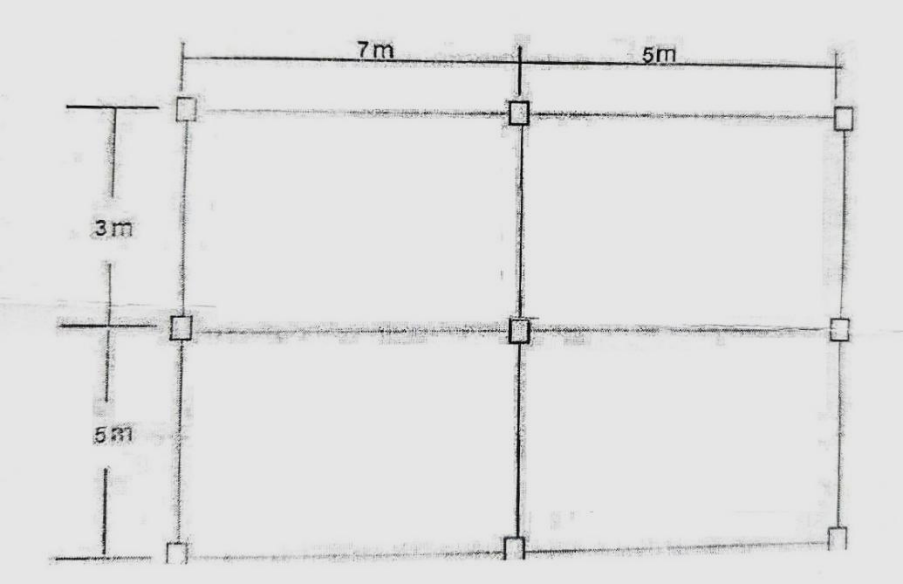
b) Response spectrum Analysis

c) Seismograph

d) Duhamal's Integral

Section – II

Q.6 It is proposed to construct a R.C.C. three storied commercial building having plan dimensions as shown in fig. 1 in zone II with following data. Determine the lateral forces and bases hear. The all-column sizes are 300 × 450 mm and beams sizes are 230 × 450 mm. The slab thickness is 120 mm and thickness of walls is 230 mm. The height of floor is 3.2 m and live load is 4.0 kN/m^2. IS 13920 provisions will not be used. The strata is medium. **12**



Q.7 Discuss the factors required for accessing **08**

a) The lateral design forces

b) The design response spectrum

Q.8 State the explain Specially confining reinforcement with suitable sketches. **08**

Q.9 Describe the various earthquake resistant features that can be introduced in Masonry building to make it earthquake resistant. **08**

SLR-QH-290

Seat No.	

Set R

Fourth. Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Earthquake Engineering (BTN01702)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) The basic factors contributing to the proper seismic behavior of a building _____.
a) Simplicity
b) Symmetry
c) Ductility and transfer of the lateral loads
d) All the above

2) Torsional effects in the buildings are produced due to _____.
a) lack of symmetry in columns
b) lack of symmetry in walls
c) irregularity in the elevation
d) All the above

3) Buildings are classified as having a "soft story" if that level is less than the following percent as stiff as the average stiffness of the three floors above it.
a) 70 % b) 80 %
c) 60 % d) None of the above

4) The response of structural to ground vibrations is a function of _____.
a) nature of foundation soil
b) material, form, size
c) mode of construction of structures
d) All the above

5) One of the following is not effect of an earthquake _____.
a) Volcano b) Landslide
c) Movement of plates d) Tsunami

6) Energy released during an earthquake is indicated by_____.
a) Intensity b) Magnitude
c) Eargs d) Joules

7) Which of the following is not a damping case?
a) Viscous damping b) Critical damping
c) Under critical damping d) Over critical damping

8) Body waves consist of the _____.
a) P waves only b) S waves only
c) P and S waves only d) Surface waves

9) Which of the following forces is not acting on the vibrating body?
a) Elastic force b) Inertia force
c) Damping force d) Virtual force

10) Degrees of freedom is _____.
a) No of independent coordinates to the geometry of vibrating body
b) Kinematic unknown
c) Static unknown
d) Unknown displacements

11) Epicentral distance is _____.
a) Distance from epicenter to seismological centre
b) Distance from hypocenter to seismological centre
c) Distance from focus to seismological centre
d) Distance from the origin of the earth

12) Importance factor, depending upon the functional use of the structures, characterized by _____.
a) hazardous consequences of its failure
b) post-earthquake functional needs
c) historical value or economic importance
d) All the above

13) Response reduction factor depends on _____.
a) characteristic of ductile or brittle deformations
b) functional use of the structures
c) rock or soil sites
d) All the above

14) Fundamental natural period of vibration for moment resisting frame building without brick infill panel may be estimated using building _____.
a) Height only b) Base dimension only
c) Height and base dimensions d) All the above

SLR-QH-290

Seat No.	

Set R

Fourth. Y. (B.Tech.) (Civil Engineering) (Sem- I) (New) (CBCS)
Examination: March/April - 2026
Earthquake Engineering (BTN01702)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 2 & 6 are compulsory. Solve any two questions from the remaining questions of each Section.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever needed and mention it clearly.
4) Use of IS 1893:2016 is allowed.

Section – I

Q.2 **a)** Discuss Reservoir Induced Seismicity. **04**

b) Differentiate between P waves and S Waves. **04**

Q.3 Derive solution for the governing differential equation of undamped free vibration for SDOF System. **10**

Q.4 Derive solution for the governing differential equation of undamped SDOF System subjected to sinusoidal loading. **10**

Q.5 **Write Short note on any two.** **10**

a) Internal Structure of Earth

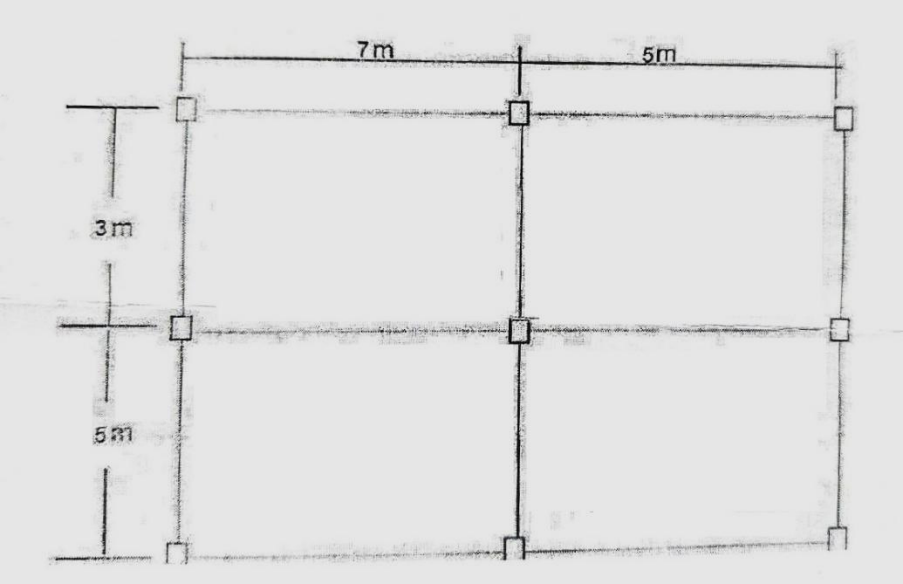
b) Response spectrum Analysis

c) Seismograph

d) Duhamal's Integral

Section – II

Q.6 It is proposed to construct a R.C.C. three storied commercial building having plan dimensions as shown in fig. 1 in zone II with following data. Determine the lateral forces and bases hear. The all-column sizes are 300 × 450 mm and beams sizes are 230 × 450 mm. The slab thickness is 120 mm and thickness of walls is 230 mm. The height of floor is 3.2 m and live load is 4.0 kN/m^2. IS 13920 provisions will not be used. The strata is medium. **12**



Q.7 Discuss the factors required for accessing **08**

a) The lateral design forces

b) The design response spectrum

Q.8 State the explain Specially confining reinforcement with suitable sketches. **08**

Q.9 Describe the various earthquake resistant features that can be introduced in Masonry building to make it earthquake resistant. **08**

Seat No.	

Set **S**

Fourth. Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Earthquake Engineering (BTN01702)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Degrees of freedom is _____.
a) No of independent coordinates to the geometry of vibrating body
b) Kinematic unknown
c) Static unknown
d) Unknown displacements

2) Epicentral distance is _____.
a) Distance from epicenter to seismological centre
b) Distance from hypocenter to seismological centre
c) Distance from focus to seismological centre
d) Distance from the origin of the earth

3) Importance factor, depending upon the functional use of the structures, characterized by _____.
a) hazardous consequences of its failure
b) post-earthquake functional needs
c) historical value or economic importance
d) All the above

4) Response reduction factor depends on _____.
a) characteristic of ductile or brittle deformations
b) functional use of the structures
c) rock or soil sites
d) All the above

5) Fundamental natural period of vibration for moment resisting frame building without brick infill panel may be estimated using building _____.
a) Height only b) Base dimension only
c) Height and base dimensions d) All the above

6) The basic factors contributing to the proper seismic behavior of a building _____.
   a) Simplicity
   b) Symmetry
   c) Ductility and transfer of the lateral loads
   d) All the above

7) Torsional effects in the buildings are produced due to _____.
   a) lack of symmetry in columns
   b) lack of symmetry in walls
   c) irregularity in the elevation
   d) All the above

8) Buildings are classified as having a "soft story" if that level is less than the following percent as stiff as the average stiffness of the three floors above it.
   a) 70 %
   b) 80 %
   c) 60 %
   d) None of the above

9) The response of structural to ground vibrations is a function of _____.
   a) nature of foundation soil
   b) material, form, size
   c) mode of construction of structures
   d) All the above

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   a) Volcano
   b) Landslide
   c) Movement of plates
   d) Tsunami

11) Energy released during an earthquake is indicated by_____.
   a) Intensity
   b) Magnitude
   c) Eargs
   d) Joules

12) Which of the following is not a damping case?
   a) Viscous damping
   b) Critical damping
   c) Under critical damping
   d) Over critical damping

13) Body waves consist of the _____.
   a) P waves only
   b) S waves only
   c) P and S waves only
   d) Surface waves

14) Which of the following forces is not acting on the vibrating body?
   a) Elastic force
   b) Inertia force
   c) Damping force
   d) Virtual force

SLR-QH-290

Seat No.	

Set S

Fourth. Y. (B.Tech.) (Civil Engineering) (Sem- I) (New) (CBCS)
Examination: March/April - 2026
Earthquake Engineering (BTN01702)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 2 & 6 are compulsory. Solve any two questions from the remaining questions of each Section.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever needed and mention it clearly.
4) Use of IS 1893:2016 is allowed.

Section – I

Q.2 **a)** Discuss Reservoir Induced Seismicity. **04**

b) Differentiate between P waves and S Waves. **04**

Q.3 Derive solution for the governing differential equation of undamped free vibration for SDOF System. **10**

Q.4 Derive solution for the governing differential equation of undamped SDOF System subjected to sinusoidal loading. **10**

Q.5 **Write Short note on any two.** **10**

a) Internal Structure of Earth

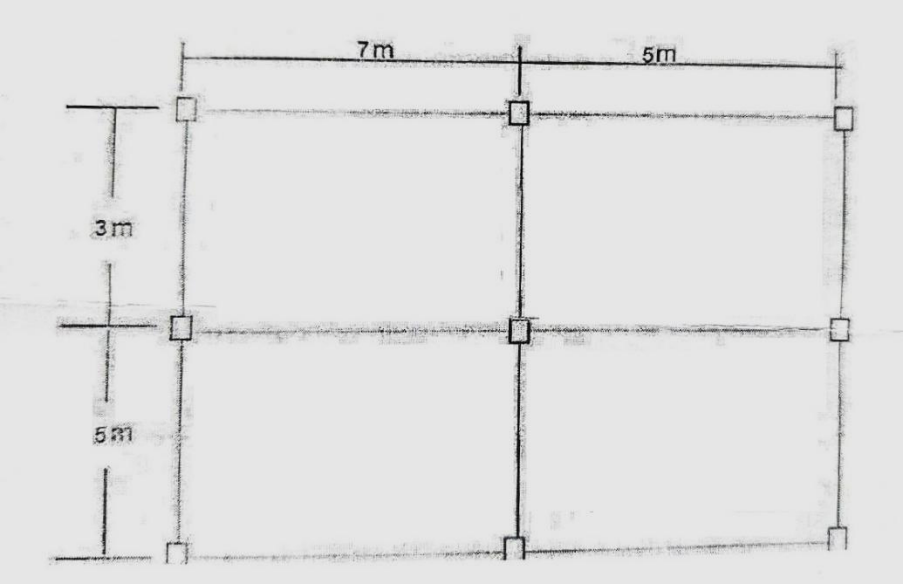
b) Response spectrum Analysis

c) Seismograph

d) Duhamal's Integral

Section – II

Q.6 It is proposed to construct a R.C.C. three storied commercial building having plan dimensions as shown in fig. 1 in zone II with following data. Determine the lateral forces and bases hear. The all-column sizes are 300 × 450 mm and beams sizes are 230 × 450 mm. The slab thickness is 120 mm and thickness of walls is 230 mm. The height of floor is 3.2 m and live load is 4.0 kN/m^2. IS 13920 provisions will not be used. The strata is medium. **12**



Q.7 Discuss the factors required for accessing **08**

a) The lateral design forces

b) The design response spectrum

Q.8 State the explain Specially confining reinforcement with suitable sketches. **08**

Q.9 Describe the various earthquake resistant features that can be introduced in Masonry building to make it earthquake resistant. **08**

SLR-QH-291

Seat No.	

Set P

Fourth. Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Construction Management and Practices (BTN01703)

Day & Date: Thursday, 07-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) Which of the following tool is used when there is uncertainty in activity duration?
a) PERT b) milestone chart
c) CPM d) bar chart

2) Please read the following statements _____.
i) Critical path has no float and it determines the project completion period.
ii) Critical path is the comparatively longest path.
Which of the above statements is/are wrong?
a) Neither i nor ii b) i
c) ii d) Both i & ii

3) PERT is a Project Management tool for managing _____.
a) Time b) Cost
c) Quality d) Resources

4) Which of the following is not a characteristic of a project?
a) Unique b) Heterogeneous
c) Infinite duration d) Non-repetitive

5) The early finish time of an activity is always _____.
a) greater than earliest start time of succeeding activity
b) less than earliest start time of succeeding activity
c) less than or equal to earliest start time of the succeeding activity
d) greater than or equal to earliest start time of the succeeding activity

6) _____ is the maximum delay possible for an activity if succeeding activity starts as early as possible and preceding activity ends as late as possible.

a) interfering float
b) total float
c) independent float
d) free float

7) In PERT calculation, if factor Z comes negative then Probability of completion of project in scheduled time is always _____.

a) 100%
b) 50%
c) less than 50%
d) greater than 50%

8) Economic haul distance for Dozer and Loader is _____.

a) up to 20 m
b) up to 100 m
c) up to 1000 m
d) above 1000 m

9) Odd man out.

a) Cost of Fuel
b) Depreciation Cost
c) Repair & Maintenance Cost
d) Operator salary

10) When there is digging or dumping in a vertical plane of relatively soft soil then _____ is effectively used.

a) Scrapper
b) Clamshell
c) Compactor
d) Bulldozer

11) Which of these causes the most construction fatalities?

a) Electrocution
b) Trench collapses
c) Contact with chemicals
d) Falls

12) Choose the correct condition for crashing.
(If CC = crash cost, NC = normal cost, CD = crash duration, ND = normal duration)

a) CC < NC, CD < ND
b) CC < NC, CD > ND
c) CC > NC, CD > ND
d) CC > NC, CD < ND

13) The extra attached arm to the 'Latice boom' to increase the working radius is called as _____.

a) Ripper
b) Angle of Swing
c) Ring base
d) Jib

14) Which of the roller is most suitable for Silty & Clayey sand and black cotton soil?

a) Pneumatic Rubber Tired Rollers
b) Smooth Wheeled Rollers
c) Vibratory roller
d) Sheep foot Roller

Seat No.	

Set **P**

Fourth. Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Construction Management and Practices (BTN01703)

Day & Date: Thursday, 07-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All Questions compulsory.
3) Figure to the right indicate full marks.
4) Assume suitable data wherever needed and mention it clearly.

SECTION – I

Q.2 Attempt Any FOUR from the following.

a) i) Draw the Bar Chart for the project with following data and find the project duration. **04**

Activity	A	B	C	D	E	F	G	H	I
Preceding Activities	-	-	-	B	A, B	B	B	C, D	G, H
Duration (Days)	2	4	10	3	5	6	4	1	7

ii) Differentiate between Bar chart and Milestone chart. **03**

b) Draw network, find out CP & PD. Calculate All floats of each non-critical Activity. **07**

Activity	A	B	C	D	E	F	G	H	I	J	K	L	M	N
Immediate Predecessor	-	-	-	B	A	A	B	C,D	C,D	E	F,G,H	F,G,H	I	J,K
Time in Months	2	6	4	3	6	8	3	7	2	5	4	3	13	7

c) Indirect Cost is given as Rs. 75/- per day. Draw the network diagram and determine the optimum project completion time and the minimum total cost of the project. **07**

Activity	Normal Time in Days	Normal Cost in Rs.	Crash Time in Days	Crash Cost in Rs.
2-4	6	120	4	200
4-6	10	1000	8	1100
4-8	13	300	9	400
4-10	19	1000	14	1100
6-8	-	-	-	-
6-10	10	400	6	800
8-10	4	500	3	575

d) A small project consists of seven activities. The time estimates in weeks of different activities are given below. Find out probability of completing the project in 18 weeks. **07**

Activity	Estimated Time		
	to	tm	tp
1-2	1	1	7
1-3	1	4	7
1-4	2	2	8
2-5	1	1	1
3-5	2	5	14
4-6	2	5	8
5-6	3	6	15

Probability Factor	Probability
0	50%
1	84.13%
2	97.72%
3	99.87%

e) Make a brief note on 'Resource Allocation.' Explain with Histogram, Timescale network, Resource Levelling & Resource Smoothening. **07**

f) i) Explain Network Updating with its need & Steps. **03**
ii) Enlist different Project Management Software. Explain any one in detail. **04**

SECTION – II

Q.3 Attempt Any FOUR from the following.

a) Write a note on *'Pneumatic Tired Roller'* with diagrams. **07**

b) Differentiate 'Manual Construction' vs 'Machine Construction'. **07**

c) Write a short note on Construction Safety, Causes of Accident, and losses due to Accident. **07**

d) Explain Prefabricated Construction including Advantages, Disadvantages, Site Prefabrication and Factory Prefabrication. **07**

e) What is 'Scrapper'? Where it is used? Explain its types, and working principle with diagram in details. **07**

f) Write a note on both.
i) Clamshell **03**
ii) Diaphragm Wall **04**

Seat No.	

Set **Q**

Fourth. Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Construction Management and Practices (BTN01703)

Day & Date: Thursday, 07-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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3) Figures to the right indicates full marks.
4) Assume suitable data wherever needed and mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) Economic haul distance for Dozer and Loader is _____.
a) up to 20 m b) up to 100 m
c) up to 1000 m d) above 1000 m

2) Odd man out.
a) Cost of Fuel b) Depreciation Cost
c) Repair & Maintenance Cost d) Operator salary

3) When there is digging or dumping in a vertical plane of relatively soft soil then _____ is effectively used.
a) Scrapper b) Clamshell
c) Compactor d) Bulldozer

4) Which of these causes the most construction fatalities?
a) Electrocution b) Trench collapses
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5) Choose the correct condition for crashing.
(If CC = crash cost, NC = normal cost, CD = crash duration, ND = normal duration)
a) CC < NC, CD < ND b) CC < NC, CD > ND
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6) The extra attached arm to the 'Latice boom' to increase the working radius is called as _____.
a) Ripper b) Angle of Swing
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7) Which of the roller is most suitable for Silty & Clayey sand and black cotton soil?
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a) 100%
b) 50%
c) less than 50%
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Seat No.	

Set **Q**

Fourth. Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Construction Management and Practices (BTN01703)

Day & Date: Thursday, 07-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All Questions compulsory.
3) Figure to the right indicate full marks.
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SECTION – I

Q.2 Attempt Any FOUR from the following.

a) i) Draw the Bar Chart for the project with following data and find the project duration. **04**

Activity	A	B	C	D	E	F	G	H	I
Preceding Activities	-	-	-	B	A, B	B	B	C, D	G, H
Duration (Days)	2	4	10	3	5	6	4	1	7

ii) Differentiate between Bar chart and Milestone chart. **03**

b) Draw network, find out CP & PD. Calculate All floats of each non-critical Activity. **07**

Activity	A	B	C	D	E	F	G	H	I	J	K	L	M	N
Immediate Predecessor	-	-	-	B	A	A	B	C,D	C,D	E	F,G,H	F,G,H	I	J,K
Time in Months	2	6	4	3	6	8	3	7	2	5	4	3	13	7

c) Indirect Cost is given as Rs. 75/- per day. Draw the network diagram and determine the optimum project completion time and the minimum total cost of the project. **07**

Activity	Normal Time in Days	Normal Cost in Rs.	Crash Time in Days	Crash Cost in Rs.
2-4	6	120	4	200
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e) Make a brief note on 'Resource Allocation.' Explain with Histogram, Timescale network, Resource Levelling & Resource Smoothening. **07**

f) i) Explain Network Updating with its need & Steps. **03**
ii) Enlist different Project Management Software. Explain any one in detail. **04**

SECTION – II

Q.3 Attempt Any FOUR from the following.

a) Write a note on *'Pneumatic Tired Roller'* with diagrams. **07**

b) Differentiate 'Manual Construction' vs 'Machine Construction'. **07**

c) Write a short note on Construction Safety, Causes of Accident, and losses due to Accident. **07**

d) Explain Prefabricated Construction including Advantages, Disadvantages, Site Prefabrication and Factory Prefabrication. **07**

e) What is 'Scrapper'? Where it is used? Explain its types, and working principle with diagram in details. **07**

f) Write a note on both.
i) Clamshell **03**
ii) Diaphragm Wall **04**

Seat No.	

Set | **R**

Fourth. Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Construction Management and Practices (BTN01703)

Day & Date: Thursday, 07-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) Which of these causes the most construction fatalities?
a) Electrocution b) Trench collapses
c) Contact with chemicals d) Falls

2) Choose the correct condition for crashing.
(If CC = crash cost, NC = normal cost, CD = crash duration, ND = normal duration)
a) CC < NC, CD < ND b) CC < NC, CD > ND
c) CC > NC, CD > ND d) CC > NC, CD < ND

3) The extra attached arm to the 'Latice boom' to increase the working radius is called as _____.
a) Ripper b) Angle of Swing
c) Ring base d) Jib

4) Which of the roller is most suitable for Silty & Clayey sand and black cotton soil?
a) Pneumatic Rubber Tired Rollers
b) Smooth Wheeled Rollers
c) Vibratory roller
d) Sheep foot Roller

5) Which of the following tool is used when there is uncertainty in activity duration?
a) PERT b) milestone chart
c) CPM d) bar chart

6) Please read the following statements _____.

i) Critical path has no float and it determines the project completion period.

ii) Critical path is the comparatively longest path.

Which of the above statements is/are wrong?

a) Neither i nor ii
b) i
c) ii
d) Both i & ii

7) PERT is a Project Management tool for managing _____.

a) Time
b) Cost
c) Quality
d) Resources

8) Which of the following is not a characteristic of a project?

a) Unique
b) Heterogeneous
c) Infinite duration
d) Non-repetitive

9) The early finish time of an activity is always _____.

a) greater than earliest start time of succeeding activity
b) less than earliest start time of succeeding activity
c) less than or equal to earliest start time of the succeeding activity
d) greater than or equal to earliest start time of the succeeding activity

10) _____ is the maximum delay possible for an activity if succeeding activity starts as early as possible and preceding activity ends as late as possible.

a) interfering float
b) total float
c) independent float
d) free float

11) In PERT calculation, if factor Z comes negative then Probability of completion of project in scheduled time is always _____.

a) 100%
b) 50%
c) less than 50%
d) greater than 50%

12) Economic haul distance for Dozer and Loader is _____.

a) up to 20 m
b) up to 100 m
c) up to 1000 m
d) above 1000 m

13) Odd man out.

a) Cost of Fuel
b) Depreciation Cost
c) Repair & Maintenance Cost
d) Operator salary

14) When there is digging or dumping in a vertical plane of relatively soft soil then _____ is effectively used.

a) Scrapper
b) Clamshell
c) Compactor
d) Bulldozer

Seat No.	

Set **R**

Fourth. Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Construction Management and Practices (BTN01703)

Day & Date: Thursday, 07-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All Questions compulsory.
3) Figure to the right indicate full marks.
4) Assume suitable data wherever needed and mention it clearly.

SECTION – I

Q.2 Attempt Any FOUR from the following.

a) i) Draw the Bar Chart for the project with following data and find the project duration. **04**

Activity	A	B	C	D	E	F	G	H	I
Preceding Activities	-	-	-	B	A, B	B	B	C, D	G, H
Duration (Days)	2	4	10	3	5	6	4	1	7

ii) Differentiate between Bar chart and Milestone chart. **03**

b) Draw network, find out CP & PD. Calculate All floats of each non-critical Activity. **07**

Activity	A	B	C	D	E	F	G	H	I	J	K	L	M	N
Immediate Predecessor	-	-	-	B	A	A	B	C,D	C,D	E	F,G,H	F,G,H	I	J,K
Time in Months	2	6	4	3	6	8	3	7	2	5	4	3	13	7

c) Indirect Cost is given as Rs. 75/- per day. Draw the network diagram and determine the optimum project completion time and the minimum total cost of the project. **07**

Activity	Normal Time in Days	Normal Cost in Rs.	Crash Time in Days	Crash Cost in Rs.
2-4	6	120	4	200
4-6	10	1000	8	1100
4-8	13	300	9	400
4-10	19	1000	14	1100
6-8	-	-	-	-
6-10	10	400	6	800
8-10	4	500	3	575

d) A small project consists of seven activities. The time estimates in weeks of different activities are given below. Find out probability of completing the project in 18 weeks. **07**

Activity	Estimated Time		
	to	tm	tp
1-2	1	1	7
1-3	1	4	7
1-4	2	2	8
2-5	1	1	1
3-5	2	5	14
4-6	2	5	8
5-6	3	6	15

Probability Factor	Probability
0	50%
1	84.13%
2	97.72%
3	99.87%

e) Make a brief note on 'Resource Allocation.' Explain with Histogram, Timescale network, Resource Levelling & Resource Smoothening. **07**

f) i) Explain Network Updating with its need & Steps. **03**
ii) Enlist different Project Management Software. Explain any one in detail. **04**

SECTION – II

Q.3 Attempt Any FOUR from the following.

a) Write a note on *'Pneumatic Tired Roller'* with diagrams. **07**

b) Differentiate 'Manual Construction' vs 'Machine Construction'. **07**

c) Write a short note on Construction Safety, Causes of Accident, and losses due to Accident. **07**

d) Explain Prefabricated Construction including Advantages, Disadvantages, Site Prefabrication and Factory Prefabrication. **07**

e) What is 'Scrapper'? Where it is used? Explain its types, and working principle with diagram in details. **07**

f) Write a note on both.
i) Clamshell **03**
ii) Diaphragm Wall **04**

Seat No.	

Set **S**

Fourth. Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Construction Management and Practices (BTN01703)

Day & Date: Thursday, 07-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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3) Figures to the right indicates full marks.
4) Assume suitable data wherever needed and mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) _____ is the maximum delay possible for an activity if succeeding activity starts as early as possible and preceding activity ends as late as possible.
a) interfering float b) total float
c) independent float d) free float

2) In PERT calculation, if factor Z comes negative then Probability of completion of project in scheduled time is always _____.
a) 100% b) 50%
c) less than 50% d) greater than 50%

3) Economic haul distance for Dozer and Loader is _____.
a) up to 20 m b) up to 100 m
c) up to 1000 m d) above 1000 m

4) Odd man out.
a) Cost of Fuel b) Depreciation Cost
c) Repair & Maintenance Cost d) Operator salary

5) When there is digging or dumping in a vertical plane of relatively soft soil then _____ is effectively used.
a) Scrapper b) Clamshell
c) Compactor d) Bulldozer

6) Which of these causes the most construction fatalities?
a) Electrocution b) Trench collapses
c) Contact with chemicals d) Falls

7) Choose the correct condition for crashing.
(If CC = crash cost, NC = normal cost, CD = crash duration, ND = normal duration)

a) CC < NC, CD < ND
b) CC < NC, CD > ND
c) CC > NC, CD > ND
d) CC > NC, CD < ND

8) The extra attached arm to the 'Latice boom' to increase the working radius is called as _____.

a) Ripper
b) Angle of Swing
c) Ring base
d) Jib

9) Which of the roller is most suitable for Silty & Clayey sand and black cotton soil?

a) Pneumatic Rubber Tired Rollers
b) Smooth Wheeled Rollers
c) Vibratory roller
d) Sheep foot Roller

10) Which of the following tool is used when there is uncertainty in activity duration?

a) PERT
b) milestone chart
c) CPM
d) bar chart

11) Please read the following statements _____.

i) Critical path has no float and it determines the project completion period.
ii) Critical path is the comparatively longest path.

Which of the above statements is/are wrong?

a) Neither i nor ii
b) i
c) ii
d) Both i & ii

12) PERT is a Project Management tool for managing _____.

a) Time
b) Cost
c) Quality
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13) Which of the following is not a characteristic of a project?

a) Unique
b) Heterogeneous
c) Infinite duration
d) Non-repetitive

14) The early finish time of an activity is always _____.

a) greater than earliest start time of succeeding activity
b) less than earliest start time of succeeding activity
c) less than or equal to earliest start time of the succeeding activity
d) greater than or equal to earliest start time of the succeeding activity

Seat No.	

Set **S**

Fourth. Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Construction Management and Practices (BTN01703)

Day & Date: Thursday, 07-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All Questions compulsory.
3) Figure to the right indicate full marks.
4) Assume suitable data wherever needed and mention it clearly.

SECTION – I

Q.2 Attempt Any FOUR from the following.

a) i) Draw the Bar Chart for the project with following data and find the project duration. **04**

Activity	A	B	C	D	E	F	G	H	I
Preceding Activities	-	-	-	B	A, B	B	B	C, D	G, H
Duration (Days)	2	4	10	3	5	6	4	1	7

ii) Differentiate between Bar chart and Milestone chart. **03**

b) Draw network, find out CP & PD. Calculate All floats of each non-critical Activity. **07**

Activity	A	B	C	D	E	F	G	H	I	J	K	L	M	N
Immediate Predecessor	-	-	-	B	A	A	B	C,D	C,D	E	F,G,H	F,G,H	I	J,K
Time in Months	2	6	4	3	6	8	3	7	2	5	4	3	13	7

c) Indirect Cost is given as Rs. 75/- per day. Draw the network diagram and determine the optimum project completion time and the minimum total cost of the project. **07**

Activity	Normal Time in Days	Normal Cost in Rs.	Crash Time in Days	Crash Cost in Rs.
2-4	6	120	4	200
4-6	10	1000	8	1100
4-8	13	300	9	400
4-10	19	1000	14	1100
6-8	-	-	-	-
6-10	10	400	6	800
8-10	4	500	3	575

d) A small project consists of seven activities. The time estimates in weeks of different activities are given below. Find out probability of completing the project in 18 weeks. **07**

Activity	Estimated Time		
	to	tm	tp
1-2	1	1	7
1-3	1	4	7
1-4	2	2	8
2-5	1	1	1
3-5	2	5	14
4-6	2	5	8
5-6	3	6	15

Probability Factor	Probability
0	50%
1	84.13%
2	97.72%
3	99.87%

e) Make a brief note on 'Resource Allocation.' Explain with Histogram, Timescale network, Resource Levelling & Resource Smoothening. **07**

f) i) Explain Network Updating with its need & Steps. **03**
ii) Enlist different Project Management Software. Explain any one in detail. **04**

SECTION – II

Q.3 Attempt Any FOUR from the following.

a) Write a note on *'Pneumatic Tired Roller'* with diagrams. **07**

b) Differentiate 'Manual Construction' vs 'Machine Construction'. **07**

c) Write a short note on Construction Safety, Causes of Accident, and losses due to Accident. **07**

d) Explain Prefabricated Construction including Advantages, Disadvantages, Site Prefabrication and Factory Prefabrication. **07**

e) What is 'Scrapper'? Where it is used? Explain its types, and working principle with diagram in details. **07**

f) Write a note on both.
i) Clamshell **03**
ii) Diaphragm Wall **04**

SLR-QH-295

Seat No.	

Set P

Fourth. Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Traffic Engineering and Management (BTN01710)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) The speed limit sign is a type of _____.
a) Warning Sign b) Regulatory Sign
c) Informatory Sign d) Route Marker

2) Which percentile speed is typically used for the geometric design of highways (Design Speed)?
a) 15th Percentile b) 50th Percentile
c) 85th Percentile d) 98th Percentile

3) In a traffic stream, if the traffic density is zero, the corresponding traffic speed is _____.
a) Zero b) Optimum Speed
c) Free Flow Speed d) Jam Speed

4) The "3-Es" of Traffic Engineering stand for _____.
a) Engineering, Education, Enforcement
b) Engineering, Economics, Enforcement
c) Education, Environment, Engineering
d) Enforcement, Efficiency, Economy

5) A diagram showing the approximate path of vehicles and pedestrians involved in an accident is called _____.
a) Spot Map b) Condition Diagram
c) Collision Diagram d) Desire Line Diagram

6) If the average length of a vehicle is 5m and the theoretical capacity is 3600 vehicles/hour/lane, what is the saturation velocity?
a) 18 kmph b) 20 kmph
c) 36 kmph d) 50 kmph

7) In Webster's method of signal design, the amber time is primarily provided to _____.
   a) Allow pedestrians to cross
   b) Allow vehicles to clear the intersection
   c) Increase capacity
   d) Reduce cycle length

8) The full form of ITS in-traffic management is _____.
   a) Indian Traffic System
   b) Intelligent Transportation System
   c) Integrated Traffic Solutions
   d) International Transport Standard

9) Desire lines are plotted in which type of traffic survey?
   a) Speed and Delay
   b) Origin and Destination (O-D)
   c) Parking Survey
   d) Accident Survey

10) When the capacity of a rotary intersection is reached, the weaving ratio is generally around _____.
   a) 0.4 to 0.5
   b) 0.8 to 0.9
   c) 1.0
   d) 0.1 to 0.2

11) Determine the PCU value for a motorcycle according to IRC standards _____.
   a) 0.5
   b) 1.0
   c) 3.0
   d) 4.5

12) Parallel parking requires _____ road width compared to 45-degree angle parking.
   a) More
   b) Less
   c) Same
   d) Double

13) If the AADT is 5000 vehicles, the expansion factor used to convert a 24-hour count to AADT depends on _____.
   a) Day of the week
   b) Month of the year
   c) Season
   d) All of the above

14) The maximum number of conflict points at a standard 4-legged intersection with two-way traffic is _____.
   a) 16
   b) 24
   c) 32
   d) 44

Seat No.	

Set P

Fourth. Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Traffic Engineering and Management (BTN01710)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

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

SECTION – I

Q.2 Solve any Two of the following. **14**

a) Define Traffic Engineering. Discuss the scope and various functions of a traffic engineer in modern urban planning.

b) A parking survey was conducted for a lot with 50 bays. The initial count at 9:00 AM was 20 vehicles. The In-Out data is given below. Calculate the Parking Accumulation and Parking Load for the given period.

Time	In	Out
9:00 – 9:05	4	2
9:05 – 9:10	3	5
9:10 – 9:15	6	2
9:15 – 9:20	5	3
9:20 – 9:25	2	4

c) Explain the "Floating Car Method" for speed and delay studies. What data is collected during this study?

d) Write short notes on any two:
i) Off-street parking facilities
ii) PIEV Theory
iii) 30th Highest Hourly Volume

Q.3 Solve any Two of the following. **14**

a) Derive and explain the fundamental relationship between Traffic Flow (q), Speed (v), and Density (k). Draw the fundamental diagrams.

b) A vehicle weighing 1500 kg skids a distance of 30 m before colliding with a stationary vehicle of 1000 kg. After the collision, both vehicles skid a distance of 10 m together. Assuming a coefficient of friction f = 0.5, calculate the initial speed of the moving vehicle.

Speed Range (kmph)	0-10	10-20	20-30	30-40	40-50	50-60	60-70
No. of Vehicles	5	15	40	110	160	80	20

c) Spot speed data for a highway is given below. Construct a frequency distribution table and determine the 15th and 85th percentile speeds.

d) What is "Passenger Car Unit" (PCU)? List the factors affecting PCU values.

Section – II

Q.4 Solve Any Two of the following. **14**

a) Sketch and explain the three major types of Traffic Signs (Regulatory, Warning, Informatory) with two examples for each.

b) A 2-phase signal is to be designed for an intersection.
Amber time = 2 sec per phase.
Startup lost time = 2 sec per phase.
Calculate the Optimum Cycle Time (C_0) and Green splits (G_1, G_2) using Webster's Method.

Arm	Normal Flow (q) (PCU/hr)	Saturation Flow (s) (PCU/hr)
North	900	2500
South	500	2000
East	700	2800
West	600	2800

c) Explain the concept of "Intelligent Transportation Systems" (ITS). Describe three specific applications of ITS in India.

d) Write a note on the design principles of street lighting. What are the different lighting layouts?

Q.5 Solve any Two of the following. **14**

a) Calculate the practical capacity of a rotary intersection using the IRC formula.
Weaving width = 12 m
Entry width = 8 m
Weaving length = 48 m
Proportion of weaving traffic = 0.6

b) Discuss the various causes of road accidents. Suggest engineering and enforcement measures to reduce them.

c) Explain the following road markings with sketches:
i) Centre Line (Broken vs Solid)
ii) Stop Line
iii) No Overtaking Zone

d) Vehicle A is traveling on a major road and Vehicle B on a minor road. An obstruction is located at the corner.
Distance of obstruction from Path A = 10 m.
Distance of obstruction from Path B = 15 m.
Design speed of Major Road = 60 kmph.
Calculate the safe speed limit for the Minor road using the National Safety Council (NSC) method.

SLR-QH-295

Seat No.	

Set Q

Fourth. Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Traffic Engineering and Management (BTN01710)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

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

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) The full form of ITS in-traffic management is _____.
a) Indian Traffic System
b) Intelligent Transportation System
c) Integrated Traffic Solutions
d) International Transport Standard

2) Desire lines are plotted in which type of traffic survey?
a) Speed and Delay b) Origin and Destination (O-D)
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3) When the capacity of a rotary intersection is reached, the weaving ratio is generally around _____.
a) 0.4 to 0.5 b) 0.8 to 0.9
c) 1.0 d) 0.1 to 0.2

4) Determine the PCU value for a motorcycle according to IRC standards _____.
a) 0.5 b) 1.0
c) 3.0 d) 4.5

5) Parallel parking requires _____ road width compared to 45-degree angle parking.
a) More b) Less
c) Same d) Double

6) If the AADT is 5000 vehicles, the expansion factor used to convert a 24-hour count to AADT depends on _____.
a) Day of the week b) Month of the year
c) Season d) All of the above

7) The maximum number of conflict points at a standard 4-legged intersection with two-way traffic is _____.

a) 16 b) 24
c) 32 d) 44

8) The speed limit sign is a type of _____.

a) Warning Sign b) Regulatory Sign
c) Informatory Sign d) Route Marker

9) Which percentile speed is typically used for the geometric design of highways (Design Speed)?

a) 15th Percentile b) 50th Percentile
c) 85th Percentile d) 98th Percentile

10) In a traffic stream, if the traffic density is zero, the corresponding traffic speed is _____.

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13) If the average length of a vehicle is 5m and the theoretical capacity is 3600 vehicles/hour/lane, what is the saturation velocity?

a) 18 kmph b) 20 kmph
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14) In Webster's method of signal design, the amber time is primarily provided to _____.

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b) Allow vehicles to clear the intersection
c) Increase capacity
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Seat No.	

Set **Q**

Fourth. Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Traffic Engineering and Management (BTN01710)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
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SECTION – I

Q.2 Solve any Two of the following. **14**

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c) Explain the "Floating Car Method" for speed and delay studies. What data is collected during this study?

d) Write short notes on any two:
i) Off-street parking facilities
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Q.3 Solve any Two of the following. **14**

a) Derive and explain the fundamental relationship between Traffic Flow (q), Speed (v), and Density (k). Draw the fundamental diagrams.

b) A vehicle weighing 1500 kg skids a distance of 30 m before colliding with a stationary vehicle of 1000 kg. After the collision, both vehicles skid a distance of 10 m together. Assuming a coefficient of friction f = 0.5, calculate the initial speed of the moving vehicle.

Speed Range (kmph)	0-10	10-20	20-30	30-40	40-50	50-60	60-70
No. of Vehicles	5	15	40	110	160	80	20

c) Spot speed data for a highway is given below. Construct a frequency distribution table and determine the 15th and 85th percentile speeds.

d) What is "Passenger Car Unit" (PCU)? List the factors affecting PCU values.

Section – II

Q.4 Solve Any Two of the following. **14**

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b) A 2-phase signal is to be designed for an intersection.
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Calculate the Optimum Cycle Time (C_0) and Green splits (G_1, G_2) using Webster's Method.

Arm	Normal Flow (q) (PCU/hr)	Saturation Flow (s) (PCU/hr)
North	900	2500
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Q.5 Solve any Two of the following. **14**

a) Calculate the practical capacity of a rotary intersection using the IRC formula.
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Entry width = 8 m
Weaving length = 48 m
Proportion of weaving traffic = 0.6

b) Discuss the various causes of road accidents. Suggest engineering and enforcement measures to reduce them.

c) Explain the following road markings with sketches:
i) Centre Line (Broken vs Solid)
ii) Stop Line
iii) No Overtaking Zone

d) Vehicle A is traveling on a major road and Vehicle B on a minor road. An obstruction is located at the corner.
Distance of obstruction from Path A = 10 m.
Distance of obstruction from Path B = 15 m.
Design speed of Major Road = 60 kmph.
Calculate the safe speed limit for the Minor road using the National Safety Council (NSC) method.

SLR-QH-295

Seat No.	

Set R

Fourth. Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Traffic Engineering and Management (BTN01710)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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3) Figures to the right indicates full marks

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) Determine the PCU value for a motorcycle according to IRC standards _____.
a) 0.5 b) 1.0
c) 3.0 d) 4.5

2) Parallel parking requires _____ road width compared to 45-degree angle parking.
a) More b) Less
c) Same d) Double

3) If the AADT is 5000 vehicles, the expansion factor used to convert a 24-hour count to AADT depends on _____.
a) Day of the week b) Month of the year
c) Season d) All of the above

4) The maximum number of conflict points at a standard 4-legged intersection with two-way traffic is _____.
a) 16 b) 24
c) 32 d) 44

5) The speed limit sign is a type of _____.
a) Warning Sign b) Regulatory Sign
c) Informatory Sign d) Route Marker

6) Which percentile speed is typically used for the geometric design of highways (Design Speed)?
a) 15th Percentile b) 50th Percentile
c) 85th Percentile d) 98th Percentile

7) In a traffic stream, if the traffic density is zero, the corresponding traffic speed is _____.
a) Zero
b) Optimum Speed
c) Free Flow Speed
d) Jam Speed

8) The "3-Es" of Traffic Engineering stand for _____.
a) Engineering, Education, Enforcement
b) Engineering, Economics, Enforcement
c) Education, Environment, Engineering
d) Enforcement, Efficiency, Economy

9) A diagram showing the approximate path of vehicles and pedestrians involved in an accident is called _____.
a) Spot Map
b) Condition Diagram
c) Collision Diagram
d) Desire Line Diagram

10) If the average length of a vehicle is 5m and the theoretical capacity is 3600 vehicles/hour/lane, what is the saturation velocity?
a) 18 kmph
b) 20 kmph
c) 36 kmph
d) 50 kmph

11) In Webster's method of signal design, the amber time is primarily provided to _____.
a) Allow pedestrians to cross
b) Allow vehicles to clear the intersection
c) Increase capacity
d) Reduce cycle length

12) The full form of ITS in-traffic management is _____.
a) Indian Traffic System
b) Intelligent Transportation System
c) Integrated Traffic Solutions
d) International Transport Standard

13) Desire lines are plotted in which type of traffic survey?
a) Speed and Delay
b) Origin and Destination (O-D)
c) Parking Survey
d) Accident Survey

14) When the capacity of a rotary intersection is reached, the weaving ratio is generally around _____.
a) 0.4 to 0.5
b) 0.8 to 0.9
c) 1.0
d) 0.1 to 0.2

Seat No.	

Set **R**

Fourth. Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Traffic Engineering and Management (BTN01710)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

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

SECTION – I

Q.2 Solve any Two of the following. **14**

a) Define Traffic Engineering. Discuss the scope and various functions of a traffic engineer in modern urban planning.

b) A parking survey was conducted for a lot with 50 bays. The initial count at 9:00 AM was 20 vehicles. The In-Out data is given below. Calculate the Parking Accumulation and Parking Load for the given period.

Time	In	Out
9:00 – 9:05	4	2
9:05 – 9:10	3	5
9:10 – 9:15	6	2
9:15 – 9:20	5	3
9:20 – 9:25	2	4

c) Explain the "Floating Car Method" for speed and delay studies. What data is collected during this study?

d) Write short notes on any two:
i) Off-street parking facilities
ii) PIEV Theory
iii) 30th Highest Hourly Volume

Q.3 Solve any Two of the following. **14**

a) Derive and explain the fundamental relationship between Traffic Flow (q), Speed (v), and Density (k). Draw the fundamental diagrams.

b) A vehicle weighing 1500 kg skids a distance of 30 m before colliding with a stationary vehicle of 1000 kg. After the collision, both vehicles skid a distance of 10 m together. Assuming a coefficient of friction f = 0.5, calculate the initial speed of the moving vehicle.

Speed Range (kmph)	0-10	10-20	20-30	30-40	40-50	50-60	60-70
No. of Vehicles	5	15	40	110	160	80	20

c) Spot speed data for a highway is given below. Construct a frequency distribution table and determine the 15th and 85th percentile speeds.

d) What is "Passenger Car Unit" (PCU)? List the factors affecting PCU values.

Section – II

Q.4 Solve Any Two of the following. **14**

a) Sketch and explain the three major types of Traffic Signs (Regulatory, Warning, Informatory) with two examples for each.

b) A 2-phase signal is to be designed for an intersection.
Amber time = 2 sec per phase.
Startup lost time = 2 sec per phase.
Calculate the Optimum Cycle Time (C_0) and Green splits (G_1, G_2) using Webster's Method.

Arm	Normal Flow (q) (PCU/hr)	Saturation Flow (s) (PCU/hr)
North	900	2500
South	500	2000
East	700	2800
West	600	2800

c) Explain the concept of "Intelligent Transportation Systems" (ITS). Describe three specific applications of ITS in India.

d) Write a note on the design principles of street lighting. What are the different lighting layouts?

Q.5 Solve any Two of the following. **14**

a) Calculate the practical capacity of a rotary intersection using the IRC formula.
Weaving width = 12 m
Entry width = 8 m
Weaving length = 48 m
Proportion of weaving traffic = 0.6

b) Discuss the various causes of road accidents. Suggest engineering and enforcement measures to reduce them.

c) Explain the following road markings with sketches:
i) Centre Line (Broken vs Solid)
ii) Stop Line
iii) No Overtaking Zone

d) Vehicle A is traveling on a major road and Vehicle B on a minor road. An obstruction is located at the corner.
Distance of obstruction from Path A = 10 m.
Distance of obstruction from Path B = 15 m.
Design speed of Major Road = 60 kmph.
Calculate the safe speed limit for the Minor road using the National Safety Council (NSC) method.

Seat No.	

Set **S**

Fourth. Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Traffic Engineering and Management (BTN01710)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) If the average length of a vehicle is 5m and the theoretical capacity is 3600 vehicles/hour/lane, what is the saturation velocity?
a) 18 kmph b) 20 kmph
c) 36 kmph d) 50 kmph

2) In Webster's method of signal design, the amber time is primarily provided to _____.
a) Allow pedestrians to cross
b) Allow vehicles to clear the intersection
c) Increase capacity
d) Reduce cycle length

3) The full form of ITS in-traffic management is _____.
a) Indian Traffic System
b) Intelligent Transportation System
c) Integrated Traffic Solutions
d) International Transport Standard

4) Desire lines are plotted in which type of traffic survey?
a) Speed and Delay b) Origin and Destination (O-D)
c) Parking Survey d) Accident Survey

5) When the capacity of a rotary intersection is reached, the weaving ratio is generally around _____.
a) 0.4 to 0.5 b) 0.8 to 0.9
c) 1.0 d) 0.1 to 0.2

6) Determine the PCU value for a motorcycle according to IRC standards _____.

a) 0.5 b) 1.0
c) 3.0 d) 4.5

7) Parallel parking requires _____ road width compared to 45-degree angle parking.

a) More b) Less
c) Same d) Double

8) If the AADT is 5000 vehicles, the expansion factor used to convert a 24-hour count to AADT depends on _____.

a) Day of the week b) Month of the year
c) Season d) All of the above

9) The maximum number of conflict points at a standard 4-legged intersection with two-way traffic is _____.

a) 16 b) 24
c) 32 d) 44

10) The speed limit sign is a type of _____.

a) Warning Sign b) Regulatory Sign
c) Informatory Sign d) Route Marker

11) Which percentile speed is typically used for the geometric design of highways (Design Speed)?

a) 15th Percentile b) 50th Percentile
c) 85th Percentile d) 98th Percentile

12) In a traffic stream, if the traffic density is zero, the corresponding traffic speed is _____.

a) Zero b) Optimum Speed
c) Free Flow Speed d) Jam Speed

13) The "3-Es" of Traffic Engineering stand for _____.

a) Engineering, Education, Enforcement
b) Engineering, Economics, Enforcement
c) Education, Environment, Engineering
d) Enforcement, Efficiency, Economy

14) A diagram showing the approximate path of vehicles and pedestrians involved in an accident is called _____.

a) Spot Map b) Condition Diagram
c) Collision Diagram d) Desire Line Diagram

SLR-QH-295

Seat No.	

Set | **S**

Fourth. Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Traffic Engineering and Management (BTN01710)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

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

SECTION – I

Q.2 Solve any Two of the following. **14**

a) Define Traffic Engineering. Discuss the scope and various functions of a traffic engineer in modern urban planning.

b) A parking survey was conducted for a lot with 50 bays. The initial count at 9:00 AM was 20 vehicles. The In-Out data is given below. Calculate the Parking Accumulation and Parking Load for the given period.

Time	In	Out
9:00 – 9:05	4	2
9:05 – 9:10	3	5
9:10 – 9:15	6	2
9:15 – 9:20	5	3
9:20 – 9:25	2	4

c) Explain the "Floating Car Method" for speed and delay studies. What data is collected during this study?

d) Write short notes on any two:
i) Off-street parking facilities
ii) PIEV Theory
iii) 30th Highest Hourly Volume

Q.3 Solve any Two of the following. **14**

a) Derive and explain the fundamental relationship between Traffic Flow (q), Speed (v), and Density (k). Draw the fundamental diagrams.

b) A vehicle weighing 1500 kg skids a distance of 30 m before colliding with a stationary vehicle of 1000 kg. After the collision, both vehicles skid a distance of 10 m together. Assuming a coefficient of friction f = 0.5, calculate the initial speed of the moving vehicle.

Speed Range (kmph)	0-10	10-20	20-30	30-40	40-50	50-60	60-70
No. of Vehicles	5	15	40	110	160	80	20

c) Spot speed data for a highway is given below. Construct a frequency distribution table and determine the 15th and 85th percentile speeds.

d) What is "Passenger Car Unit" (PCU)? List the factors affecting PCU values.

Section – II

Q.4 Solve Any Two of the following. **14**

a) Sketch and explain the three major types of Traffic Signs (Regulatory, Warning, Informatory) with two examples for each.

b) A 2-phase signal is to be designed for an intersection.
Amber time = 2 sec per phase.
Startup lost time = 2 sec per phase.
Calculate the Optimum Cycle Time (C_0) and Green splits (G_1, G_2) using Webster's Method.

Arm	Normal Flow (q) (PCU/hr)	Saturation Flow (s) (PCU/hr)
North	900	2500
South	500	2000
East	700	2800
West	600	2800

c) Explain the concept of "Intelligent Transportation Systems" (ITS). Describe three specific applications of ITS in India.

d) Write a note on the design principles of street lighting. What are the different lighting layouts?

Q.5 Solve any Two of the following. **14**

a) Calculate the practical capacity of a rotary intersection using the IRC formula.
Weaving width = 12 m
Entry width = 8 m
Weaving length = 48 m
Proportion of weaving traffic = 0.6

b) Discuss the various causes of road accidents. Suggest engineering and enforcement measures to reduce them.

c) Explain the following road markings with sketches:
i) Centre Line (Broken vs Solid)
ii) Stop Line
iii) No Overtaking Zone

d) Vehicle A is traveling on a major road and Vehicle B on a minor road. An obstruction is located at the corner.
Distance of obstruction from Path A = 10 m.
Distance of obstruction from Path B = 15 m.
Design speed of Major Road = 60 kmph.
Calculate the safe speed limit for the Minor road using the National Safety Council (NSC) method.

SLR-QH-296

Seat No.	

Set P

Fourth. Y. (B.Tech.) (Civil Engineering) (Sem - I) (New) (CBCS)
Examination: March/April – 2026
Geo Synthetics and Soil Structures (BTN01711)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) What are the natural products used in Geotechnical Constructions?
a) Coir, Polymer, Hemp b) Jute, Hemp, Metal
c) Coir, Jute, Hemp d) Metal, Polymer, Coir

2) The modern concept of reinforced earth was invented by _____.
a) Terzaghi b) Skempton
c) Henri Vidal d) Bjerrum

3) Woven Geotextile can be used as _____.
a) Separator b) Filter
c) Reinforcement d) All of the above

4) Indian standard test number pertaining to the sampling of geosynthetic specimen is _____.
a) IS 14716 b) IS 14706
c) ISO 554 d) None of the above

5) What are the hydraulic properties of Geosynthetics?
a) Gradient ratio b) Permittivity
c) Transmissivity d) All the above

6) For good compatibility between the geotextile and the soil, the gradient ratio should be _____.
a) less than 3 b) 3 to 5
c) more than 3 d) Any reasonable value

7) Which type of structure is NOT suitable for deep excavations in restricted areas?
a) Diaphragm Walls b) Reinforced Soil Walls
c) Secant Piles d) Sheet Piles

8) Trapezoidal walls are suitable in case of _____.
a) Weak foundation soil
b) Strong foundation soil
c) For law height of walls
d) For high height of walls

9) Which of the following walls of the same height exert the least pressure on the foundation soil?
a) Geosynthetics reinforced soil retaining walls
b) Masonry gravity wall
c) Reinforced concrete gravity walls
d) All walls will exert the same foundation pressure

10) Creep reduction factor is applicable to which type of reinforcement?
a) Polymeric reinforcement
b) Metallic Strips
c) Metallic Meshes
d) Applicable to all reinforcement types

11) What are the different surface treatments used to protect the slope surfaces?
a) Vegetation
b) Coir or jute mats
c) Gabion facings
d) All of the above

12) Which Indian Code is pertaining to the design of stone columns?
a) IS 15284
b) IS 2700
c) IS 3820
d) IS 456

13) Most suitable geosynthetics for dramas application will be _____.
a) Geogrid
b) Woven geotextiles
c) Nonwoven geotextiles
d) Geomembranes

14) Why is the cover provided above the landfill?
a) To prevent the ingress of rain water
b) To prevent the release of order
c) To prevent bird menace
d) All of the above

SLR-QH-296

Seat No.		Set	P

Fourth. Y. (B.Tech.) (Civil Engineering) (Sem - I) (New) (CBCS)
Examination: March/April – 2026
Geo Synthetics and Soil Structures (BTN01711)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. 2 from Section I is compulsory. Solve any two questions from the remaining Q.3, 4 and 5.
2) Q.6 from Section II is compulsory. Solve any two questions from the remaining Q.7, 8 and 9
3) Figures to the right indicate full marks.
4) Assume additional suitable data if necessary and state it clearly

SECTION – I

Q.2 Answer the following questions. (Any Four) **08**

a) Write a note on Mohr Circle Analysis.
b) List various testing methods of Geosynthetics
c) List various types of Reinforced Soil retaining walls
d) Different Slope Stability Analysis Methods
e) Apparent opening size

Q.3 **a)** Explain the different types of geosynthetics and their primary functions. **05**
b) What are the main functions of Geotextiles in Geotechnical Engg? **05**

Q.4 **a)** Explain in detail cross plane permeability tests. **05**
b) Enlist different techniques of testing strength properties of geosynthetics. **05**

Q.5 **a)** Explain FHWA method of construction for reinforced soil retaining walls. **05**
b) Write a detailed note on Planer Wedge Method. **05**

Section – II

Q.6 Answer the following questions. (Any Four) **08**

a) Erosion control on slopes using geosynthetics
b) Write a short note Giroud-Norway approach.
c) Write a note on landfills.
d) Collection techniques for Leachate
e) Criteria for selection of geotextiles

Q.7	**a)**	Explain erosion control on slopes can be done by using Geosynthetics.	**05**
	b)	Write a detailed note on application of geosynthetics in drainage and filtration.	**05**
Q.8	**a)**	Explain the use of geosynthetics for construction of heavy container yards and railway lines.	**05**
	b)	Explain the role of geonets for drainage in landfills.	**05**
Q.9	**a)**	Explain geosynthetic clay liner as barrier.	**05**
	b)	Write short notes on: i) Gabian walls ii) Mechanically Stabilized Earth (MSE) walls	**05**

SLR-QH-296

Seat No.		Set	Q

Fourth. Y. (B.Tech.) (Civil Engineering) (Sem - I) (New) (CBCS)
Examination: March/April – 2026
Geo Synthetics and Soil Structures (BTN01711)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) Trapezoidal walls are suitable in case of _____.
a) Weak foundation soil b) Strong foundation soil
c) For law height of walls d) For high height of walls

2) Which of the following walls of the same height exert the least pressure on the foundation soil?
a) Geosynthetics reinforced soil retaining walls
b) Masonry gravity wall
c) Reinforced concrete gravity walls
d) All walls will exert the same foundation pressure

3) Creep reduction factor is applicable to which type of reinforcement?
a) Polymeric reinforcement
b) Metallic Strips
c) Metallic Meshes
d) Applicable to all reinforcement types

4) What are the different surface treatments used to protect the slope surfaces?
a) Vegetation b) Coir or jute mats
c) Gabion facings d) All of the above

5) Which Indian Code is pertaining to the design of stone columns?
a) IS 15284 b) IS 2700
c) IS 3820 d) IS 456

6) Most suitable geosynthetics for dramas application will be _____.
a) Geogrid b) Woven geotextiles
c) Nonwoven geotextiles d) Geomembranes

7) Why is the cover provided above the landfill?
a) To prevent the ingress of rain water
b) To prevent the release of order
c) To prevent bird menace
d) All of the above

8) What are the natural products used in Geotechnical Constructions?
a) Coir, Polymer, Hemp
b) Jute, Hemp, Metal
c) Coir, Jute, Hemp
d) Metal, Polymer, Coir

9) The modern concept of reinforced earth was invented by _____.
a) Terzaghi
b) Skempton
c) Henri Vidal
d) Bjerrum

10) Woven Geotextile can be used as _____.
a) Separator
b) Filter
c) Reinforcement
d) All of the above

11) Indian standard test number pertaining to the sampling of geosynthetic specimen is _____.
a) IS 14716
b) IS 14706
c) ISO 554
d) None of the above

12) What are the hydraulic properties of Geosynthetics?
a) Gradient ratio
b) Permittivity
c) Transmissivity
d) All the above

13) For good compatibility between the geotextile and the soil, the gradient ratio should be _____.
a) less than 3
b) 3 to 5
c) more than 3
d) Any reasonable value

14) Which type of structure is NOT suitable for deep excavations in restricted areas?
a) Diaphragm Walls
b) Reinforced Soil Walls
c) Secant Piles
d) Sheet Piles

Seat No.	

Set **Q**

Fourth. Y. (B.Tech.) (Civil Engineering) (Sem - I) (New) (CBCS)
Examination: March/April – 2026
Geo Synthetics and Soil Structures (BTN01711)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. 2 from Section I is compulsory. Solve any two questions from the remaining Q.3, 4 and 5.
2) Q.6 from Section II is compulsory. Solve any two questions from the remaining Q.7, 8 and 9
3) Figures to the right indicate full marks.
4) Assume additional suitable data if necessary and state it clearly

SECTION – I

Q.2 Answer the following questions. (Any Four) **08**

a) Write a note on Mohr Circle Analysis.
b) List various testing methods of Geosynthetics
c) List various types of Reinforced Soil retaining walls
d) Different Slope Stability Analysis Methods
e) Apparent opening size

Q.3 **a)** Explain the different types of geosynthetics and their primary functions. **05**

b) What are the main functions of Geotextiles in Geotechnical Engg? **05**

Q.4 **a)** Explain in detail cross plane permeability tests. **05**

b) Enlist different techniques of testing strength properties of geosynthetics. **05**

Q.5 **a)** Explain FHWA method of construction for reinforced soil retaining walls. **05**

b) Write a detailed note on Planer Wedge Method. **05**

Section – II

Q.6 Answer the following questions. (Any Four) **08**

a) Erosion control on slopes using geosynthetics
b) Write a short note Giroud-Norway approach.
c) Write a note on landfills.
d) Collection techniques for Leachate
e) Criteria for selection of geotextiles

Q.7	**a)**	Explain erosion control on slopes can be done by using Geosynthetics.	**05**
	b)	Write a detailed note on application of geosynthetics in drainage and filtration.	**05**
Q.8	**a)**	Explain the use of geosynthetics for construction of heavy container yards and railway lines.	**05**
	b)	Explain the role of geonets for drainage in landfills.	**05**
Q.9	**a)**	Explain geosynthetic clay liner as barrier.	**05**
	b)	Write short notes on: i) Gabian walls ii) Mechanically Stabilized Earth (MSE) walls	**05**

Seat No.	

Set **R**

Fourth. Y. (B.Tech.) (Civil Engineering) (Sem - I) (New) (CBCS)
Examination: March/April – 2026
Geo Synthetics and Soil Structures (BTN01711)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) What are the different surface treatments used to protect the slope surfaces?
a) Vegetation b) Coir or jute mats
c) Gabion facings d) All of the above

2) Which Indian Code is pertaining to the design of stone columns?
a) IS 15284 b) IS 2700
c) IS 3820 d) IS 456

3) Most suitable geosynthetics for dramas application will be _____.
a) Geogrid b) Woven geotextiles
c) Nonwoven geotextiles d) Geomembranes

4) Why is the cover provided above the landfill?
a) To prevent the ingress of rain water
b) To prevent the release of order
c) To prevent bird menace
d) All of the above

5) What are the natural products used in Geotechnical Constructions?
a) Coir, Polymer, Hemp b) Jute, Hemp, Metal
c) Coir, Jute, Hemp d) Metal, Polymer, Coir

6) The modern concept of reinforced earth was invented by _____.
a) Terzaghi b) Skempton
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7) Woven Geotextile can be used as _____.
a) Separator b) Filter
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8) Indian standard test number pertaining to the sampling of geosynthetic specimen is _____.
a) IS 14716 b) IS 14706
c) ISO 554 d) None of the above

9) What are the hydraulic properties of Geosynthetics?
a) Gradient ratio b) Permittivity
c) Transmissivity d) All the above

10) For good compatibility between the geotextile and the soil, the gradient ratio should be _____.
a) less than 3 b) 3 to 5
c) more than 3 d) Any reasonable value

11) Which type of structure is NOT suitable for deep excavations in restricted areas?
a) Diaphragm Walls b) Reinforced Soil Walls
c) Secant Piles d) Sheet Piles

12) Trapezoidal walls are suitable in case of _____.
a) Weak foundation soil b) Strong foundation soil
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13) Which of the following walls of the same height exert the least pressure on the foundation soil?
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14) Creep reduction factor is applicable to which type of reinforcement?
a) Polymeric reinforcement
b) Metallic Strips
c) Metallic Meshes
d) Applicable to all reinforcement types

Seat No.		Set	R

Fourth. Y. (B.Tech.) (Civil Engineering) (Sem - I) (New) (CBCS)
Examination: March/April – 2026
Geo Synthetics and Soil Structures (BTN01711)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. 2 from Section I is compulsory. Solve any two questions from the remaining Q.3, 4 and 5.
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3) Figures to the right indicate full marks.
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SECTION – I

Q.2 Answer the following questions. (Any Four) **08**

a) Write a note on Mohr Circle Analysis.
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e) Apparent opening size

Q.3 **a)** Explain the different types of geosynthetics and their primary functions. **05**

b) What are the main functions of Geotextiles in Geotechnical Engg? **05**

Q.4 **a)** Explain in detail cross plane permeability tests. **05**

b) Enlist different techniques of testing strength properties of geosynthetics. **05**

Q.5 **a)** Explain FHWA method of construction for reinforced soil retaining walls. **05**

b) Write a detailed note on Planer Wedge Method. **05**

Section – II

Q.6 Answer the following questions. (Any Four) **08**

a) Erosion control on slopes using geosynthetics
b) Write a short note Giroud-Norway approach.
c) Write a note on landfills.
d) Collection techniques for Leachate
e) Criteria for selection of geotextiles

Q.7	**a)**	Explain erosion control on slopes can be done by using Geosynthetics.	**05**
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Q.8	**a)**	Explain the use of geosynthetics for construction of heavy container yards and railway lines.	**05**
	b)	Explain the role of geonets for drainage in landfills.	**05**
Q.9	**a)**	Explain geosynthetic clay liner as barrier.	**05**
	b)	Write short notes on: i) Gabian walls ii) Mechanically Stabilized Earth (MSE) walls	**05**

Seat No.		Set	S

Fourth. Y. (B.Tech.) (Civil Engineering) (Sem - I) (New) (CBCS)
Examination: March/April – 2026
Geo Synthetics and Soil Structures (BTN01711)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) For good compatibility between the geotextile and the soil, the gradient ratio should be _____.
a) less than 3 b) 3 to 5
c) more than 3 d) Any reasonable value

2) Which type of structure is NOT suitable for deep excavations in restricted areas?
a) Diaphragm Walls b) Reinforced Soil Walls
c) Secant Piles d) Sheet Piles

3) Trapezoidal walls are suitable in case of _____.
a) Weak foundation soil b) Strong foundation soil
c) For law height of walls d) For high height of walls

4) Which of the following walls of the same height exert the least pressure on the foundation soil?
a) Geosynthetics reinforced soil retaining walls
b) Masonry gravity wall
c) Reinforced concrete gravity walls
d) All walls will exert the same foundation pressure

5) Creep reduction factor is applicable to which type of reinforcement?
a) Polymeric reinforcement
b) Metallic Strips
c) Metallic Meshes
d) Applicable to all reinforcement types

6) What are the different surface treatments used to protect the slope surfaces?
a) Vegetation
b) Coir or jute mats
c) Gabion facings
d) All of the above

7) Which Indian Code is pertaining to the design of stone columns?
a) IS 15284
b) IS 2700
c) IS 3820
d) IS 456

8) Most suitable geosynthetics for dramas application will be _____.
a) Geogrid
b) Woven geotextiles
c) Nonwoven geotextiles
d) Geomembranes

9) Why is the cover provided above the landfill?
a) To prevent the ingress of rain water
b) To prevent the release of order
c) To prevent bird menace
d) All of the above

10) What are the natural products used in Geotechnical Constructions?
a) Coir, Polymer, Hemp
b) Jute, Hemp, Metal
c) Coir, Jute, Hemp
d) Metal, Polymer, Coir

11) The modern concept of reinforced earth was invented by _____.
a) Terzaghi
b) Skempton
c) Henri Vidal
d) Bjerrum

12) Woven Geotextile can be used as _____.
a) Separator
b) Filter
c) Reinforcement
d) All of the above

13) Indian standard test number pertaining to the sampling of geosynthetic specimen is _____.
a) IS 14716
b) IS 14706
c) ISO 554
d) None of the above

14) What are the hydraulic properties of Geosynthetics?
a) Gradient ratio
b) Permittivity
c) Transmissivity
d) All the above

SLR-QH-296

Seat No.		Set	S

Fourth. Y. (B.Tech.) (Civil Engineering) (Sem - I) (New) (CBCS)
Examination: March/April – 2026
Geo Synthetics and Soil Structures (BTN01711)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. 2 from Section I is compulsory. Solve any two questions from the remaining Q.3, 4 and 5.
2) Q.6 from Section II is compulsory. Solve any two questions from the remaining Q.7, 8 and 9
3) Figures to the right indicate full marks.
4) Assume additional suitable data if necessary and state it clearly

SECTION – I

Q.2 Answer the following questions. (Any Four) **08**

a) Write a note on Mohr Circle Analysis.
b) List various testing methods of Geosynthetics
c) List various types of Reinforced Soil retaining walls
d) Different Slope Stability Analysis Methods
e) Apparent opening size

Q.3 **a)** Explain the different types of geosynthetics and their primary functions. **05**

b) What are the main functions of Geotextiles in Geotechnical Engg? **05**

Q.4 **a)** Explain in detail cross plane permeability tests. **05**

b) Enlist different techniques of testing strength properties of geosynthetics. **05**

Q.5 **a)** Explain FHWA method of construction for reinforced soil retaining walls. **05**

b) Write a detailed note on Planer Wedge Method. **05**

Section – II

Q.6 Answer the following questions. (Any Four) **08**

a) Erosion control on slopes using geosynthetics
b) Write a short note Giroud-Norway approach.
c) Write a note on landfills.
d) Collection techniques for Leachate
e) Criteria for selection of geotextiles

Q.7 **a)** Explain erosion control on slopes can be done by using Geosynthetics. **05**

b) Write a detailed note on application of geosynthetics in drainage and filtration. **05**

Q.8 **a)** Explain the use of geosynthetics for construction of heavy container yards and railway lines. **05**

b) Explain the role of geonets for drainage in landfills. **05**

Q.9 **a)** Explain geosynthetic clay liner as barrier. **05**

b) Write short notes on: **05**

i) Gabian walls

ii) Mechanically Stabilized Earth (MSE) walls

SLR-QH-298

Seat No.		Set	P

Fourth. Y. (B.Tech.) (Civil Engineering) (Sem- I) (New) (CBCS)
Examination: March/April – 2026
Entrepreneurship (BTN01713)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Multiple Choice Question. **14**

1) Venture capital is concerned with _____.
a) New project having potential for higher profit
b) New project of high technology
c) New project having high risk
d) All the above

2) Why should an entrepreneur do a feasibility study for starting a new venture _____.
a) To identify possible sources of funds
b) To see if there are possible barriers to success
c) To estimate the expected sales
d) To explore potential customers

3) What is the process by which individuals pursue opportunities without regard to resources they currently control?
a) Startup management b) Entrepreneurship
c) Financial analysis d) Feasibility planning

4) Which one of the following is the process of entrepreneurs developing new products that over time make current products obsolete?
a) New business model b) Anatomization
c) None of the given options d) Creative destruction

5) The term Entrepreneur is derived from the _____ word.
a) English b) Tamil
c) Hindi d) French

6) The person who creates an enterprise is called _____.
   a) Entrepreneur
   b) Managers
   c) Leaders
   d) Owners

7) An entrepreneur is someone who?
   a) Organize a business
   b) Manages a business
   c) Takes risks
   d) All of the above

8) What is the role of creativity in entrepreneurship?
   a) It helps in generating new ideas and solutions
   b) It hinders the problem-solving process
   c) It is not relevant to entrepreneurship
   d) It only applies to artistic ventures

9) What is the relationship between innovation and entrepreneurship?
   a) Innovation is the process of bringing new ideas to the market, which is essential for entrepreneurship
   b) Innovation and entrepreneurship are unrelated concepts
   c) Innovation is only relevant for technology-based businesses
   d) Entrepreneurship focuses on tradition, while innovation focuses on change

10) Which of the following is NOT a characteristic of women entrepreneurs?
   a) Risk-taking
   b) Perseverance
   c) Lack of confidence
   d) Creativity

11) What is a major challenge faced by women entrepreneurs in India?
   a) Access to education
   b) Social and cultural barriers
   c) Lack of family support
   d) All of the above

12) Which organization focuses on promoting women entrepreneurship in India?
   a) FICCI Ladies Organization (FLO)
   b) National Alliance of Young Entrepreneurs (NAYE)
   c) District Industries Centres (DIC)
   d) Small Industries Service Institute (SISI)

13) What is the role of the government in promoting entrepreneurship?
   a) Creating a supportive policy environment
   b) Providing financial assistance
   c) Offering training and development programs
   d) All of the above

14) What is the purpose of a District Industries Centre (DIC)?
   a) To provide support and guidance to entrepreneurs at the district level
   b) To promote large-scale industries
   c) To regulate international trade
   d) To conduct research on economic development

Seat No.	

Set **P**

Fourth. Y. (B.Tech.) (Civil Engineering) (Sem- I) (New) (CBCS)
Examination: March/April – 2026
Entrepreneurship (BTN01713)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

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

SECTION – I

Q.2 Attempt Any Two. **14**

a) Explain the different types of entrepreneurs based on their motivation and entrepreneurial activity, with relevant examples.

b) Discuss the qualities of a successful entrepreneur. How do these qualities contribute to overcoming challenges and achieving business goals?

c) Explain the concept of 'Creativity and Innovation' in the context of entrepreneurship. How can these be fostered?

Q.3 Attempt Any Two. **14**

a) Discuss the role of various agencies like DIC, SISI, and EDII in supporting entrepreneurship development.

b) What are the different forms of financial support available to entrepreneurs? Explain the role of commercial banks and other financial institutions.

c) Explain the importance of preparing a comprehensive business plan for a new venture. What are the key elements to include?

SECTION – II

Q.4 Attempt Any Two. **14**

a) Explain the process of estimating the cost of a project. What are the different cost components and methods of cost estimation?

b) Discuss the significance of financial ratios in analyzing the performance of a business. Explain any three important financial ratios with examples.

c) What are the different stages involved in the project implementation process? Explain the key activities in each stage.

Q.5 Write a note on Any Two. **14**

a) Discuss the importance of 'Market Study' and 'Sales Promotion' for businesses. How can these contribute to business success?

b) Explain the concept of 'Risk and Risk Analysis'. What are the different types of risks, and how can they be managed?

c) Discuss the importance of effective communication skills for entrepreneurs. What are the barriers to effective communication, and how can they be overcome?

SLR-QH-298

Seat No.		Set	Q

Fourth. Y. (B.Tech.) (Civil Engineering) (Sem- I) (New) (CBCS)
Examination: March/April – 2026
Entrepreneurship (BTN01713)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Multiple Choice Question. **14**

1) What is the role of creativity in entrepreneurship?
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c) It is not relevant to entrepreneurship
d) It only applies to artistic ventures

2) What is the relationship between innovation and entrepreneurship?
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b) Innovation and entrepreneurship are unrelated concepts
c) Innovation is only relevant for technology-based businesses
d) Entrepreneurship focuses on tradition, while innovation focuses on change

3) Which of the following is NOT a characteristic of women entrepreneurs?
a) Risk-taking b) Perseverance
c) Lack of confidence d) Creativity

4) What is a major challenge faced by women entrepreneurs in India?
a) Access to education b) Social and cultural barriers
c) Lack of family support d) All of the above

5) Which organization focuses on promoting women entrepreneurship in India?
a) FICCI Ladies Organization (FLO)
b) National Alliance of Young Entrepreneurs (NAYE)
c) District Industries Centres (DIC)
d) Small Industries Service Institute (SISI)

6) What is the role of the government in promoting entrepreneurship?
   a) Creating a supportive policy environment
   b) Providing financial assistance
   c) Offering training and development programs
   d) All of the above

7) What is the purpose of a District Industries Centre (DIC)?
   a) To provide support and guidance to entrepreneurs at the district level
   b) To promote large-scale industries
   c) To regulate international trade
   d) To conduct research on economic development

8) Venture capital is concerned with _____.
   a) New project having potential for higher profit
   b) New project of high technology
   c) New project having high risk
   d) All the above

9) Why should an entrepreneur do a feasibility study for starting a new venture _____.
   a) To identify possible sources of funds
   b) To see if there are possible barriers to success
   c) To estimate the expected sales
   d) To explore potential customers

10) What is the process by which individuals pursue opportunities without regard to resources they currently control?
   a) Startup management
   b) Entrepreneurship
   c) Financial analysis
   d) Feasibility planning

11) Which one of the following is the process of entrepreneurs developing new products that over time make current products obsolete?
   a) New business model
   b) Anatomization
   c) None of the given options
   d) Creative destruction

12) The term Entrepreneur is derived from the _____ word.
   a) English
   b) Tamil
   c) Hindi
   d) French

13) The person who creates an enterprise is called _____.
   a) Entrepreneur
   b) Managers
   c) Leaders
   d) Owners

14) An entrepreneur is someone who?
   a) Organize a business
   b) Manages a business
   c) Takes risks
   d) All of the above

Seat No.	

Set **Q**

Fourth. Y. (B.Tech.) (Civil Engineering) (Sem- I) (New) (CBCS)
Examination: March/April – 2026
Entrepreneurship (BTN01713)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

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

SECTION – I

Q.2 Attempt Any Two. **14**

a) Explain the different types of entrepreneurs based on their motivation and entrepreneurial activity, with relevant examples.

b) Discuss the qualities of a successful entrepreneur. How do these qualities contribute to overcoming challenges and achieving business goals?

c) Explain the concept of 'Creativity and Innovation' in the context of entrepreneurship. How can these be fostered?

Q.3 Attempt Any Two. **14**

a) Discuss the role of various agencies like DIC, SISI, and EDII in supporting entrepreneurship development.

b) What are the different forms of financial support available to entrepreneurs? Explain the role of commercial banks and other financial institutions.

c) Explain the importance of preparing a comprehensive business plan for a new venture. What are the key elements to include?

SECTION – II

Q.4 Attempt Any Two. **14**

a) Explain the process of estimating the cost of a project. What are the different cost components and methods of cost estimation?

b) Discuss the significance of financial ratios in analyzing the performance of a business. Explain any three important financial ratios with examples.

c) What are the different stages involved in the project implementation process? Explain the key activities in each stage.

Q.5 Write a note on Any Two. **14**

a) Discuss the importance of 'Market Study' and 'Sales Promotion' for businesses. How can these contribute to business success?

b) Explain the concept of 'Risk and Risk Analysis'. What are the different types of risks, and how can they be managed?

c) Discuss the importance of effective communication skills for entrepreneurs. What are the barriers to effective communication, and how can they be overcome?

Seat No.		Set	R

Fourth. Y. (B.Tech.) (Civil Engineering) (Sem- I) (New) (CBCS)
Examination: March/April – 2026
Entrepreneurship (BTN01713)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Multiple Choice Question. **14**

1) What is a major challenge faced by women entrepreneurs in India?
a) Access to education
b) Social and cultural barriers
c) Lack of family support
d) All of the above

2) Which organization focuses on promoting women entrepreneurship in India?
a) FICCI Ladies Organization (FLO)
b) National Alliance of Young Entrepreneurs (NAYE)
c) District Industries Centres (DIC)
d) Small Industries Service Institute (SISI)

3) What is the role of the government in promoting entrepreneurship?
a) Creating a supportive policy environment
b) Providing financial assistance
c) Offering training and development programs
d) All of the above

4) What is the purpose of a District Industries Centre (DIC)?
a) To provide support and guidance to entrepreneurs at the district level
b) To promote large-scale industries
c) To regulate international trade
d) To conduct research on economic development

5) Venture capital is concerned with _____.
a) New project having potential for higher profit
b) New project of high technology
c) New project having high risk
d) All the above

6) Why should an entrepreneur do a feasibility study for starting a new venture _____.
   a) To identify possible sources of funds
   b) To see if there are possible barriers to success
   c) To estimate the expected sales
   d) To explore potential customers

7) What is the process by which individuals pursue opportunities without regard to resources they currently control?
   a) Startup management
   b) Entrepreneurship
   c) Financial analysis
   d) Feasibility planning

8) Which one of the following is the process of entrepreneurs developing new products that over time make current products obsolete?
   a) New business model
   b) Anatomization
   c) None of the given options
   d) Creative destruction

9) The term Entrepreneur is derived from the _____ word.
   a) English
   b) Tamil
   c) Hindi
   d) French

10) The person who creates an enterprise is called _____.
   a) Entrepreneur
   b) Managers
   c) Leaders
   d) Owners

11) An entrepreneur is someone who?
   a) Organize a business
   b) Manages a business
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   d) All of the above

12) What is the role of creativity in entrepreneurship?
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13) What is the relationship between innovation and entrepreneurship?
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   b) Innovation and entrepreneurship are unrelated concepts
   c) Innovation is only relevant for technology-based businesses
   d) Entrepreneurship focuses on tradition, while innovation focuses on change

14) Which of the following is NOT a characteristic of women entrepreneurs?
   a) Risk-taking
   b) Perseverance
   c) Lack of confidence
   d) Creativity

Seat No.	

Set **R**

Fourth. Y. (B.Tech.) (Civil Engineering) (Sem- I) (New) (CBCS)
Examination: March/April – 2026
Entrepreneurship (BTN01713)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

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

SECTION – I

Q.2 Attempt Any Two. **14**

a) Explain the different types of entrepreneurs based on their motivation and entrepreneurial activity, with relevant examples.

b) Discuss the qualities of a successful entrepreneur. How do these qualities contribute to overcoming challenges and achieving business goals?

c) Explain the concept of 'Creativity and Innovation' in the context of entrepreneurship. How can these be fostered?

Q.3 Attempt Any Two. **14**

a) Discuss the role of various agencies like DIC, SISI, and EDII in supporting entrepreneurship development.

b) What are the different forms of financial support available to entrepreneurs? Explain the role of commercial banks and other financial institutions.

c) Explain the importance of preparing a comprehensive business plan for a new venture. What are the key elements to include?

SECTION – II

Q.4 Attempt Any Two. **14**

a) Explain the process of estimating the cost of a project. What are the different cost components and methods of cost estimation?

b) Discuss the significance of financial ratios in analyzing the performance of a business. Explain any three important financial ratios with examples.

c) What are the different stages involved in the project implementation process? Explain the key activities in each stage.

Q.5 Write a note on Any Two. **14**

a) Discuss the importance of 'Market Study' and 'Sales Promotion' for businesses. How can these contribute to business success?

b) Explain the concept of 'Risk and Risk Analysis'. What are the different types of risks, and how can they be managed?

c) Discuss the importance of effective communication skills for entrepreneurs. What are the barriers to effective communication, and how can they be overcome?

SLR-QH-298

Seat No.		Set	S

Fourth. Y. (B.Tech.) (Civil Engineering) (Sem- I) (New) (CBCS)
Examination: March/April – 2026
Entrepreneurship (BTN01713)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Multiple Choice Question. **14**

1) The person who creates an enterprise is called _____.
a) Entrepreneur b) Managers
c) Leaders d) Owners

2) An entrepreneur is someone who?
a) Organize a business b) Manages a business
c) Takes risks d) All of the above

3) What is the role of creativity in entrepreneurship?
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5) Which of the following is NOT a characteristic of women entrepreneurs?
a) Risk-taking b) Perseverance
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6) What is a major challenge faced by women entrepreneurs in India?
a) Access to education b) Social and cultural barriers
c) Lack of family support d) All of the above

7) Which organization focuses on promoting women entrepreneurship in India?
   a) FICCI Ladies Organization (FLO)
   b) National Alliance of Young Entrepreneurs (NAYE)
   c) District Industries Centres (DIC)
   d) Small Industries Service Institute (SISI)

8) What is the role of the government in promoting entrepreneurship?
   a) Creating a supportive policy environment
   b) Providing financial assistance
   c) Offering training and development programs
   d) All of the above

9) What is the purpose of a District Industries Centre (DIC)?
   a) To provide support and guidance to entrepreneurs at the district level
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10) Venture capital is concerned with _____.
   a) New project having potential for higher profit
   b) New project of high technology
   c) New project having high risk
   d) All the above

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   c) To estimate the expected sales
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   a) Startup management
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13) Which one of the following is the process of entrepreneurs developing new products that over time make current products obsolete?
   a) New business model
   b) Anatomization
   c) None of the given options
   d) Creative destruction

14) The term Entrepreneur is derived from the _____ word.
   a) English
   b) Tamil
   c) Hindi
   d) French

Seat No.		Set	S

Fourth. Y. (B.Tech.) (Civil Engineering) (Sem- I) (New) (CBCS)
Examination: March/April – 2026
Entrepreneurship (BTN01713)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

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

SECTION – I

Q.2 Attempt Any Two. **14**

a) Explain the different types of entrepreneurs based on their motivation and entrepreneurial activity, with relevant examples.

b) Discuss the qualities of a successful entrepreneur. How do these qualities contribute to overcoming challenges and achieving business goals?

c) Explain the concept of 'Creativity and Innovation' in the context of entrepreneurship. How can these be fostered?

Q.3 Attempt Any Two. **14**

a) Discuss the role of various agencies like DIC, SISI, and EDII in supporting entrepreneurship development.

b) What are the different forms of financial support available to entrepreneurs? Explain the role of commercial banks and other financial institutions.

c) Explain the importance of preparing a comprehensive business plan for a new venture. What are the key elements to include?

SECTION – II

Q.4 Attempt Any Two. **14**

a) Explain the process of estimating the cost of a project. What are the different cost components and methods of cost estimation?

b) Discuss the significance of financial ratios in analyzing the performance of a business. Explain any three important financial ratios with examples.

c) What are the different stages involved in the project implementation process? Explain the key activities in each stage.

Q.5 Write a note on Any Two. **14**

a) Discuss the importance of 'Market Study' and 'Sales Promotion' for businesses. How can these contribute to business success?

b) Explain the concept of 'Risk and Risk Analysis'. What are the different types of risks, and how can they be managed?

c) Discuss the importance of effective communication skills for entrepreneurs. What are the barriers to effective communication, and how can they be overcome?

SLR-QH-300

Seat No.		Set	P

Fourth. Y. (B.Tech.) (Civil Engineering) (Sem - I) (New) (CBCS)
Examination: March/April - 2026
Water Power Engineering (BTN01715)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data wherever necessary.
5) Use of only non-programmable calculators is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) What is the primary component of a hydro power project?
a) Solar Panels b) Turbine
c) Wind Turbine d) Geothermal Pump

2) Which type of power station primarily uses fossil fuels?
a) Nuclear Power Station b) Hydro Power Station
c) Thermal Power Station d) Wind Power Station

3) Which of the following is a renewable source of energy?
a) Coal b) Natural Gas
c) Solar Energy d) Nuclear Energy

4) In a pumped storage hydroelectric scheme, water is _____.
a) Only used once
b) Stored in a reservoir and used to generate electricity when needed
c) Constantly flowing downriver
d) Used for irrigation only

5) What does the load factor indicate?
a) The ratio of maximum demand to average demand
b) The total energy produced in a year
c) The efficiency of a power plant
d) The proportion of time a plant operates at full capacity

6) What is the primary function of a trash rack in an intake structure?
   a) To regulate water flow
   b) To filter debris and prevent blockages
   c) To control the water level in a reservoir
   d) To measure water quality

7) What is the primary advantage of hydro power plants?
   a) High carbon emissions
   b) Low operating costs and renewable energy source
   c) Dependency on fossil fuels
   d) None of the Above

8) What is "firm power"?
   a) Power that can be guaranteed to be available at all times
   b) Power generated from renewable sources only
   c) The total capacity of a power plant
   d) Power that varies with demand

9) What is the basic equation used to estimate hydro power potential?
   a) $P = IV$
   b) $P = \eta \times \rho \times g \times Q \times H$
   c) $P = E/t$
   d) $P = mgh$

10) What is the primary purpose of a pumped storage plant?
   a) To provide constant power generation
   b) To store energy by moving water between two reservoirs
   c) To filter and purify water
   d) To generate electricity from wind

11) What is a significant disadvantage of pumped storage plants?
   a) High initial capital costs
   b) Low efficiency compared to conventional plants
   c) Limited energy storage capability
   d) Dependency on weather conditions

12) What is the primary environmental concern associated with tidal power stations?
   a) Air pollution
   b) Noise pollution
   c) Disruption of marine life and habitats
   d) High water consumption

13) Which of the following is a disadvantage of tidal power stations?
   a) They are environmentally friendly
   b) They can disrupt local ecosystems
   c) They have predictable energy output
   d) They are renewable energy sources

14) What is the primary principle of operation for tidal power stations?

a) Solar energy conversion
b) Kinetic and potential energy of tides
c) Wind energy harnessing
d) Geothermal energy extraction

SLR-QH-300

Seat No.	

Set P

Fourth. Y. (B.Tech.) (Civil Engineering) (Sem- I) (New) (CBCS)
Examination: March/April – 2026
Water Power Engineering (BTN01715)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever necessary.
4) Draw neat, labeled diagrams wherever necessary.
5) Use of only non-programmable calculators is allowed.

Section – I

Q.2 Attempt Any Four of the following questions. **16**

a) What are the different classifications of sources in India?

b) What factors should be considered when estimating hydro power potential in India?

c) State the function of hydro power schemes and draw the general layout of various hydropower scheme.

d) Common load shared by two stations base load plant with 20 MW capacity and other being standby plant with 25 MW capacity. The yearly output for base load station is 120×10^6 KWh, and for standby station is 10.5×10^6 KWh. The peak load taken by standby station is 20 MW which works for 2500 hrs during the year. The base load station takes peak load as 25.5 MW. Calculate annual load factor, plant use factor, and capacity factor for both the stations.

e) Calculate the power factor for a utility to supply a maximum 1500 kW of real power, when the reactive power at that time is 1200 kVAR.

Q.3 Attempt Any Two of the following questions. **12**

a) A penstock pipe, 700 m long, takes off from a reservoir and feeds water to turbine, the level of which is 210 m below the reservoir water level. The first 225 m length of the penstock has a cross section area of 5 m^2 and the rest has an area of 3 m^2. The steady state discharge is 09m^3/sec. If the turbine gates are closed completely in 4.5 seconds at a uniform rate, what would be the water hammer pressure developed? (from Allieri chart $= Z^2 = 1.32$)

b) Explain in brief with diagram the following:
i) Forebay
ii) Intake structure
iii) Tail Race

c) What is water hammer in a pipe line? Derive the expression for the water hammer pressure in case of rigid pipe and elastic pipe.

d) A penstock, with an internal diameter of 1.30m, supplies water at a head equivalent to 17.6kg/cm^2. There is a possibility of 20% increase in the pressure due to transient conditions. The design stress and the efficiency of the joint may be assumed to be 1150 kg/cm^2 and 80%, respectively. Calculate the approximate wall thickness of the penstock required.

Section – II

Q.4 Attempt any four of the following questions. **16**

a) Classify the different types of surge tank? Explain any one with sketch.

b) What do you understand by 'pumped storage' plant? What are the advantages and disadvantages of this power plant?

c) A Pelton wheel having a mean bucket diameter of 1.2m is running at 1000rpm. The net head on Pelton wheel is 840m. if the side clearance angle is 15° and discharge through nozzle is 0.12m^3/s. (Take Cv = 1) Determine,

i) Power available at the nozzle.
ii) Hydraulic efficiency of turbine.

d) Power house is equipped with 4 units of vertical shaft Pelton turbines to be coupled with 69000 kVA, 3 phase. 50 hertz generators. The generation is provided with 10 pairs of poles. The gross design head is 505 m and transmission efficiency of head race tunnel and penstocks together is to be 94 percent.
The four units together will provide for a power of 256000 KW at a guaranteed efficiency of 91 percent. The nozzle efficiency is 0.98.
Find:

i) the design discharge for the turbine,
ii) jet dia. and no. of jets,
iii) the nozzle tip diameter
iv) the pitch circle dia. of the wheel
v) the specific speed and
vi) number of buckets on the wheel

e) Can you compare the different types of intake structures and their applications?

Q.5 Attempt Any Two of the following questions. **12**

a) What are the important types of turbines? Enlist the factors on which choice of turbine depends.

b) Describe the tidal cycle and explain how it affects the feasibility of tidal power generation, including its limitations.

c) At a hydroelectric power station Kaplan turbine is used which has following data,
Operating head = 23.5m
output power at this head = 120 MW,
discharge = 625 m3/sec
speed = 68 rpm,
Runner tip to tip diameter = 9.5 m
Hub diameter = 4.5m
Number of blades = 6,
calculate the speed ratio, flow ratio, and the overall efficiency.

SLR-QH-300

Seat No.	

Set Q

Fourth. Y. (B.Tech.) (Civil Engineering) (Sem - I) (New) (CBCS)
Examination: March/April - 2026
Water Power Engineering (BTN01715)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data wherever necessary.
5) Use of only non-programmable calculators is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) What is "firm power"?
a) Power that can be guaranteed to be available at all times
b) Power generated from renewable sources only
c) The total capacity of a power plant
d) Power that varies with demand

2) What is the basic equation used to estimate hydro power potential?
a) $P = IV$ b) $P = \eta \times \rho \times g \times Q \times H$
c) $P = E/t$ d) $P = mgh$

3) What is the primary purpose of a pumped storage plant?
a) To provide constant power generation
b) To store energy by moving water between two reservoirs
c) To filter and purify water
d) To generate electricity from wind

4) What is a significant disadvantage of pumped storage plants?
a) High initial capital costs
b) Low efficiency compared to conventional plants
c) Limited energy storage capability
d) Dependency on weather conditions

5) What is the primary environmental concern associated with tidal power stations?
a) Air pollution
b) Noise pollution
c) Disruption of marine life and habitats
d) High water consumption

6) Which of the following is a disadvantage of tidal power stations?
   a) They are environmentally friendly
   b) They can disrupt local ecosystems
   c) They have predictable energy output
   d) They are renewable energy sources

7) What is the primary principle of operation for tidal power stations?
   a) Solar energy conversion
   b) Kinetic and potential energy of tides
   c) Wind energy harnessing
   d) Geothermal energy extraction

8) What is the primary component of a hydro power project?
   a) Solar Panels
   b) Turbine
   c) Wind Turbine
   d) Geothermal Pump

9) Which type of power station primarily uses fossil fuels?
   a) Nuclear Power Station
   b) Hydro Power Station
   c) Thermal Power Station
   d) Wind Power Station

10) Which of the following is a renewable source of energy?
   a) Coal
   b) Natural Gas
   c) Solar Energy
   d) Nuclear Energy

11) In a pumped storage hydroelectric scheme, water is _____.
   a) Only used once
   b) Stored in a reservoir and used to generate electricity when needed
   c) Constantly flowing downriver
   d) Used for irrigation only

12) What does the load factor indicate?
   a) The ratio of maximum demand to average demand
   b) The total energy produced in a year
   c) The efficiency of a power plant
   d) The proportion of time a plant operates at full capacity

13) What is the primary function of a trash rack in an intake structure?
   a) To regulate water flow
   b) To filter debris and prevent blockages
   c) To control the water level in a reservoir
   d) To measure water quality

14) What is the primary advantage of hydro power plants?
   a) High carbon emissions
   b) Low operating costs and renewable energy source
   c) Dependency on fossil fuels
   d) None of the Above

SLR-QH-300

Seat No.	

Set Q

Fourth. Y. (B.Tech.) (Civil Engineering) (Sem- I) (New) (CBCS)
Examination: March/April – 2026
Water Power Engineering (BTN01715)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever necessary.
4) Draw neat, labeled diagrams wherever necessary.
5) Use of only non-programmable calculators is allowed.

Section – I

Q.2 Attempt Any Four of the following questions. **16**

a) What are the different classifications of sources in India?

b) What factors should be considered when estimating hydro power potential in India?

c) State the function of hydro power schemes and draw the general layout of various hydropower scheme.

d) Common load shared by two stations base load plant with 20 MW capacity and other being standby plant with 25 MW capacity. The yearly output for base load station is 120×10^6 KWh, and for standby station is 10.5×10^6 KWh. The peak load taken by standby station is 20 MW which works for 2500 hrs during the year. The base load station takes peak load as 25.5 MW. Calculate annual load factor, plant use factor, and capacity factor for both the stations.

e) Calculate the power factor for a utility to supply a maximum 1500 kW of real power, when the reactive power at that time is 1200 kVAR.

Q.3 Attempt Any Two of the following questions. **12**

a) A penstock pipe, 700 m long, takes off from a reservoir and feeds water to turbine, the level of which is 210 m below the reservoir water level. The first 225 m length of the penstock has a cross section area of 5 m^2 and the rest has an area of 3 m^2. The steady state discharge is $09m^3$/sec. If the turbine gates are closed completely in 4.5 seconds at a uniform rate, what would be the water hammer pressure developed? (from Allieri chart $= Z^2 = 1.32$)

b) Explain in brief with diagram the following:
i) Forebay
ii) Intake structure
iii) Tail Race

c) What is water hammer in a pipe line? Derive the expression for the water hammer pressure in case of rigid pipe and elastic pipe.

d) A penstock, with an internal diameter of 1.30m, supplies water at a head equivalent to 17.6kg/cm^2. There is a possibility of 20% increase in the pressure due to transient conditions. The design stress and the efficiency of the joint may be assumed to be 1150 kg/cm^2 and 80%, respectively. Calculate the approximate wall thickness of the penstock required.

Section – II

Q.4 Attempt any four of the following questions. **16**

a) Classify the different types of surge tank? Explain any one with sketch.

b) What do you understand by 'pumped storage' plant? What are the advantages and disadvantages of this power plant?

c) A Pelton wheel having a mean bucket diameter of 1.2m is running at 1000rpm. The net head on Pelton wheel is 840m. if the side clearance angle is 15° and discharge through nozzle is 0.12m^3/s. (Take Cv = 1) Determine,

i) Power available at the nozzle.
ii) Hydraulic efficiency of turbine.

d) Power house is equipped with 4 units of vertical shaft Pelton turbines to be coupled with 69000 kVA, 3 phase. 50 hertz generators. The generation is provided with 10 pairs of poles. The gross design head is 505 m and transmission efficiency of head race tunnel and penstocks together is to be 94 percent.
The four units together will provide for a power of 256000 KW at a guaranteed efficiency of 91 percent. The nozzle efficiency is 0.98. Find:

i) the design discharge for the turbine,
ii) jet dia. and no. of jets,
iii) the nozzle tip diameter
iv) the pitch circle dia. of the wheel
v) the specific speed and
vi) number of buckets on the wheel

e) Can you compare the different types of intake structures and their applications?

Q.5 Attempt Any Two of the following questions. **12**

a) What are the important types of turbines? Enlist the factors on which choice of turbine depends.

b) Describe the tidal cycle and explain how it affects the feasibility of tidal power generation, including its limitations.

c) At a hydroelectric power station Kaplan turbine is used which has following data,
Operating head = 23.5m
output power at this head = 120 MW,
discharge = 625 m3/sec
speed = 68 rpm,
Runner tip to tip diameter = 9.5 m
Hub diameter = 4.5m
Number of blades = 6,
calculate the speed ratio, flow ratio, and the overall efficiency.

SLR-QH-300

Seat No.	

Set R

Fourth. Y. (B.Tech.) (Civil Engineering) (Sem - I) (New) (CBCS)
Examination: March/April - 2026
Water Power Engineering (BTN01715)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data wherever necessary.
5) Use of only non-programmable calculators is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) What is a significant disadvantage of pumped storage plants?
a) High initial capital costs
b) Low efficiency compared to conventional plants
c) Limited energy storage capability
d) Dependency on weather conditions

2) What is the primary environmental concern associated with tidal power stations?
a) Air pollution
b) Noise pollution
c) Disruption of marine life and habitats
d) High water consumption

3) Which of the following is a disadvantage of tidal power stations?
a) They are environmentally friendly
b) They can disrupt local ecosystems
c) They have predictable energy output
d) They are renewable energy sources

4) What is the primary principle of operation for tidal power stations?
a) Solar energy conversion
b) Kinetic and potential energy of tides
c) Wind energy harnessing
d) Geothermal energy extraction

5) What is the primary component of a hydro power project?
a) Solar Panels
b) Turbine
c) Wind Turbine
d) Geothermal Pump

6) Which type of power station primarily uses fossil fuels?
a) Nuclear Power Station
b) Hydro Power Station
c) Thermal Power Station
d) Wind Power Station

7) Which of the following is a renewable source of energy?
a) Coal
b) Natural Gas
c) Solar Energy
d) Nuclear Energy

8) In a pumped storage hydroelectric scheme, water is _____.
a) Only used once
b) Stored in a reservoir and used to generate electricity when needed
c) Constantly flowing downriver
d) Used for irrigation only

9) What does the load factor indicate?
a) The ratio of maximum demand to average demand
b) The total energy produced in a year
c) The efficiency of a power plant
d) The proportion of time a plant operates at full capacity

10) What is the primary function of a trash rack in an intake structure?
a) To regulate water flow
b) To filter debris and prevent blockages
c) To control the water level in a reservoir
d) To measure water quality

11) What is the primary advantage of hydro power plants?
a) High carbon emissions
b) Low operating costs and renewable energy source
c) Dependency on fossil fuels
d) None of the Above

12) What is "firm power"?
a) Power that can be guaranteed to be available at all times
b) Power generated from renewable sources only
c) The total capacity of a power plant
d) Power that varies with demand

13) What is the basic equation used to estimate hydro power potential?
a) $P = IV$
b) $P = \eta \times \rho \times g \times Q \times H$
c) $P = E/t$
d) $P = mgh$

14) What is the primary purpose of a pumped storage plant?

a) To provide constant power generation
b) To store energy by moving water between two reservoirs
c) To filter and purify water
d) To generate electricity from wind

SLR-QH-300

Seat No.	

Set R

Fourth. Y. (B.Tech.) (Civil Engineering) (Sem- I) (New) (CBCS)
Examination: March/April – 2026
Water Power Engineering (BTN01715)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever necessary.
4) Draw neat, labeled diagrams wherever necessary.
5) Use of only non-programmable calculators is allowed.

Section – I

Q.2 Attempt Any Four of the following questions. **16**

a) What are the different classifications of sources in India?

b) What factors should be considered when estimating hydro power potential in India?

c) State the function of hydro power schemes and draw the general layout of various hydropower scheme.

d) Common load shared by two stations base load plant with 20 MW capacity and other being standby plant with 25 MW capacity. The yearly output for base load station is 120×10^6 KWh, and for standby station is 10.5×10^6 KWh. The peak load taken by standby station is 20 MW which works for 2500 hrs during the year. The base load station takes peak load as 25.5 MW. Calculate annual load factor, plant use factor, and capacity factor for both the stations.

e) Calculate the power factor for a utility to supply a maximum 1500 kW of real power, when the reactive power at that time is 1200 kVAR.

Q.3 Attempt Any Two of the following questions. **12**

a) A penstock pipe, 700 m long, takes off from a reservoir and feeds water to turbine, the level of which is 210 m below the reservoir water level. The first 225 m length of the penstock has a cross section area of 5 m^2 and the rest has an area of 3 m^2. The steady state discharge is 09m^3/sec. If the turbine gates are closed completely in 4.5 seconds at a uniform rate, what would be the water hammer pressure developed? (from Allieri chart $= Z^2 = 1.32$)

b) Explain in brief with diagram the following:
i) Forebay
ii) Intake structure
iii) Tail Race

c) What is water hammer in a pipe line? Derive the expression for the water hammer pressure in case of rigid pipe and elastic pipe.

d) A penstock, with an internal diameter of 1.30m, supplies water at a head equivalent to 17.6kg/cm^2. There is a possibility of 20% increase in the pressure due to transient conditions. The design stress and the efficiency of the joint may be assumed to be 1150 kg/cm^2 and 80%, respectively. Calculate the approximate wall thickness of the penstock required.

Section – II

Q.4 Attempt any four of the following questions. **16**

a) Classify the different types of surge tank? Explain any one with sketch.

b) What do you understand by 'pumped storage' plant? What are the advantages and disadvantages of this power plant?

c) A Pelton wheel having a mean bucket diameter of 1.2m is running at 1000rpm. The net head on Pelton wheel is 840m. if the side clearance angle is 15° and discharge through nozzle is 0.12m^3/s. (Take Cv = 1) Determine,

i) Power available at the nozzle.
ii) Hydraulic efficiency of turbine.

d) Power house is equipped with 4 units of vertical shaft Pelton turbines to be coupled with 69000 kVA, 3 phase. 50 hertz generators. The generation is provided with 10 pairs of poles. The gross design head is 505 m and transmission efficiency of head race tunnel and penstocks together is to be 94 percent.
The four units together will provide for a power of 256000 KW at a guaranteed efficiency of 91 percent. The nozzle efficiency is 0.98.
Find:

i) the design discharge for the turbine,
ii) jet dia. and no. of jets,
iii) the nozzle tip diameter
iv) the pitch circle dia. of the wheel
v) the specific speed and
vi) number of buckets on the wheel

e) Can you compare the different types of intake structures and their applications?

Q.5 Attempt Any Two of the following questions. **12**

a) What are the important types of turbines? Enlist the factors on which choice of turbine depends.

b) Describe the tidal cycle and explain how it affects the feasibility of tidal power generation, including its limitations.

c) At a hydroelectric power station Kaplan turbine is used which has following data,
Operating head = 23.5m
output power at this head = 120 MW,
discharge = 625 m3/sec
speed = 68 rpm,
Runner tip to tip diameter = 9.5 m
Hub diameter = 4.5m
Number of blades = 6,
calculate the speed ratio, flow ratio, and the overall efficiency.

SLR-QH-300

Seat No.		Set	S

Fourth. Y. (B.Tech.) (Civil Engineering) (Sem - I) (New) (CBCS)
Examination: March/April - 2026
Water Power Engineering (BTN01715)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data wherever necessary.
5) Use of only non-programmable calculators is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) What is the primary function of a trash rack in an intake structure?
a) To regulate water flow
b) To filter debris and prevent blockages
c) To control the water level in a reservoir
d) To measure water quality

2) What is the primary advantage of hydro power plants?
a) High carbon emissions
b) Low operating costs and renewable energy source
c) Dependency on fossil fuels
d) None of the Above

3) What is "firm power"?
a) Power that can be guaranteed to be available at all times
b) Power generated from renewable sources only
c) The total capacity of a power plant
d) Power that varies with demand

4) What is the basic equation used to estimate hydro power potential?
a) $P = IV$ b) $P = \eta \times \rho \times g \times Q \times H$
c) $P = E/t$ d) $P = mgh$

5) What is the primary purpose of a pumped storage plant?
a) To provide constant power generation
b) To store energy by moving water between two reservoirs
c) To filter and purify water
d) To generate electricity from wind

6) What is a significant disadvantage of pumped storage plants?
   a) High initial capital costs
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7) What is the primary environmental concern associated with tidal power stations?
   a) Air pollution
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8) Which of the following is a disadvantage of tidal power stations?
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12) Which of the following is a renewable source of energy?
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14) What does the load factor indicate?
   a) The ratio of maximum demand to average demand
   b) The total energy produced in a year
   c) The efficiency of a power plant
   d) The proportion of time a plant operates at full capacity

Seat No.	

Set **S**

Fourth. Y. (B.Tech.) (Civil Engineering) (Sem- I) (New) (CBCS)
Examination: March/April – 2026
Water Power Engineering (BTN01715)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever necessary.
4) Draw neat, labeled diagrams wherever necessary.
5) Use of only non-programmable calculators is allowed.

Section – I

Q.2 Attempt Any Four of the following questions. **16**

a) What are the different classifications of sources in India?

b) What factors should be considered when estimating hydro power potential in India?

c) State the function of hydro power schemes and draw the general layout of various hydropower scheme.

d) Common load shared by two stations base load plant with 20 MW capacity and other being standby plant with 25 MW capacity. The yearly output for base load station is 120×10^6 KWh, and for standby station is 10.5×10^6 KWh. The peak load taken by standby station is 20 MW which works for 2500 hrs during the year. The base load station takes peak load as 25.5 MW. Calculate annual load factor, plant use factor, and capacity factor for both the stations.

e) Calculate the power factor for a utility to supply a maximum 1500 kW of real power, when the reactive power at that time is 1200 kVAR.

Q.3 Attempt Any Two of the following questions. **12**

a) A penstock pipe, 700 m long, takes off from a reservoir and feeds water to turbine, the level of which is 210 m below the reservoir water level. The first 225 m length of the penstock has a cross section area of 5 m^2 and the rest has an area of 3 m^2. The steady state discharge is 09m^3/sec. If the turbine gates are closed completely in 4.5 seconds at a uniform rate, what would be the water hammer pressure developed? (from Allieri chart $= Z^2 = 1.32$)

b) Explain in brief with diagram the following:
i) Forebay
ii) Intake structure
iii) Tail Race

c) What is water hammer in a pipe line? Derive the expression for the water hammer pressure in case of rigid pipe and elastic pipe.

d) A penstock, with an internal diameter of 1.30m, supplies water at a head equivalent to 17.6kg/cm^2. There is a possibility of 20% increase in the pressure due to transient conditions. The design stress and the efficiency of the joint may be assumed to be 1150 kg/cm^2 and 80%, respectively. Calculate the approximate wall thickness of the penstock required.

Section – II

Q.4 Attempt any four of the following questions. **16**

a) Classify the different types of surge tank? Explain any one with sketch.

b) What do you understand by 'pumped storage' plant? What are the advantages and disadvantages of this power plant?

c) A Pelton wheel having a mean bucket diameter of 1.2m is running at 1000rpm. The net head on Pelton wheel is 840m. if the side clearance angle is 15° and discharge through nozzle is 0.12m^3/s. (Take Cv = 1) Determine,

i) Power available at the nozzle.
ii) Hydraulic efficiency of turbine.

d) Power house is equipped with 4 units of vertical shaft Pelton turbines to be coupled with 69000 kVA, 3 phase. 50 hertz generators. The generation is provided with 10 pairs of poles. The gross design head is 505 m and transmission efficiency of head race tunnel and penstocks together is to be 94 percent.
The four units together will provide for a power of 256000 KW at a guaranteed efficiency of 91 percent. The nozzle efficiency is 0.98.
Find:

i) the design discharge for the turbine,
ii) jet dia. and no. of jets,
iii) the nozzle tip diameter
iv) the pitch circle dia. of the wheel
v) the specific speed and
vi) number of buckets on the wheel

e) Can you compare the different types of intake structures and their applications?

Q.5 Attempt Any Two of the following questions. **12**

a) What are the important types of turbines? Enlist the factors on which choice of turbine depends.

b) Describe the tidal cycle and explain how it affects the feasibility of tidal power generation, including its limitations.

c) At a hydroelectric power station Kaplan turbine is used which has following data,
Operating head = 23.5m
output power at this head = 120 MW,
discharge = 625 m3/sec
speed = 68 rpm,
Runner tip to tip diameter = 9.5 m
Hub diameter = 4.5m
Number of blades = 6,
calculate the speed ratio, flow ratio, and the overall efficiency.

SLR-QH-301

Seat No.	

Set P

Fourth. Y. (B.Tech.) (Civil Engineering) (Sem- I) (New) (CBCS)
Examination: March/April – 2026
Air and Noise Pollution and Control (BTN01716)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) _____ is commonly found carcinogenic indoor pollutant.
a) Ozone b) Radon
c) Both a) and b) d) Uranium

2) In cyclone gas flow reverses from _____ part.
a) Vortex finder b) Conical
c) Cylindrical d) Outlet

3) In ESP particulates are separated by virtue of _____ action.
a) Gravitational acceleration b) centrifugal
c) Electrostatic d) diffusion

4) Velocity of gas flow in gravity settler should be less than _____ m/s for excellent results.
a) 0.3 b) 0.5
c) 3.1 d) 10

5) _____ prevents upward movement of air pollutants if it exists in atmosphere.
a) DALR b) Wind
c) Clouds d) An inversion

6) In tray type gravity settler, trays are fixed to _____ the efficiency.
a) Decrease b) Increase
c) Keep Constant d) None of above

7) Photochemical smog commonly occurs in _____ area.
a) Urban
b) Motorized
c) Both a) and b)
d) None of these

8) Bags in bag house filter are _____ m in length.
a) 12-40
b) 10-15
c) 15-20
d) 2-10

9) As per NAAQS (2009), standard for PM_{10} for industrial area considering annual average is _____ micrograms/m^3.
a) 60
b) 100
c) 8
d) 800

10) The depletion of ozone in outer atmosphere may result in increased _____.
a) Heart attack cases
b) Skin cancer cases
c) Asthma cases
d) None of these

11) Concentration of pollutants in stack emissions can be measured by _____.
a) High volume sampler
b) Stack monitoring kit
c) Thermometer
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12) Formation and destruction of ozone in the atmosphere can be explained by _____ reactions.
a) Hofmann
b) Chapman
c) Dobson
d) Hudson

13) Noise pollution is created if sound is in excess to _____.
a) 70−75 dB
b) 50−60 dB
c) 80−99 dB
d) 40−65 dB

14) Day time noise standard prescribed for residential areas in India is _____.
a) 75 dB
b) 65 dB
c) 50 dB
d) 55 dB

SLR-QH-301

Seat No.		Set	P

Fourth. Y. (B.Tech.) (Civil Engineering) (Sem- I) (New) (CBCS)
Examination: March/April – 2026
Air and Noise Pollution and Control (BTN01716)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 2 & Q. No. 6 are compulsory and attempt any two questions from the remaining questions from each section.
2) Figure to the right indicate full marks.
3) Assume suitable data if necessary and mention it clearly.

Section – I

Q.2 **a)** What are different zones of atmosphere? Explain with the help of neat graph. **05**

b) Explain Air pollution meaning as per BIS. Discuss importance of air quality study. **05**

Q.3 **a)** Discuss effect of SO2 in presence of SPM on human health with the help of tabular format. **05**

b) What is meant by radiation inversion and subsidence inversion? Explain with sketch. **04**

Q.4 **a)** Give Gaussian dispersion model equation used for prediction of concentration of air pollutants. **04**

b) A factory uses 150000 litre of fuel oil per month. The exhaust gases from factory contain the following quantities of pollutant per ML per year: **05**

i) Particulate matter= 3 tonnes
ii) Sulphur dioxide= 59.7 tonnes
iii) Hydrocarbons= 0.37 tonnes
iv) Carbon monoxide= 0.52 tonnes

Determine the safe height of chimney required for safe dispersion of pollutants.

Q.5 **a)** Enlist components of stack monitoring kit. Explain with neat diagram what is sampling train? **04**

b) A conventional cyclone with diameter 1 m handles $3m^3$/sec of air carrying particles of density 1900 kg/m^3. Number of effective turns = 6. Determine cut size diameter (dpc) if $\mu = 1.85\times10^{-5}$ kg/m.sec. (Note - treat it as a standard cyclone). **05**

Section – II

Q.6 **a)** Explain with the help of neat sketch 'standard cyclone'. **05**

b) A settling chamber is designed for removing 90 μ dia. Particles with 100% efficiency. The particulate matter density is 1300 kg/m3. Depth and width of chamber is 2.2 m each. Determine: **05**

i) Length of chamber required without trays.

ii) Length of chamber with 10 trays.

Q.7 **a)** An ESP with overall spacing of 0.24 cm and mean gas velocity 1.4 m/s has collector plate area of 5500 m^2 gives efficiency of 96% in treating 200 m3/s of gas. To achieve 98% and 99% efficiency. What should be plate area required? **05**

b) Explain working of ESP with neat sketch. **04**

Q.8 **a)** Write 'absorption' as a gaseous control technique. **04**

b) Explain decibel scale with sample sound level and frequency of sound waves. **05**

Q.9 **Write short notes. (Any Three)** **09**

a) National ambient quality standards for noise.

b) Sources of noise.

c) Instrumentation Requirements in noise.

d) The Air act, 1981

Seat No.	

Set **Q**

Fourth. Y. (B.Tech.) (Civil Engineering) (Sem- I) (New) (CBCS)
Examination: March/April – 2026
Air and Noise Pollution and Control (BTN01716)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) Bags in bag house filter are _____ m in length.
a) 12-40 b) 10-15
c) 15-20 d) 2-10

2) As per NAAQS (2009), standard for PM_{10} for industrial area considering annual average is _____ micrograms/m^3.
a) 60 b) 100
c) 8 d) 800

3) The depletion of ozone in outer atmosphere may result in increased _____.
a) Heart attack cases b) Skin cancer cases
c) Asthma cases d) None of these

4) Concentration of pollutants in stack emissions can be measured by _____.
a) High volume sampler b) Stack monitoring kit
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5) Formation and destruction of ozone in the atmosphere can be explained by _____ reactions.
a) Hofmann b) Chapman
c) Dobson d) Hudson

6) Noise pollution is created if sound is in excess to _____.
a) 70−75 dB b) 50−60 dB
c) 80−99 dB d) 40−65 dB

7) Day time noise standard prescribed for residential areas in India is _____.
a) 75 dB b) 65 dB
c) 50 dB d) 55 dB

8) _____ is commonly found carcinogenic indoor pollutant.
a) Ozone b) Radon
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9) In cyclone gas flow reverses from _____ part.
a) Vortex finder b) Conical
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10) In ESP particulates are separated by virtue of _____ action.
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13) In tray type gravity settler, trays are fixed to _____ the efficiency.
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c) Keep Constant d) None of above

14) Photochemical smog commonly occurs in _____ area.
a) Urban b) Motorized
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Seat No.	

Set **Q**

Fourth. Y. (B.Tech.) (Civil Engineering) (Sem- I) (New) (CBCS)
Examination: March/April – 2026
Air and Noise Pollution and Control (BTN01716)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 2 & Q. No. 6 are compulsory and attempt any two questions from the remaining questions from each section.
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Section – I

Q.2 **a)** What are different zones of atmosphere? Explain with the help of neat graph. **05**

b) Explain Air pollution meaning as per BIS. Discuss importance of air quality study. **05**

Q.3 **a)** Discuss effect of SO2 in presence of SPM on human health with the help of tabular format. **05**

b) What is meant by radiation inversion and subsidence inversion? Explain with sketch. **04**

Q.4 **a)** Give Gaussian dispersion model equation used for prediction of concentration of air pollutants. **04**

b) A factory uses 150000 litre of fuel oil per month. The exhaust gases from factory contain the following quantities of pollutant per ML per year: **05**

i) Particulate matter= 3 tonnes
ii) Sulphur dioxide= 59.7 tonnes
iii) Hydrocarbons= 0.37 tonnes
iv) Carbon monoxide= 0.52 tonnes

Determine the safe height of chimney required for safe dispersion of pollutants.

Q.5 **a)** Enlist components of stack monitoring kit. Explain with neat diagram what is sampling train? **04**

b) A conventional cyclone with diameter 1 m handles $3m^3$/sec of air carrying particles of density 1900 kg/m^3. Number of effective turns = 6. Determine cut size diameter (dpc) if $\mu = 1.85\times10^{-5}$ kg/m.sec. (Note - treat it as a standard cyclone). **05**

Section – II

Q.6 **a)** Explain with the help of neat sketch 'standard cyclone'. **05**

b) A settling chamber is designed for removing 90 μ dia. Particles with 100% efficiency. The particulate matter density is 1300 kg/m3. Depth and width of chamber is 2.2 m each. Determine: **05**

i) Length of chamber required without trays.

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Q.7 **a)** An ESP with overall spacing of 0.24 cm and mean gas velocity 1.4 m/s has collector plate area of 5500 m^2 gives efficiency of 96% in treating 200 m3/s of gas. To achieve 98% and 99% efficiency. What should be plate area required? **05**

b) Explain working of ESP with neat sketch. **04**

Q.8 **a)** Write 'absorption' as a gaseous control technique. **04**

b) Explain decibel scale with sample sound level and frequency of sound waves. **05**

Q.9 **Write short notes. (Any Three)** **09**

a) National ambient quality standards for noise.

b) Sources of noise.

c) Instrumentation Requirements in noise.

d) The Air act, 1981

SLR-QH-301

Seat No.	

Set R

Fourth. Y. (B.Tech.) (Civil Engineering) (Sem- I) (New) (CBCS)
Examination: March/April – 2026
Air and Noise Pollution and Control (BTN01716)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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3) Figures to the right indicates full marks.
4) Assume suitable whenever needed and mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) Concentration of pollutants in stack emissions can be measured by _____.
a) High volume sampler b) Stack monitoring kit
c) Thermometer d) Hygrometer

2) Formation and destruction of ozone in the atmosphere can be explained by _____ reactions.
a) Hofmann b) Chapman
c) Dobson d) Hudson

3) Noise pollution is created if sound is in excess to _____.
a) 70−75 dB b) 50−60 dB
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4) Day time noise standard prescribed for residential areas in India is _____.
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5) _____ is commonly found carcinogenic indoor pollutant.
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6) In cyclone gas flow reverses from _____ part.
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9) _____ prevents upward movement of air pollutants if it exists in atmosphere.
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10) In tray type gravity settler, trays are fixed to _____ the efficiency.
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12) Bags in bag house filter are _____ m in length.
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13) As per NAAQS (2009), standard for PM_{10} for industrial area considering annual average is _____ micrograms/m^3.
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SLR-QH-301

Seat No.		Set	R

Fourth. Y. (B.Tech.) (Civil Engineering) (Sem- I) (New) (CBCS)
Examination: March/April – 2026
Air and Noise Pollution and Control (BTN01716)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 2 & Q. No. 6 are compulsory and attempt any two questions from the remaining questions from each section.
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Section – I

Q.2 **a)** What are different zones of atmosphere? Explain with the help of neat graph. **05**

b) Explain Air pollution meaning as per BIS. Discuss importance of air quality study. **05**

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b) What is meant by radiation inversion and subsidence inversion? Explain with sketch. **04**

Q.4 **a)** Give Gaussian dispersion model equation used for prediction of concentration of air pollutants. **04**

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iv) Carbon monoxide= 0.52 tonnes

Determine the safe height of chimney required for safe dispersion of pollutants.

Q.5 **a)** Enlist components of stack monitoring kit. Explain with neat diagram what is sampling train? **04**

b) A conventional cyclone with diameter 1 m handles $3m^3$/sec of air carrying particles of density 1900 kg/m^3. Number of effective turns = 6. Determine cut size diameter (dpc) if $\mu = 1.85\times10^{-5}$ kg/m.sec. (Note - treat it as a standard cyclone). **05**

Section – II

Q.6 **a)** Explain with the help of neat sketch 'standard cyclone'. **05**

b) A settling chamber is designed for removing 90 μ dia. Particles with 100% efficiency. The particulate matter density is 1300 kg/m3. Depth and width of chamber is 2.2 m each. Determine: **05**

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Q.7 **a)** An ESP with overall spacing of 0.24 cm and mean gas velocity 1.4 m/s has collector plate area of 5500 m^2 gives efficiency of 96% in treating 200 m3/s of gas. To achieve 98% and 99% efficiency. What should be plate area required? **05**

b) Explain working of ESP with neat sketch. **04**

Q.8 **a)** Write 'absorption' as a gaseous control technique. **04**

b) Explain decibel scale with sample sound level and frequency of sound waves. **05**

Q.9 **Write short notes. (Any Three)** **09**

a) National ambient quality standards for noise.

b) Sources of noise.

c) Instrumentation Requirements in noise.

d) The Air act, 1981

Seat No.	

Set **S**

Fourth. Y. (B.Tech.) (Civil Engineering) (Sem- I) (New) (CBCS)
Examination: March/April – 2026
Air and Noise Pollution and Control (BTN01716)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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3) Figures to the right indicates full marks.
4) Assume suitable whenever needed and mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) In tray type gravity settler, trays are fixed to _____ the efficiency.
a) Decrease b) Increase
c) Keep Constant d) None of above

2) Photochemical smog commonly occurs in _____ area.
a) Urban b) Motorized
c) Both a) and b) d) None of these

3) Bags in bag house filter are _____ m in length.
a) 12-40 b) 10-15
c) 15-20 d) 2-10

4) As per NAAQS (2009), standard for PM_{10} for industrial area considering annual average is _____ micrograms/m^3.
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10) _____ is commonly found carcinogenic indoor pollutant.
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c) Clouds d) An inversion

SLR-QH-301

Seat No.		Set	S

Fourth. Y. (B.Tech.) (Civil Engineering) (Sem- I) (New) (CBCS)
Examination: March/April – 2026
Air and Noise Pollution and Control (BTN01716)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 2 & Q. No. 6 are compulsory and attempt any two questions from the remaining questions from each section.
2) Figure to the right indicate full marks.
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Section – I

Q.2 **a)** What are different zones of atmosphere? Explain with the help of neat graph. **05**

b) Explain Air pollution meaning as per BIS. Discuss importance of air quality study. **05**

Q.3 **a)** Discuss effect of SO2 in presence of SPM on human health with the help of tabular format. **05**

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b) A factory uses 150000 litre of fuel oil per month. The exhaust gases from factory contain the following quantities of pollutant per ML per year: **05**

i) Particulate matter= 3 tonnes
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Determine the safe height of chimney required for safe dispersion of pollutants.

Q.5 **a)** Enlist components of stack monitoring kit. Explain with neat diagram what is sampling train? **04**

b) A conventional cyclone with diameter 1 m handles $3m^3$/sec of air carrying particles of density 1900 kg/m^3. Number of effective turns = 6. Determine cut size diameter (dpc) if $\mu = 1.85\times10^{-5}$ kg/m.sec. (Note - treat it as a standard cyclone). **05**

Section – II

Q.6 **a)** Explain with the help of neat sketch 'standard cyclone'. **05**

b) A settling chamber is designed for removing 90 μ dia. Particles with 100% efficiency. The particulate matter density is 1300 kg/m3. Depth and width of chamber is 2.2 m each. Determine: **05**

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b) Explain working of ESP with neat sketch. **04**

Q.8 **a)** Write 'absorption' as a gaseous control technique. **04**

b) Explain decibel scale with sample sound level and frequency of sound waves. **05**

Q.9 **Write short notes. (Any Three)** **09**

a) National ambient quality standards for noise.

b) Sources of noise.

c) Instrumentation Requirements in noise.

d) The Air act, 1981

SLR-QH-302

Seat No.	

Set P

Fourth. Y. (B.Tech.) (Civil Engineering) (Sem- I) (New) (CBCS)
Examination: March/April – 2026
Recovery, Rehabilitation and Reconstruction (BTN01717)

Day & Date: Monday, 11-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) What is the primary purpose of insurance in disaster risk management?
a) To create financial burdens for individuals
b) To transfer and manage the financial risks associated with disasters
c) To discourage risk reduction efforts
d) To ignore the impact of disasters

2) Which of the following best describes *Rehabilitation* in disaster management?
a) Rebuilding only the physical infrastructure
b) Temporary arrangement for relief work
c) Long-term process to restore normal life and livelihood
d) Providing early warning systems

3) The National Disaster Management Authority (NDMA) is headed by _____.
a) Prime Minister of India b) President of India
c) Governor of States d) Chief Minister of States

4) Disaster Management includes _____.
a) Mitigation b) Reconstruction
c) Rehabilitation d) All of the Above

5) Which traditional construction material is known for its earthquake resistance?
a) Bamboo b) Mud bricks
c) Timber d) Concrete

6) Fiscal discipline refers to _____.
   a) Strict control over public spending
   b) Generous spending on public projects
   c) Reducing taxes without considering the budget
   d) Unrestricted borrowing for development projects

7) What is the primary goal of socio-economic rehabilitation?
   a) Preservation of cultural heritage
   b) Restoration of physical health
   c) Restoration of economic and social well-being
   d) Implementation of new policies

8) In the aftermath of a natural disaster, which aspect of socio-economic rehabilitation is crucial for long-term resilience?
   a) Short-term financial aid
   b) Infrastructure reconstruction
   c) Community empowerment
   d) Technological advancements

9) Which phase of disaster management involves restoring the affected community to a stable and sustainable state?
   a) Response
   b) Preparedness
   c) Recovery
   d) Mitigation

10) How can microfinance initiatives contribute to livelihood restoration?
   a) By creating dependency on external aid
   b) By promoting unequal distribution of resources
   c) By providing financial support for small businesses and entrepreneurs
   d) By discouraging local entrepreneurship

11) The *recovery phase* in disaster management primarily aims at _____.
   a) Conducting rescue operations
   b) Rebuilding and restoring normal life
   c) Providing early warning systems
   d) Conducting mock drills

12) What is a primary concern regarding drinking water during a disaster?
   a) Over hydration
   b) Contamination
   c) Lack of taste
   d) Excessive fluoride content

13) What is the purpose of a shear wall in earthquake-resistant house?
   a) To resist wind loads
   b) To provide insulation
   c) To enhance aesthetics
   d) To resist lateral forces during earthquakes

14) Community-Based Disaster Management (CBDM) mainly emphasizes _____.

a) External expert-driven response
b) Top-down decision-making
c) Empowering local communities to manage disasters
d) Ignoring traditional knowledge

SLR-QH-302

Seat No.	

Set P

Fourth. Y. (B.Tech.) (Civil Engineering) (Sem- I) (New) (CBCS)
Examination: March/April – 2026
Recovery, Rehabilitation and Reconstruction (BTN01717)

Day & Date: Monday, 11-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q.2 is compulsory; answer any two from remaining questions from Section - I.
2) Q.6 is compulsory; answer any two from remaining questions from Section - II.
3) Figures to the right indicate full marks.

SECTION – I

Q.2	**a)**	Write short note on Rehabilitation.	**04**
	b)	Write the roles of Local elected bodies in rehabilitation.	**03**
	c)	What is fiscal discipline in disaster management financing?	**03**
Q.3	**a)**	Write short note pre-disaster phase of disaster management.	**05**
	b)	Give the classification of damage as per the MSK scale.	**04**
Q.4	**a)**	What do you mean by Social Infrastructure? Explain development of Social Infrastructure.	**05**
	b)	Write Key elements of contingency plans for reconstructions.	**04**
Q.5	**a)**	Briefly Explain Earthquake Resistant Construction Techniques.	**05**
	b)	What are the methods of Community Mobilization for Resource Generation?	**04**

SECTION – II

Q.6	**a)**	What is Role of Information Dissemination?	**04**
	b)	Explain short term, medium term & long-term phases of Recovery.	**03**
	c)	Which life skills are required in Disaster Management.	**03**
Q.7	**a)**	Explain the key steps of Evaluation of Rehabilitation work.	**05**
	b)	Explain Economic rehabilitation in detail.	**04**

Q.8	**a)**	How can recovery be linked with safe development? Discuss the concept of “Build Back Better” with examples.	**05**
	b)	What is Livelihood? Why Livelihood Restoration is important?	**04**
Q.9	**a)**	How do individuals, communities, and institutions typically respond to disasters?	**05**
	b)	Why Time Management Skills is important in Disaster Management?	**04**

Seat No.	

Set **Q**

Fourth. Y. (B.Tech.) (Civil Engineering) (Sem- I) (New) (CBCS)
Examination: March/April – 2026
Recovery, Rehabilitation and Reconstruction (BTN01717)

Day & Date: Monday, 11-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

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d) Excessive fluoride content

6) What is the purpose of a shear wall in earthquake-resistant house?
   a) To resist wind loads
   b) To provide insulation
   c) To enhance aesthetics
   d) To resist lateral forces during earthquakes

7) Community-Based Disaster Management (CBDM) mainly emphasizes _____.
   a) External expert-driven response
   b) Top-down decision-making
   c) Empowering local communities to manage disasters
   d) Ignoring traditional knowledge

8) What is the primary purpose of insurance in disaster risk management?
   a) To create financial burdens for individuals
   b) To transfer and manage the financial risks associated with disasters
   c) To discourage risk reduction efforts
   d) To ignore the impact of disasters

9) Which of the following best describes *Rehabilitation* in disaster management?
   a) Rebuilding only the physical infrastructure
   b) Temporary arrangement for relief work
   c) Long-term process to restore normal life and livelihood
   d) Providing early warning systems

10) The National Disaster Management Authority (NDMA) is headed by _____.
   a) Prime Minister of India
   b) President of India
   c) Governor of States
   d) Chief Minister of States

11) Disaster Management includes _____.
   a) Mitigation
   b) Reconstruction
   c) Rehabilitation
   d) All of the Above

12) Which traditional construction material is known for its earthquake resistance?
   a) Bamboo
   b) Mud bricks
   c) Timber
   d) Concrete

13) Fiscal discipline refers to _____.
   a) Strict control over public spending
   b) Generous spending on public projects
   c) Reducing taxes without considering the budget
   d) Unrestricted borrowing for development projects

14) What is the primary goal of socio-economic rehabilitation?

a) Preservation of cultural heritage
b) Restoration of physical health
c) Restoration of economic and social well-being
d) Implementation of new policies

SLR-QH-302

Seat No.	

Set Q

Fourth. Y. (B.Tech.) (Civil Engineering) (Sem- I) (New) (CBCS)
Examination: March/April – 2026
Recovery, Rehabilitation and Reconstruction (BTN01717)

Day & Date: Monday, 11-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q.2 is compulsory; answer any two from remaining questions from Section - I.
2) Q.6 is compulsory; answer any two from remaining questions from Section - II.
3) Figures to the right indicate full marks.

SECTION – I

Q.2	**a)**	Write short note on Rehabilitation.	**04**
	b)	Write the roles of Local elected bodies in rehabilitation.	**03**
	c)	What is fiscal discipline in disaster management financing?	**03**
Q.3	**a)**	Write short note pre-disaster phase of disaster management.	**05**
	b)	Give the classification of damage as per the MSK scale.	**04**
Q.4	**a)**	What do you mean by Social Infrastructure? Explain development of Social Infrastructure.	**05**
	b)	Write Key elements of contingency plans for reconstructions.	**04**
Q.5	**a)**	Briefly Explain Earthquake Resistant Construction Techniques.	**05**
	b)	What are the methods of Community Mobilization for Resource Generation?	**04**

SECTION – II

Q.6	**a)**	What is Role of Information Dissemination?	**04**
	b)	Explain short term, medium term & long-term phases of Recovery.	**03**
	c)	Which life skills are required in Disaster Management.	**03**
Q.7	**a)**	Explain the key steps of Evaluation of Rehabilitation work.	**05**
	b)	Explain Economic rehabilitation in detail.	**04**

Q.8	**a)**	How can recovery be linked with safe development? Discuss the concept of “Build Back Better” with examples.	**05**
	b)	What is Livelihood? Why Livelihood Restoration is important?	**04**
Q.9	**a)**	How do individuals, communities, and institutions typically respond to disasters?	**05**
	b)	Why Time Management Skills is important in Disaster Management?	**04**

Seat No.	

Set | **R**

Fourth. Y. (B.Tech.) (Civil Engineering) (Sem- I) (New) (CBCS)
Examination: March/April – 2026
Recovery, Rehabilitation and Reconstruction (BTN01717)

Day & Date: Monday, 11-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) The *recovery phase* in disaster management primarily aims at _____.
a) Conducting rescue operations
b) Rebuilding and restoring normal life
c) Providing early warning systems
d) Conducting mock drills

2) What is a primary concern regarding drinking water during a disaster?
a) Over hydration b) Contamination
c) Lack of taste d) Excessive fluoride content

3) What is the purpose of a shear wall in earthquake-resistant house?
a) To resist wind loads
b) To provide insulation
c) To enhance aesthetics
d) To resist lateral forces during earthquakes

4) Community-Based Disaster Management (CBDM) mainly emphasizes _____.
a) External expert-driven response
b) Top-down decision-making
c) Empowering local communities to manage disasters
d) Ignoring traditional knowledge

5) What is the primary purpose of insurance in disaster risk management?
a) To create financial burdens for individuals
b) To transfer and manage the financial risks associated with disasters
c) To discourage risk reduction efforts
d) To ignore the impact of disasters

6) Which of the following best describes *Rehabilitation* in disaster management?
   a) Rebuilding only the physical infrastructure
   b) Temporary arrangement for relief work
   c) Long-term process to restore normal life and livelihood
   d) Providing early warning systems

7) The National Disaster Management Authority (NDMA) is headed by _____.
   a) Prime Minister of India
   b) President of India
   c) Governor of States
   d) Chief Minister of States

8) Disaster Management includes _____.
   a) Mitigation
   b) Reconstruction
   c) Rehabilitation
   d) All of the Above

9) Which traditional construction material is known for its earthquake resistance?
   a) Bamboo
   b) Mud bricks
   c) Timber
   d) Concrete

10) Fiscal discipline refers to _____.
   a) Strict control over public spending
   b) Generous spending on public projects
   c) Reducing taxes without considering the budget
   d) Unrestricted borrowing for development projects

11) What is the primary goal of socio-economic rehabilitation?
   a) Preservation of cultural heritage
   b) Restoration of physical health
   c) Restoration of economic and social well-being
   d) Implementation of new policies

12) In the aftermath of a natural disaster, which aspect of socio-economic rehabilitation is crucial for long-term resilience?
   a) Short-term financial aid
   b) Infrastructure reconstruction
   c) Community empowerment
   d) Technological advancements

13) Which phase of disaster management involves restoring the affected community to a stable and sustainable state?
   a) Response
   b) Preparedness
   c) Recovery
   d) Mitigation

14) How can microfinance initiatives contribute to livelihood restoration?
   a) By creating dependency on external aid
   b) By promoting unequal distribution of resources
   c) By providing financial support for small businesses and entrepreneurs
   d) By discouraging local entrepreneurship

SLR-QH-302

Seat No.	

Set R

Fourth. Y. (B.Tech.) (Civil Engineering) (Sem- I) (New) (CBCS)
Examination: March/April – 2026
Recovery, Rehabilitation and Reconstruction (BTN01717)

Day & Date: Monday, 11-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q.2 is compulsory; answer any two from remaining questions from Section - I.
2) Q.6 is compulsory; answer any two from remaining questions from Section - II.
3) Figures to the right indicate full marks.

SECTION – I

Q.2	**a)**	Write short note on Rehabilitation.	**04**
	b)	Write the roles of Local elected bodies in rehabilitation.	**03**
	c)	What is fiscal discipline in disaster management financing?	**03**
Q.3	**a)**	Write short note pre-disaster phase of disaster management.	**05**
	b)	Give the classification of damage as per the MSK scale.	**04**
Q.4	**a)**	What do you mean by Social Infrastructure? Explain development of Social Infrastructure.	**05**
	b)	Write Key elements of contingency plans for reconstructions.	**04**
Q.5	**a)**	Briefly Explain Earthquake Resistant Construction Techniques.	**05**
	b)	What are the methods of Community Mobilization for Resource Generation?	**04**

SECTION – II

Q.6	**a)**	What is Role of Information Dissemination?	**04**
	b)	Explain short term, medium term & long-term phases of Recovery.	**03**
	c)	Which life skills are required in Disaster Management.	**03**
Q.7	**a)**	Explain the key steps of Evaluation of Rehabilitation work.	**05**
	b)	Explain Economic rehabilitation in detail.	**04**

Q.8	**a)**	How can recovery be linked with safe development? Discuss the concept of “Build Back Better” with examples.	**05**
	b)	What is Livelihood? Why Livelihood Restoration is important?	**04**
Q.9	**a)**	How do individuals, communities, and institutions typically respond to disasters?	**05**
	b)	Why Time Management Skills is important in Disaster Management?	**04**

SLR-QH-302

Seat No.	

Set S

Fourth. Y. (B.Tech.) (Civil Engineering) (Sem- I) (New) (CBCS)
Examination: March/April – 2026
Recovery, Rehabilitation and Reconstruction (BTN01717)

Day & Date: Monday, 11-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Fiscal discipline refers to _____.
a) Strict control over public spending
b) Generous spending on public projects
c) Reducing taxes without considering the budget
d) Unrestricted borrowing for development projects

2) What is the primary goal of socio-economic rehabilitation?
a) Preservation of cultural heritage
b) Restoration of physical health
c) Restoration of economic and social well-being
d) Implementation of new policies

3) In the aftermath of a natural disaster, which aspect of socio-economic rehabilitation is crucial for long-term resilience?
a) Short-term financial aid b) Infrastructure reconstruction
c) Community empowerment d) Technological advancements

4) Which phase of disaster management involves restoring the affected community to a stable and sustainable state?
a) Response b) Preparedness
c) Recovery d) Mitigation

5) How can microfinance initiatives contribute to livelihood restoration?
a) By creating dependency on external aid
b) By promoting unequal distribution of resources
c) By providing financial support for small businesses and entrepreneurs
d) By discouraging local entrepreneurship

6) The *recovery phase* in disaster management primarily aims at _____.
   a) Conducting rescue operations
   b) Rebuilding and restoring normal life
   c) Providing early warning systems
   d) Conducting mock drills

7) What is a primary concern regarding drinking water during a disaster?
   a) Over hydration
   b) Contamination
   c) Lack of taste
   d) Excessive fluoride content

8) What is the purpose of a shear wall in earthquake-resistant house?
   a) To resist wind loads
   b) To provide insulation
   c) To enhance aesthetics
   d) To resist lateral forces during earthquakes

9) Community-Based Disaster Management (CBDM) mainly emphasizes _____.
   a) External expert-driven response
   b) Top-down decision-making
   c) Empowering local communities to manage disasters
   d) Ignoring traditional knowledge

10) What is the primary purpose of insurance in disaster risk management?
   a) To create financial burdens for individuals
   b) To transfer and manage the financial risks associated with disasters
   c) To discourage risk reduction efforts
   d) To ignore the impact of disasters

11) Which of the following best describes *Rehabilitation* in disaster management?
   a) Rebuilding only the physical infrastructure
   b) Temporary arrangement for relief work
   c) Long-term process to restore normal life and livelihood
   d) Providing early warning systems

12) The National Disaster Management Authority (NDMA) is headed by _____.
   a) Prime Minister of India
   b) President of India
   c) Governor of States
   d) Chief Minister of States

13) Disaster Management includes _____.
   a) Mitigation
   b) Reconstruction
   c) Rehabilitation
   d) All of the Above

14) Which traditional construction material is known for its earthquake resistance?

a) Bamboo
b) Mud bricks
c) Timber
d) Concrete

SLR-QH-302

Seat No.	

Set S

Fourth. Y. (B.Tech.) (Civil Engineering) (Sem- I) (New) (CBCS)
Examination: March/April – 2026
Recovery, Rehabilitation and Reconstruction (BTN01717)

Day & Date: Monday, 11-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q.2 is compulsory; answer any two from remaining questions from Section - I.
2) Q.6 is compulsory; answer any two from remaining questions from Section - II.
3) Figures to the right indicate full marks.

SECTION – I

Q.2	**a)**	Write short note on Rehabilitation.	**04**
	b)	Write the roles of Local elected bodies in rehabilitation.	**03**
	c)	What is fiscal discipline in disaster management financing?	**03**
Q.3	**a)**	Write short note pre-disaster phase of disaster management.	**05**
	b)	Give the classification of damage as per the MSK scale.	**04**
Q.4	**a)**	What do you mean by Social Infrastructure? Explain development of Social Infrastructure.	**05**
	b)	Write Key elements of contingency plans for reconstructions.	**04**
Q.5	**a)**	Briefly Explain Earthquake Resistant Construction Techniques.	**05**
	b)	What are the methods of Community Mobilization for Resource Generation?	**04**

SECTION – II

Q.6	**a)**	What is Role of Information Dissemination?	**04**
	b)	Explain short term, medium term & long-term phases of Recovery.	**03**
	c)	Which life skills are required in Disaster Management.	**03**
Q.7	**a)**	Explain the key steps of Evaluation of Rehabilitation work.	**05**
	b)	Explain Economic rehabilitation in detail.	**04**

Q.8	**a)**	How can recovery be linked with safe development? Discuss the concept of “Build Back Better” with examples.	**05**
	b)	What is Livelihood? Why Livelihood Restoration is important?	**04**
Q.9	**a)**	How do individuals, communities, and institutions typically respond to disasters?	**05**
	b)	Why Time Management Skills is important in Disaster Management?	**04**

SLR-QH-303

Seat No.		Set	P

Fourth. Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Bridge and Grade Separated Structures (BTN01718)

Day & Date: Monday, 11-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Solve following Multiple Choice Questions. 14

1) _____ of the following are components of bridges.
a) Pier b) Abutment
c) Foundation d) All of these

2) Factors affecting Selection of Type of Bridge and Bridge Site _____.
a) The nature and bed conditions of river or stream
b) Hydraulic data collected at the site
c) The climatic condition of the area
d) All of these

3) Types of Bridge Bearings are _____.
a) Fixed Bearings b) Elastomeric Bearings
c) Pot Bearings d) All of these

4) Types of grade separated structures are _____.
a) Overpass b) Under pass
c) Flyover d) All of these

5) Types of Bridge foundations are _____.
a) Caisson Foundation b) Pile foundation
c) Pier Foundation d) All of these

6) Steps involved in the Construction of Diaphragm Walls are _____.
a) Excavation Preparation b) Slurry Trench
c) Concrete Pouring d) All of these

7) Pipe jacking involves moving _____ to the ground.
a) Box b) Pipe
c) both a) and b) d) All of these

8) Launching girders for bridges involves the following steps _____.
   a) Planning and Design
   b) Fabrication
   c) Transportation to the Site
   d) All of these

9) Offshore platforms are _____.
   a) Structure built in the lake
   b) Structure built on the sea
   c) Structure built in the pond
   d) All of these

10) Material handling is _____.
   a) Process of change of material
   b) Process of transporting, lifting, and placing various construction materials and equipment
   c) Process of finding Quality of Construction Material
   d) Process of finding Quantity of Construction Material

11) Erecting lightweight components on tall structures in bridges requires _____.
   a) Engineering and Design
   b) Assembly and Connection
   c) Specialized Equipment
   d) All of these

12) _____ of the following is not type of well foundations.
   a) Box Caisson
   b) Open Caisson
   c) Ring Caisson
   d) Pneumatic Caisson

13) Ground improvement techniques are _____.
   a) Compaction
   b) Grouting
   c) Deep Soil Mixing
   d) All of these

14) What is the basis for PERT analysis?
   a) An optimistic time
   b) A pessimistic period of time
   c) The date that is most likely
   d) All options mentioned above

Seat No.	

Set **P**

Fourth. Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Bridge and Grade Separated Structures (BTN01718)

Day & Date: Monday, 11-05-2026 Max. Marks:56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Make suitable data wherever needed and mention it clearly.
4) Draw neat sketches wherever necessary.

SECTION – I

Q.2 Solve following. (Any Two) **14**

a) Explain Structural Requirements of Bridge

b) Explain various basic elements of Bridge.

c) Explain in detail *'Box Jacking'*

Q.3 Solve following. (Any Two) **14**

a) Explain in detail the process of **'**Dewatering'

b) Explain in detail process of launching of Girders for bridge.

c) Explain in detail, ***'Strengthening of bridges' .***

SECTION – II

Q.4 Solve following. (Any Two) **14**

a) Explain the process of Embankment Construction in detail.

b) Explain in detail, ***'****Cofferdam'*.

c) Explain in detail, *'Cost control of equipment'*.

Q.5 Solve following. (Any Two) **14**

a) Explain the concept of Maintenance management in construction projects.

b) Differentiate between CPM and PERT Techniques.

c) The following table shows the list of activities and their durations. Calculate the project duration and critical path of the network.

Activity	Duration	Depends on
A	2	-
B	4	A
C	3	A
D	6	B,C
E	7	B
F	3	D,E

Seat No.	

Set | Q

Fourth. Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Bridge and Grade Separated Structures (BTN01718)

Day & Date: Monday, 11-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Solve following Multiple Choice Questions. 14

1) Launching girders for bridges involves the following steps _____.
a) Planning and Design b) Fabrication
c) Transportation to the Site d) All of these

2) Offshore platforms are _____.
a) Structure built in the lake b) Structure built on the sea
c) Structure built in the pond d) All of these

3) Material handling is _____.
a) Process of change of material
b) Process of transporting, lifting, and placing various construction materials and equipment
c) Process of finding Quality of Construction Material
d) Process of finding Quantity of Construction Material

4) Erecting lightweight components on tall structures in bridges requires _____.
a) Engineering and Design b) Assembly and Connection
c) Specialized Equipment d) All of these

5) _____ of the following is not type of well foundations.
a) Box Caisson b) Open Caisson
c) Ring Caisson d) Pneumatic Caisson

6) Ground improvement techniques are _____.
a) Compaction b) Grouting
c) Deep Soil Mixing d) All of these

7) What is the basis for PERT analysis?
   a) An optimistic time
   b) A pessimistic period of time
   c) The date that is most likely
   d) All options mentioned above

8) _____ of the following are components of bridges.
   a) Pier
   b) Abutment
   c) Foundation
   d) All of these

9) Factors affecting Selection of Type of Bridge and Bridge Site _____.
   a) The nature and bed conditions of river or stream
   b) Hydraulic data collected at the site
   c) The climatic condition of the area
   d) All of these

10) Types of Bridge Bearings are _____.
   a) Fixed Bearings
   b) Elastomeric Bearings
   c) Pot Bearings
   d) All of these

11) Types of grade separated structures are _____.
   a) Overpass
   b) Under pass
   c) Flyover
   d) All of these

12) Types of Bridge foundations are _____.
   a) Caisson Foundation
   b) Pile foundation
   c) Pier Foundation
   d) All of these

13) Steps involved in the Construction of Diaphragm Walls are _____.
   a) Excavation Preparation
   b) Slurry Trench
   c) Concrete Pouring
   d) All of these

14) Pipe jacking involves moving _____ to the ground.
   a) Box
   b) Pipe
   c) both a) and b)
   d) All of these

Seat No.	

Set **Q**

Fourth. Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Bridge and Grade Separated Structures (BTN01718)

Day & Date: Monday, 11-05-2026 Max. Marks:56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Make suitable data wherever needed and mention it clearly.
4) Draw neat sketches wherever necessary.

SECTION – I

Q.2 Solve following. (Any Two) **14**

a) Explain Structural Requirements of Bridge

b) Explain various basic elements of Bridge.

c) Explain in detail *'Box Jacking'*

Q.3 Solve following. (Any Two) **14**

a) Explain in detail the process of **'**Dewatering'

b) Explain in detail process of launching of Girders for bridge.

c) Explain in detail, ***'Strengthening of bridges' .***

SECTION – II

Q.4 Solve following. (Any Two) **14**

a) Explain the process of Embankment Construction in detail.

b) Explain in detail, ***'****Cofferdam'*.

c) Explain in detail, *'Cost control of equipment'*.

Q.5 Solve following. (Any Two) **14**

a) Explain the concept of Maintenance management in construction projects.

b) Differentiate between CPM and PERT Techniques.

c) The following table shows the list of activities and their durations. Calculate the project duration and critical path of the network.

Activity	Duration	Depends on
A	2	-
B	4	A
C	3	A
D	6	B,C
E	7	B
F	3	D,E

Seat No.	

Set **R**

Fourth. Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Bridge and Grade Separated Structures (BTN01718)

Day & Date: Monday, 11-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Solve following Multiple Choice Questions. **14**

1) Erecting lightweight components on tall structures in bridges requires _____.
a) Engineering and Design b) Assembly and Connection
c) Specialized Equipment d) All of these

2) _____ of the following is not type of well foundations.
a) Box Caisson b) Open Caisson
c) Ring Caisson d) Pneumatic Caisson

3) Ground improvement techniques are _____.
a) Compaction b) Grouting
c) Deep Soil Mixing d) All of these

4) What is the basis for PERT analysis?
a) An optimistic time
b) A pessimistic period of time
c) The date that is most likely
d) All options mentioned above

5) _____ of the following are components of bridges.
a) Pier b) Abutment
c) Foundation d) All of these

6) Factors affecting Selection of Type of Bridge and Bridge Site _____.
a) The nature and bed conditions of river or stream
b) Hydraulic data collected at the site
c) The climatic condition of the area
d) All of these

7) Types of Bridge Bearings are _____.
a) Fixed Bearings b) Elastomeric Bearings
c) Pot Bearings d) All of these

8) Types of grade separated structures are _____.
a) Overpass b) Under pass
c) Flyover d) All of these

9) Types of Bridge foundations are _____.
a) Caisson Foundation b) Pile foundation
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10) Steps involved in the Construction of Diaphragm Walls are _____.
a) Excavation Preparation b) Slurry Trench
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11) Pipe jacking involves moving _____ to the ground.
a) Box b) Pipe
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12) Launching girders for bridges involves the following steps _____.
a) Planning and Design b) Fabrication
c) Transportation to the Site d) All of these

13) Offshore platforms are _____.
a) Structure built in the lake b) Structure built on the sea
c) Structure built in the pond d) All of these

14) Material handling is _____.
a) Process of change of material
b) Process of transporting, lifting, and placing various construction materials and equipment
c) Process of finding Quality of Construction Material
d) Process of finding Quantity of Construction Material

Seat No.	

Set **R**

Fourth. Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Bridge and Grade Separated Structures (BTN01718)

Day & Date: Monday, 11-05-2026 Max. Marks:56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Make suitable data wherever needed and mention it clearly.
4) Draw neat sketches wherever necessary.

SECTION – I

Q.2 Solve following. (Any Two) **14**

a) Explain Structural Requirements of Bridge

b) Explain various basic elements of Bridge.

c) Explain in detail *'Box Jacking'*

Q.3 Solve following. (Any Two) **14**

a) Explain in detail the process of **'**Dewatering'

b) Explain in detail process of launching of Girders for bridge.

c) Explain in detail, ***'Strengthening of bridges'*** **.**

SECTION – II

Q.4 Solve following. (Any Two) **14**

a) Explain the process of Embankment Construction in detail.

b) Explain in detail, ***'****Cofferdam'*.

c) Explain in detail, *'Cost control of equipment'*.

Q.5 Solve following. (Any Two) **14**

a) Explain the concept of Maintenance management in construction projects.

b) Differentiate between CPM and PERT Techniques.

c) The following table shows the list of activities and their durations. Calculate the project duration and critical path of the network.

Activity	Duration	Depends on
A	2	-
B	4	A
C	3	A
D	6	B,C
E	7	B
F	3	D,E

SLR-QH-303

Seat No.		Set	S

Fourth. Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Bridge and Grade Separated Structures (BTN01718)

Day & Date: Monday, 11-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Solve following Multiple Choice Questions. 14

1) Steps involved in the Construction of Diaphragm Walls are _____.
a) Excavation Preparation b) Slurry Trench
c) Concrete Pouring d) All of these

2) Pipe jacking involves moving _____ to the ground.
a) Box b) Pipe
c) both a) and b) d) All of these

3) Launching girders for bridges involves the following steps _____.
a) Planning and Design b) Fabrication
c) Transportation to the Site d) All of these

4) Offshore platforms are _____.
a) Structure built in the lake b) Structure built on the sea
c) Structure built in the pond d) All of these

5) Material handling is _____.
a) Process of change of material
b) Process of transporting, lifting, and placing various construction materials and equipment
c) Process of finding Quality of Construction Material
d) Process of finding Quantity of Construction Material

6) Erecting lightweight components on tall structures in bridges requires _____.
a) Engineering and Design b) Assembly and Connection
c) Specialized Equipment d) All of these

7) _____ of the following is not type of well foundations.
a) Box Caisson
b) Open Caisson
c) Ring Caisson
d) Pneumatic Caisson

8) Ground improvement techniques are _____.
a) Compaction
b) Grouting
c) Deep Soil Mixing
d) All of these

9) What is the basis for PERT analysis?
a) An optimistic time
b) A pessimistic period of time
c) The date that is most likely
d) All options mentioned above

10) _____ of the following are components of bridges.
a) Pier
b) Abutment
c) Foundation
d) All of these

11) Factors affecting Selection of Type of Bridge and Bridge Site _____.
a) The nature and bed conditions of river or stream
b) Hydraulic data collected at the site
c) The climatic condition of the area
d) All of these

12) Types of Bridge Bearings are _____.
a) Fixed Bearings
b) Elastomeric Bearings
c) Pot Bearings
d) All of these

13) Types of grade separated structures are _____.
a) Overpass
b) Under pass
c) Flyover
d) All of these

14) Types of Bridge foundations are _____.
a) Caisson Foundation
b) Pile foundation
c) Pier Foundation
d) All of these

SLR-QH-303

Seat No.		Set	S

Fourth. Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Bridge and Grade Separated Structures (BTN01718)

Day & Date: Monday, 11-05-2026 Max. Marks:56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Make suitable data wherever needed and mention it clearly.
4) Draw neat sketches wherever necessary.

SECTION – I

Q.2 Solve following. (Any Two) **14**

a) Explain Structural Requirements of Bridge

b) Explain various basic elements of Bridge.

c) Explain in detail *'Box Jacking'*

Q.3 Solve following. (Any Two) **14**

a) Explain in detail the process of **'**Dewatering'

b) Explain in detail process of launching of Girders for bridge.

c) Explain in detail, ***'Strengthening of bridges' .***

SECTION – II

Q.4 Solve following. (Any Two) **14**

a) Explain the process of Embankment Construction in detail.

b) Explain in detail, ***'****Cofferdam'*.

c) Explain in detail, *'Cost control of equipment'*.

Q.5 Solve following. (Any Two) **14**

a) Explain the concept of Maintenance management in construction projects.

b) Differentiate between CPM and PERT Techniques.

c) The following table shows the list of activities and their durations. Calculate the project duration and critical path of the network.

Activity	Duration	Depends on
A	2	-
B	4	A
C	3	A
D	6	B,C
E	7	B
F	3	D,E

SLR-QH-304

Seat No.		Set	P

Fourth. Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April - 2026
Sustainable Engineering & Technology (BTN01719)

Day & Date: Monday, 11-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Multiple Choice Questions. **14**

1) Which of the following is a fundamental principle of sustainable development?
a) Focusing solely on economic growth
b) Ignoring environmental concerns for rapid development
c) Ensuring that development meets the needs of the present without compromising the ability of future generations to meet their own needs
d) Prioritizing technology over social equity

2) The Clean Development Mechanism (CDM) aims to _____.
a) Reduce carbon emissions in developed countries only
b) Facilitate the transfer of technology to developing countries to help them meet sustainable development goals
c) Promote economic growth without regard to environmental Impacts
d) Increase the use of fossil fuels in developing countries

3) Which of the following best describes the Nexus between technology and sustainable development?
a) Technology only hinders the achievement of sustainability
b) Technology can provide innovative solutions to achieve sustainability goals
c) Technology is irrelevant in sustainable development
d) Technology focuses solely on economic advancement

4) Which of the following is one of the 5R concepts in solid waste management?
a) Recycle
b) Release
c) Reject
d) Recapture

5) What is the greenhouse effect?
   a) The cooling of the Earth due to greenhouse gases
   b) The process by which greenhouse gases trap heat in the atmosphere
   c) The natural process of eliminating waste materials
   d) The process of recycling atmospheric gases

6) How do carbon credits work in reducing greenhouse gas emissions?
   a) By allowing companies to trade physical carbon emissions
   b) By allowing companies to purchase credits to offset their emissions
   c) By reducing the cost of carbon-based products
   d) By removing carbon from the atmosphere

7) What is the primary goal of carbon trading?
   a) To reduce the overall cost of environmental protection
   b) To incentivize companies to reduce their carbon footprint through market-based mechanisms
   c) To promote the use of fossil fuels
   d) To eliminate the need for governmental environmental regulations

8) What does the concept of a circular economy focus on?
   a) Maximizing profit through resource exploitation
   b) Ensuring continuous consumption of natural resources
   c) Minimizing waste by reusing and recycling products and materials
   d) Reducing production costs by outsourcing materials

9) Bio-mimicking in environmental management refers to _____.
   a) Imitating biological systems to solve engineering problems
   b) Using synthetic materials to mimic natural processes
   c) Reproducing artificial ecosystems for research
   d) Emulating animal behavior to optimize processes

10) What is the primary principle behind the functioning of a fuel cell?
   a) Conversion of chemical energy directly into electricity
   b) Conversion of thermal energy into mechanical energy
   c) Conversion of nuclear energy into electricity
   d) Conversion of electrical energy into chemical energy

11) Which of the following is a major advantage of wind energy?
   a) It produces greenhouse gases
   b) It is highly dependent on fuel availability
   c) It is a renewable and clean source of energy
   d) It is more expensive than fossil fuels

12) What is the primary source of energy for small hydro plants?
   a) Wind
   b) Ocean tides
   c) Water flow from rivers or streams
   d) Geothermal heat

13) What does Green Engineering focus on?

a) Enhancing traditional industrial methods without considering environmental impacts
b) Integrating environmental principles into engineering design and processes
c) Increasing the carbon footprint of manufacturing processes
d) Reducing the use of renewable resources in industrial production

14) A sustainable city is characterized by _____.

a) Heavy reliance on fossil fuels
b) A large population with limited green spaces
c) Efficient use of resources, green spaces, and clean energy systems
d) Minimal public transportation options

Seat No.	

Set **P**

Fourth. Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April - 2026
Sustainable Engineering & Technology (BTN01719)

Day & Date: Monday, 11-05-2026 Max. Marks:56
Time: 10:00 AM To 01:00 PM

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

SECTION – I

Q.2	**a)**	What is sustainable development, and how does it contribute to achieving global well-being?	**05**
	b)	Describe the relationship between technology and sustainable development, providing examples of how technology can, support sustainability.	**05**
Q.3	**a)**	What are the Millennium Development Goals (MDGs), and how do they relate to the Sustainable Development Goals (SDGs)?	**05**
	b)	Describe the 5R concepts in solid waste management and provide examples of their application.	**04**
Q.4	**a)**	Discuss the causes and impacts of global warming on the environment and human societies.	**05**
	b)	Explain the greenhouse effect and its role in climate change.	**04**
Q.5	**a)**	Describe the mechanism of carbon credits and how they contribute to reducing global carbon emissions.	**05**
	b)	How does carbon trading function, and what role does it play in achieving emission reduction targets?	**04**

SECTION – II

Q.6	**a)**	Describe the process of bio-mimicking and how it is applied in environmental management.	**05**
	b)	What is an Environmental Impact Assessment (EIA), and why is it essential in planning new projects?	**05**
Q.7	**a)**	What are fuel cells, and how do they contribute to the production of clean energy?	**05**
	b)	Discuss the advantages and challenges of utilizing wind energy as a renewable energy source.	**04**
Q.8	**a)**	What are small hydro plants, and how do they help in the generation of renewable energy?	**05**
	b)	Describe the principles of sustainable urbanization and how they contribute to environmental and social sustainability.	**04**
Q.9	**a)**	What are the key features of sustainable cities, and how can they be designed to support both the environment and the community?	**05**
	b)	How can sustainable transport systems reduce the carbon footprint of urban areas and improve public health?	**04**

Seat No.	

Set **Q**

Fourth. Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April - 2026
Sustainable Engineering & Technology (BTN01719)

Day & Date: Monday, 11-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Multiple Choice Questions. **14**

1) What does the concept of a circular economy focus on?
a) Maximizing profit through resource exploitation
b) Ensuring continuous consumption of natural resources
c) Minimizing waste by reusing and recycling products and materials
d) Reducing production costs by outsourcing materials

2) Bio-mimicking in environmental management refers to _____.
a) Imitating biological systems to solve engineering problems
b) Using synthetic materials to mimic natural processes
c) Reproducing artificial ecosystems for research
d) Emulating animal behavior to optimize processes

3) What is the primary principle behind the functioning of a fuel cell?
a) Conversion of chemical energy directly into electricity
b) Conversion of thermal energy into mechanical energy
c) Conversion of nuclear energy into electricity
d) Conversion of electrical energy into chemical energy

4) Which of the following is a major advantage of wind energy?
a) It produces greenhouse gases
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c) It is a renewable and clean source of energy
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5) What is the primary source of energy for small hydro plants?
a) Wind
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c) Water flow from rivers or streams
d) Geothermal heat

6) What does Green Engineering focus on?
   a) Enhancing traditional industrial methods without considering environmental impacts
   b) Integrating environmental principles into engineering design and processes
   c) Increasing the carbon footprint of manufacturing processes
   d) Reducing the use of renewable resources in industrial production

7) A sustainable city is characterized by _____.
   a) Heavy reliance on fossil fuels
   b) A large population with limited green spaces
   c) Efficient use of resources, green spaces, and clean energy systems
   d) Minimal public transportation options

8) Which of the following is a fundamental principle of sustainable development?
   a) Focusing solely on economic growth
   b) Ignoring environmental concerns for rapid development
   c) Ensuring that development meets the needs of the present without compromising the ability of future generations to meet their own needs
   d) Prioritizing technology over social equity

9) The Clean Development Mechanism (CDM) aims to _____.
   a) Reduce carbon emissions in developed countries only
   b) Facilitate the transfer of technology to developing countries to help them meet sustainable development goals
   c) Promote economic growth without regard to environmental Impacts
   d) Increase the use of fossil fuels in developing countries

10) Which of the following best describes the Nexus between technology and sustainable development?
   a) Technology only hinders the achievement of sustainability
   b) Technology can provide innovative solutions to achieve sustainability goals
   c) Technology is irrelevant in sustainable development
   d) Technology focuses solely on economic advancement

11) Which of the following is one of the 5R concepts in solid waste management?
   a) Recycle
   b) Release
   c) Reject
   d) Recapture

12) What is the greenhouse effect?
   a) The cooling of the Earth due to greenhouse gases
   b) The process by which greenhouse gases trap heat in the atmosphere
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13) How do carbon credits work in reducing greenhouse gas emissions?
   a) By allowing companies to trade physical carbon emissions
   b) By allowing companies to purchase credits to offset their emissions
   c) By reducing the cost of carbon-based products
   d) By removing carbon from the atmosphere

14) What is the primary goal of carbon trading?
   a) To reduce the overall cost of environmental protection
   b) To incentivize companies to reduce their carbon footprint through market-based mechanisms
   c) To promote the use of fossil fuels
   d) To eliminate the need for governmental environmental regulations

Seat No.	

Set **Q**

Fourth. Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April - 2026
Sustainable Engineering & Technology (BTN01719)

Day & Date: Monday, 11-05-2026 Max. Marks:56
Time: 10:00 AM To 01:00 PM

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SECTION – I

Q.2	**a)**	What is sustainable development, and how does it contribute to achieving global well-being?	**05**
	b)	Describe the relationship between technology and sustainable development, providing examples of how technology can, support sustainability.	**05**
Q.3	**a)**	What are the Millennium Development Goals (MDGs), and how do they relate to the Sustainable Development Goals (SDGs)?	**05**
	b)	Describe the 5R concepts in solid waste management and provide examples of their application.	**04**
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	b)	Explain the greenhouse effect and its role in climate change.	**04**
Q.5	**a)**	Describe the mechanism of carbon credits and how they contribute to reducing global carbon emissions.	**05**
	b)	How does carbon trading function, and what role does it play in achieving emission reduction targets?	**04**

SECTION – II

Q.6	**a)**	Describe the process of bio-mimicking and how it is applied in environmental management.	**05**
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	b)	How can sustainable transport systems reduce the carbon footprint of urban areas and improve public health?	**04**

Seat No.	

Set **R**

Fourth. Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April - 2026
Sustainable Engineering & Technology (BTN01719)

Day & Date: Monday, 11-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Multiple Choice Questions. **14**

1) Which of the following is a major advantage of wind energy?
a) It produces greenhouse gases
b) It is highly dependent on fuel availability
c) It is a renewable and clean source of energy
d) It is more expensive than fossil fuels

2) What is the primary source of energy for small hydro plants?
a) Wind
b) Ocean tides
c) Water flow from rivers or streams
d) Geothermal heat

3) What does Green Engineering focus on?
a) Enhancing traditional industrial methods without considering environmental impacts
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c) Increasing the carbon footprint of manufacturing processes
d) Reducing the use of renewable resources in industrial production

4) A sustainable city is characterized by _____.
a) Heavy reliance on fossil fuels
b) A large population with limited green spaces
c) Efficient use of resources, green spaces, and clean energy systems
d) Minimal public transportation options

5) Which of the following is a fundamental principle of sustainable development?
   a) Focusing solely on economic growth
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6) The Clean Development Mechanism (CDM) aims to _____.
   a) Reduce carbon emissions in developed countries only
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   a) Imitating biological systems to solve engineering problems
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14) What is the primary principle behind the functioning of a fuel cell?
   a) Conversion of chemical energy directly into electricity
   b) Conversion of thermal energy into mechanical energy
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Seat No.	

Set **R**

Fourth. Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April - 2026
Sustainable Engineering & Technology (BTN01719)

Day & Date: Monday, 11-05-2026 Max. Marks:56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 2 is compulsory in section I, and solve any two questions from the remaining. Q. No. 6 is compulsory in section II, and solve any two questions from the remaining
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3) Assume suitable data whenever necessary and state it clearly.
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SECTION – I

Q.2	**a)**	What is sustainable development, and how does it contribute to achieving global well-being?	**05**
	b)	Describe the relationship between technology and sustainable development, providing examples of how technology can, support sustainability.	**05**
Q.3	**a)**	What are the Millennium Development Goals (MDGs), and how do they relate to the Sustainable Development Goals (SDGs)?	**05**
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SECTION – II

Q.6	**a)**	Describe the process of bio-mimicking and how it is applied in environmental management.	**05**
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Seat No.		Set	S

Fourth. Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April - 2026
Sustainable Engineering & Technology (BTN01719)

Day & Date: Monday, 11-05-2026 Max. Marks: 70
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3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Multiple Choice Questions. **14**

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13) Which of the following is one of the 5R concepts in solid waste management?

a) Recycle
b) Release
c) Reject
d) Recapture

14) What is the greenhouse effect?

a) The cooling of the Earth due to greenhouse gases
b) The process by which greenhouse gases trap heat in the atmosphere
c) The natural process of eliminating waste materials
d) The process of recycling atmospheric gases

Seat No.	

Set **S**

Fourth. Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April - 2026
Sustainable Engineering & Technology (BTN01719)

Day & Date: Monday, 11-05-2026 Max. Marks:56
Time: 10:00 AM To 01:00 PM

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3) Assume suitable data whenever necessary and state it clearly.
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SECTION – I

Q.2	**a)**	What is sustainable development, and how does it contribute to achieving global well-being?	**05**
	b)	Describe the relationship between technology and sustainable development, providing examples of how technology can, support sustainability.	**05**
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	b)	Describe the 5R concepts in solid waste management and provide examples of their application.	**04**
Q.4	**a)**	Discuss the causes and impacts of global warming on the environment and human societies.	**05**
	b)	Explain the greenhouse effect and its role in climate change.	**04**
Q.5	**a)**	Describe the mechanism of carbon credits and how they contribute to reducing global carbon emissions.	**05**
	b)	How does carbon trading function, and what role does it play in achieving emission reduction targets?	**04**

SECTION – II

Q.6	**a)**	Describe the process of bio-mimicking and how it is applied in environmental management.	**05**
	b)	What is an Environmental Impact Assessment (EIA), and why is it essential in planning new projects?	**05**
Q.7	**a)**	What are fuel cells, and how do they contribute to the production of clean energy?	**05**
	b)	Discuss the advantages and challenges of utilizing wind energy as a renewable energy source.	**04**
Q.8	**a)**	What are small hydro plants, and how do they help in the generation of renewable energy?	**05**
	b)	Describe the principles of sustainable urbanization and how they contribute to environmental and social sustainability.	**04**
Q.9	**a)**	What are the key features of sustainable cities, and how can they be designed to support both the environment and the community?	**05**
	b)	How can sustainable transport systems reduce the carbon footprint of urban areas and improve public health?	**04**

SLR-QH-305

Seat No.	

Set P

Fourth. Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Civil Engineering System Analysis and Design (BTN01720)

Day & Date: Monday, 11-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) _____ is set of components that work together for overall objectives.
a) System b) Goals
c) Objective d) None of these

2) _____ is termed as performance measure, simply an objective that stated in measurable terms.
a) Measure of Effectiveness b) Dimension
c) Planning d) None

3) Which of the following is not property of desired MOE?
a) Appropriateness b) Measurability
c) Realistic d) Cost Saving

4) The super systems are _____.
a) Higher level systems b) Lower level systems
c) Both d) None of these

5) _____ models describe the amount of money needed to undertake specific action.
a) Demand b) Cost
c) Real d) Supply

6) Which of the following is tool for task of description?
a) Probability b) Statistics
c) Economics d) All of the above

7) _____ models are that use the mathematics of decision making to choose a course of action, design or policy.
a) Prescriptive b) Descriptive
c) Analog d) Real

8) _____ provides basis for predicting the need for proposed civil system.
a) Planning
b) Need Assessment
c) Controlling
d) None

9) A _____ may be defined as deficiency, an unfulfilled requirement, lack of product that is necessary.
a) Supply
b) Need
c) None
d) All of these

10) Which of the following is the stakeholder of system?
a) Users
b) Community
c) System Owner
d) All

11) From _____ perspective, the system inputs considered in system planning could have short term, moderate term & long term effects.
a) Temporal
b) Operational
c) Phase
d) None

12) Which of the following is classification of design?
a) Selection Design
b) Configuration Design
c) Both of the above
d) None of the above

13) In Preliminary Design, analysis & evaluation of design is done on _____ stage.
a) Detailed
b) Conceptual
c) Multiple
d) Preliminary

14) In _____ design, analysis & evaluation of alternative designs is done in details.
a) Conceptual
b) Preliminary
c) Detailed
d) None

Seat No.	

Set **P**

Fourth. Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Civil Engineering System Analysis and Design (BTN01720)

Day & Date: Monday, 11-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Make suitable data wherever necessary and mention it clearly.
4) Use of non-programmable calculator is allowed.

SECTION – I

Q.2 Solve Any Four of following. **20**

a) Explain various classifications of system.

b) Explain concept of process of system development.

c) Classify different models with examples.

d) Explain examples of tasks at each phase of civil system development.

e) Explain hierarchy of desired outcomes: Values, Goals, Objectives.

f) Explain different types of outcomes in system.

g) Explain Monetary & non-monetary outcomes.

Q.3 Write Any Two of the following. **08**

a) Explain concept of system theory.

b) Write a short note on system evaluation.

c) Explain Tools used for task of system description.

d) Explain role of operations research & decision making in system development.

SECTION – II

Q.4 Solve Any Four of following. **20**

a) Explain mechanisms of user target with example.

b) Explain dimensions of system planning.

c) Explain principles of system planning.

d) Explain concept of need assessment. Also explain types of needs.

e) Explain different types of system design.

f) Write applications of system design.

Q.5 Write Any Two of following. **08**

a) Explain process of system design in detail.

b) Explain process of system planning.

c) Explain different barriers in system planning.

Seat No.	

Set **Q**

Fourth. Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Civil Engineering System Analysis and Design (BTN01720)

Day & Date: Monday, 11-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) _____ provides basis for predicting the need for proposed civil system.
a) Planning b) Need Assessment
c) Controlling d) None

2) A _____ may be defined as deficiency, an unfulfilled requirement, lack of product that is necessary.
a) Supply b) Need
c) None d) All of these

3) Which of the following is the stakeholder of system?
a) Users b) Community
c) System Owner d) All

4) From _____ perspective, the system inputs considered in system planning could have short term, moderate term & long term effects.
a) Temporal b) Operational
c) Phase d) None

5) Which of the following is classification of design?
a) Selection Design b) Configuration Design
c) Both of the above d) None of the above

6) In Preliminary Design, analysis & evaluation of design is done on _____ stage.
a) Detailed b) Conceptual
c) Multiple d) Preliminary

7) In _____ design, analysis & evaluation of alternative designs is done in details.
a) Conceptual b) Preliminary
c) Detailed d) None

8) _____ is set of components that work together for overall objectives.
a) System b) Goals
c) Objective d) None of these

9) _____ is termed as performance measure, simply an objective that stated in measurable terms.
a) Measure of Effectiveness b) Dimension
c) Planning d) None

10) Which of the following is not property of desired MOE?
a) Appropriateness b) Measurability
c) Realistic d) Cost Saving

11) The super systems are _____.
a) Higher level systems b) Lower level systems
c) Both d) None of these

12) _____ models describe the amount of money needed to undertake specific action.
a) Demand b) Cost
c) Real d) Supply

13) Which of the following is tool for task of description?
a) Probability b) Statistics
c) Economics d) All of the above

14) _____ models are that use the mathematics of decision making to choose a course of action, design or policy.
a) Prescriptive b) Descriptive
c) Analog d) Real

Seat No.	

Set **Q**

Fourth. Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Civil Engineering System Analysis and Design (BTN01720)

Day & Date: Monday, 11-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Make suitable data wherever necessary and mention it clearly.
4) Use of non-programmable calculator is allowed.

SECTION – I

Q.2 Solve Any Four of following. **20**

a) Explain various classifications of system.

b) Explain concept of process of system development.

c) Classify different models with examples.

d) Explain examples of tasks at each phase of civil system development.

e) Explain hierarchy of desired outcomes: Values, Goals, Objectives.

f) Explain different types of outcomes in system.

g) Explain Monetary & non-monetary outcomes.

Q.3 Write Any Two of the following. **08**

a) Explain concept of system theory.

b) Write a short note on system evaluation.

c) Explain Tools used for task of system description.

d) Explain role of operations research & decision making in system development.

SECTION – II

Q.4 Solve Any Four of following. **20**

a) Explain mechanisms of user target with example.

b) Explain dimensions of system planning.

c) Explain principles of system planning.

d) Explain concept of need assessment. Also explain types of needs.

e) Explain different types of system design.

f) Write applications of system design.

Q.5 Write Any Two of following. **08**

a) Explain process of system design in detail.

b) Explain process of system planning.

c) Explain different barriers in system planning.

Seat No.	

Set R

Fourth. Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Civil Engineering System Analysis and Design (BTN01720)

Day & Date: Monday, 11-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) From _____ perspective, the system inputs considered in system planning could have short term, moderate term & long term effects.
a) Temporal b) Operational
c) Phase d) None

2) Which of the following is classification of design?
a) Selection Design b) Configuration Design
c) Both of the above d) None of the above

3) In Preliminary Design, analysis & evaluation of design is done on _____ stage.
a) Detailed b) Conceptual
c) Multiple d) Preliminary

4) In _____ design, analysis & evaluation of alternative designs is done in details.
a) Conceptual b) Preliminary
c) Detailed d) None

5) _____ is set of components that work together for overall objectives.
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c) Objective d) None of these

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c) Planning d) None

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c) Realistic d) Cost Saving

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a) Higher level systems b) Lower level systems
c) Both d) None of these

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a) Demand b) Cost
c) Real d) Supply

10) Which of the following is tool for task of description?
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c) Economics d) All of the above

11) _____ models are that use the mathematics of decision making to choose a course of action, design or policy.
a) Prescriptive b) Descriptive
c) Analog d) Real

12) _____ provides basis for predicting the need for proposed civil system.
a) Planning b) Need Assessment
c) Controlling d) None

13) A _____ may be defined as deficiency, an unfulfilled requirement, lack of product that is necessary.
a) Supply b) Need
c) None d) All of these

14) Which of the following is the stakeholder of system?
a) Users b) Community
c) System Owner d) All

Seat No.	

Set **R**

Fourth. Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Civil Engineering System Analysis and Design (BTN01720)

Day & Date: Monday, 11-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Make suitable data wherever necessary and mention it clearly.
4) Use of non-programmable calculator is allowed.

SECTION – I

Q.2 Solve Any Four of following. **20**

a) Explain various classifications of system.

b) Explain concept of process of system development.

c) Classify different models with examples.

d) Explain examples of tasks at each phase of civil system development.

e) Explain hierarchy of desired outcomes: Values, Goals, Objectives.

f) Explain different types of outcomes in system.

g) Explain Monetary & non-monetary outcomes.

Q.3 Write Any Two of the following. **08**

a) Explain concept of system theory.

b) Write a short note on system evaluation.

c) Explain Tools used for task of system description.

d) Explain role of operations research & decision making in system development.

SECTION – II

Q.4 Solve Any Four of following. **20**

a) Explain mechanisms of user target with example.

b) Explain dimensions of system planning.

c) Explain principles of system planning.

d) Explain concept of need assessment. Also explain types of needs.

e) Explain different types of system design.

f) Write applications of system design.

Q.5 Write Any Two of following. **08**

a) Explain process of system design in detail.

b) Explain process of system planning.

c) Explain different barriers in system planning.

SLR-QH-305

Seat No.		Set	S

Fourth. Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Civil Engineering System Analysis and Design (BTN01720)

Day & Date: Monday, 11-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. 14

1) Which of the following is tool for task of description?
a) Probability b) Statistics
c) Economics d) All of the above

2) _____ models are that use the mathematics of decision making to choose a course of action, design or policy.
a) Prescriptive b) Descriptive
c) Analog d) Real

3) _____ provides basis for predicting the need for proposed civil system.
a) Planning b) Need Assessment
c) Controlling d) None

4) A _____ may be defined as deficiency, an unfulfilled requirement, lack of product that is necessary.
a) Supply b) Need
c) None d) All of these

5) Which of the following is the stakeholder of system?
a) Users b) Community
c) System Owner d) All

6) From _____ perspective, the system inputs considered in system planning could have short term, moderate term & long term effects.
a) Temporal b) Operational
c) Phase d) None

7) Which of the following is classification of design?
a) Selection Design b) Configuration Design
c) Both of the above d) None of the above

8) In Preliminary Design, analysis & evaluation of design is done on _____ stage.

a) Detailed b) Conceptual
c) Multiple d) Preliminary

9) In _____ design, analysis & evaluation of alternative designs is done in details.

a) Conceptual b) Preliminary
c) Detailed d) None

10) _____ is set of components that work together for overall objectives.

a) System b) Goals
c) Objective d) None of these

11) _____ is termed as performance measure, simply an objective that stated in measurable terms.

a) Measure of Effectiveness b) Dimension
c) Planning d) None

12) Which of the following is not property of desired MOE?

a) Appropriateness b) Measurability
c) Realistic d) Cost Saving

13) The super systems are _____.

a) Higher level systems b) Lower level systems
c) Both d) None of these

14) _____ models describe the amount of money needed to undertake specific action.

a) Demand b) Cost
c) Real d) Supply

Seat No.	

Set **S**

Fourth. Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Civil Engineering System Analysis and Design (BTN01720)

Day & Date: Monday, 11-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Make suitable data wherever necessary and mention it clearly.
4) Use of non-programmable calculator is allowed.

SECTION – I

Q.2 Solve Any Four of following. **20**

a) Explain various classifications of system.

b) Explain concept of process of system development.

c) Classify different models with examples.

d) Explain examples of tasks at each phase of civil system development.

e) Explain hierarchy of desired outcomes: Values, Goals, Objectives.

f) Explain different types of outcomes in system.

g) Explain Monetary & non-monetary outcomes.

Q.3 Write Any Two of the following. **08**

a) Explain concept of system theory.

b) Write a short note on system evaluation.

c) Explain Tools used for task of system description.

d) Explain role of operations research & decision making in system development.

SECTION – II

Q.4 Solve Any Four of following. **20**

a) Explain mechanisms of user target with example.

b) Explain dimensions of system planning.

c) Explain principles of system planning.

d) Explain concept of need assessment. Also explain types of needs.

e) Explain different types of system design.

f) Write applications of system design.

Q.5 Write Any Two of following. **08**

a) Explain process of system design in detail.

b) Explain process of system planning.

c) Explain different barriers in system planning.

SLR-QH-306

Seat No.	

Set P

Fourth Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Professional Practice, Law & Ethics (BTN01801)

Day & Date: Thursday, 14-05-2026 Max. Marks: 100
Time: 03:00 PM To 06:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:20

Q.1 Choose the correct alternatives from the options. 20

1) Which of the following is not true with respect to ensure a safety design?
a) The maximum requirement is that a design must comply with the applicable laws.
b) An acceptable design must meet the standard of "accepted engineering practice."
c) Alternative designs that are potentially safer must be explored.
d) Engineer must attempt to foresee potential misuses of the product by the consumer and must design to avoid these problems

2) In _____, a neutral third party assists the disputing parties in reaching a settlement of their dispute.
a) Infiltration b) Arbitration
c) Mediation d) Negotiation

3) Which of the following stakeholder has the responsibility of prescribing norms to ensure safety of the citizens?
a) Government b) Professional Societies
c) Standardization Bodies d) All of these

4) What does a trademark protect?
a) An invention
b) Logos, names and brands
c) The look, shape and feel of a product
d) A secret formula

5) How long do patents usually last for?
a) 10 years b) 20 years
c) 40 years d) 60 years

6) Safety provisions in Indian Factory Act does not cover _____.
a) Fencing of machinery b) Precaution against fire
c) Lunch rooms d) Protection eyes

7) Which of the following matter are not referred to arbitration?
a) Civil matters b) Matrimonial matters
c) Banking matters d) Property matters

8) What is an ethical dilemma?
a) an issue caused by not following guidelines
b) conflict between what's right and what's wrong
c) same as a professional dilemma
d) moral conflict between values

9) _____ is the concept that describe the beliefs of an individual or culture.
a) Values b) Attitude
c) Behaviour d) Personality

10) In the _____ right conduct for an individual is regarded as whatever directly benefits oneself.
a) pre-conventional level b) post-conventional level
c) conventional level d) Final level

11) An agreement not enforceable by law is said to be _____.
a) A contract b) Void
c) A voidable contract d) A void contract

12) We use which among the following technique in business organizations and firms for protecting the IT assets?
a) Ethical hacking b) Unethical hacking
c) Fixing bugs d) Internal data-breach

13) A contract consists of _____.
a) Mutual promises or agreement enforceable by law
b) Agreement not enforceable by law
c) Involuntary obligations
d) None of these

14) Which of the following is not true with respect to Titanic disaster?
a) Adequate Life boats
b) Ship sailed at high speed in the night
c) It had hit against an ice berg
d) The ship tore into two parts due to hitting against iceberg

15) Which professional body certifies engineers in India?
a) Indian Roads Congress (IRC)
b) Indian Institute of Architects (IIA)
c) Institution of Engineers (India)
d) Engineers Council of India (ECI)

16) Contractors in the construction sector are primarily governed by _____.
a) Regulatory Acts, standards, and contracts
b) Clients' preferences
c) International standards
d) Manufacturer's guidelines

17) Which of the following is an example of a standardization body in India?
a) Ministry of Housing and Urban Affairs
b) Bureau of Indian Standards (BIS)
c) National Institute of Urban Affairs (NIUA)
d) Indian Roads Congress (IRC)

18) What is the primary responsibility of consultants in the construction industry?
a) Designing the project
b) Certifying the quality of materials
c) Providing professional expertise, governed by bodies like CEAI
d) Overseeing construction work

19) Which of the following is NOT a feature of a valid contract?
a) Offer and acceptance
b) Legal consideration
c) Freedom of privacy in contract
d) Illegal objectives

20) Prime contracts and subcontracts differ in _____.
a) The method of negotiation
b) The legal authority to execute
c) The nature of obligations between parties
d) The type of dispute resolution used

SLR-QH-306

Seat No.		Set	P

Fourth Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Professional Practice, Law & Ethics (BTN01801)

Day & Date: Thursday, 14-05-2026 Max. Marks: 80
Time: 03:00 PM To 06:00 PM

Instructions: 1) Solve any two questions from Section I.
2) Solve any two questions from Section II.
3) Figures to the right indicate full marks.
4) Make suitable assumptions if necessary and state them clearly.

Section – I

Q.2 **a)** What role does contract documentation play in ensuring the enforcement of contract terms? **10**

b) State and explain Professional bodies certifying and offering platform for Civil engineers. **10**

Q.3 **a)** Define the terms: - **10**
i) Professional Ethics ii) contract variations
iii) Whistleblowing iv) Significance of Notice to Proceed

b) State Code of Ethics as defined in the website of Institution of Engineers. **10**

Q.4 **a)** Describe principle of contract management, also discuss Indian Contract Act, 1972. **10**

b) What legal provisions apply when one party in a joint venture defaults on their obligations? **10**

Section – II

Q.5 **a)** Discuss the role of confidentiality in arbitration. How is it maintained, and why is it important? **10**

b) Distinguish between Conciliation, Negotiation, Mediation and Arbitration. **10**

Q.6 **a)** What challenges do civil engineers face with respect to labour management and how can they overcome them? **10**

b) Discuss how the provisions of the Workmen's Compensation Act protect workers on construction sites. **10**

Q.7 **a)** Discuss the process for initiating legal action for infringement of copyrights, patents, and trademarks in India. **10**

b) Explain Copyright in India including Historical evolution of Copy Rights Act, 1957. **10**

Seat No.	

Set **Q**

Fourth Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Professional Practice, Law & Ethics (BTN01801)

Day & Date: Thursday, 14-05-2026 Max. Marks: 100
Time: 03:00 PM To 06:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:20

Q.1 Choose the correct alternatives from the options. **20**

1) Safety provisions in Indian Factory Act does not cover _____.
a) Fencing of machinery b) Precaution against fire
c) Lunch rooms d) Protection eyes

2) Which of the following matter are not referred to arbitration?
a) Civil matters b) Matrimonial matters
c) Banking matters d) Property matters

3) What is an ethical dilemma?
a) an issue caused by not following guidelines
b) conflict between what's right and what's wrong
c) same as a professional dilemma
d) moral conflict between values

4) _____ is the concept that describe the beliefs of an individual or culture.
a) Values b) Attitude
c) Behaviour d) Personality

5) In the _____ right conduct for an individual is regarded as whatever directly benefits oneself.
a) pre-conventional level b) post-conventional level
c) conventional level d) Final level

6) An agreement not enforceable by law is said to be _____.
a) A contract b) Void
c) A voidable contract d) A void contract

7) We use which among the following technique in business organizations and firms for protecting the IT assets?
   a) Ethical hacking
   b) Unethical hacking
   c) Fixing bugs
   d) Internal data-breach

8) A contract consists of _____.
   a) Mutual promises or agreement enforceable by law
   b) Agreement not enforceable by law
   c) Involuntary obligations
   d) None of these

9) Which of the following is not true with respect to Titanic disaster?
   a) Adequate Life boats
   b) Ship sailed at high speed in the night
   c) It had hit against an ice berg
   d) The ship tore into two parts due to hitting against iceberg

10) Which professional body certifies engineers in India?
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   b) Indian Institute of Architects (IIA)
   c) Institution of Engineers (India)
   d) Engineers Council of India (ECI)

11) Contractors in the construction sector are primarily governed by _____.
   a) Regulatory Acts, standards, and contracts
   b) Clients' preferences
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   d) Manufacturer's guidelines

12) Which of the following is an example of a standardization body in India?
   a) Ministry of Housing and Urban Affairs
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13) What is the primary responsibility of consultants in the construction industry?
   a) Designing the project
   b) Certifying the quality of materials
   c) Providing professional expertise, governed by bodies like CEAI
   d) Overseeing construction work

14) Which of the following is NOT a feature of a valid contract?
   a) Offer and acceptance
   b) Legal consideration
   c) Freedom of privacy in contract
   d) Illegal objectives

15) Prime contracts and subcontracts differ in _____.
a) The method of negotiation
b) The legal authority to execute
c) The nature of obligations between parties
d) The type of dispute resolution used

16) Which of the following is not true with respect to ensure a safety design?
a) The maximum requirement is that a design must comply with the applicable laws.
b) An acceptable design must meet the standard of “accepted engineering practice.”
c) Alternative designs that are potentially safer must be explored.
d) Engineer must attempt to foresee potential misuses of the product by the consumer and must design to avoid these problems

17) In _____, a neutral third party assists the disputing parties in reaching a settlement of their dispute.
a) Infiltration
b) Arbitration
c) Mediation
d) Negotiation

18) Which of the following stakeholder has the responsibility of prescribing norms to ensure safety of the citizens?
a) Government
b) Professional Societies
c) Standardization Bodies
d) All of these

19) What does a trademark protect?
a) An invention
b) Logos, names and brands
c) The look, shape and feel of a product
d) A secret formula

20) How long do patents usually last for?
a) 10 years
b) 20 years
c) 40 years
d) 60 years

Seat No.	

Set **Q**

Fourth Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Professional Practice, Law & Ethics (BTN01801)

Day & Date: Thursday, 14-05-2026 Max. Marks: 80
Time: 03:00 PM To 06:00 PM

Instructions: 1) Solve any two questions from Section I.
2) Solve any two questions from Section II.
3) Figures to the right indicate full marks.
4) Make suitable assumptions if necessary and state them clearly.

Section – I

Q.2 **a)** What role does contract documentation play in ensuring the enforcement of contract terms? **10**

b) State and explain Professional bodies certifying and offering platform for Civil engineers. **10**

Q.3 **a)** Define the terms: - **10**
i) Professional Ethics ii) contract variations
iii) Whistleblowing iv) Significance of Notice to Proceed

b) State Code of Ethics as defined in the website of Institution of Engineers. **10**

Q.4 **a)** Describe principle of contract management, also discuss Indian Contract Act, 1972. **10**

b) What legal provisions apply when one party in a joint venture defaults on their obligations? **10**

Section – II

Q.5 **a)** Discuss the role of confidentiality in arbitration. How is it maintained, and why is it important? **10**

b) Distinguish between Conciliation, Negotiation, Mediation and Arbitration. **10**

Q.6 **a)** What challenges do civil engineers face with respect to labour management and how can they overcome them? **10**

b) Discuss how the provisions of the Workmen's Compensation Act protect workers on construction sites. **10**

Q.7 **a)** Discuss the process for initiating legal action for infringement of copyrights, patents, and trademarks in India. **10**

b) Explain Copyright in India including Historical evolution of Copy Rights Act, 1957. **10**

Seat No.	

Set **R**

Fourth Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Professional Practice, Law & Ethics (BTN01801)

Day & Date: Thursday, 14-05-2026 Max. Marks: 100
Time: 03:00 PM To 06:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:20

Q.1 Choose the correct alternatives from the options. 20

1) An agreement not enforceable by law is said to be _____.
a) A contract b) Void
c) A voidable contract d) A void contract

2) We use which among the following technique in business organizations and firms for protecting the IT assets?
a) Ethical hacking b) Unethical hacking
c) Fixing bugs d) Internal data-breach

3) A contract consists of _____.
a) Mutual promises or agreement enforceable by law
b) Agreement not enforceable by law
c) Involuntary obligations
d) None of these

4) Which of the following is not true with respect to Titanic disaster?
a) Adequate Life boats
b) Ship sailed at high speed in the night
c) It had hit against an ice berg
d) The ship tore into two parts due to hitting against iceberg

5) Which professional body certifies engineers in India?
a) Indian Roads Congress (IRC)
b) Indian Institute of Architects (IIA)
c) Institution of Engineers (India)
d) Engineers Council of India (ECI)

6) Contractors in the construction sector are primarily governed by _____.
   a) Regulatory Acts, standards, and contracts
   b) Clients' preferences
   c) International standards
   d) Manufacturer's guidelines

7) Which of the following is an example of a standardization body in India?
   a) Ministry of Housing and Urban Affairs
   b) Bureau of Indian Standards (BIS)
   c) National Institute of Urban Affairs (NIUA)
   d) Indian Roads Congress (IRC)

8) What is the primary responsibility of consultants in the construction industry?
   a) Designing the project
   b) Certifying the quality of materials
   c) Providing professional expertise, governed by bodies like CEAI
   d) Overseeing construction work

9) Which of the following is NOT a feature of a valid contract?
   a) Offer and acceptance
   b) Legal consideration
   c) Freedom of privacy in contract
   d) Illegal objectives

10) Prime contracts and subcontracts differ in _____.
   a) The method of negotiation
   b) The legal authority to execute
   c) The nature of obligations between parties
   d) The type of dispute resolution used

11) Which of the following is not true with respect to ensure a safety design?
   a) The maximum requirement is that a design must comply with the applicable laws.
   b) An acceptable design must meet the standard of "accepted engineering practice."
   c) Alternative designs that are potentially safer must be explored.
   d) Engineer must attempt to foresee potential misuses of the product by the consumer and must design to avoid these problems

12) In _____, a neutral third party assists the disputing parties in reaching a settlement of their dispute.
   a) Infiltration
   b) Arbitration
   c) Mediation
   d) Negotiation

13) Which of the following stakeholder has the responsibility of prescribing norms to ensure safety of the citizens?

a) Government
b) Professional Societies
c) Standardization Bodies
d) All of these

14) What does a trademark protect?

a) An invention
b) Logos, names and brands
c) The look, shape and feel of a product
d) A secret formula

15) How long do patents usually last for?

a) 10 years
b) 20 years
c) 40 years
d) 60 years

16) Safety provisions in Indian Factory Act does not cover _____.

a) Fencing of machinery
b) Precaution against fire
c) Lunch rooms
d) Protection eyes

17) Which of the following matter are not referred to arbitration?

a) Civil matters
b) Matrimonial matters
c) Banking matters
d) Property matters

18) What is an ethical dilemma?

a) an issue caused by not following guidelines
b) conflict between what's right and what's wrong
c) same as a professional dilemma
d) moral conflict between values

19) _____ is the concept that describe the beliefs of an individual or culture.

a) Values
b) Attitude
c) Behaviour
d) Personality

20) In the _____ right conduct for an individual is regarded as whatever directly benefits oneself.

a) pre-conventional level
b) post-conventional level
c) conventional level
d) Final level

Seat No.	

Set **R**

Fourth Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Professional Practice, Law & Ethics (BTN01801)

Day & Date: Thursday, 14-05-2026 Max. Marks: 80
Time: 03:00 PM To 06:00 PM

Instructions: 1) Solve any two questions from Section I.
2) Solve any two questions from Section II.
3) Figures to the right indicate full marks.
4) Make suitable assumptions if necessary and state them clearly.

Section – I

Q.2 **a)** What role does contract documentation play in ensuring the enforcement of contract terms? **10**

b) State and explain Professional bodies certifying and offering platform for Civil engineers. **10**

Q.3 **a)** Define the terms: - **10**
i) Professional Ethics ii) contract variations
iii) Whistleblowing iv) Significance of Notice to Proceed

b) State Code of Ethics as defined in the website of Institution of Engineers. **10**

Q.4 **a)** Describe principle of contract management, also discuss Indian Contract Act, 1972. **10**

b) What legal provisions apply when one party in a joint venture defaults on their obligations? **10**

Section – II

Q.5 **a)** Discuss the role of confidentiality in arbitration. How is it maintained, and why is it important? **10**

b) Distinguish between Conciliation, Negotiation, Mediation and Arbitration. **10**

Q.6 **a)** What challenges do civil engineers face with respect to labour management and how can they overcome them? **10**

b) Discuss how the provisions of the Workmen's Compensation Act protect workers on construction sites. **10**

Q.7 **a)** Discuss the process for initiating legal action for infringement of copyrights, patents, and trademarks in India. **10**

b) Explain Copyright in India including Historical evolution of Copy Rights Act, 1957. **10**

Seat No.		Set	S

Fourth Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Professional Practice, Law & Ethics (BTN01801)

Day & Date: Thursday, 14-05-2026 Max. Marks: 100
Time: 03:00 PM To 06:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:20

Q.1 Choose the correct alternatives from the options. 20

1) Contractors in the construction sector are primarily governed by _____.
a) Regulatory Acts, standards, and contracts
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d) Manufacturer's guidelines

2) Which of the following is an example of a standardization body in India?
a) Ministry of Housing and Urban Affairs
b) Bureau of Indian Standards (BIS)
c) National Institute of Urban Affairs (NIUA)
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3) What is the primary responsibility of consultants in the construction industry?
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5) Prime contracts and subcontracts differ in _____.
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   d) Engineer must attempt to foresee potential misuses of the product by the consumer and must design to avoid these problems

7) In _____, a neutral third party assists the disputing parties in reaching a settlement of their dispute.
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   b) Arbitration
   c) Mediation
   d) Negotiation

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   b) Professional Societies
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10) How long do patents usually last for?
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   b) 20 years
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b) Attitude
c) Behaviour
d) Personality

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d) Final level

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b) Ship sailed at high speed in the night
c) It had hit against an ice berg
d) The ship tore into two parts due to hitting against iceberg

20) Which professional body certifies engineers in India?
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c) Institution of Engineers (India)
d) Engineers Council of India (ECI)

SLR-QH-306

Seat No.		Set	S

Fourth Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Professional Practice, Law & Ethics (BTN01801)

Day & Date: Thursday, 14-05-2026 Max. Marks: 80
Time: 03:00 PM To 06:00 PM

Instructions: 1) Solve any two questions from Section I.
2) Solve any two questions from Section II.
3) Figures to the right indicate full marks.
4) Make suitable assumptions if necessary and state them clearly.

Section – I

Q.2 **a)** What role does contract documentation play in ensuring the enforcement of contract terms? **10**

b) State and explain Professional bodies certifying and offering platform for Civil engineers. **10**

Q.3 **a)** Define the terms: - **10**
i) Professional Ethics ii) contract variations
iii) Whistleblowing iv) Significance of Notice to Proceed

b) State Code of Ethics as defined in the website of Institution of Engineers. **10**

Q.4 **a)** Describe principle of contract management, also discuss Indian Contract Act, 1972. **10**

b) What legal provisions apply when one party in a joint venture defaults on their obligations? **10**

Section – II

Q.5 **a)** Discuss the role of confidentiality in arbitration. How is it maintained, and why is it important? **10**

b) Distinguish between Conciliation, Negotiation, Mediation and Arbitration. **10**

Q.6 **a)** What challenges do civil engineers face with respect to labour management and how can they overcome them? **10**

b) Discuss how the provisions of the Workmen's Compensation Act protect workers on construction sites. **10**

Q.7 **a)** Discuss the process for initiating legal action for infringement of copyrights, patents, and trademarks in India. **10**

b) Explain Copyright in India including Historical evolution of Copy Rights Act, 1957. **10**

SLR-QH-307

Seat No.	

Set P

Fourth Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Repairs & Rehabilitation of Structures (BTN01803)

Day & Date: Monday, 18-05-2026 Max. Marks: 100
Time: 03:00 PM To 06:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 20

Q.1 Choose the correct Answer. **20**

1) After finishing concrete surface must be kept _____.
a) Dry b) First dry it and then wet it
c) First wet it and then dry it d) Wet

2) Cracks in the concrete are bonded by the injection of ____ bonding components under pressure.
a) epoxy b) ether
c) acetylene d) resin

3) Factors which contribute to corrosion of reinforcement in concrete are _____.
a) formation of cracks in concrete
b) permeability of concrete and mortar
c) use of admixtures and pozzolonas
d) relative humidity

4) Remove a whole building or part of building in control way is known as _____.
a) restoration b) demolition
c) retrofitting d) maintenance

5) One of the testing equipment used for inspection is _____.
a) Strain gauge b) Measuring jar
c) Test tubes d) None of these

6) The method of deposition of concrete by jetting it with high velocity is called _____.
a) Dry mixing concrete b) shotcrete
c) motor replacement d) None of the above

7) _____ is/are Mechanical methods of demolishing.
a) Wrecking Ball b) Pusher Arm
c) Wire Rope Pulling d) All of the above

8) Activities which are repeated at relatively fixed intervals of time is known as _____.
a) Preventive Maintenance b) Special Maintenance
c) Routine Maintenance d) Emergency Maintenance

9) Special maintenance includes _____.
a) Provision of water proofing treatment on the roof
b) repair of internal roads and pavements
c) replacement water supply & sanitary units
d) All of the above

10) Rehabilitation is the _____ of an individual with a disability into society.
a) Re integration b) Removal
c) Addition d) None of the above

11) Who is responsible for the combination of the polymer particles?
a) monomer b) nanomer
c) tetramer d) crystal

12) Honey combing in concrete is caused due to _____.
a) Inadequate compaction b) Chemical reaction
c) Shock waves d) Lack of curing

13) Epoxy resins have _____.
a) poor mechanical strength b) poor thermal strength
c) low tensile strength d) none of the above

14) Which NDT test work on the principle of rebound of the elastic mass?
a) Hammer test b) Ultrasonic test
c) Chloride test d) None of the above

15) A fire detector cannot detect _____.
a) Radiation b) Heat
c) Light d) Smoke

16) pH Value of fresh concrete around _____.
a) 8 b) 9
c) 10 d) 12.5

17) Low velocity in ultrasonic pulse velocity testing indicates _____.

a) good concrete
b) fairly good concrete
c) poor concrete
d) very poor concrete

18) Which of the following is not a measure for the prevention of cracks?

a) Choice of material
b) Design of building
c) Construction techniques and practices
d) Aggregate with low coefficient of thermal expansion

19) Curing should be done for a minimum period of _____ days.

a) 7 to 10
b) 10 to 12
c) 15 to 20
d) 20 to 25

20) Which of the instrument is used for grouting _____.

a) Heating
b) Grout pump
c) Compressor
d) All of the above

Seat No.	

Set P

Fourth Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Repairs & Rehabilitation of Structures (BTN01803)

Day & Date: Monday, 18-05-2026 Max. Marks: 80
Time: 03:00 PM To 06:00 PM

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

Section – I

Q.2 Solve. (Any Two) **12**

a) Write a note on methods of repairs of cracks in concrete.

b) Explain Strength-durability relationship in details.

c) Write a note on polymer modified concrete.

Q.3 Solve. (Any Two) **16**

a) Explain underpinning and shoring.

b) Explain Ferrocement concrete.

c) Define Corrosion inhibitor & Give some examples for corrosion inhibitors?

Q.4 Solve. (Any Three) **12**

a) What are the uses of Polymer concrete?

b) Define - Repair, Maintenance.

c) How deterioration occurs due to corrosion?

d) How can use prevent the effect of freezing and thawing in concrete?

Section – II

Q.5 Solve. (Any Two) **16**

a) Give a brief note preliminary investigation before demolition of a structure.

b) Give a short note on epoxy coatings.

c) Describe with neat sketch the repair techniques when the structure is subjected to cracking & corrosion problem.

Q.6 Solve. (Any Two) **12**

a) Write a note on repairs in underwater structures.

b) Write short notes on demolition by hand.

c) Explain the retrofitting techniques used in repair of columns & slabs.

Q.7 Solve. (Any Three) **12**

a) Write short notes on overlay.

b) Write short notes on nibblers.

c) Write short notes on blanketing.

d) Write short notes on balling machine.

SLR-QH-307

Seat No.	

Set Q

Fourth Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Repairs & Rehabilitation of Structures (BTN01803)

Day & Date: Monday, 18-05-2026 Max. Marks: 100
Time: 03:00 PM To 06:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 20

Q.1 Choose the correct Answer. 20

1) The method of deposition of concrete by jetting it with high velocity is called _____.
a) Dry mixing concrete b) shotcrete
c) motor replacement d) None of the above

2) _____ is/are Mechanical methods of demolishing.
a) Wrecking Ball b) Pusher Arm
c) Wire Rope Pulling d) All of the above

3) Activities which are repeated at relatively fixed intervals of time is known as _____.
a) Preventive Maintenance b) Special Maintenance
c) Routine Maintenance d) Emergency Maintenance

4) Special maintenance includes _____.
a) Provision of water proofing treatment on the roof
b) repair of internal roads and pavements
c) replacement water supply & sanitary units
d) All of the above

5) Rehabilitation is the _____ of an individual with a disability into society.
a) Re integration b) Removal
c) Addition d) None of the above

6) Who is responsible for the combination of the polymer particles?
a) monomer b) nanomer
c) tetramer d) crystal

7) Honey combing in concrete is caused due to _____.
a) Inadequate compaction
b) Chemical reaction
c) Shock waves
d) Lack of curing

8) Epoxy resins have _____.
a) poor mechanical strength
b) poor thermal strength
c) low tensile strength
d) none of the above

9) Which NDT test work on the principle of rebound of the elastic mass?
a) Hammer test
b) Ultrasonic test
c) Chloride test
d) None of the above

10) A fire detector cannot detect _____.
a) Radiation
b) Heat
c) Light
d) Smoke

11) pH Value of fresh concrete around _____.
a) 8
b) 9
c) 10
d) 12.5

12) Low velocity in ultrasonic pulse velocity testing indicates _____.
a) good concrete
b) fairly good concrete
c) poor concrete
d) very poor concrete

13) Which of the following is not a measure for the prevention of cracks?
a) Choice of material
b) Design of building
c) Construction techniques and practices
d) Aggregate with low coefficient of thermal expansion

14) Curing should be done for a minimum period of _____ days.
a) 7 to 10
b) 10 to 12
c) 15 to 20
d) 20 to 25

15) Which of the instrument is used for grouting _____.
a) Heating
b) Grout pump
c) Compressor
d) All of the above

16) After finishing concrete surface must be kept _____.
a) Dry
b) First dry it and then wet it
c) First wet it and then dry it
d) Wet

17) Cracks in the concrete are bonded by the injection of ____ bonding components under pressure.
a) epoxy
b) ether
c) acetylene
d) resin

18) Factors which contribute to corrosion of reinforcement in concrete are _____.

a) formation of cracks in concrete
b) permeability of concrete and mortar
c) use of admixtures and pozzolonas
d) relative humidity

19) Remove a whole building or part of building in control way is known as _____.

a) restoration
b) demolition
c) retrofitting
d) maintenance

20) One of the testing equipment used for inspection is _____.

a) Strain gauge
b) Measuring jar
c) Test tubes
d) None of these

SLR-QH-307

Seat No.	

Set Q

Fourth Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Repairs & Rehabilitation of Structures (BTN01803)

Day & Date: Monday, 18-05-2026 Max. Marks: 80
Time: 03:00 PM To 06:00 PM

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

Section – I

Q.2 Solve. (Any Two) **12**

a) Write a note on methods of repairs of cracks in concrete.

b) Explain Strength-durability relationship in details.

c) Write a note on polymer modified concrete.

Q.3 Solve. (Any Two) **16**

a) Explain underpinning and shoring.

b) Explain Ferrocement concrete.

c) Define Corrosion inhibitor & Give some examples for corrosion inhibitors?

Q.4 Solve. (Any Three) **12**

a) What are the uses of Polymer concrete?

b) Define - Repair, Maintenance.

c) How deterioration occurs due to corrosion?

d) How can use prevent the effect of freezing and thawing in concrete?

Section – II

Q.5 Solve. (Any Two) **16**

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Q.6 Solve. (Any Two) **12**

a) Write a note on repairs in underwater structures.

b) Write short notes on demolition by hand.

c) Explain the retrofitting techniques used in repair of columns & slabs.

Q.7 Solve. (Any Three) **12**

a) Write short notes on overlay.

b) Write short notes on nibblers.

c) Write short notes on blanketing.

d) Write short notes on balling machine.

SLR-QH-307

Seat No.	

Set R

Fourth Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Repairs & Rehabilitation of Structures (BTN01803)

Day & Date: Monday, 18-05-2026 Max. Marks: 100
Time: 03:00 PM To 06:00 PM

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

Duration: 30 Minutes Marks:20

Q.1 Choose the correct Answer. **20**

1) Who is responsible for the combination of the polymer particles?
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2) Honey combing in concrete is caused due to _____.
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c) Wire Rope Pulling
d) All of the above

18) Activities which are repeated at relatively fixed intervals of time is known as _____.

a) Preventive Maintenance
b) Special Maintenance
c) Routine Maintenance
d) Emergency Maintenance

19) Special maintenance includes _____.

a) Provision of water proofing treatment on the roof
b) repair of internal roads and pavements
c) replacement water supply & sanitary units
d) All of the above

20) Rehabilitation is the _____ of an individual with a disability into society.

a) Re integration
b) Removal
c) Addition
d) None of the above

SLR-QH-307

Seat No.	

Set R

Fourth Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Repairs & Rehabilitation of Structures (BTN01803)

Day & Date: Monday, 18-05-2026 Max. Marks: 80
Time: 03:00 PM To 06:00 PM

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

Section – I

Q.2 Solve. (Any Two) **12**

a) Write a note on methods of repairs of cracks in concrete.

b) Explain Strength-durability relationship in details.

c) Write a note on polymer modified concrete.

Q.3 Solve. (Any Two) **16**

a) Explain underpinning and shoring.

b) Explain Ferrocement concrete.

c) Define Corrosion inhibitor & Give some examples for corrosion inhibitors?

Q.4 Solve. (Any Three) **12**

a) What are the uses of Polymer concrete?

b) Define - Repair, Maintenance.

c) How deterioration occurs due to corrosion?

d) How can use prevent the effect of freezing and thawing in concrete?

Section – II

Q.5 Solve. (Any Two) **16**

a) Give a brief note preliminary investigation before demolition of a structure.

b) Give a short note on epoxy coatings.

c) Describe with neat sketch the repair techniques when the structure is subjected to cracking & corrosion problem.

Q.6 Solve. (Any Two) **12**

a) Write a note on repairs in underwater structures.

b) Write short notes on demolition by hand.

c) Explain the retrofitting techniques used in repair of columns & slabs.

Q.7 Solve. (Any Three) **12**

a) Write short notes on overlay.

b) Write short notes on nibblers.

c) Write short notes on blanketing.

d) Write short notes on balling machine.

SLR-QH-307

Seat No.	

Set S

Fourth Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Repairs & Rehabilitation of Structures (BTN01803)

Day & Date: Monday, 18-05-2026 Max. Marks: 100
Time: 03:00 PM To 06:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:20

Q.1 Choose the correct Answer. **20**

1) pH Value of fresh concrete around _____.
a) 8 b) 9
c) 10 d) 12.5

2) Low velocity in ultrasonic pulse velocity testing indicates _____.
a) good concrete b) fairly good concrete
c) poor concrete d) very poor concrete

3) Which of the following is not a measure for the prevention of cracks?
a) Choice of material
b) Design of building
c) Construction techniques and practices
d) Aggregate with low coefficient of thermal expansion

4) Curing should be done for a minimum period of _____ days.
a) 7 to 10 b) 10 to 12
c) 15 to 20 d) 20 to 25

5) Which of the instrument is used for grouting _____.
a) Heating b) Grout pump
c) Compressor d) All of the above

6) After finishing concrete surface must be kept _____.
a) Dry b) First dry it and then wet it
c) First wet it and then dry it d) Wet

7) Cracks in the concrete are bonded by the injection of ____ bonding components under pressure.
a) epoxy b) ether
c) acetylene d) resin

8) Factors which contribute to corrosion of reinforcement in concrete are _____.
a) formation of cracks in concrete
b) permeability of concrete and mortar
c) use of admixtures and pozzolonas
d) relative humidity

9) Remove a whole building or part of building in control way is known as _____.
a) restoration b) demolition
c) retrofitting d) maintenance

10) One of the testing equipment used for inspection is _____.
a) Strain gauge b) Measuring jar
c) Test tubes d) None of these

11) The method of deposition of concrete by jetting it with high velocity is called _____.
a) Dry mixing concrete b) shotcrete
c) motor replacement d) None of the above

12) _____ is/are Mechanical methods of demolishing.
a) Wrecking Ball b) Pusher Arm
c) Wire Rope Pulling d) All of the above

13) Activities which are repeated at relatively fixed intervals of time is known as _____.
a) Preventive Maintenance b) Special Maintenance
c) Routine Maintenance d) Emergency Maintenance

14) Special maintenance includes _____.
a) Provision of water proofing treatment on the roof
b) repair of internal roads and pavements
c) replacement water supply & sanitary units
d) All of the above

15) Rehabilitation is the _____ of an individual with a disability into society.
a) Re integration b) Removal
c) Addition d) None of the above

16) Who is responsible for the combination of the polymer particles?
a) monomer b) nanomer
c) tetramer d) crystal

17) Honey combing in concrete is caused due to _____.

a) Inadequate compaction
b) Chemical reaction
c) Shock waves
d) Lack of curing

18) Epoxy resins have _____.

a) poor mechanical strength
b) poor thermal strength
c) low tensile strength
d) none of the above

19) Which NDT test work on the principle of rebound of the elastic mass?

a) Hammer test
b) Ultrasonic test
c) Chloride test
d) None of the above

20) A fire detector cannot detect _____.

a) Radiation
b) Heat
c) Light
d) Smoke

SLR-QH-307

Seat No.	

Set S

Fourth Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Repairs & Rehabilitation of Structures (BTN01803)

Day & Date: Monday, 18-05-2026 Max. Marks: 80
Time: 03:00 PM To 06:00 PM

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

Section – I

Q.2 Solve. (Any Two) **12**

a) Write a note on methods of repairs of cracks in concrete.

b) Explain Strength-durability relationship in details.

c) Write a note on polymer modified concrete.

Q.3 Solve. (Any Two) **16**

a) Explain underpinning and shoring.

b) Explain Ferrocement concrete.

c) Define Corrosion inhibitor & Give some examples for corrosion inhibitors?

Q.4 Solve. (Any Three) **12**

a) What are the uses of Polymer concrete?

b) Define - Repair, Maintenance.

c) How deterioration occurs due to corrosion?

d) How can use prevent the effect of freezing and thawing in concrete?

Section – II

Q.5 Solve. (Any Two) **16**

a) Give a brief note preliminary investigation before demolition of a structure.

b) Give a short note on epoxy coatings.

c) Describe with neat sketch the repair techniques when the structure is subjected to cracking & corrosion problem.

Q.6 Solve. (Any Two) **12**

a) Write a note on repairs in underwater structures.

b) Write short notes on demolition by hand.

c) Explain the retrofitting techniques used in repair of columns & slabs.

Q.7 Solve. (Any Three) **12**

a) Write short notes on overlay.

b) Write short notes on nibblers.

c) Write short notes on blanketing.

d) Write short notes on balling machine.

SLR-QH-312

Seat No.	

Set P

Fourth Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Disaster Management (BTN01808)

Day & Date: Monday, 18-05-2026 Max. Marks: 100
Time: 03:00 PM To 06:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 20

Q.1 Choose the correct Answer. **20**

1) What is the primary difference between environmental hazards and environmental disasters? **02**
a) Magnitude of impact
b) Frequency of occurrence
c) Duration of the event
d) Geographic location

2) The tectonic condition that often leads to landslides is _____. **01**
a) Divergent plate boundaries
b) Convergent plate boundaries
c) Transform faults
d) None of these

3) Which of the following is NOT a characteristic of earthquake hazards? **01**
a) Seismic waves
b) Volcanic eruptions
c) Seismic zones
d) Vulnerability assessment

4) The type of cyclone most common in India is _____. **02**
a) Tornado
b) Tropical cyclone
c) Extratropical cyclone
d) Dust storm

5) What are the three stages of disaster management? **01**
a) Preparedness, Response, Recovery
b) Prevention, Preparedness, Recovery
c) Preparedness, Mitigation, Response
d) Response, Recovery, Rehabilitation

6) Which of the following is an approach to mitigate earthquake damage? **01**

a) Zoning regulations b) Cloud seeding
c) Reforestation d) Dredging

7) What is one measure of adjustment to natural hazards? **02**

a) Immediate relief measures
b) Predictability of disasters
c) Land use zoning
d) Disaster-resistant construction

8) The process of retrofitting is a part of which disaster stage? **01**

a) Preparedness b) Mitigation
c) Rehabilitation d) Warning

9) Disaster Mitigation What role do GIS and GPS applications play in disaster mitigation? **01**

a) Monitoring disaster recovery efforts
b) Providing real-time information during disasters
c) Identifying vulnerable populations
d) Assessing environmental damage

10) Disaster-resistant house construction focuses on: _____. **02**

a) Energy efficiency
b) Resilience against hazards
c) Cost reduction
d) Urban aesthetics

11) Which of the following is a characteristic of volcanic eruptions? **01**

a) Seismic waves b) Lava flow
c) Landslides d) Tornadoes

12) The primary objective of immediate relief measures is to _____. **01**

a) Prevent future disasters
b) Restore normalcy quickly
c) Conduct research
d) Implement long-term strategies

13) Which national agency is primarily responsible for coordinating disaster response efforts in India? **02**

a) Indian Red Cross Society
b) National Institute of Disaster Management
c) National Civil Defense Organization
d) Ministry of Environment, Forest and Climate Change

14) Which of the following is an example of a natural hazard adjustment measure? **02**

a) Evacuation planning b) Urbanization
c) Agricultural expansion d) Deforestation

SLR-QH-312

Seat No.	

Set P

Fourth Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Disaster Management (BTN01808)

Day & Date: Monday, 18-05-2026 Max. Marks: 80
Time: 03:00 PM To 06:00 PM

Instructions: 1) Solve any two questions from each section.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever needed and mention it clearly.

Section – I

Q.2	**a)**	Discuss the factors leading to landslides and identify landslide-prone areas in India.	**10**
	b)	Explain the causes and impacts of volcanic eruptions on the environment.	**10**
Q.3	**a)**	Write a detailed note on human adjustments and mitigation measures for earthquakes.	**10**
	b)	How to analyze the hazards of cyclones and tsunamis on coastal regions. Discuss measures to enhance coastal community resilience.	**10**
Q.4	**a)**	Discuss the three stages of disaster management with examples.	**10**
	b)	Explore challenges and opportunities in post-disaster rehabilitation efforts, including infrastructure and community engagement.	**10**

Section – II

Q.5	**a)**	Write a detailed note on measures to adjust to natural hazards with examples.	**10**
	b)	Discuss the role of prediction in disaster management and its limitations.	**10**
Q.6	**a)**	Explain the importance of GIS and GPS in disaster management.	**10**
	b)	Describe the role of community involvement in disaster mitigation and management.	**10**
Q.7	**a)**	Discuss the functions of the National Institute of Disaster Management in India.	**10**
	b)	Discuss the importance of collaboration between international and national agencies in disaster mitigation.	**10**

SLR-QH-312

Seat No.	

Set Q

Fourth Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Disaster Management (BTN01808)

Day & Date: Monday, 18-05-2026 Max. Marks: 100
Time: 03:00 PM To 06:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:20

Q.1 Choose the correct Answer. **20**

1) The process of retrofitting is a part of which disaster stage? **01**
a) Preparedness b) Mitigation
c) Rehabilitation d) Warning

2) Disaster Mitigation What role do GIS and GPS applications play in disaster mitigation? **01**
a) Monitoring disaster recovery efforts
b) Providing real-time information during disasters
c) Identifying vulnerable populations
d) Assessing environmental damage

3) Disaster-resistant house construction focuses on: _____. **02**
a) Energy efficiency
b) Resilience against hazards
c) Cost reduction
d) Urban aesthetics

4) Which of the following is a characteristic of volcanic eruptions? **01**
a) Seismic waves b) Lava flow
c) Landslides d) Tornadoes

5) The primary objective of immediate relief measures is to _____. **01**
a) Prevent future disasters
b) Restore normalcy quickly
c) Conduct research
d) Implement long-term strategies

6) Which national agency is primarily responsible for coordinating disaster response efforts in India? **02**
a) Indian Red Cross Society
b) National Institute of Disaster Management
c) National Civil Defense Organization
d) Ministry of Environment, Forest and Climate Change

7) Which of the following is an example of a natural hazard adjustment measure? **02**
a) Evacuation planning
b) Urbanization
c) Agricultural expansion
d) Deforestation

8) What is the primary difference between environmental hazards and environmental disasters? **02**
a) Magnitude of impact
b) Frequency of occurrence
c) Duration of the event
d) Geographic location

9) The tectonic condition that often leads to landslides is _____. **01**
a) Divergent plate boundaries
b) Convergent plate boundaries
c) Transform faults
d) None of these

10) Which of the following is NOT a characteristic of earthquake hazards? **01**
a) Seismic waves
b) Volcanic eruptions
c) Seismic zones
d) Vulnerability assessment

11) The type of cyclone most common in India is _____. **02**
a) Tornado
b) Tropical cyclone
c) Extratropical cyclone
d) Dust storm

12) What are the three stages of disaster management? **01**
a) Preparedness, Response, Recovery
b) Prevention, Preparedness, Recovery
c) Preparedness, Mitigation, Response
d) Response, Recovery, Rehabilitation

13) Which of the following is an approach to mitigate earthquake damage? **01**
a) Zoning regulations
b) Cloud seeding
c) Reforestation
d) Dredging

14) What is one measure of adjustment to natural hazards? **02**
a) Immediate relief measures
b) Predictability of disasters
c) Land use zoning
d) Disaster-resistant construction

SLR-QH-312

Seat No.	

Set Q

Fourth Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Disaster Management (BTN01808)

Day & Date: Monday, 18-05-2026 Max. Marks: 80
Time: 03:00 PM To 06:00 PM

Instructions: 1) Solve any two questions from each section.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever needed and mention it clearly.

Section – I

Q.2	**a)**	Discuss the factors leading to landslides and identify landslide-prone areas in India.	**10**
	b)	Explain the causes and impacts of volcanic eruptions on the environment.	**10**
Q.3	**a)**	Write a detailed note on human adjustments and mitigation measures for earthquakes.	**10**
	b)	How to analyze the hazards of cyclones and tsunamis on coastal regions. Discuss measures to enhance coastal community resilience.	**10**
Q.4	**a)**	Discuss the three stages of disaster management with examples.	**10**
	b)	Explore challenges and opportunities in post-disaster rehabilitation efforts, including infrastructure and community engagement.	**10**

Section – II

Q.5	**a)**	Write a detailed note on measures to adjust to natural hazards with examples.	**10**
	b)	Discuss the role of prediction in disaster management and its limitations.	**10**
Q.6	**a)**	Explain the importance of GIS and GPS in disaster management.	**10**
	b)	Describe the role of community involvement in disaster mitigation and management.	**10**
Q.7	**a)**	Discuss the functions of the National Institute of Disaster Management in India.	**10**
	b)	Discuss the importance of collaboration between international and national agencies in disaster mitigation.	**10**

SLR-QH-312

Seat No.	

Set R

Fourth Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Disaster Management (BTN01808)

Day & Date: Monday, 18-05-2026 Max. Marks: 100
Time: 03:00 PM To 06:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:20

Q.1 Choose the correct Answer. **20**

1) Which of the following is a characteristic of volcanic eruptions? **01**
a) Seismic waves b) Lava flow
c) Landslides d) Tornadoes

2) The primary objective of immediate relief measures is to _____. **01**
a) Prevent future disasters
b) Restore normalcy quickly
c) Conduct research
d) Implement long-term strategies

3) Which national agency is primarily responsible for coordinating disaster response efforts in India? **02**
a) Indian Red Cross Society
b) National Institute of Disaster Management
c) National Civil Defense Organization
d) Ministry of Environment, Forest and Climate Change

4) Which of the following is an example of a natural hazard adjustment measure? **02**
a) Evacuation planning b) Urbanization
c) Agricultural expansion d) Deforestation

5) What is the primary difference between environmental hazards and environmental disasters? **02**
a) Magnitude of impact b) Frequency of occurrence
c) Duration of the event d) Geographic location

6) The tectonic condition that often leads to landslides is _____. **01**
a) Divergent plate boundaries
b) Convergent plate boundaries
c) Transform faults
d) None of these

7) Which of the following is NOT a characteristic of earthquake hazards? **01**
a) Seismic waves
b) Volcanic eruptions
c) Seismic zones
d) Vulnerability assessment

8) The type of cyclone most common in India is _____. **02**
a) Tornado
b) Tropical cyclone
c) Extratropical cyclone
d) Dust storm

9) What are the three stages of disaster management? **01**
a) Preparedness, Response, Recovery
b) Prevention, Preparedness, Recovery
c) Preparedness, Mitigation, Response
d) Response, Recovery, Rehabilitation

10) Which of the following is an approach to mitigate earthquake damage? **01**
a) Zoning regulations
b) Cloud seeding
c) Reforestation
d) Dredging

11) What is one measure of adjustment to natural hazards? **02**
a) Immediate relief measures
b) Predictability of disasters
c) Land use zoning
d) Disaster-resistant construction

12) The process of retrofitting is a part of which disaster stage? **01**
a) Preparedness
b) Mitigation
c) Rehabilitation
d) Warning

13) Disaster Mitigation What role do GIS and GPS applications play in disaster mitigation? **01**
a) Monitoring disaster recovery efforts
b) Providing real-time information during disasters
c) Identifying vulnerable populations
d) Assessing environmental damage

14) Disaster-resistant house construction focuses on: _____. **02**
a) Energy efficiency
b) Resilience against hazards
c) Cost reduction
d) Urban aesthetics

SLR-QH-312

Seat No.	

Set R

Fourth Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Disaster Management (BTN01808)

Day & Date: Monday, 18-05-2026 Max. Marks: 80
Time: 03:00 PM To 06:00 PM

Instructions: 1) Solve any two questions from each section.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever needed and mention it clearly.

Section – I

Q.2	**a)**	Discuss the factors leading to landslides and identify landslide-prone areas in India.	**10**
	b)	Explain the causes and impacts of volcanic eruptions on the environment.	**10**
Q.3	**a)**	Write a detailed note on human adjustments and mitigation measures for earthquakes.	**10**
	b)	How to analyze the hazards of cyclones and tsunamis on coastal regions. Discuss measures to enhance coastal community resilience.	**10**
Q.4	**a)**	Discuss the three stages of disaster management with examples.	**10**
	b)	Explore challenges and opportunities in post-disaster rehabilitation efforts, including infrastructure and community engagement.	**10**

Section – II

Q.5	**a)**	Write a detailed note on measures to adjust to natural hazards with examples.	**10**
	b)	Discuss the role of prediction in disaster management and its limitations.	**10**
Q.6	**a)**	Explain the importance of GIS and GPS in disaster management.	**10**
	b)	Describe the role of community involvement in disaster mitigation and management.	**10**
Q.7	**a)**	Discuss the functions of the National Institute of Disaster Management in India.	**10**
	b)	Discuss the importance of collaboration between international and national agencies in disaster mitigation.	**10**

SLR-QH-312

Seat No.		Set	S

Fourth Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Disaster Management (BTN01808)

Day & Date: Monday, 18-05-2026 Max. Marks: 100
Time: 03:00 PM To 06:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:20

Q.1 Choose the correct Answer. **20**

1) Which of the following is an approach to mitigate earthquake damage? **01**
a) Zoning regulations b) Cloud seeding
c) Reforestation d) Dredging

2) What is one measure of adjustment to natural hazards? **02**
a) Immediate relief measures
b) Predictability of disasters
c) Land use zoning
d) Disaster-resistant construction

3) The process of retrofitting is a part of which disaster stage? **01**
a) Preparedness b) Mitigation
c) Rehabilitation d) Warning

4) Disaster Mitigation What role do GIS and GPS applications play in disaster mitigation? **01**
a) Monitoring disaster recovery efforts
b) Providing real-time information during disasters
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d) Assessing environmental damage

5) Disaster-resistant house construction focuses on: _____. **02**
a) Energy efficiency
b) Resilience against hazards
c) Cost reduction
d) Urban aesthetics

6) Which of the following is a characteristic of volcanic eruptions? **01**
a) Seismic waves b) Lava flow
c) Landslides d) Tornadoes

7) The primary objective of immediate relief measures is to _____. **01**
a) Prevent future disasters
b) Restore normalcy quickly
c) Conduct research
d) Implement long-term strategies

8) Which national agency is primarily responsible for coordinating disaster response efforts in India? **02**
a) Indian Red Cross Society
b) National Institute of Disaster Management
c) National Civil Defense Organization
d) Ministry of Environment, Forest and Climate Change

9) Which of the following is an example of a natural hazard adjustment measure? **02**
a) Evacuation planning b) Urbanization
c) Agricultural expansion d) Deforestation

10) What is the primary difference between environmental hazards and environmental disasters? **02**
a) Magnitude of impact b) Frequency of occurrence
c) Duration of the event d) Geographic location

11) The tectonic condition that often leads to landslides is _____. **01**
a) Divergent plate boundaries
b) Convergent plate boundaries
c) Transform faults
d) None of these

12) Which of the following is NOT a characteristic of earthquake hazards? **01**
a) Seismic waves b) Volcanic eruptions
c) Seismic zones d) Vulnerability assessment

13) The type of cyclone most common in India is _____. **02**
a) Tornado b) Tropical cyclone
c) Extratropical cyclone d) Dust storm

14) What are the three stages of disaster management? **01**
a) Preparedness, Response, Recovery
b) Prevention, Preparedness, Recovery
c) Preparedness, Mitigation, Response
d) Response, Recovery, Rehabilitation

SLR-QH-312

Seat No.	

Set S

Fourth Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Disaster Management (BTN01808)

Day & Date: Monday, 18-05-2026 Max. Marks: 80
Time: 03:00 PM To 06:00 PM

Instructions: 1) Solve any two questions from each section.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever needed and mention it clearly.

Section – I

Q.2	**a)**	Discuss the factors leading to landslides and identify landslide-prone areas in India.	**10**
	b)	Explain the causes and impacts of volcanic eruptions on the environment.	**10**
Q.3	**a)**	Write a detailed note on human adjustments and mitigation measures for earthquakes.	**10**
	b)	How to analyze the hazards of cyclones and tsunamis on coastal regions. Discuss measures to enhance coastal community resilience.	**10**
Q.4	**a)**	Discuss the three stages of disaster management with examples.	**10**
	b)	Explore challenges and opportunities in post-disaster rehabilitation efforts, including infrastructure and community engagement.	**10**

Section – II

Q.5	**a)**	Write a detailed note on measures to adjust to natural hazards with examples.	**10**
	b)	Discuss the role of prediction in disaster management and its limitations.	**10**
Q.6	**a)**	Explain the importance of GIS and GPS in disaster management.	**10**
	b)	Describe the role of community involvement in disaster mitigation and management.	**10**
Q.7	**a)**	Discuss the functions of the National Institute of Disaster Management in India.	**10**
	b)	Discuss the importance of collaboration between international and national agencies in disaster mitigation.	**10**

SLR-QH-313

Seat No.	

Set P

Fourth Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Water and Air Quality Modelling (BTN01809)

Day & Date: Monday, 18-05-2026 Max. Marks: 100
Time: 03:00 PM To 06:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks :20

Q.1 Choose the correct Answer. 20

1) _____ is generally used to summarize specific expert opinions to develop parameter weight for different water quality index.
a) Streeter Phelps method b) Le Chatelier's method
c) Delphi method d) Newton method

2) Ground water models are used to predict the effect of hydrological changes on the behavior of _____.
a) Soil water zone b) Aquifer
c) Capillary zone d) Intermediate zone

3) The density of ambient water at room temperature 20-25oC is _____.
a) 1.98 g/cm3 b) 1 g/cm3
c) 0.99 g/cm3 d) 0.5 g/cm3

4) Water quality index is one of the most used tools to describe _____.
a) Water quality b) Salinity
c) Physical characteristics d) BOD level

5) _____ are used to make predictions and conclusions based on how two random variables are connected.
a) Casual Models b) Simple Models
c) Statistical models d) Stochastic Models

6) The diffusion of pollutants by turbulence related to temperature, stratification and wind field leads to _____.
a) Stability class b) Smog
c) Biological change in air d) Physical change in air

7) _____ refers to a disposal pattern of gaseous pollutants in atmosphere depending upon wind condition, atmospheric stability and vertical temperature gradient.

a) Plume behaviour
b) Dispersion
c) Air Emission
d) Lapse rate

8) _____ take the pollutant concentration to distribute in both horizontal and vertical aspects.

a) Atmospheric model
b) Transport model
c) Gaussian model
d) Diffusion model

9) _____ is a movement of particles from high concentration to low concentration, resulting in equal distribution of substances.

a) Diffusion
b) Dispersion
c) Emission
d) Transportation

10) _____ is a biological process in which certain bacteria are capable of converting atmospheric nitrogen to ammonia.

a) Denitrification
b) Ammonification
c) Nitrogen fixation
d) Assimilation

11) The behaviour and dispersion of plume entirely depend on _____.

a) Adiabatic Lapse Rate
b) Environmental Lapse Rate
c) Sub Adiabatic Lapse Rate
d) Standard Temperature Lapse Rate

12) _____ Concentration such as CO and SO_2 forecast due to their relative inertness.

a) Non-reactive models
b) Emission Standards
c) Meteorology
d) Ambient air

13) _____ is a difference in wind speed or direction over short distance in Atmosphere.

a) Atmospheric stability
b) Temperature gradient
c) Wind shear
d) Solar radiation

14) _____ is typically used for predicting pollutant levels under “worst scenarios”.

a) Long term modelling
b) Short term modelling
c) Intermediate modelling
d) Substandard modelling

15) The atmospheric stability is related to the variation with altitude of _____.

a) Temperature
b) Pressure
c) Humidity
d) All of above

16) _____ is an application of conservation of mass to the analysis of physical system.

a) Mass balance
b) Rate Constants
c) Conservation of mass
d) Law of mass action

17) The monitoring and evaluation of ambient air quality is first important steps in _____air pollution.

a) Rapid mixing
b) Refraction
c) Agglomeration
d) Controlling

18) WQI concept is based on the factor _____.

a) Parameter selection for measurement
b) Transformation and raw data parameter
c) Aggregation of sub index values
d) All of above

19) The object of ambient water quality programs is to ensure water quality monitoring _____.

a) Toxic Control
b) Quality assurance and quality control
c) Standard quantity
d) Pollution control

20) _____ equation is used as water quality model to describe decrease of DO content in a river along a certain distance by degradation of BOD.

a) Delphi method
b) Streeter Phelps
c) Le Chatelier's
d) Darcy

SLR-QH-313

Seat No.	

Set P

Fourth Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Water and Air Quality Modelling (BTN01809)

Day & Date: Monday, 18-05-2026 Max. Marks: 80
Time: 03:00 PM To 06:00 PM

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

Section – I

Q.2	**a)**	Explain 4 main types of Statistical model.	**07**
	b)	Explain 5 major air pollutants and their health effects.	**07**
Q.3	**a)**	Explain the purpose of water quality model.	**07**
	b)	What factors affect the intensity of Oxygen sag curve?	**06**
Q.4	**a)**	What are limitations of ground water model?	**07**
	b)	How can meteorology help in controlling air pollutants?	**06**
Q.5	**a)**	Explain with neat sketch how Oxygen Sag Curve is created.	**07**
	b)	Write Short Notes on. i) Benefits of Model Making ii) Casual Model	**06**

Section – II

Q.6	**a)**	Explain the features of Gaussian Plume Model.	**07**
	b)	Explain the merits of Water Quality Index.	**07**
Q.7	**a)**	Explain Fixed box model with respect to wind blowing parallel to longer direction X.	**07**
	b)	Explain the advantages of Delphi model.	**06**

Q.8	**a)**	Explain Extreme value Theory for predicting Violations of Air Quality Standards.	**07**
	b)	What are the six categories of National Air Quality Index?	**06**
Q.9	**a)**	Explain theory of diffusion model and how it is useful in decision making.	**07**
	b)	Write Short Notes on: i) Air Quality Index ii) Fixed Box Model	**06**

SLR-QH-313

Seat No.	

Set Q

Fourth Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Water and Air Quality Modelling (BTN01809)

Day & Date: Monday, 18-05-2026 Max. Marks: 100
Time: 03:00 PM To 06:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks :20

Q.1 Choose the correct Answer. 20

1) The diffusion of pollutants by turbulence related to temperature, stratification and wind field leads to _____.
a) Stability class b) Smog
c) Biological change in air d) Physical change in air

2) _____ refers to a disposal pattern of gaseous pollutants in atmosphere depending upon wind condition, atmospheric stability and vertical temperature gradient.
a) Plume behaviour b) Dispersion
c) Air Emission d) Lapse rate

3) _____ take the pollutant concentration to distribute in both horizontal and vertical aspects.
a) Atmospheric model b) Transport model
c) Gaussian model d) Diffusion model

4) _____ is a movement of particles from high concentration to low concentration, resulting in equal distribution of substances.
a) Diffusion b) Dispersion
c) Emission d) Transportation

5) _____ is a biological process in which certain bacteria are capable of converting atmospheric nitrogen to ammonia.
a) Denitrification b) Ammonification
c) Nitrogen fixation d) Assimilation

6) The behaviour and dispersion of plume entirely depend on _____.
a) Adiabatic Lapse Rate
b) Environmental Lapse Rate
c) Sub Adiabatic Lapse Rate
d) Standard Temperature Lapse Rate

7) _____ Concentration such as CO and SO_2 forecast due to their relative inertness.
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b) Emission Standards
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c) Wind shear
d) Solar radiation

9) _____ is typically used for predicting pollutant levels under “worst scenarios”.
a) Long term modelling
b) Short term modelling
c) Intermediate modelling
d) Substandard modelling

10) The atmospheric stability is related to the variation with altitude of _____.
a) Temperature
b) Pressure
c) Humidity
d) All of above

11) _____ is an application of conservation of mass to the analysis of physical system.
a) Mass balance
b) Rate Constants
c) Conservation of mass
d) Law of mass action

12) The monitoring and evaluation of ambient air quality is first important steps in _____air pollution.
a) Rapid mixing
b) Refraction
c) Agglomeration
d) Controlling

13) WQI concept is based on the factor _____.
a) Parameter selection for measurement
b) Transformation and raw data parameter
c) Aggregation of sub index values
d) All of above

14) The object of ambient water quality programs is to ensure water quality monitoring _____.
a) Toxic Control
b) Quality assurance and quality control
c) Standard quantity
d) Pollution control

15) _____ equation is used as water quality model to describe decrease of DO content in a river along a certain distance by degradation of BOD.

a) Delphi method
b) Streeter Phelps
c) Le Chatelier's
d) Darcy

16) _____ is generally used to summarize specific expert opinions to develop parameter weight for different water quality index.

a) Streeter Phelps method
b) Le Chatelier's method
c) Delphi method
d) Newton method

17) Ground water models are used to predict the effect of hydrological changes on the behavior of _____.

a) Soil water zone
b) Aquifer
c) Capillary zone
d) Intermediate zone

18) The density of ambient water at room temperature 20-25oC is _____.

a) 1.98 g/cm3
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19) Water quality index is one of the most used tools to describe _____.

a) Water quality
b) Salinity
c) Physical characteristics
d) BOD level

20) _____ are used to make predictions and conclusions based on how two random variables are connected.

a) Casual Models
b) Simple Models
c) Statistical models
d) Stochastic Models

SLR-QH-313

Seat No.	

Set Q

Fourth Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Water and Air Quality Modelling (BTN01809)

Day & Date: Monday, 18-05-2026 Max. Marks: 80
Time: 03:00 PM To 06:00 PM

Instructions: 1) Question no.2 is compulsory in section I, and solve any two questions from the remaining.
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Section – I

Q.2 **a)** Explain 4 main types of Statistical model. **07**

b) Explain 5 major air pollutants and their health effects. **07**

Q.3 **a)** Explain the purpose of water quality model. **07**

b) What factors affect the intensity of Oxygen sag curve? **06**

Q.4 **a)** What are limitations of ground water model? **07**

b) How can meteorology help in controlling air pollutants? **06**

Q.5 **a)** Explain with neat sketch how Oxygen Sag Curve is created. **07**

b) Write Short Notes on. **06**
i) Benefits of Model Making
ii) Casual Model

Section – II

Q.6 **a)** Explain the features of Gaussian Plume Model. **07**

b) Explain the merits of Water Quality Index. **07**

Q.7 **a)** Explain Fixed box model with respect to wind blowing parallel to longer direction X. **07**

b) Explain the advantages of Delphi model. **06**

Q.8	**a)**	Explain Extreme value Theory for predicting Violations of Air Quality Standards.	**07**
	b)	What are the six categories of National Air Quality Index?	**06**
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SLR-QH-313

Seat No.	

Set R

Fourth Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Water and Air Quality Modelling (BTN01809)

Day & Date: Monday, 18-05-2026 Max. Marks: 100
Time: 03:00 PM To 06:00 PM

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

Duration: 30 Minutes Marks:20

Q.1 Choose the correct Answer. 20

1) The behaviour and dispersion of plume entirely depend on _____.
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b) Environmental Lapse Rate
c) Sub Adiabatic Lapse Rate
d) Standard Temperature Lapse Rate

2) _____ Concentration such as CO and SO_2 forecast due to their relative inertness.
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c) Meteorology d) Ambient air

3) _____ is a difference in wind speed or direction over short distance in Atmosphere.
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4) _____ is typically used for predicting pollutant levels under "worst scenarios".
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d) Controlling

8) WQI concept is based on the factor _____.
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10) _____ equation is used as water quality model to describe decrease of DO content in a river along a certain distance by degradation of BOD.
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b) Ammonification
c) Nitrogen fixation
d) Assimilation

SLR-QH-313

Seat No.	

Set R

Fourth Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Water and Air Quality Modelling (BTN01809)

Day & Date: Monday, 18-05-2026 Max. Marks: 80
Time: 03:00 PM To 06:00 PM

Instructions: 1) Question no.2 is compulsory in section I, and solve any two questions from the remaining.
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Section – I

Q.2 **a)** Explain 4 main types of Statistical model. **07**

b) Explain 5 major air pollutants and their health effects. **07**

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b) What factors affect the intensity of Oxygen sag curve? **06**

Q.4 **a)** What are limitations of ground water model? **07**

b) How can meteorology help in controlling air pollutants? **06**

Q.5 **a)** Explain with neat sketch how Oxygen Sag Curve is created. **07**

b) Write Short Notes on. **06**
i) Benefits of Model Making
ii) Casual Model

Section – II

Q.6 **a)** Explain the features of Gaussian Plume Model. **07**

b) Explain the merits of Water Quality Index. **07**

Q.7 **a)** Explain Fixed box model with respect to wind blowing parallel to longer direction X. **07**

b) Explain the advantages of Delphi model. **06**

Q.8	**a)**	Explain Extreme value Theory for predicting Violations of Air Quality Standards.	**07**
	b)	What are the six categories of National Air Quality Index?	**06**
Q.9	**a)**	Explain theory of diffusion model and how it is useful in decision making.	**07**
	b)	Write Short Notes on: i) Air Quality Index ii) Fixed Box Model	**06**

SLR-QH-313

Seat No.		Set	S

Fourth Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Water and Air Quality Modelling (BTN01809)

Day & Date: Monday, 18-05-2026 Max. Marks: 100
Time: 03:00 PM To 06:00 PM

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

Duration: 30 Minutes Marks :20

Q.1 Choose the correct Answer. 20

1) _____ is an application of conservation of mass to the analysis of physical system.
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2) The monitoring and evaluation of ambient air quality is first important steps in _____air pollution.
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3) WQI concept is based on the factor _____.
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b) Temperature gradient
c) Wind shear
d) Solar radiation

19) _____ is typically used for predicting pollutant levels under “worst scenarios”.
a) Long term modelling
b) Short term modelling
c) Intermediate modelling
d) Substandard modelling

20) The atmospheric stability is related to the variation with altitude of _____.
a) Temperature
b) Pressure
c) Humidity
d) All of above

SLR-QH-313

Seat No.	

Set S

Fourth Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Water and Air Quality Modelling (BTN01809)

Day & Date: Monday, 18-05-2026 Max. Marks: 80
Time: 03:00 PM To 06:00 PM

Instructions: 1) Question no.2 is compulsory in section I, and solve any two questions from the remaining.
2) Question no. 6 is compulsory in section II, and solve any two questions from remaining.
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Section – I

Q.2 **a)** Explain 4 main types of Statistical model. **07**

b) Explain 5 major air pollutants and their health effects. **07**

Q.3 **a)** Explain the purpose of water quality model. **07**

b) What factors affect the intensity of Oxygen sag curve? **06**

Q.4 **a)** What are limitations of ground water model? **07**

b) How can meteorology help in controlling air pollutants? **06**

Q.5 **a)** Explain with neat sketch how Oxygen Sag Curve is created. **07**

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i) Benefits of Model Making
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Section – II

Q.6 **a)** Explain the features of Gaussian Plume Model. **07**

b) Explain the merits of Water Quality Index. **07**

Q.7 **a)** Explain Fixed box model with respect to wind blowing parallel to longer direction X. **07**

b) Explain the advantages of Delphi model. **06**

Q.8	**a)**	Explain Extreme value Theory for predicting Violations of Air Quality Standards.	**07**
	b)	What are the six categories of National Air Quality Index?	**06**
Q.9	**a)**	Explain theory of diffusion model and how it is useful in decision making.	**07**
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SLR-QH-314

Seat No.	

Set P

Fourth Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Concrete composites (BTN01810)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 100
Time: 03:00 PM To 06:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:20

Q.1 Choose the correct Answer. **20**

1) The specific surface (m^2/kg) of silica fume _____.
a) 370 b) 15000-30000
c) 45000 d) 420

2) What is the content of Al_2O_3 in fly ash?
a) 30-60% b) 1-7%
c) Up to 30% d) 15-30%

3) Silica fume is usually added during _____.
a) Before concrete production at a concrete plant
b) After concrete production at a concrete plant
c) Concrete production at a concrete plant
d) Curing

4) What is the content of unburnt fuel in fly ash?
a) 30-60% b) 15-30%
c) Up to 30% d) 1-7%

5) Concrete containing silica fume can have very _____ strength and can be very _____.
a) low, durable b) high, durable
c) low, brittle d) high, brittle

6) Glass fiber is made up from _____ individual filaments.
a) 100-200 b) 200-400
c) 500 d) >50

7) What is the thickness of the steel fiber after silting in mm?
a) 0.25 b) 0.3-0.5
c) 0.155-0.41 d) 0.25-0.90

8) In polymer impregnated concrete the moisture content of the aggregate shall not exceed from _____.
a) 0.1%-0.5% b) 1%-55
c) 10%-50% d) 15%

9) Higher resin dosage is recommended when using _____.
a) Coarse aggregate b) Fine aggregates
c) All in aggregates d) More cement

10) The addition of glass fibers are in the range of _____.
a) 0-6% b) 10%
c) 15-20% d) 20%-25%

11) Which test used for fiber reinforced concrete?
a) Slump test b) Compacting factor test
c) Flow table test d) Vee-Bee test

12) In fibre reinforced concrete, aspect ratio is the ratio of _____.
a) Fibre length/Diameter b) Fibre Diameter/length
c) Both a & b d) None of these

13) For concreting of heavily reinforced sections without vibration, the workability of concrete expressed as compacting factor should be _____.
a) 0.75-0.80 b) 0.80-0.85
c) 0.85-0.92 d) Above 0.92

14) Bulk density of the silica fume varies from _____.
a) 130-600 kg/m^3 b) 650 kg/mm^3
c) 75-150 kg/mm^3 d) 750 kg/mm^3

15) Which material is most commonly used as reinforcement in ferrocement structures?
a) Aluminum mesh b) Steel wire mesh
c) Plastic mesh d) Copper mesh

16) One of the major mechanical properties of ferrocement is _____.
a) Low tensile strength
b) Brittle behavior
c) High crack resistance and ductility
d) Poor durability

17) The primary reason for improved strength in HSC microstructure is _____.
a) Increased water-cement ratio
b) Reduced porosity and denser C-S-H gel
c) Larger aggregate size only
d) Use of more sand

18) Which material is commonly used in HSC to improve particle packing and strength?
a) Lime
b) Silica fume
c) Gypsum
d) Clay

19) In manufacturing HSC, the water-cement ratio is generally _____.
a) Above 0.60
b) Between 0.50-0.60
c) Very low, often below 0.35
d) Equal to 1.0

20) Ultra-High Strength Concrete (UHSC) generally has compressive strength above _____.
a) 40 MPa
b) 80 MPa
c) 120 MPa
d) 20 MPa

Seat No.	

Set **P**

Fourth Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Concrete composites (BTN01810)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 80
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever needed and mention it clearly.

Section – I

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

a) Explain the concept of Fiber Reinforced Concrete (FRC) and discuss its need, advantages, and limitations in modem construction.

b) Describe the different types of fibers used in Fiber Reinforced Concrete and explain the properties of constituent materials required for effective FRC.

c) Describe the constituent materials used in ferrocement along with their required properties.

Q.3 Answer the following. (Any Four) **24**

a) Describe the properties of freshly mixed Fiber Reinforced Concrete and explain how fibers influence workability, segregation, and bleeding characteristics.

b) Explain the behavior of Fiber Reinforced Concrete under compression, tension, and flexure.

c) Discuss the practical applications of Fiber Reinforced Concrete in pavements, industrial floors, tunnels, precast elements, seismic-resistant structures.

d) Discuss various construction techniques of ferrocement and curing procedures.

e) Describe the role of wire mesh reinforcement in ferrocement and explain how mesh layers, spacing, and orientation affect structural performance.

f) What are the merits and demerits of ferrocement as a structural material compared to conventional reinforced concrete?

Section – II

Q.4 Answer the following. (Any Two) **16**

a) Explain silica fume and explain its origin, production process, and significance as a supplementary cementitious material in concrete technology.

b) Explain the chemical properties and composition of silica fume, explain the role of amorphous silicon dioxide (SiO_2) in improving concrete characteristics.

c) Explain the microstructure of High Strength Concrete. Discuss the factors affecting the strength development of HSC.

Q.5 Answer the following. (Any Four) **24**

a) Explain how silica fume improves the durability properties of concrete.

b) Discuss the advantages and limitations of using silica fume in concrete.

c) Define polymer concrete and explain its concept, need, and advantages over conventional cement concrete.

d) Discuss the properties of constituent materials used in polymer concrete.

e) Explain the mechanical and durability properties of High Strength Concrete and Ultra High Strength Concrete.

f) Define High Performance Concrete (HPC) and discuss its requirements, essential properties, and major design considerations.

SLR-QH-314

Seat No.	

Set Q

Fourth Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Concrete composites (BTN01810)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 100
Time: 03:00 PM To 06:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:20

Q.1 Choose the correct Answer. **20**

1) Glass fiber is made up from _____ individual filaments.
a) 100-200 b) 200-400
c) 500 d) >50

2) What is the thickness of the steel fiber after silting in mm?
a) 0.25 b) 0.3-0.5
c) 0.155-0.41 d) 0.25-0.90

3) In polymer impregnated concrete the moisture content of the aggregate shall not exceed from _____.
a) 0.1%-0.5% b) 1%-55
c) 10%-50% d) 15%

4) Higher resin dosage is recommended when using _____.
a) Coarse aggregate b) Fine aggregates
c) All in aggregates d) More cement

5) The addition of glass fibers are in the range of _____.
a) 0-6% b) 10%
c) 15-20% d) 20%-25%

6) Which test used for fiber reinforced concrete?
a) Slump test b) Compacting factor test
c) Flow table test d) Vee-Bee test

7) In fibre reinforced concrete, aspect ratio is the ratio of _____.
a) Fibre length/Diameter b) Fibre Diameter/length
c) Both a & b d) None of these

8) For concreting of heavily reinforced sections without vibration, the workability of concrete expressed as compacting factor should be _____.
a) 0.75-0.80 b) 0.80-0.85
c) 0.85-0.92 d) Above 0.92

9) Bulk density of the silica fume varies from _____.
a) 130-600 kg/m^3 b) 650 kg/mm^3
c) 75-150 kg/mm^3 d) 750 kg/mm^3

10) Which material is most commonly used as reinforcement in ferrocement structures?
a) Aluminum mesh b) Steel wire mesh
c) Plastic mesh d) Copper mesh

11) One of the major mechanical properties of ferrocement is _____.
a) Low tensile strength
b) Brittle behavior
c) High crack resistance and ductility
d) Poor durability

12) The primary reason for improved strength in HSC microstructure is _____.
a) Increased water-cement ratio
b) Reduced porosity and denser C-S-H gel
c) Larger aggregate size only
d) Use of more sand

13) Which material is commonly used in HSC to improve particle packing and strength?
a) Lime b) Silica fume
c) Gypsum d) Clay

14) In manufacturing HSC, the water-cement ratio is generally _____.
a) Above 0.60 b) Between 0.50-0.60
c) Very low, often below 0.35 d) Equal to 1.0

15) Ultra-High Strength Concrete (UHSC) generally has compressive strength above _____.
a) 40 MPa b) 80 MPa
c) 120 MPa d) 20 MPa

16) The specific surface (m^2/kg) of silica fume _____.
a) 370 b) 15000-30000
c) 45000 d) 420

17) What is the content of Al_2O_3 in fly ash?
a) 30-60% b) 1-7%
c) Up to 30% d) 15-30%

18) Silica fume is usually added during _____.
a) Before concrete production at a concrete plant
b) After concrete production at a concrete plant
c) Concrete production at a concrete plant
d) Curing

19) What is the content of unburnt fuel in fly ash?
a) 30-60%
b) 15-30%
c) Up to 30%
d) 1-7%

20) Concrete containing silica fume can have very _____ strength and can be very _____.
a) low, durable
b) high, durable
c) low, brittle
d) high, brittle

Seat No.	

Set **Q**

Fourth Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Concrete composites (BTN01810)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 80
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever needed and mention it clearly.

Section – I

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

a) Explain the concept of Fiber Reinforced Concrete (FRC) and discuss its need, advantages, and limitations in modem construction.

b) Describe the different types of fibers used in Fiber Reinforced Concrete and explain the properties of constituent materials required for effective FRC.

c) Describe the constituent materials used in ferrocement along with their required properties.

Q.3 Answer the following. (Any Four) **24**

a) Describe the properties of freshly mixed Fiber Reinforced Concrete and explain how fibers influence workability, segregation, and bleeding characteristics.

b) Explain the behavior of Fiber Reinforced Concrete under compression, tension, and flexure.

c) Discuss the practical applications of Fiber Reinforced Concrete in pavements, industrial floors, tunnels, precast elements, seismic-resistant structures.

d) Discuss various construction techniques of ferrocement and curing procedures.

e) Describe the role of wire mesh reinforcement in ferrocement and explain how mesh layers, spacing, and orientation affect structural performance.

f) What are the merits and demerits of ferrocement as a structural material compared to conventional reinforced concrete?

Section – II

Q.4 Answer the following. (Any Two) **16**

a) Explain silica fume and explain its origin, production process, and significance as a supplementary cementitious material in concrete technology.

b) Explain the chemical properties and composition of silica fume, explain the role of amorphous silicon dioxide (SiO_2) in improving concrete characteristics.

c) Explain the microstructure of High Strength Concrete. Discuss the factors affecting the strength development of HSC.

Q.5 Answer the following. (Any Four) **24**

a) Explain how silica fume improves the durability properties of concrete.

b) Discuss the advantages and limitations of using silica fume in concrete.

c) Define polymer concrete and explain its concept, need, and advantages over conventional cement concrete.

d) Discuss the properties of constituent materials used in polymer concrete.

e) Explain the mechanical and durability properties of High Strength Concrete and Ultra High Strength Concrete.

f) Define High Performance Concrete (HPC) and discuss its requirements, essential properties, and major design considerations.

SLR-QH-314

Seat No.	

Set R

Fourth Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Concrete composites (BTN01810)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 100
Time: 03:00 PM To 06:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:20

Q.1 Choose the correct Answer. **20**

1) Which test used for fiber reinforced concrete?
a) Slump test b) Compacting factor test
c) Flow table test d) Vee-Bee test

2) In fibre reinforced concrete, aspect ratio is the ratio of _____.
a) Fibre length/Diameter b) Fibre Diameter/length
c) Both a & b d) None of these

3) For concreting of heavily reinforced sections without vibration, the workability of concrete expressed as compacting factor should be _____.
a) 0.75-0.80 b) 0.80-0.85
c) 0.85-0.92 d) Above 0.92

4) Bulk density of the silica fume varies from _____.
a) 130-600 kg/m^3 b) 650 kg/mm^3
c) 75-150 kg/mm^3 d) 750 kg/mm^3

5) Which material is most commonly used as reinforcement in ferrocement structures?
a) Aluminum mesh b) Steel wire mesh
c) Plastic mesh d) Copper mesh

6) One of the major mechanical properties of ferrocement is _____.
a) Low tensile strength
b) Brittle behavior
c) High crack resistance and ductility
d) Poor durability

7) The primary reason for improved strength in HSC microstructure is _____.
a) Increased water-cement ratio
b) Reduced porosity and denser C-S-H gel
c) Larger aggregate size only
d) Use of more sand

8) Which material is commonly used in HSC to improve particle packing and strength?
a) Lime
b) Silica fume
c) Gypsum
d) Clay

9) In manufacturing HSC, the water-cement ratio is generally _____.
a) Above 0.60
b) Between 0.50-0.60
c) Very low, often below 0.35
d) Equal to 1.0

10) Ultra-High Strength Concrete (UHSC) generally has compressive strength above _____.
a) 40 MPa
b) 80 MPa
c) 120 MPa
d) 20 MPa

11) The specific surface (m^2/kg) of silica fume _____.
a) 370
b) 15000-30000
c) 45000
d) 420

12) What is the content of Al_2O_3 in fly ash?
a) 30-60%
b) 1-7%
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13) Silica fume is usually added during _____.
a) Before concrete production at a concrete plant
b) After concrete production at a concrete plant
c) Concrete production at a concrete plant
d) Curing

14) What is the content of unburnt fuel in fly ash?
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b) high, durable
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16) Glass fiber is made up from _____ individual filaments.
a) 100-200
b) 200-400
c) 500
d) >50

17) What is the thickness of the steel fiber after silting in mm?

a) 0.25 b) 0.3-0.5
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18) In polymer impregnated concrete the moisture content of the aggregate shall not exceed from _____.

a) 0.1%-0.5% b) 1%-55
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19) Higher resin dosage is recommended when using _____.

a) Coarse aggregate b) Fine aggregates
c) All in aggregates d) More cement

20) The addition of glass fibers are in the range of _____.

a) 0-6% b) 10%
c) 15-20% d) 20%-25%

Seat No.	

Set **R**

Fourth Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Concrete composites (BTN01810)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 80
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever needed and mention it clearly.

Section – I

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

a) Explain the concept of Fiber Reinforced Concrete (FRC) and discuss its need, advantages, and limitations in modem construction.

b) Describe the different types of fibers used in Fiber Reinforced Concrete and explain the properties of constituent materials required for effective FRC.

c) Describe the constituent materials used in ferrocement along with their required properties.

Q.3 Answer the following. (Any Four) **24**

a) Describe the properties of freshly mixed Fiber Reinforced Concrete and explain how fibers influence workability, segregation, and bleeding characteristics.

b) Explain the behavior of Fiber Reinforced Concrete under compression, tension, and flexure.

c) Discuss the practical applications of Fiber Reinforced Concrete in pavements, industrial floors, tunnels, precast elements, seismic-resistant structures.

d) Discuss various construction techniques of ferrocement and curing procedures.

e) Describe the role of wire mesh reinforcement in ferrocement and explain how mesh layers, spacing, and orientation affect structural performance.

f) What are the merits and demerits of ferrocement as a structural material compared to conventional reinforced concrete?

Section – II

Q.4 Answer the following. (Any Two) **16**

a) Explain silica fume and explain its origin, production process, and significance as a supplementary cementitious material in concrete technology.

b) Explain the chemical properties and composition of silica fume, explain the role of amorphous silicon dioxide (SiO_2) in improving concrete characteristics.

c) Explain the microstructure of High Strength Concrete. Discuss the factors affecting the strength development of HSC.

Q.5 Answer the following. (Any Four) **24**

a) Explain how silica fume improves the durability properties of concrete.

b) Discuss the advantages and limitations of using silica fume in concrete.

c) Define polymer concrete and explain its concept, need, and advantages over conventional cement concrete.

d) Discuss the properties of constituent materials used in polymer concrete.

e) Explain the mechanical and durability properties of High Strength Concrete and Ultra High Strength Concrete.

f) Define High Performance Concrete (HPC) and discuss its requirements, essential properties, and major design considerations.

SLR-QH-314

Seat No.		Set	S

Fourth Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Concrete composites (BTN01810)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 100
Time: 03:00 PM To 06:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:20

Q.1 Choose the correct Answer. **20**

1) One of the major mechanical properties of ferrocement is _____.
a) Low tensile strength
b) Brittle behavior
c) High crack resistance and ductility
d) Poor durability

2) The primary reason for improved strength in HSC microstructure is _____.
a) Increased water-cement ratio
b) Reduced porosity and denser C-S-H gel
c) Larger aggregate size only
d) Use of more sand

3) Which material is commonly used in HSC to improve particle packing and strength?
a) Lime b) Silica fume
c) Gypsum d) Clay

4) In manufacturing HSC, the water-cement ratio is generally _____.
a) Above 0.60 b) Between 0.50-0.60
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5) Ultra-High Strength Concrete (UHSC) generally has compressive strength above _____.
a) 40 MPa b) 80 MPa
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6) The specific surface (m^2/kg) of silica fume _____.
a) 370 b) 15000-30000
c) 45000 d) 420

7) What is the content of Al_2O_3 in fly ash?
a) 30-60% b) 1-7%
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8) Silica fume is usually added during _____.
a) Before concrete production at a concrete plant
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c) Concrete production at a concrete plant
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9) What is the content of unburnt fuel in fly ash?
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11) Glass fiber is made up from _____ individual filaments.
a) 100-200 b) 200-400
c) 500 d) >50

12) What is the thickness of the steel fiber after silting in mm?
a) 0.25 b) 0.3-0.5
c) 0.155-0.41 d) 0.25-0.90

13) In polymer impregnated concrete the moisture content of the aggregate shall not exceed from _____.
a) 0.1%-0.5% b) 1%-55
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14) Higher resin dosage is recommended when using _____.
a) Coarse aggregate b) Fine aggregates
c) All in aggregates d) More cement

15) The addition of glass fibers are in the range of _____.
a) 0-6% b) 10%
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16) Which test used for fiber reinforced concrete?
a) Slump test b) Compacting factor test
c) Flow table test d) Vee-Bee test

17) In fibre reinforced concrete, aspect ratio is the ratio of _____.

a) Fibre length/Diameter
b) Fibre Diameter/length
c) Both a & b
d) None of these

18) For concreting of heavily reinforced sections without vibration, the workability of concrete expressed as compacting factor should be _____.

a) 0.75-0.80
b) 0.80-0.85
c) 0.85-0.92
d) Above 0.92

19) Bulk density of the silica fume varies from _____.

a) 130-600 kg/m^3
b) 650 kg/mm^3
c) 75-150 kg/mm^3
d) 750 kg/mm^3

20) Which material is most commonly used as reinforcement in ferrocement structures?

a) Aluminum mesh
b) Steel wire mesh
c) Plastic mesh
d) Copper mesh

SLR-QH-314

Seat No.	

Set S

Fourth Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Concrete composites (BTN01810)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 80
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever needed and mention it clearly.

Section – I

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

a) Explain the concept of Fiber Reinforced Concrete (FRC) and discuss its need, advantages, and limitations in modem construction.

b) Describe the different types of fibers used in Fiber Reinforced Concrete and explain the properties of constituent materials required for effective FRC.

c) Describe the constituent materials used in ferrocement along with their required properties.

Q.3 Answer the following. (Any Four) **24**

a) Describe the properties of freshly mixed Fiber Reinforced Concrete and explain how fibers influence workability, segregation, and bleeding characteristics.

b) Explain the behavior of Fiber Reinforced Concrete under compression, tension, and flexure.

c) Discuss the practical applications of Fiber Reinforced Concrete in pavements, industrial floors, tunnels, precast elements, seismic-resistant structures.

d) Discuss various construction techniques of ferrocement and curing procedures.

e) Describe the role of wire mesh reinforcement in ferrocement and explain how mesh layers, spacing, and orientation affect structural performance.

f) What are the merits and demerits of ferrocement as a structural material compared to conventional reinforced concrete?

Section – II

Q.4 Answer the following. (Any Two) **16**

a) Explain silica fume and explain its origin, production process, and significance as a supplementary cementitious material in concrete technology.

b) Explain the chemical properties and composition of silica fume, explain the role of amorphous silicon dioxide (SiO_2) in improving concrete characteristics.

c) Explain the microstructure of High Strength Concrete. Discuss the factors affecting the strength development of HSC.

Q.5 Answer the following. (Any Four) **24**

a) Explain how silica fume improves the durability properties of concrete.

b) Discuss the advantages and limitations of using silica fume in concrete.

c) Define polymer concrete and explain its concept, need, and advantages over conventional cement concrete.

d) Discuss the properties of constituent materials used in polymer concrete.

e) Explain the mechanical and durability properties of High Strength Concrete and Ultra High Strength Concrete.

f) Define High Performance Concrete (HPC) and discuss its requirements, essential properties, and major design considerations.

SLR-QH-315

Seat No.	

Set P

Fourth Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Rural Roads (BTN01812)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 100
Time: 03:00 PM To 06:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 20

Q.1 Choose the correct alternatives from the given options. 20

1) Which factor is NOT considered in the environmental impact assessment of rural road projects?
a) Soil erosion b) Air pollution
c) Noise pollution d) Population growth

2) Which agency is typically responsible for the maintenance of rural roads?
a) Municipalities b) National highway authority
c) Rural development authority d) Local communities

3) Which technique is used for strengthening the subgrade of rural roads?
a) Geotextiles b) Compaction
c) Stabilization d) Reinforcement

4) In geometric design, what does the "grade" refer to?
a) The width of the roadway
b) The slope of the roadway
c) The curvature of the roadway
d) The alignment of the roadway

5) Which geometric design element ensures that drivers have adequate visibility of the road ahead?
a) Sight distance b) Super-elevation
c) Horizontal curve d) Vertical curve

6) What is the primary purpose of a vertical curve in geometric design?
   a) To provide a transition between different grades
   b) To control the alignment of the roadway
   c) To increase the super-elevation on curves
   d) To accommodate pedestrian crossings

7) Cobblestone pavements are characterized by_____.
   a) High maintenance requirements
   b) Low initial cost
   c) Smooth surface
   d) Rapid construction

8) Which of the following materials is commonly used as a sub-base in rural road pavements?
   a) Sand
   b) Gravel
   c) Concrete
   d) Bitumen

9) Which type of material is suitable for stabilizing weak subgrade soils in rural road construction?
   a) Geotextiles
   b) Fly ash
   c) Lime
   d) Asphalt emulsion

10) Which type of pavement material is commonly used in rural roads due to its availability and cost-effectiveness?
   a) Concrete
   b) Asphalt
   c) Brick
   d) Gravel

11) What is the purpose of providing drainage in pavement design for rural roads?
   a) To reduce noise pollution
   b) To prevent erosion
   c) To enhance aesthetics
   d) To improve ride comfort

12) Which method is commonly used for pavement thickness design in rural roads?
   a) American Association of State Highway and Transportation Officials (AASHTO) method
   b) Mechanistic-Empirical (ME) method
   c) British Standards (BS) method
   d) Asphalt Institute method

13) Which factor is NOT considered in the AASHTO pavement design method?
   a) Traffic load
   b) Soil bearing capacity
   c) Climate conditions
   d) Pavement material availability

14) Which layer of a typical rural road construction provides structural support and distributes traffic loads?

a) Subgrade
b) Base course
c) Sub-base
d) Surface course

15) What is the purpose of compaction during road construction?

a) To increase construction cost
b) To reduce the road's strength
c) To improve soil stability and density
d) To accelerate road degradation

16) Which of the following factors does NOT influence the choice of road pavement thickness in rural areas?

a) Soil type
b) Traffic load
c) Roadside vegetation
d) Climate conditions

17) Which type of drainage is essential to prevent waterlogging and prolong the lifespan of rural roads?

a) Surface drainage
b) Subsurface drainage
c) Vegetative drainage
d) Atmospheric drainage

18) Which of the following is a common maintenance activity for rural roads?

a) Painting murals on road surfaces
b) Installing solar panels along the roadside
c) Filling potholes
d) Erecting statues along the roadside

19) What is the purpose of routine maintenance of rural roads?

a) To increase traffic congestion
b) To decrease road safety
c) To extend the lifespan of the road
d) To promote environmental degradation

20) Which of the following materials is commonly used for road surfacing in rural areas?

a) Glass
b) Rubber
c) Asphalt
d) Plastic

Seat No.	

Set **P**

Fourth Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Rural Roads (BTN01812)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 80
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw neat sketches wherever necessary.
4) Assume suitable data wherever needed and mention it clearly.

SECTION – I

Q.2 Solve the following. (Any Two)

a) Explain Recent developments on rural roads in India. **10**

b) Explain the concept of 'Network Planning in Rural Roads'. **10**

c) 4-Lane expressway having design speed of 120 kmph and radius of 250 m and passing through plain and rolling terrain. Calculate length of transition curve for the cases: **10**
i) Rate of change of centrifugal acceleration
ii) Rate of change of super-elevation

Q.3 Solve the following. (Any Two)

a) Explain location surveys for rural roads. **10**

b) Explain Survey for marginal materials and aggregates/ low grade materials, artificial aggregates, waste materials, new materials and stabilizers. **10**

c) Explain the concept of Special Pavement in detail. **10**

SECTION – II

Q.4 Solve the following. (Any Two)

a) What are the various pavement components Design of flexible pavement as per IRC. **10**

b) Explain the design of semi-rigid pavement in detail in rural roads. **10**

c) Explain Construction of roller compacted concrete. **10**

Q.5 Solve the following. (Any Two)

a) Explain Specifications and tests for quality control as per IRC. **10**

b) Explain maintenance of special pavements. **10**

c) Explain the concept of 'Rehabilitation'. **10**

SLR-QH-315

Seat No.	

Set Q

Fourth Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Rural Roads (BTN01812)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 100
Time: 03:00 PM To 06:00 PM

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

Duration: 30 Minutes Marks: 20

Q.1 Choose the correct alternatives from the given options. 20

1) What is the primary purpose of a vertical curve in geometric design?
a) To provide a transition between different grades
b) To control the alignment of the roadway
c) To increase the super-elevation on curves
d) To accommodate pedestrian crossings

2) Cobblestone pavements are characterized by_____.
a) High maintenance requirements
b) Low initial cost
c) Smooth surface
d) Rapid construction

3) Which of the following materials is commonly used as a sub-base in rural road pavements?
a) Sand b) Gravel
c) Concrete d) Bitumen

4) Which type of material is suitable for stabilizing weak subgrade soils in rural road construction?
a) Geotextiles b) Fly ash
c) Lime d) Asphalt emulsion

5) Which type of pavement material is commonly used in rural roads due to its availability and cost-effectiveness?
a) Concrete b) Asphalt
c) Brick d) Gravel

6) What is the purpose of providing drainage in pavement design for rural roads?
   a) To reduce noise pollution
   b) To prevent erosion
   c) To enhance aesthetics
   d) To improve ride comfort

7) Which method is commonly used for pavement thickness design in rural roads?
   a) American Association of State Highway and Transportation Officials (AASHTO) method
   b) Mechanistic-Empirical (ME) method
   c) British Standards (BS) method
   d) Asphalt Institute method

8) Which factor is NOT considered in the AASHTO pavement design method?
   a) Traffic load
   b) Soil bearing capacity
   c) Climate conditions
   d) Pavement material availability

9) Which layer of a typical rural road construction provides structural support and distributes traffic loads?
   a) Subgrade
   b) Base course
   c) Sub-base
   d) Surface course

10) What is the purpose of compaction during road construction?
   a) To increase construction cost
   b) To reduce the road's strength
   c) To improve soil stability and density
   d) To accelerate road degradation

11) Which of the following factors does NOT influence the choice of road pavement thickness in rural areas?
   a) Soil type
   b) Traffic load
   c) Roadside vegetation
   d) Climate conditions

12) Which type of drainage is essential to prevent waterlogging and prolong the lifespan of rural roads?
   a) Surface drainage
   b) Subsurface drainage
   c) Vegetative drainage
   d) Atmospheric drainage

13) Which of the following is a common maintenance activity for rural roads?
   a) Painting murals on road surfaces
   b) Installing solar panels along the roadside
   c) Filling potholes
   d) Erecting statues along the roadside

14) What is the purpose of routine maintenance of rural roads?
a) To increase traffic congestion
b) To decrease road safety
c) To extend the lifespan of the road
d) To promote environmental degradation

15) Which of the following materials is commonly used for road surfacing in rural areas?
a) Glass
b) Rubber
c) Asphalt
d) Plastic

16) Which factor is NOT considered in the environmental impact assessment of rural road projects?
a) Soil erosion
b) Air pollution
c) Noise pollution
d) Population growth

17) Which agency is typically responsible for the maintenance of rural roads?
a) Municipalities
b) National highway authority
c) Rural development authority
d) Local communities

18) Which technique is used for strengthening the subgrade of rural roads?
a) Geotextiles
b) Compaction
c) Stabilization
d) Reinforcement

19) In geometric design, what does the “grade” refer to?
a) The width of the roadway
b) The slope of the roadway
c) The curvature of the roadway
d) The alignment of the roadway

20) Which geometric design element ensures that drivers have adequate visibility of the road ahead?
a) Sight distance
b) Super-elevation
c) Horizontal curve
d) Vertical curve

Seat No.	

Set **Q**

Fourth Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Rural Roads (BTN01812)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 80
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw neat sketches wherever necessary.
4) Assume suitable data wherever needed and mention it clearly.

SECTION – I

Q.2 Solve the following. (Any Two)

a) Explain Recent developments on rural roads in India. **10**

b) Explain the concept of 'Network Planning in Rural Roads'. **10**

c) 4-Lane expressway having design speed of 120 kmph and radius of 250 m and passing through plain and rolling terrain. Calculate length of transition curve for the cases: **10**
i) Rate of change of centrifugal acceleration
ii) Rate of change of super-elevation

Q.3 Solve the following. (Any Two)

a) Explain location surveys for rural roads. **10**

b) Explain Survey for marginal materials and aggregates/ low grade materials, artificial aggregates, waste materials, new materials and stabilizers. **10**

c) Explain the concept of Special Pavement in detail. **10**

SECTION – II

Q.4 Solve the following. (Any Two)

a) What are the various pavement components Design of flexible pavement as per IRC. **10**

b) Explain the design of semi-rigid pavement in detail in rural roads. **10**

c) Explain Construction of roller compacted concrete. **10**

Q.5 Solve the following. (Any Two)

a) Explain Specifications and tests for quality control as per IRC. **10**

b) Explain maintenance of special pavements. **10**

c) Explain the concept of 'Rehabilitation'. **10**

SLR-QH-315

Seat No.	

Set R

Fourth Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Rural Roads (BTN01812)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 100
Time: 03:00 PM To 06:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:20

Q.1 Choose the correct alternatives from the given options. 20

1) What is the purpose of providing drainage in pavement design for rural roads?
a) To reduce noise pollution b) To prevent erosion
c) To enhance aesthetics d) To improve ride comfort

2) Which method is commonly used for pavement thickness design in rural roads?
a) American Association of State Highway and Transportation Officials (AASHTO) method
b) Mechanistic-Empirical (ME) method
c) British Standards (BS) method
d) Asphalt Institute method

3) Which factor is NOT considered in the AASHTO pavement design method?
a) Traffic load
b) Soil bearing capacity
c) Climate conditions
d) Pavement material availability

4) Which layer of a typical rural road construction provides structural support and distributes traffic loads?
a) Subgrade b) Base course
c) Sub-base d) Surface course

5) What is the purpose of compaction during road construction?
a) To increase construction cost
b) To reduce the road's strength
c) To improve soil stability and density
d) To accelerate road degradation

6) Which of the following factors does NOT influence the choice of road pavement thickness in rural areas?
a) Soil type
b) Traffic load
c) Roadside vegetation
d) Climate conditions

7) Which type of drainage is essential to prevent waterlogging and prolong the lifespan of rural roads?
a) Surface drainage
b) Subsurface drainage
c) Vegetative drainage
d) Atmospheric drainage

8) Which of the following is a common maintenance activity for rural roads?
a) Painting murals on road surfaces
b) Installing solar panels along the roadside
c) Filling potholes
d) Erecting statues along the roadside

9) What is the purpose of routine maintenance of rural roads?
a) To increase traffic congestion
b) To decrease road safety
c) To extend the lifespan of the road
d) To promote environmental degradation

10) Which of the following materials is commonly used for road surfacing in rural areas?
a) Glass
b) Rubber
c) Asphalt
d) Plastic

11) Which factor is NOT considered in the environmental impact assessment of rural road projects?
a) Soil erosion
b) Air pollution
c) Noise pollution
d) Population growth

12) Which agency is typically responsible for the maintenance of rural roads?
a) Municipalities
b) National highway authority
c) Rural development authority
d) Local communities

13) Which technique is used for strengthening the subgrade of rural roads?
a) Geotextiles
b) Compaction
c) Stabilization
d) Reinforcement

14) In geometric design, what does the “grade” refer to?
a) The width of the roadway
b) The slope of the roadway
c) The curvature of the roadway
d) The alignment of the roadway

15) Which geometric design element ensures that drivers have adequate visibility of the road ahead?
a) Sight distance
b) Super-elevation
c) Horizontal curve
d) Vertical curve

16) What is the primary purpose of a vertical curve in geometric design?
a) To provide a transition between different grades
b) To control the alignment of the roadway
c) To increase the super-elevation on curves
d) To accommodate pedestrian crossings

17) Cobblestone pavements are characterized by_____.
a) High maintenance requirements
b) Low initial cost
c) Smooth surface
d) Rapid construction

18) Which of the following materials is commonly used as a sub-base in rural road pavements?
a) Sand
b) Gravel
c) Concrete
d) Bitumen

19) Which type of material is suitable for stabilizing weak subgrade soils in rural road construction?
a) Geotextiles
b) Fly ash
c) Lime
d) Asphalt emulsion

20) Which type of pavement material is commonly used in rural roads due to its availability and cost-effectiveness?
a) Concrete
b) Asphalt
c) Brick
d) Gravel

Seat No.	

Set **R**

Fourth Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Rural Roads (BTN01812)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 80
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw neat sketches wherever necessary.
4) Assume suitable data wherever needed and mention it clearly.

SECTION – I

Q.2 Solve the following. (Any Two)

a) Explain Recent developments on rural roads in India. **10**

b) Explain the concept of 'Network Planning in Rural Roads'. **10**

c) 4-Lane expressway having design speed of 120 kmph and radius of 250 m and passing through plain and rolling terrain. Calculate length of transition curve for the cases: **10**
i) Rate of change of centrifugal acceleration
ii) Rate of change of super-elevation

Q.3 Solve the following. (Any Two)

a) Explain location surveys for rural roads. **10**

b) Explain Survey for marginal materials and aggregates/ low grade materials, artificial aggregates, waste materials, new materials and stabilizers. **10**

c) Explain the concept of Special Pavement in detail. **10**

SECTION – II

Q.4 Solve the following. (Any Two)

a) What are the various pavement components Design of flexible pavement as per IRC. **10**

b) Explain the design of semi-rigid pavement in detail in rural roads. **10**

c) Explain Construction of roller compacted concrete. **10**

Q.5 Solve the following. (Any Two)

a) Explain Specifications and tests for quality control as per IRC. **10**

b) Explain maintenance of special pavements. **10**

c) Explain the concept of 'Rehabilitation'. **10**

SLR-QH-315

Seat No.	

Set S

Fourth Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Rural Roads (BTN01812)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 100
Time: 03:00 PM To 06:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:20

Q.1 Choose the correct alternatives from the given options. 20

1) Which of the following factors does NOT influence the choice of road pavement thickness in rural areas?
a) Soil type b) Traffic load
c) Roadside vegetation d) Climate conditions

2) Which type of drainage is essential to prevent waterlogging and prolong the lifespan of rural roads?
a) Surface drainage b) Subsurface drainage
c) Vegetative drainage d) Atmospheric drainage

3) Which of the following is a common maintenance activity for rural roads?
a) Painting murals on road surfaces
b) Installing solar panels along the roadside
c) Filling potholes
d) Erecting statues along the roadside

4) What is the purpose of routine maintenance of rural roads?
a) To increase traffic congestion
b) To decrease road safety
c) To extend the lifespan of the road
d) To promote environmental degradation

5) Which of the following materials is commonly used for road surfacing in rural areas?
a) Glass b) Rubber
c) Asphalt d) Plastic

6) Which factor is NOT considered in the environmental impact assessment of rural road projects?
a) Soil erosion
b) Air pollution
c) Noise pollution
d) Population growth

7) Which agency is typically responsible for the maintenance of rural roads?
a) Municipalities
b) National highway authority
c) Rural development authority
d) Local communities

8) Which technique is used for strengthening the subgrade of rural roads?
a) Geotextiles
b) Compaction
c) Stabilization
d) Reinforcement

9) In geometric design, what does the “grade” refer to?
a) The width of the roadway
b) The slope of the roadway
c) The curvature of the roadway
d) The alignment of the roadway

10) Which geometric design element ensures that drivers have adequate visibility of the road ahead?
a) Sight distance
b) Super-elevation
c) Horizontal curve
d) Vertical curve

11) What is the primary purpose of a vertical curve in geometric design?
a) To provide a transition between different grades
b) To control the alignment of the roadway
c) To increase the super-elevation on curves
d) To accommodate pedestrian crossings

12) Cobblestone pavements are characterized by_____.
a) High maintenance requirements
b) Low initial cost
c) Smooth surface
d) Rapid construction

13) Which of the following materials is commonly used as a sub-base in rural road pavements?
a) Sand
b) Gravel
c) Concrete
d) Bitumen

14) Which type of material is suitable for stabilizing weak subgrade soils in rural road construction?
a) Geotextiles
b) Fly ash
c) Lime
d) Asphalt emulsion

15) Which type of pavement material is commonly used in rural roads due to its availability and cost-effectiveness?

a) Concrete
b) Asphalt
c) Brick
d) Gravel

16) What is the purpose of providing drainage in pavement design for rural roads?

a) To reduce noise pollution
b) To prevent erosion
c) To enhance aesthetics
d) To improve ride comfort

17) Which method is commonly used for pavement thickness design in rural roads?

a) American Association of State Highway and Transportation Officials (AASHTO) method
b) Mechanistic-Empirical (ME) method
c) British Standards (BS) method
d) Asphalt Institute method

18) Which factor is NOT considered in the AASHTO pavement design method?

a) Traffic load
b) Soil bearing capacity
c) Climate conditions
d) Pavement material availability

19) Which layer of a typical rural road construction provides structural support and distributes traffic loads?

a) Subgrade
b) Base course
c) Sub-base
d) Surface course

20) What is the purpose of compaction during road construction?

a) To increase construction cost
b) To reduce the road's strength
c) To improve soil stability and density
d) To accelerate road degradation

SLR-QH-315

Seat No.		Set	S

Fourth Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Rural Roads (BTN01812)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 80
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw neat sketches wherever necessary.
4) Assume suitable data wherever needed and mention it clearly.

SECTION – I

Q.2 Solve the following. (Any Two)

a) Explain Recent developments on rural roads in India. **10**

b) Explain the concept of 'Network Planning in Rural Roads'. **10**

c) 4-Lane expressway having design speed of 120 kmph and radius of 250 m and passing through plain and rolling terrain. Calculate length of transition curve for the cases: **10**
i) Rate of change of centrifugal acceleration
ii) Rate of change of super-elevation

Q.3 Solve the following. (Any Two)

a) Explain location surveys for rural roads. **10**

b) Explain Survey for marginal materials and aggregates/ low grade materials, artificial aggregates, waste materials, new materials and stabilizers. **10**

c) Explain the concept of Special Pavement in detail. **10**

SECTION – II

Q.4 Solve the following. (Any Two)

a) What are the various pavement components Design of flexible pavement as per IRC. **10**

b) Explain the design of semi-rigid pavement in detail in rural roads. **10**

c) Explain Construction of roller compacted concrete. **10**

Q.5 Solve the following. (Any Two)

a) Explain Specifications and tests for quality control as per IRC. **10**

b) Explain maintenance of special pavements. **10**

c) Explain the concept of 'Rehabilitation'. **10**

SLR-QH-316

Seat No.	

Set P

Fourth Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
TQM and MIS in Civil Engineering (BTN01813)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 100
Time: 03:00 PM To 06:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 20

Q.1 Choose the correct alternatives from the given options. 20

1) A key difference between data and information is _____.
a) Data is processed; information is raw
b) Data is meaningful, information is not
c) Data is raw, information is processed and meaningful
d) There is no difference

2) What does the acronym ERP stand for in a business context?
a) Employee Resource Planning
b) Enterprise Resource Planning
c) External Resource Protocol
d) Efficiency Reporting Program

3) TQM & ISO both focuses on _____.
a) Customer b) Employee
c) Supplier d) All of the above

4) ISO 9000 seeks standardization in terms of _____.
a) products b) production procedures
c) supplier's specification d) procedures to manage quality

5) The person who ensures that systems are developed on time, within budget, and with acceptable quality is a _____.
a) systems designer b) project manager
c) systems owner d) systems builder

6) An _____ is a set of processes and procedures that transform data into information and knowledge.
a) information system b) Knowledge system
c) Database system d) Computer system

7) The focal point of all quality control should be _____.
a) Price focus b) Cost Focus
c) Customer Focus d) Manufacturing Focus

8) _____ are used in six sigma.
a) black belt b) green belt
c) both black belt and green belt d) none of the above

9) _____ is any business-related exchange such as payments to employees, sales to customers, or payments to suppliers.
a) Data b) E-commerce
c) A transaction d) Input

10) _____ is a standard that companies compare themselves to and strive to be that good.
a) Production b) Benchmarking
c) Structuring d) Formatting

11) Meaning of 'Seiso' in 5s technique is _____.
a) Short b) Shine
c) Structured d) Straighten

12) Which of the following is NOT a core principle of Total Quality Management (TQM)?
a) Continuous improvement b) Customer focus
c) Defect detection d) Employee involvement

13) MIS structure is based on _____.
a) Management Activity b) Population
c) Both a) and b) d) None

14) The objective of ISO-9000 family of Quality management is _____.
a) Customer satisfaction b) Employee satisfaction
c) Skill enhancement d) Environmental issues

15) A fundamental attribute of TQM is _____.
a) Drawing control charts
b) Top management's direct involvement
c) Meeting ISO 9000 audit
d) All of above

16) The information of MIS comes from the _____.
a) Internal source
b) External source
c) Both internal and external source
d) None of the above

17) Which of the following is NOT one of the 8 Principles of Quality Management (ISO 9001)?

a) Customer focus
b) Leadership
c) Process approach
d) Financial auditing

18) An MIS designed for long-term goals and forecasting (e.g., “Should we expand into a new city?”) is operating at the _____.

a) Strategic planning level
b) Management control level
c) Operational control level
d) Transaction processing level

19) In construction, ‘honeycombing’ in concrete is a common defect primarily caused by _____.

a) Improper vibration/compaction
b) Excess water in the mix
c) Poor quality of aggregate
d) Cold joints

20) A Decision Support System (DSS) is primarily designed to _____.

a) Process daily transactions
b) Help managers make non-routine, semi-structured decisions
c) Generate pre-defined, scheduled reports
d) Replace the need for a human manager

Seat No.	

Set **P**

Fourth Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
TQM and MIS in Civil Engineering (BTN01813)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 80
Time: 03:00 PM To 06:00 PM

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

SECTION – I

Q.2 Attempt the following. (Any Four) **40**

a) Differentiate between Quality Control and Quality Assurance.

b) What is “Kaizen”? Explain with 7-key concepts & 5s Methodology.

c) Explain all 8 Principles of Quality Management.

d) Discuss common defects in construction (e.g., in concrete and plastering). What measures can be taken to prevent these defects and what are the general procedures for their rectification?

e) What is Supply Chain Management (SCM)? Explain its role and significance as a tool in TQM for a large-scale construction project.

f) Explain Quality manual along with its Importance, contents & documentation.

SECTION – II

Q.3 Answer the following. (Any Four) **40**

a) Define data and information. What are the major differences between them? Explain with the help of suitable Example.

b) Explain Decision Support System with ‘purpose’ & components.

c) Elaborate ‘ERP’ with benefits, limitation & ERP module with diagrammatical explanation.

d) Discuss the key components of information systems technology (Hardware, Software, and Communications Technology) and their relevance in a modern MIS for a construction firm.

e) What are Information Resources? Explain how a construction firm can identify and manage its key information resources effectively.

f) What is “Management Information System (MIS)”? Explain in brief objective and function MIS.

Seat No.	

Set **Q**

Fourth Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
TQM and MIS in Civil Engineering (BTN01813)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 100
Time: 03:00 PM To 06:00 PM

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

Duration: 30 Minutes Marks: 20

Q.1 Choose the correct alternatives from the given options. 20

1) An _____ is a set of processes and procedures that transform data into information and knowledge.
a) information system b) Knowledge system
c) Database system d) Computer system

2) The focal point of all quality control should be _____.
a) Price focus b) Cost Focus
c) Customer Focus d) Manufacturing Focus

3) _____ are used in six sigma.
a) black belt b) green belt
c) both black belt and green belt d) none of the above

4) _____ is any business-related exchange such as payments to employees, sales to customers, or payments to suppliers.
a) Data b) E-commerce
c) A transaction d) Input

5) _____ is a standard that companies compare themselves to and strive to be that good.
a) Production b) Benchmarking
c) Structuring d) Formatting

6) Meaning of 'Seiso' in 5s technique is _____.
a) Short b) Shine
c) Structured d) Straighten

7) Which of the following is NOT a core principle of Total Quality Management (TQM)?
a) Continuous improvement b) Customer focus
c) Defect detection d) Employee involvement

8) MIS structure is based on _____.
a) Management Activity b) Population
c) Both a) and b) d) None

9) The objective of ISO-9000 family of Quality management is _____.
a) Customer satisfaction b) Employee satisfaction
c) Skill enhancement d) Environmental issues

10) A fundamental attribute of TQM is _____.
a) Drawing control charts
b) Top management's direct involvement
c) Meeting ISO 9000 audit
d) All of above

11) The information of MIS comes from the _____.
a) Internal source
b) External source
c) Both internal and external source
d) None of the above

12) Which of the following is NOT one of the 8 Principles of Quality Management (ISO 9001)?
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c) Process approach d) Financial auditing

13) An MIS designed for long-term goals and forecasting (e.g., "Should we expand into a new city?") is operating at the _____.
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b) Management control level
c) Operational control level
d) Transaction processing level

14) In construction, 'honeycombing' in concrete is a common defect primarily caused by _____.
a) Improper vibration/compaction
b) Excess water in the mix
c) Poor quality of aggregate
d) Cold joints

15) A Decision Support System (DSS) is primarily designed to _____.
a) Process daily transactions
b) Help managers make non-routine, semi-structured decisions
c) Generate pre-defined, scheduled reports
d) Replace the need for a human manager

16) A key difference between data and information is _____.
a) Data is processed; information is raw
b) Data is meaningful, information is not
c) Data is raw, information is processed and meaningful
d) There is no difference

17) What does the acronym ERP stand for in a business context?
a) Employee Resource Planning
b) Enterprise Resource Planning
c) External Resource Protocol
d) Efficiency Reporting Program

18) TQM & ISO both focuses on _____.
a) Customer
b) Employee
c) Supplier
d) All of the above

19) ISO 9000 seeks standardization in terms of _____.
a) products
b) production procedures
c) supplier's specification
d) procedures to manage quality

20) The person who ensures that systems are developed on time, within budget, and with acceptable quality is a _____.
a) systems designer
b) project manager
c) systems owner
d) systems builder

Seat No.	

Set **Q**

Fourth Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
TQM and MIS in Civil Engineering (BTN01813)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 80
Time: 03:00 PM To 06:00 PM

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

SECTION – I

Q.2 Attempt the following. (Any Four) **40**

a) Differentiate between Quality Control and Quality Assurance.

b) What is “Kaizen”? Explain with 7-key concepts & 5s Methodology.

c) Explain all 8 Principles of Quality Management.

d) Discuss common defects in construction (e.g., in concrete and plastering). What measures can be taken to prevent these defects and what are the general procedures for their rectification?

e) What is Supply Chain Management (SCM)? Explain its role and significance as a tool in TQM for a large-scale construction project.

f) Explain Quality manual along with its Importance, contents & documentation.

SECTION – II

Q.3 Answer the following. (Any Four) **40**

a) Define data and information. What are the major differences between them? Explain with the help of suitable Example.

b) Explain Decision Support System with ‘purpose’ & components.

c) Elaborate ‘ERP’ with benefits, limitation & ERP module with diagrammatical explanation.

d) Discuss the key components of information systems technology (Hardware, Software, and Communications Technology) and their relevance in a modern MIS for a construction firm.

e) What are Information Resources? Explain how a construction firm can identify and manage its key information resources effectively.

f) What is “Management Information System (MIS)”? Explain in brief objective and function MIS.

SLR-QH-316

Seat No.	

Set R

Fourth Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
TQM and MIS in Civil Engineering (BTN01813)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 100
Time: 03:00 PM To 06:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:20

Q.1 Choose the correct alternatives from the given options. 20

1) Meaning of 'Seiso' in 5s technique is _____.
a) Short b) Shine
c) Structured d) Straighten

2) Which of the following is NOT a core principle of Total Quality Management (TQM)?
a) Continuous improvement b) Customer focus
c) Defect detection d) Employee involvement

3) MIS structure is based on _____.
a) Management Activity b) Population
c) Both a) and b) d) None

4) The objective of ISO-9000 family of Quality management is _____.
a) Customer satisfaction b) Employee satisfaction
c) Skill enhancement d) Environmental issues

5) A fundamental attribute of TQM is _____.
a) Drawing control charts
b) Top management's direct involvement
c) Meeting ISO 9000 audit
d) All of above

6) The information of MIS comes from the _____.
a) Internal source
b) External source
c) Both internal and external source
d) None of the above

7) Which of the following is NOT one of the 8 Principles of Quality Management (ISO 9001)?
a) Customer focus
b) Leadership
c) Process approach
d) Financial auditing

8) An MIS designed for long-term goals and forecasting (e.g., “Should we expand into a new city?”) is operating at the _____.
a) Strategic planning level
b) Management control level
c) Operational control level
d) Transaction processing level

9) In construction, ‘honeycombing’ in concrete is a common defect primarily caused by _____.
a) Improper vibration/compaction
b) Excess water in the mix
c) Poor quality of aggregate
d) Cold joints

10) A Decision Support System (DSS) is primarily designed to _____.
a) Process daily transactions
b) Help managers make non-routine, semi-structured decisions
c) Generate pre-defined, scheduled reports
d) Replace the need for a human manager

11) A key difference between data and information is _____.
a) Data is processed; information is raw
b) Data is meaningful, information is not
c) Data is raw, information is processed and meaningful
d) There is no difference

12) What does the acronym ERP stand for in a business context?
a) Employee Resource Planning
b) Enterprise Resource Planning
c) External Resource Protocol
d) Efficiency Reporting Program

13) TQM & ISO both focuses on _____.
a) Customer
b) Employee
c) Supplier
d) All of the above

14) ISO 9000 seeks standardization in terms of _____.
a) products
b) production procedures
c) supplier’s specification
d) procedures to manage quality

15) The person who ensures that systems are developed on time, within budget, and with acceptable quality is a _____.
a) systems designer
b) project manager
c) systems owner
d) systems builder

16) An _____ is a set of processes and procedures that transform data into information and knowledge.

a) information system
b) Knowledge system
c) Database system
d) Computer system

17) The focal point of all quality control should be _____.

a) Price focus
b) Cost Focus
c) Customer Focus
d) Manufacturing Focus

18) _____ are used in six sigma.

a) black belt
b) green belt
c) both black belt and green belt
d) none of the above

19) _____ is any business-related exchange such as payments to employees, sales to customers, or payments to suppliers.

a) Data
b) E-commerce
c) A transaction
d) Input

20) _____ is a standard that companies compare themselves to and strive to be that good.

a) Production
b) Benchmarking
c) Structuring
d) Formatting

Seat No.	

Set **R**

Fourth Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
TQM and MIS in Civil Engineering (BTN01813)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 80
Time: 03:00 PM To 06:00 PM

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

SECTION – I

Q.2 Attempt the following. (Any Four) **40**

a) Differentiate between Quality Control and Quality Assurance.

b) What is “Kaizen”? Explain with 7-key concepts & 5s Methodology.

c) Explain all 8 Principles of Quality Management.

d) Discuss common defects in construction (e.g., in concrete and plastering). What measures can be taken to prevent these defects and what are the general procedures for their rectification?

e) What is Supply Chain Management (SCM)? Explain its role and significance as a tool in TQM for a large-scale construction project.

f) Explain Quality manual along with its Importance, contents & documentation.

SECTION – II

Q.3 Answer the following. (Any Four) **40**

a) Define data and information. What are the major differences between them? Explain with the help of suitable Example.

b) Explain Decision Support System with ‘purpose’ & components.

c) Elaborate ‘ERP’ with benefits, limitation & ERP module with diagrammatical explanation.

d) Discuss the key components of information systems technology (Hardware, Software, and Communications Technology) and their relevance in a modern MIS for a construction firm.

e) What are Information Resources? Explain how a construction firm can identify and manage its key information resources effectively.

f) What is “Management Information System (MIS)”? Explain in brief objective and function MIS.

Seat No.	

Set **S**

Fourth Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
TQM and MIS in Civil Engineering (BTN01813)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 100
Time: 03:00 PM To 06:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:20

Q.1 Choose the correct alternatives from the given options. 20

1) The information of MIS comes from the _____.
a) Internal source
b) External source
c) Both internal and external source
d) None of the above

2) Which of the following is NOT one of the 8 Principles of Quality Management (ISO 9001)?
a) Customer focus b) Leadership
c) Process approach d) Financial auditing

3) An MIS designed for long-term goals and forecasting (e.g., "Should we expand into a new city?") is operating at the _____.
a) Strategic planning level
b) Management control level
c) Operational control level
d) Transaction processing level

4) In construction, 'honeycombing' in concrete is a common defect primarily caused by _____.
a) Improper vibration/compaction
b) Excess water in the mix
c) Poor quality of aggregate
d) Cold joints

5) A Decision Support System (DSS) is primarily designed to _____.
a) Process daily transactions
b) Help managers make non-routine, semi-structured decisions
c) Generate pre-defined, scheduled reports
d) Replace the need for a human manager

6) A key difference between data and information is _____.
a) Data is processed; information is raw
b) Data is meaningful, information is not
c) Data is raw, information is processed and meaningful
d) There is no difference

7) What does the acronym ERP stand for in a business context?
a) Employee Resource Planning
b) Enterprise Resource Planning
c) External Resource Protocol
d) Efficiency Reporting Program

8) TQM & ISO both focuses on _____.
a) Customer
b) Employee
c) Supplier
d) All of the above

9) ISO 9000 seeks standardization in terms of _____.
a) products
b) production procedures
c) supplier's specification
d) procedures to manage quality

10) The person who ensures that systems are developed on time, within budget, and with acceptable quality is a _____.
a) systems designer
b) project manager
c) systems owner
d) systems builder

11) An _____ is a set of processes and procedures that transform data into information and knowledge.
a) information system
b) Knowledge system
c) Database system
d) Computer system

12) The focal point of all quality control should be _____.
a) Price focus
b) Cost Focus
c) Customer Focus
d) Manufacturing Focus

13) _____ are used in six sigma.
a) black belt
b) green belt
c) both black belt and green belt
d) none of the above

14) _____ is any business-related exchange such as payments to employees, sales to customers, or payments to suppliers.
a) Data
b) E-commerce
c) A transaction
d) Input

15) _____ is a standard that companies compare themselves to and strive to be that good.

a) Production
b) Benchmarking
c) Structuring
d) Formatting

16) Meaning of 'Seiso' in 5s technique is _____.

a) Short
b) Shine
c) Structured
d) Straighten

17) Which of the following is NOT a core principle of Total Quality Management (TQM)?

a) Continuous improvement
b) Customer focus
c) Defect detection
d) Employee involvement

18) MIS structure is based on _____.

a) Management Activity
b) Population
c) Both a) and b)
d) None

19) The objective of ISO-9000 family of Quality management is _____.

a) Customer satisfaction
b) Employee satisfaction
c) Skill enhancement
d) Environmental issues

20) A fundamental attribute of TQM is _____.

a) Drawing control charts
b) Top management's direct involvement
c) Meeting ISO 9000 audit
d) All of above

SLR-QH-316

Seat No.	

Set S

Fourth Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
TQM and MIS in Civil Engineering (BTN01813)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 80
Time: 03:00 PM To 06:00 PM

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

SECTION – I

Q.2 Attempt the following. (Any Four) **40**

a) Differentiate between Quality Control and Quality Assurance.

b) What is “Kaizen”? Explain with 7-key concepts & 5s Methodology.

c) Explain all 8 Principles of Quality Management.

d) Discuss common defects in construction (e.g., in concrete and plastering). What measures can be taken to prevent these defects and what are the general procedures for their rectification?

e) What is Supply Chain Management (SCM)? Explain its role and significance as a tool in TQM for a large-scale construction project.

f) Explain Quality manual along with its Importance, contents & documentation.

SECTION – II

Q.3 Answer the following. (Any Four) **40**

a) Define data and information. What are the major differences between them? Explain with the help of suitable Example.

b) Explain Decision Support System with ‘purpose’ & components.

c) Elaborate ‘ERP’ with benefits, limitation & ERP module with diagrammatical explanation.

d) Discuss the key components of information systems technology (Hardware, Software, and Communications Technology) and their relevance in a modern MIS for a construction firm.

e) What are Information Resources? Explain how a construction firm can identify and manage its key information resources effectively.

f) What is “Management Information System (MIS)”? Explain in brief objective and function MIS.

SLR-QH-317

Seat No.	

Set P

Fourth Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Planning for Sustainable Development (BTN01814)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 100
Time: 03:00 PM To 06:00 PM

Instructions: 1) Question no. 1 is compulsory in section I, and solve any four questions from the remaining.
2) Question no. 7 is compulsory in section II, and solve any four questions from the remaining.
3) Figures to the right indicate full marks.
4) Assume suitable data wherever necessary and mention it clearly.

SECTION – I

Q.1 Discuss the relationship between environmental degradation and poverty. How does one exacerbate the other? **10**

Q.2 What are the main principles of sustainable development? Explain their importance in policymaking and resource management. **10**

Q.3 Describe any two alternative approaches to sustainable development. How do these differ from mainstream strategies? **10**

Q.4 Examine any two important current issues in sustainable development. How do these challenges impact global sustainability efforts? **10**

Q.5 Discuss innovative approaches in environmental management. How do they enhance efficiency and reduce environmental impacts? **10**

Q.6 What are the main barriers to innovation for sustainable development? How can these barriers be overcome? **10**

SECTION – II

Q.7 Explain the relevance of institutional theory in sustainable development. How do institutions influence environmental governance? **10**

Q.8 What institutional barriers impede the implementation of sustainable development practices? How can these be addressed? **10**

Q.9 What are the key principles of governance for sustainable development? Why are they essential for effective environmental management? **10**

Q.10 How does technology contribute to capacity development for innovation? Discuss its impact on education, collaboration, and problem-solving. **10**

Q.11 What is the role of research in addressing sustainability challenges? How can research methods contribute to innovative solutions? **10**

Q.12 Compare and contrast qualitative and quantitative research methods in the context of sustainable development. When is each approach more suitable? **10**

SLR-QH-318

Seat No.		Set	P

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Advance Manufacturing Technology (MECHPCC-07)

Day & Date: Saturday, 02-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer from the given options. 14

1) A drill is held in following while drilling on lathe machine.
a) Headstock b) Tailstock
c) Tool Post d) Carriage

2) Which of the following operations are performed on a lathe machine?
a) Turning b) Parting-off
c) Tapping d) All of the above

3) Which of the following operations can be performed by a drilling machine?
a) Drilling b) Countersinking
c) Reaming d) All of the above

4) The boring is an operation which _____.
a) Finish the drilled hole b) Enlarge pre drilled hole
c) Internal thread d) Form external thread

5) Whitworth Quick Return mechanism is used in _____.
a) Milling machine b) Broaching machine
c) Shaper d) Grinding machine

6) Which of the following is used for machining larger jobs?
a) Shaper b) Planer
c) Both a and b d) None of the above

7) Gear shaving is the process of _____.
a) Gear finishing b) Gear parting
c) Gear generation d) None of the above

8) In simple indexing, one complete rotation of spindle makes _____ rotation of index crank.

a) 20 b) 30
c) 40 d) 24

9) Up milling is also called as _____.

a) Climb milling b) Form milling
c) Conventional milling d) None of these

10) Which of the following is finishing process?

a) Lapping b) Superfinishing
c) Honing d) All of these

11) Which of the following material cannot be machined by EDM?

a) Cast Iron b) Steel
c) Glass d) None of these

12) In which of the following methods, an electrolyte is used?

a) EDM b) AWJM
c) ECM d) USM

13) In honing process, tool is _____.

a) Reciprocating b) Rotating
c) Both a) and b) d) None of these

14) Loss in the sharpness of grinding wheel due to the presence of chips in gaps of grains is termed as _____.

a) Loading b) Glazing
c) Truing d) Dressing

Seat No.	

Set **P**

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS)
Examination: March/April - 2026
Advance Manufacturing Technology (MECHPCC-07)

Day & Date: Saturday, 02-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Attempt any two questions from each section.
2) Use of scientific calculator is allowed**.**
2) Figures to right indicate full marks.
3) Assume additional suitable data if necessary and state it clearly.

Section – I

Q.2 **a)** Draw neat sketch of centre lathe and explain its parts. **05**

b) The pitch or a lead screw is 6 mm. and the pitch or the thread to be cut is 1 mm. Find change gears. **05**

c) Explain Slotting Machine. **04**

Q.3 **a)** Explain working and construction of pillar type drilling machine. **05**

b) Explain working and construction of horizontal boring machine with neat sketch. **05**

c) Compare between shaper and planer. **04**

Q.4 **a)** Explain the construction & working of standard double housing planer with neat sketch. **05**

b) Write short note on any three: **09**
i) Specification of Lathe machine
ii) Taper turning by a taper attachment
iii) Job holding devices used on drilling machine
iv) Broaching

Section – II

Q.5 **a)** Compare up milling and down milling process. **05**

b) Index work piece for 83 divisions using dividing head by differential indexing method. Use **05**
Indexing plate 1: 15, 16, 17, 18, 19, 20
Indexing plate 2: 21, 23, 27, 29, 31, 33
Indexing plate 3: 37, 39, 41, 43, 47, 49
Change gears: 24, 24, 28, 32, 40, 44, 48, 56, 64, 72, 86, 100, 140

c) Explain lapping process. **04**

Q.6	**a)**	Explain with neat sketch cylindrical center type grinder.	**05**
	b)	Explain with neat sketch construction and working of AJWM machine.	**05**
	c)	Explain need and significance of unconventional machining.	**04**
Q.7	**a)**	Explain with neat sketch construction and working principal of EDM machine.	**05**
	b)	Write short note on any three i) Compound indexing ii) Glazing iii) Honning iv) Gear Shaving	**09**

Seat No.	

Set **Q**

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Advance Manufacturing Technology (MECHPCC-07)

Day & Date: Saturday, 02-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer from the given options. 14

1) In simple indexing, one complete rotation of spindle makes _____ rotation of index crank.
a) 20 b) 30
c) 40 d) 24

2) Up milling is also called as _____.
a) Climb milling b) Form milling
c) Conventional milling d) None of these

3) Which of the following is finishing process?
a) Lapping b) Superfinishing
c) Honing d) All of these

4) Which of the following material cannot be machined by EDM?
a) Cast Iron b) Steel
c) Glass d) None of these

5) In which of the following methods, an electrolyte is used?
a) EDM b) AWJM
c) ECM d) USM

6) In honing process, tool is _____.
a) Reciprocating b) Rotating
c) Both a) and b) d) None of these

7) Loss in the sharpness of grinding wheel due to the presence of chips in gaps of grains is termed as _____.
a) Loading b) Glazing
c) Truing d) Dressing

8) A drill is held in following while drilling on lathe machine.
a) Headstock b) Tailstock
c) Tool Post d) Carriage

9) Which of the following operations are performed on a lathe machine?
a) Turning b) Parting-off
c) Tapping d) All of the above

10) Which of the following operations can be performed by a drilling machine?
a) Drilling b) Countersinking
c) Reaming d) All of the above

11) The boring is an operation which _____.
a) Finish the drilled hole b) Enlarge pre drilled hole
c) Internal thread d) Form external thread

12) Whitworth Quick Return mechanism is used in _____.
a) Milling machine b) Broaching machine
c) Shaper d) Grinding machine

13) Which of the following is used for machining larger jobs?
a) Shaper b) Planer
c) Both a and b d) None of the above

14) Gear shaving is the process of _____.
a) Gear finishing b) Gear parting
c) Gear generation d) None of the above

Seat No.	

Set **Q**

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS)
Examination: March/April - 2026
Advance Manufacturing Technology (MECHPCC-07)

Day & Date: Saturday, 02-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Attempt any two questions from each section.
2) Use of scientific calculator is allowed**.**
2) Figures to right indicate full marks.
3) Assume additional suitable data if necessary and state it clearly.

Section – I

Q.2 **a)** Draw neat sketch of centre lathe and explain its parts. **05**

b) The pitch or a lead screw is 6 mm. and the pitch or the thread to be cut is 1 mm. Find change gears. **05**

c) Explain Slotting Machine. **04**

Q.3 **a)** Explain working and construction of pillar type drilling machine. **05**

b) Explain working and construction of horizontal boring machine with neat sketch. **05**

c) Compare between shaper and planer. **04**

Q.4 **a)** Explain the construction & working of standard double housing planer with neat sketch. **05**

b) Write short note on any three: **09**
i) Specification of Lathe machine
ii) Taper turning by a taper attachment
iii) Job holding devices used on drilling machine
iv) Broaching

Section – II

Q.5 **a)** Compare up milling and down milling process. **05**

b) Index work piece for 83 divisions using dividing head by differential indexing method. Use **05**
Indexing plate 1: 15, 16, 17, 18, 19, 20
Indexing plate 2: 21, 23, 27, 29, 31, 33
Indexing plate 3: 37, 39, 41, 43, 47, 49
Change gears: 24, 24, 28, 32, 40, 44, 48, 56, 64, 72, 86, 100, 140

c) Explain lapping process. **04**

Q.6	**a)**	Explain with neat sketch cylindrical center type grinder.	**05**
	b)	Explain with neat sketch construction and working of AJWM machine.	**05**
	c)	Explain need and significance of unconventional machining.	**04**
Q.7	**a)**	Explain with neat sketch construction and working principal of EDM machine.	**05**
	b)	Write short note on any three i) Compound indexing ii) Glazing iii) Honning iv) Gear Shaving	**09**

Seat No.		Set	R

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Advance Manufacturing Technology (MECHPCC-07)

Day & Date: Saturday, 02-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer from the given options. 14

1) Which of the following material cannot be machined by EDM?
a) Cast Iron b) Steel
c) Glass d) None of these

2) In which of the following methods, an electrolyte is used?
a) EDM b) AWJM
c) ECM d) USM

3) In honing process, tool is _____.
a) Reciprocating b) Rotating
c) Both a) and b) d) None of these

4) Loss in the sharpness of grinding wheel due to the presence of chips in gaps of grains is termed as _____.
a) Loading b) Glazing
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5) A drill is held in following while drilling on lathe machine.
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9) Whitworth Quick Return mechanism is used in _____.
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c) Shaper d) Grinding machine

10) Which of the following is used for machining larger jobs?
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11) Gear shaving is the process of _____.
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c) Gear generation d) None of the above

12) In simple indexing, one complete rotation of spindle makes _____ rotation of index crank.
a) 20 b) 30
c) 40 d) 24

13) Up milling is also called as _____.
a) Climb milling b) Form milling
c) Conventional milling d) None of these

14) Which of the following is finishing process?
a) Lapping b) Superfinishing
c) Honing d) All of these

Seat No.	

Set **R**

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS)
Examination: March/April - 2026
Advance Manufacturing Technology (MECHPCC-07)

Day & Date: Saturday, 02-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Attempt any two questions from each section.
2) Use of scientific calculator is allowed**.**
2) Figures to right indicate full marks.
3) Assume additional suitable data if necessary and state it clearly.

Section – I

Q.2 **a)** Draw neat sketch of centre lathe and explain its parts. **05**

b) The pitch or a lead screw is 6 mm. and the pitch or the thread to be cut is 1 mm. Find change gears. **05**

c) Explain Slotting Machine. **04**

Q.3 **a)** Explain working and construction of pillar type drilling machine. **05**

b) Explain working and construction of horizontal boring machine with neat sketch. **05**

c) Compare between shaper and planer. **04**

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b) Write short note on any three: **09**
i) Specification of Lathe machine
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Section – II

Q.5 **a)** Compare up milling and down milling process. **05**

b) Index work piece for 83 divisions using dividing head by differential indexing method. Use **05**
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Change gears: 24, 24, 28, 32, 40, 44, 48, 56, 64, 72, 86, 100, 140

c) Explain lapping process. **04**

Q.6	**a)**	Explain with neat sketch cylindrical center type grinder.	**05**
	b)	Explain with neat sketch construction and working of AJWM machine.	**05**
	c)	Explain need and significance of unconventional machining.	**04**
Q.7	**a)**	Explain with neat sketch construction and working principal of EDM machine.	**05**
	b)	Write short note on any three i) Compound indexing ii) Glazing iii) Honning iv) Gear Shaving	**09**

Seat No.	

Set **S**

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Advance Manufacturing Technology (MECHPCC-07)

Day & Date: Saturday, 02-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer from the given options. 14

1) Which of the following is used for machining larger jobs?
a) Shaper b) Planer
c) Both a and b d) None of the above

2) Gear shaving is the process of _____.
a) Gear finishing b) Gear parting
c) Gear generation d) None of the above

3) In simple indexing, one complete rotation of spindle makes _____ rotation of index crank.
a) 20 b) 30
c) 40 d) 24

4) Up milling is also called as _____.
a) Climb milling b) Form milling
c) Conventional milling d) None of these

5) Which of the following is finishing process?
a) Lapping b) Superfinishing
c) Honing d) All of these

6) Which of the following material cannot be machined by EDM?
a) Cast Iron b) Steel
c) Glass d) None of these

7) In which of the following methods, an electrolyte is used?
a) EDM b) AWJM
c) ECM d) USM

8) In honing process, tool is _____.
a) Reciprocating b) Rotating
c) Both a) and b) d) None of these

9) Loss in the sharpness of grinding wheel due to the presence of chips in gaps of grains is termed as _____.
a) Loading b) Glazing
c) Truing d) Dressing

10) A drill is held in following while drilling on lathe machine.
a) Headstock b) Tailstock
c) Tool Post d) Carriage

11) Which of the following operations are performed on a lathe machine?
a) Turning b) Parting-off
c) Tapping d) All of the above

12) Which of the following operations can be performed by a drilling machine?
a) Drilling b) Countersinking
c) Reaming d) All of the above

13) The boring is an operation which _____.
a) Finish the drilled hole b) Enlarge pre drilled hole
c) Internal thread d) Form external thread

14) Whitworth Quick Return mechanism is used in _____.
a) Milling machine b) Broaching machine
c) Shaper d) Grinding machine

Seat No.	

Set **S**

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS)
Examination: March/April - 2026
Advance Manufacturing Technology (MECHPCC-07)

Day & Date: Saturday, 02-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Attempt any two questions from each section.
2) Use of scientific calculator is allowed**.**
2) Figures to right indicate full marks.
3) Assume additional suitable data if necessary and state it clearly.

Section – I

Q.2 **a)** Draw neat sketch of centre lathe and explain its parts. **05**

b) The pitch or a lead screw is 6 mm. and the pitch or the thread to be cut is 1 mm. Find change gears. **05**

c) Explain Slotting Machine. **04**

Q.3 **a)** Explain working and construction of pillar type drilling machine. **05**

b) Explain working and construction of horizontal boring machine with neat sketch. **05**

c) Compare between shaper and planer. **04**

Q.4 **a)** Explain the construction & working of standard double housing planer with neat sketch. **05**

b) Write short note on any three: **09**
i) Specification of Lathe machine
ii) Taper turning by a taper attachment
iii) Job holding devices used on drilling machine
iv) Broaching

Section – II

Q.5 **a)** Compare up milling and down milling process. **05**

b) Index work piece for 83 divisions using dividing head by differential indexing method. Use **05**
Indexing plate 1: 15, 16, 17, 18, 19, 20
Indexing plate 2: 21, 23, 27, 29, 31, 33
Indexing plate 3: 37, 39, 41, 43, 47, 49
Change gears: 24, 24, 28, 32, 40, 44, 48, 56, 64, 72, 86, 100, 140

c) Explain lapping process. **04**

Q.6	**a)**	Explain with neat sketch cylindrical center type grinder.	**05**
	b)	Explain with neat sketch construction and working of AJWM machine.	**05**
	c)	Explain need and significance of unconventional machining.	**04**
Q.7	**a)**	Explain with neat sketch construction and working principal of EDM machine.	**05**
	b)	Write short note on any three i) Compound indexing ii) Glazing iii) Honning iv) Gear Shaving	**09**

SLR-QH-319

Seat No.	

Set P

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Design of Machine Elements (MECHPCC-08)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose correct Answer. 14

1) A shaft designed for 200 MPa allowable stress and 600 MPa yield stress has FoS = _____.
a) 2.0 b) 3.0
c) 3.5 d) 4.0

2) A uniform section in casting helps to ____.
a) Reduce turbulence b) Minimize internal stress
c) Improve fatigue d) Prevent inclusions

3) Factor of safety mainly depends on ____.
a) Loading & material b) Cost
c) Color d) Aesthetics

4) For $\sigma u = 600\ \text{MPa}, \sigma e = 250\ \text{MPa}, \sigma m = 100\ \text{MPa}, \sigma a = ?$
a) 130 b) 140
c) 160 d) 200 MPa

5) Fatigue cracks usually start at ____.
a) Centre b) Tensile surface
c) Compressive zone d) Grain boundary

6) Notch increases fatigue risk because it ____.
a) Raises strain b) Adds conductivity
c) Reduces modulus d) Changes stress

7) Flat belt: $T_1/T_2 = 3, v = 10\ \text{m/s}, T_2 = 300\ \text{N}$, Power = ?
a) 2.5 kW b) 3.0 kW
c) 4.5 kW d) 6.0 kW

8) Belt transmits maximum power when _____.
a) Tc = Tmax
b) Tc = Tmax/3
c) Ti = Tmax
d) v minimum

9) Solid shaft torque is given by _____.
a) $\pi/16\ \tau D^3$
b) $\pi/32\ \tau D^3$
c) $\pi/16\ \tau D^4$
d) $\pi/32\ \tau D^4$

10) According to the ASME code, equivalent torque is _____.
a) $\sqrt{(M^2 + T^2)}$
b) $\sqrt{(M^2 + T^2/2)}$
c) $\sqrt{(M^2 + T^2/0.75)}$
d) $\sqrt{(M^2 + T^2/4)}$

11) The purpose of a key way is to _____.
a) increase stiffness
b) transfer torque
c) increase fatigue strength
d) act as relief groove

12) Deflection of a helical spring under load W is proportional to _____.
a) Wd^3/D^3
b) WD^3/d^4
c) D/Wd^3
d) d^4/D^3

13) The Wahl factor accounts for ____.
a) Curvature & shear
b) Torsion only
c) Axial only
d) Pitch error

14) An eccentrically loaded weld joint has maximum stress at _____.
a) Centroid
b) Farthest weld throat
c) Fillet edge
d) Bolt line

Seat No.	

Set **P**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Design of Machine Elements (MECHPCC-08)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Attempt any two questions from each Section.
2) Figures to the right indicate full marks.
3) Make necessary assumptions, if required and mention it clearly.

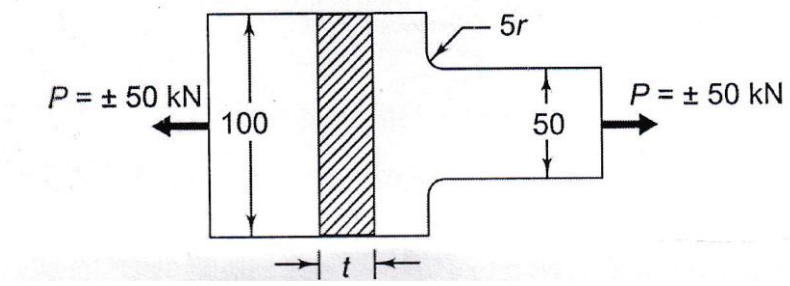
Section – I

Q.2 **a)** Elaborate theories of failures in the design of machine elements. **07**

b) Brief selection factors of the factor of safety, along with its significance. **07**

Q.3 **a)** Explain the following terms in connection with the design of machine members subjected to various loads: **07**
a. Endurance limit, b. Surface finish factor, c. Size factor, d. Notch sensitivity, e. Fatigue failure, f. Mean stress, g. Amplitude stress

b) A component machined from a plate made of steel 45C8 (Sut = 630 N/mm^2) is shown in Fig. It is subjected to a completely reversed axial force of 50 kN. The expected reliability is 90% and the factor of safety is 2. The size factor is 0.85. Determine the plate thickness t for infinite life, if the notch sensitivity factor is 0.8. Take Ka = 0.76 Kb = 0.85 For 90% reliability, Kc = 0.897, Kt = 2.27 **07**



Q.4 **a)** It is required to select a flat belt drive for a compressor running at 720 rpm, which is driven by a 25 kW, 1440 rpm motor. Space is available for a center distance of 3 m. The belt is open-type. Take Fa = 1.02. Make suitable assumption if necessary. **08**

b) Elaborate on the selection process of V Belt from the manufacturer's catalog in detail. **06**

Section – II

Q.5 **a)** Elaborate ASME Code in the design of Shaft. **03**

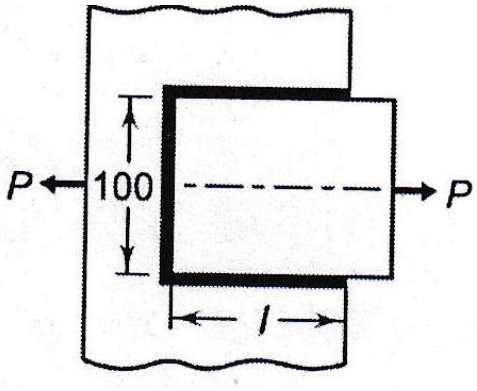
b) Elaborate on Equivalent Torsional Moment and Equivalent Bending Moment with a mathematical expression. **04**

c) A shaft is transmitting 7.51 kW of power at 1441 rpm to a flat belt pulley supported with a key at the center between two bearings 325 mm apart. The belt tension acting is 2.51 kN at the tight side & 1.1 kN at the slack side. The shaft is made of plain carbon steel (Sut = 450 MPa). Determine the diameter of the shaft using shear stress theory. Use ASME code, take Kb=1.5 & Kt=1.0. Design shaft using ASME Code. **07**

Q.6 **a)** Define the following related to spring i) Solid length ii) Free length iii) Spring index iv) Spring rate v) Pitch vi) Active coils. **06**

b) It is required to design a helical compression spring subjected to a maximum force of 1250 N. The deflection of the spring corresponding to the maximum force should be approximately 30 mm. The spring index can be taken as 6. The spring is made of patented and cold-drawn steel wire. The ultimate tensile strength and modulus of rigidity of the spring material are 1090 and 81 370 N/mm^2, respectively. The permissible shear stress for the spring wire should be taken as 50% of the ultimate tensile strength. Design the spring and calculate: (i) wire diameter; (ii) mean coil diameter; (iii) number of active coils; (iv) total number of coils (v) free length of the spring; and (vi) pitch of the coil. Draw a neat sketch of the spring showing various dimensions **08**

Q.7 **a)** A steel plate, 100 mm wide and 10 mm thick, is joined with another steel plate by means of single transverse and double parallel fillet welds, as shown in Fig. The strength of the welded joint should be equal to the strength of the plates to be joined. The permissible tensile and shear stresses for the weld material and the plates are 70 and 50 N/mm^2, respectively. Find the length of each parallel fillet weld. Assume the tensile force acting on the plates as static. **07**



b) Explain the design procedure for an axially loaded unsymmetrical welded joint. **04**

c) Elaborate Types of butt weld with applications. **03**

Arc of contact factor (F_d)

α (Deg.)	120	130	140	150	160	170	180	190	200
F_d	1.33	1.26	1.19	1.13	1.08	1.04	1.00	0.97	0.94

The power transmitting capacities

HI-SPEED	0.0118 kW per mm width per ply
FORT	0.0147 kW per mm width per ply

The standard widths of these belts (in mm)

3-Ply	25	40	50	63	76					
4-Ply	40	44	50	63	76	90	100	112	125	152
5-Ply	76	100	112	125	152					
6-Ply	112	125	152	180	200					

: Preferred pitch diameters of pulleys :

Pitch diameter (mm) :			125	132	140	150	160	170	180	190
200	212	224	236	250	265	280	300	315	355	375
400	425	450	475	500	530	560	600	630	670	710
750	800	900	1000							

Seat No.	

Set **Q**

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Design of Machine Elements (MECHPCC-08)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose correct Answer. **14**

1) Belt transmits maximum power when _____.
a) Tc = Tmax b) Tc = Tmax/3
c) Ti = Tmax d) v minimum

2) Solid shaft torque is given by _____.
a) $\pi/16\ \tau D^3$ b) $\pi/32\ \tau D^3$
c) $\pi/16\ \tau D^4$ d) $\pi/32\ \tau D^4$

3) According to the ASME code, equivalent torque is _____.
a) $\sqrt{(M^2+T^2)}$ b) $\sqrt{(M^2+T^2/2)}$
c) $\sqrt{(M^2+T^2/0.75)}$ d) $\sqrt{(M^2+T^2/4)}$

4) The purpose of a key way is to _____.
a) increase stiffness b) transfer torque
c) increase fatigue strength d) act as relief groove

5) Deflection of a helical spring under load W is proportional to _____.
a) Wd^3/D^3 b) WD^3/d^4
c) D/Wd^3 d) d^4/D^3

6) The Wahl factor accounts for ____.
a) Curvature & shear b) Torsion only
c) Axial only d) Pitch error

7) An eccentrically loaded weld joint has maximum stress at _____.
a) Centroid b) Farthest weld throat
c) Fillet edge d) Bolt line

8) A shaft designed for 200 MPa allowable stress and 600 MPa yield stress has FoS = _____.

a) 2.0 b) 3.0
c) 3.5 d) 4.0

9) A uniform section in casting helps to ____.

a) Reduce turbulence b) Minimize internal stress
c) Improve fatigue d) Prevent inclusions

10) Factor of safety mainly depends on ____.

a) Loading & material b) Cost
c) Color d) Aesthetics

11) For $\sigma u = 600\ \text{MPa}, \sigma e = 250\ \text{MPa}, \sigma m = 100\ \text{MPa}, \sigma a = ?$

a) 130 b) 140
c) 160 d) 200 MPa

12) Fatigue cracks usually start at ____.

a) Centre b) Tensile surface
c) Compressive zone d) Grain boundary

13) Notch increases fatigue risk because it ____.

a) Raises strain b) Adds conductivity
c) Reduces modulus d) Changes stress

14) Flat belt: $\text{T}_1/\text{T}_2 = 3, \text{v} = 10\ \text{m/s}, \text{T}_2 = 300\ \text{N}$, Power $= ?$

a) 2.5 kW b) 3.0 kW
c) 4.5 kW d) 6.0 kW

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Design of Machine Elements (MECHPCC-08)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Attempt any two questions from each Section.
2) Figures to the right indicate full marks.
3) Make necessary assumptions, if required and mention it clearly.

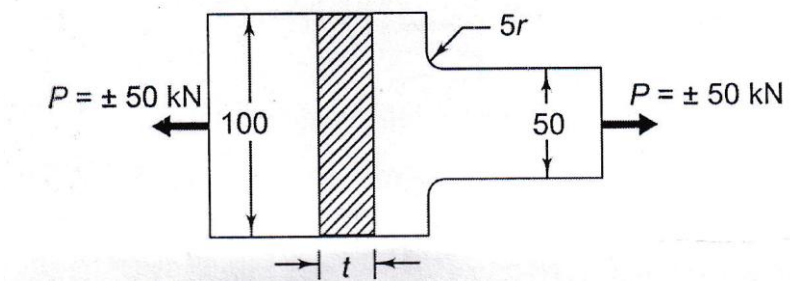
Section – I

Q.2 **a)** Elaborate theories of failures in the design of machine elements. **07**

b) Brief selection factors of the factor of safety, along with its significance. **07**

Q.3 **a)** Explain the following terms in connection with the design of machine members subjected to various loads: **07**
a. Endurance limit, b. Surface finish factor, c. Size factor, d. Notch sensitivity, e. Fatigue failure, f. Mean stress, g. Amplitude stress

b) A component machined from a plate made of steel 45C8 (Sut = 630 N/mm^2) is shown in Fig. It is subjected to a completely reversed axial force of 50 kN. The expected reliability is 90% and the factor of safety is 2. The size factor is 0.85. Determine the plate thickness t for infinite life, if the notch sensitivity factor is 0.8. Take Ka = 0.76 Kb = 0.85 For 90% reliability, Kc = 0.897, Kt = 2.27 **07**



Q.4 **a)** It is required to select a flat belt drive for a compressor running at 720 rpm, which is driven by a 25 kW, 1440 rpm motor. Space is available for a center distance of 3 m. The belt is open-type. Take Fa = 1.02. Make suitable assumption if necessary. **08**

b) Elaborate on the selection process of V Belt from the manufacturer's catalog in detail. **06**

Section – II

Q.5 **a)** Elaborate ASME Code in the design of Shaft. **03**

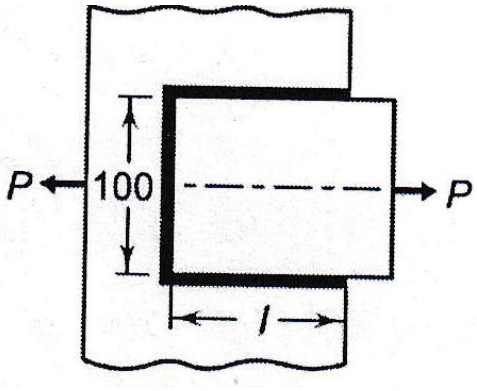
b) Elaborate on Equivalent Torsional Moment and Equivalent Bending Moment with a mathematical expression. **04**

c) A shaft is transmitting 7.51 kW of power at 1441 rpm to a flat belt pulley supported with a key at the center between two bearings 325 mm apart. The belt tension acting is 2.51 kN at the tight side & 1.1 kN at the slack side. The shaft is made of plain carbon steel (Sut = 450 MPa). Determine the diameter of the shaft using shear stress theory. Use ASME code, take Kb=1.5 & Kt=1.0. Design shaft using ASME Code. **07**

Q.6 **a)** Define the following related to spring i) Solid length ii) Free length iii) Spring index iv) Spring rate v) Pitch vi) Active coils. **06**

b) It is required to design a helical compression spring subjected to a maximum force of 1250 N. The deflection of the spring corresponding to the maximum force should be approximately 30 mm. The spring index can be taken as 6. The spring is made of patented and cold-drawn steel wire. The ultimate tensile strength and modulus of rigidity of the spring material are 1090 and 81 370 N/mm^2, respectively. The permissible shear stress for the spring wire should be taken as 50% of the ultimate tensile strength. Design the spring and calculate: (i) wire diameter; (ii) mean coil diameter; (iii) number of active coils; (iv) total number of coils (v) free length of the spring; and (vi) pitch of the coil. Draw a neat sketch of the spring showing various dimensions **08**

Q.7 **a)** A steel plate, 100 mm wide and 10 mm thick, is joined with another steel plate by means of single transverse and double parallel fillet welds, as shown in Fig. The strength of the welded joint should be equal to the strength of the plates to be joined. The permissible tensile and shear stresses for the weld material and the plates are 70 and 50 N/mm^2, respectively. Find the length of each parallel fillet weld. Assume the tensile force acting on the plates as static. **07**



b) Explain the design procedure for an axially loaded unsymmetrical welded joint. **04**

c) Elaborate Types of butt weld with applications. **03**

Arc of contact factor (F_d)

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HI-SPEED	0.0118 kW per mm width per ply
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The standard widths of these belts (in mm)

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5-Ply	76	100	112	125	152					
6-Ply	112	125	152	180	200					

: Preferred pitch diameters of pulleys :

Pitch diameter (mm) :			125	132	140	150	160	170	180	190
200	212	224	236	250	265	280	300	315	355	375
400	425	450	475	500	530	560	600	630	670	710
750	800	900	1000							

Seat No.	

Set R

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Design of Machine Elements (MECHPCC-08)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose correct Answer. **14**

1) The purpose of a key way is to _____.
a) increase stiffness b) transfer torque
c) increase fatigue strength d) act as relief groove

2) Deflection of a helical spring under load W is proportional to _____.
a) Wd^3/D^3 b) WD^3/d^4
c) D/Wd^3 d) d^4/D^3

3) The Wahl factor accounts for ____.
a) Curvature & shear b) Torsion only
c) Axial only d) Pitch error

4) An eccentrically loaded weld joint has maximum stress at _____.
a) Centroid b) Farthest weld throat
c) Fillet edge d) Bolt line

5) A shaft designed for 200 MPa allowable stress and 600 MPa yield stress has FoS = _____.
a) 2.0 b) 3.0
c) 3.5 d) 4.0

6) A uniform section in casting helps to ____.
a) Reduce turbulence b) Minimize internal stress
c) Improve fatigue d) Prevent inclusions

7) Factor of safety mainly depends on ____.
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8) For $\sigma u = 600\ \text{MPa}, \sigma e = 250\ \text{MPa}, \sigma m = 100\ \text{MPa}, \sigma a = ?$

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9) Fatigue cracks usually start at ____.

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10) Notch increases fatigue risk because it ____.

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11) Flat belt: $\text{T}_1/\text{T}_2 = 3, \text{v} = 10\ \text{m/s}, \text{T}_2 = 300\ \text{N}$, Power $= ?$

a) 2.5 kW b) 3.0 kW
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Seat No.	

Set **R**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Design of Machine Elements (MECHPCC-08)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Attempt any two questions from each Section.
2) Figures to the right indicate full marks.
3) Make necessary assumptions, if required and mention it clearly.

Section – I

Q.2 **a)** Elaborate theories of failures in the design of machine elements. **07**

b) Brief selection factors of the factor of safety, along with its significance. **07**

Q.3 **a)** Explain the following terms in connection with the design of machine members subjected to various loads: **07**
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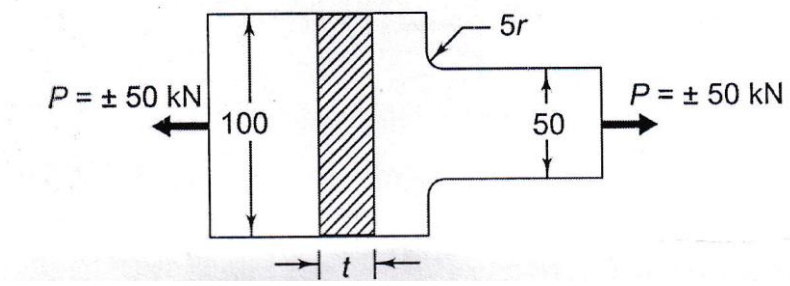
b) A component machined from a plate made of steel 45C8 (Sut = 630 N/mm^2) is shown in Fig. It is subjected to a completely reversed axial force of 50 kN. The expected reliability is 90% and the factor of safety is 2. The size factor is 0.85. Determine the plate thickness t for infinite life, if the notch sensitivity factor is 0.8. Take Ka = 0.76 Kb = 0.85 For 90% reliability, Kc = 0.897, Kt = 2.27 **07**



Q.4 **a)** It is required to select a flat belt drive for a compressor running at 720 rpm, which is driven by a 25 kW, 1440 rpm motor. Space is available for a center distance of 3 m. The belt is open-type. Take Fa = 1.02. Make suitable assumption if necessary. **08**

b) Elaborate on the selection process of V Belt from the manufacturer's catalog in detail. **06**

Section – II

Q.5 **a)** Elaborate ASME Code in the design of Shaft. **03**

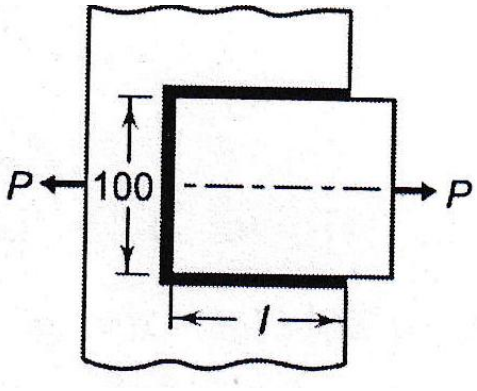
b) Elaborate on Equivalent Torsional Moment and Equivalent Bending Moment with a mathematical expression. **04**

c) A shaft is transmitting 7.51 kW of power at 1441 rpm to a flat belt pulley supported with a key at the center between two bearings 325 mm apart. The belt tension acting is 2.51 kN at the tight side & 1.1 kN at the slack side. The shaft is made of plain carbon steel (Sut = 450 MPa). Determine the diameter of the shaft using shear stress theory. Use ASME code, take Kb=1.5 & Kt=1.0. Design shaft using ASME Code. **07**

Q.6 **a)** Define the following related to spring i) Solid length ii) Free length iii) Spring index iv) Spring rate v) Pitch vi) Active coils. **06**

b) It is required to design a helical compression spring subjected to a maximum force of 1250 N. The deflection of the spring corresponding to the maximum force should be approximately 30 mm. The spring index can be taken as 6. The spring is made of patented and cold-drawn steel wire. The ultimate tensile strength and modulus of rigidity of the spring material are 1090 and 81 370 N/mm^2, respectively. The permissible shear stress for the spring wire should be taken as 50% of the ultimate tensile strength. Design the spring and calculate: (i) wire diameter; (ii) mean coil diameter; (iii) number of active coils; (iv) total number of coils (v) free length of the spring; and (vi) pitch of the coil. Draw a neat sketch of the spring showing various dimensions **08**

Q.7 **a)** A steel plate, 100 mm wide and 10 mm thick, is joined with another steel plate by means of single transverse and double parallel fillet welds, as shown in Fig. The strength of the welded joint should be equal to the strength of the plates to be joined. The permissible tensile and shear stresses for the weld material and the plates are 70 and 50 N/mm^2, respectively. Find the length of each parallel fillet weld. Assume the tensile force acting on the plates as static. **07**



b) Explain the design procedure for an axially loaded unsymmetrical welded joint. **04**

c) Elaborate Types of butt weld with applications. **03**

Arc of contact factor (F_d)

α (Deg.)	120	130	140	150	160	170	180	190	200
F_d	1.33	1.26	1.19	1.13	1.08	1.04	1.00	0.97	0.94

The power transmitting capacities

HI-SPEED	0.0118 kW per mm width per ply
FORT	0.0147 kW per mm width per ply

The standard widths of these belts (in mm)

3-Ply	25	40	50	63	76					
4-Ply	40	44	50	63	76	90	100	112	125	152
5-Ply	76	100	112	125	152					
6-Ply	112	125	152	180	200					

: Preferred pitch diameters of pulleys :

Pitch diameter (mm) :			125	132	140	150	160	170	180	190
200	212	224	236	250	265	280	300	315	355	375
400	425	450	475	500	530	560	600	630	670	710
750	800	900	1000							

Seat No.	

Set **S**

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Design of Machine Elements (MECHPCC-08)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose correct Answer. **14**

1) Notch increases fatigue risk because it ____.
a) Raises strain b) Adds conductivity
c) Reduces modulus d) Changes stress

2) Flat belt: $T_1/T_2 = 3, v = 10\ m/s, T_2 = 300\ N$, Power = ?
a) 2.5 kW b) 3.0 kW
c) 4.5 kW d) 6.0 kW

3) Belt transmits maximum power when _____.
a) Tc = Tmax b) Tc = Tmax/3
c) Ti = Tmax d) v minimum

4) Solid shaft torque is given by _____.
a) $\pi/16\ \tau D^3$ b) $\pi/32\ \tau D^3$
c) $\pi/16\ \tau D^4$ d) $\pi/32\ \tau D^4$

5) According to the ASME code, equivalent torque is _____.
a) $\sqrt{(M^2 + T^2)}$ b) $\sqrt{(M^2 + T^2/2)}$
c) $\sqrt{(M^2 + T^2/0.75)}$ d) $\sqrt{(M^2 + T^2/4)}$

6) The purpose of a key way is to _____.
a) increase stiffness b) transfer torque
c) increase fatigue strength d) act as relief groove

7) Deflection of a helical spring under load W is proportional to _____.
a) Wd^3/D^3 b) WD^3/d^4
c) D/Wd^3 d) d^4/D^3

8) The Wahl factor accounts for ____.
a) Curvature & shear
b) Torsion only
c) Axial only
d) Pitch error

9) An eccentrically loaded weld joint has maximum stress at _____.
a) Centroid
b) Farthest weld throat
c) Fillet edge
d) Bolt line

10) A shaft designed for 200 MPa allowable stress and 600 MPa yield stress has FoS = _____.
a) 2.0
b) 3.0
c) 3.5
d) 4.0

11) A uniform section in casting helps to ____.
a) Reduce turbulence
b) Minimize internal stress
c) Improve fatigue
d) Prevent inclusions

12) Factor of safety mainly depends on ____.
a) Loading & material
b) Cost
c) Color
d) Aesthetics

13) For $\sigma u = 600\ \text{MPa}, \sigma e = 250\ \text{MPa}, \sigma m = 100\ \text{MPa}, \sigma a = ?$
a) 130
b) 140
c) 160
d) 200 MPa

14) Fatigue cracks usually start at ____.
a) Centre
b) Tensile surface
c) Compressive zone
d) Grain boundary

Seat No.	

Set **S**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Design of Machine Elements (MECHPCC-08)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Attempt any two questions from each Section.
2) Figures to the right indicate full marks.
3) Make necessary assumptions, if required and mention it clearly.

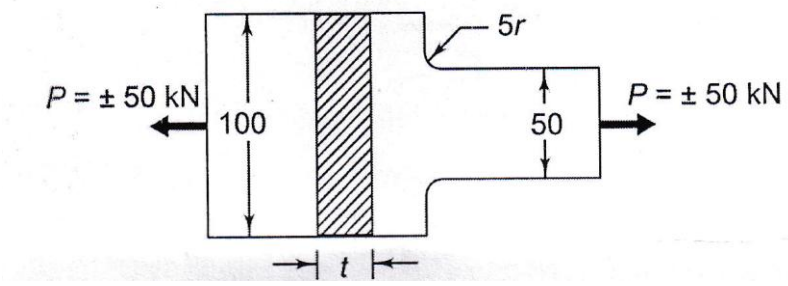
Section – I

Q.2 **a)** Elaborate theories of failures in the design of machine elements. **07**

b) Brief selection factors of the factor of safety, along with its significance. **07**

Q.3 **a)** Explain the following terms in connection with the design of machine members subjected to various loads: **07**
a. Endurance limit, b. Surface finish factor, c. Size factor, d. Notch sensitivity, e. Fatigue failure, f. Mean stress, g. Amplitude stress

b) A component machined from a plate made of steel 45C8 (Sut = 630 N/mm^2) is shown in Fig. It is subjected to a completely reversed axial force of 50 kN. The expected reliability is 90% and the factor of safety is 2. The size factor is 0.85. Determine the plate thickness t for infinite life, if the notch sensitivity factor is 0.8. Take Ka = 0.76 Kb = 0.85 For 90% reliability, Kc = 0.897, Kt = 2.27 **07**



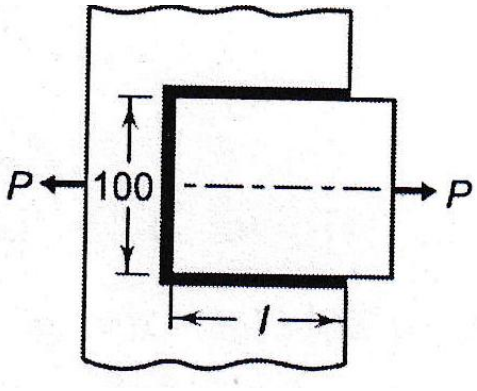
Q.4 **a)** It is required to select a flat belt drive for a compressor running at 720 rpm, which is driven by a 25 kW, 1440 rpm motor. Space is available for a center distance of 3 m. The belt is open-type. Take Fa = 1.02. Make suitable assumption if necessary. **08**

b) Elaborate on the selection process of V Belt from the manufacturer's catalog in detail. **06**

Section – II

Q.5	**a)**	Elaborate ASME Code in the design of Shaft.	**03**
	b)	Elaborate on Equivalent Torsional Moment and Equivalent Bending Moment with a mathematical expression.	**04**
	c)	A shaft is transmitting 7.51 kW of power at 1441 rpm to a flat belt pulley supported with a key at the center between two bearings 325 mm apart. The belt tension acting is 2.51 kN at the tight side & 1.1 kN at the slack side. The shaft is made of plain carbon steel (Sut = 450 MPa). Determine the diameter of the shaft using shear stress theory. Use ASME code, take Kb=1.5 & Kt=1.0. Design shaft using ASME Code.	**07**
Q.6	**a)**	Define the following related to spring i) Solid length ii) Free length iii) Spring index iv) Spring rate v) Pitch vi) Active coils.	**06**
	b)	It is required to design a helical compression spring subjected to a maximum force of 1250 N. The deflection of the spring corresponding to the maximum force should be approximately 30 mm. The spring index can be taken as 6. The spring is made of patented and cold-drawn steel wire. The ultimate tensile strength and modulus of rigidity of the spring material are 1090 and 81 370 N/mm^2, respectively. The permissible shear stress for the spring wire should be taken as 50% of the ultimate tensile strength. Design the spring and calculate: (i) wire diameter; (ii) mean coil diameter; (iii) number of active coils; (iv) total number of coils (v) free length of the spring; and (vi) pitch of the coil. Draw a neat sketch of the spring showing various dimensions	**08**

Q.7 **a)** A steel plate, 100 mm wide and 10 mm thick, is joined with another steel plate by means of single transverse and double parallel fillet welds, as shown in Fig. The strength of the welded joint should be equal to the strength of the plates to be joined. The permissible tensile and shear stresses for the weld material and the plates are 70 and 50 N/mm^2, respectively. Find the length of each parallel fillet weld. Assume the tensile force acting on the plates as static. **07**



b) Explain the design procedure for an axially loaded unsymmetrical welded joint. **04**

c) Elaborate Types of butt weld with applications. **03**

Arc of contact factor (F_d)

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The power transmitting capacities

HI-SPEED	0.0118 kW per mm width per ply
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The standard widths of these belts (in mm)

3-Ply	25	40	50	63	76					
4-Ply	40	44	50	63	76	90	100	112	125	152
5-Ply	76	100	112	125	152					
6-Ply	112	125	152	180	200					

: Preferred pitch diameters of pulleys :

Pitch diameter (mm) :			125	132	140	150	160	170	180	190
200	212	224	236	250	265	280	300	315	355	375
400	425	450	475	500	530	560	600	630	670	710
750	800	900	1000							

SLR-QH-320

Seat No.	

Set P

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Metallurgy (MECHPCC-09)

Day & Date: Thursday, 07-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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3) Figures to the right indicate full marks.
4) Make suitable assumptions if required and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Eutectic means complete solubility in _____.
a) Liquid state b) Solid state
c) Liquid & solid state d) Neither liquid nor solid

2) Malleablizing treatment is carried out on _____.
a) SG Iron b) Grey Iron
c) White Iron d) None of above

3) Eutectoid reaction occurs at _____.
a) 600°C b) 723°C
c) 1147°C d) 1443°C

4) Cast iron is used for machine beds because of its high _____.
a) Tensile strength b) Endurance strength
c) Damping capacity d) Compressive strength

5) Which of the following alloys is precipitation hardened?
a) Brass b) Tin Bronze
c) Al-4.5%Cu d) Silicon bronze

6) Which of the following alloy is given modification treatment?
a) Al-Cu alloy b) Cu-Sn alloy
c) Al-Si alloy d) Cu-Al alloy

7) Main alloying element in stainless steel?
a) Chromium b) Nickel
c) Copper d) Zinc

8) Which of the following steel is non hardenable by HT?
a) OHNS
b) 304 Stainless Steel
c) HCHC Steel
d) High Carbon Steel

9) Nitriding treatment is carried out by heating the steel in the range of _____
a) 200°C - 300°C
b) 500°C - 550°C
c) 900°C - 925°C
d) 900°C - 950°C

10) Slow cooling of austenite below the eutectoid temperature results in the formation of which microstructure?
a) Pearlite
b) Bainite
c) Martensite
d) Cementite

11) Which of the following components are manufactured by P/M technique?
a) Carbide cutting tool
b) Friction Materials
c) Porous Bearings
d) All of these

12) The Stress-Strain curve is related to _____test/phenomenon.
a) Creep Test
b) Fatigue Test
c) Tensile test
d) Impact test

13) During manufacturing of Self-lubricating bearing, which of the following is an important step?
a) Sizing
b) Heat treatment
c) Inspection
d) Impregnation

14) To detect internal cracks in steel forgings at higher depth which NDT is employed?
a) DP test
b) MP test
c) Ultrasonic test
d) All above

Seat No.	

Set **P**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Metallurgy (MECHPCC-09)

Day & Date: Thursday, 07-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Attempt any two questions from each section.
2) Figures to the right indicate full marks.
3) Make suitable assumptions if required and state them clearly.

SECTION – I

Q.2 Solve the Following.

a) Give brief classification of Metallic materials. **04**

b) Explain Plain carbon steels with types, properties, composition, microstructure and applications. **05**

c) Draw an Eutectic Type phase diagram and explain micro-structural changes during cooling with suitable example. **05**

Q.3 Solve the Following.

a) What is Stainless Steel? Give types, compositions, properties & application. **04**

b) Draw the neat sketch for Nodular Cast Iron & Grey Cast Iron micro-structure. **04**

c) Draw the complete Iron-Iron Carbide (Fe-Fe3C) equilibrium diagram. Label all the constituents and temperatures correctly with all three transformation reactions. **06**

Q.4 Solve the Following.

a) Draw & explain Cu-Zn equilibrium diagram. **04**

b) Write a short note on Babbitts or White metal alloy with its properties, composition, microstructure and applications. **04**

c) Discuss Composite materials with its types, advantages, and applications. **06**

SECTION – II

Q.5 Solve the Following.

a) Explain the process of Induction hardening with a neat sketch & its advantages, disadvantages and applications. **06**

b) Superimpose following Heat treatment processes on TTT diagram. (Any Four) **08**

i) Conventional Hardening
ii) Martempering
iii) Patenting
iv) Isoforming
v) Austempering

Q.6 a) Differentiate between Austempering and Martempering. **04**

b) Explain in Tensile test procedure with help of a neat sketch and Draw Stress-Strain curve for Ductile and Brittle materials. **04**

c) Explain the setup for the Ultrasonic test pointing out its advantages, limitations and applications. **06**

Q.7 Solve the Following.

a) Illustrate manufacturing of Cemented Carbide Cutting Tool by using Powder Metallurgy technique with help of Flow chart. **07**

b) Discuss Creep testing procedure and its outcome (Creep Curve) with the help of a neat sketch. **04**

c) List out different types of powder manufacturing and explain with neat sketch at least one method of powder manufacturing. **03**

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Metallurgy (MECHPCC-09)

Day & Date: Thursday, 07-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which of the following steel is non hardenable by HT?
a) OHNS b) 304 Stainless Steel
c) HCHC Steel d) High Carbon Steel

2) Nitriding treatment is carried out by heating the steel in the range of _____
a) 200°C - 300°C b) 500°C - 550°C
c) 900°C - 925°C d) 900°C - 950°C

3) Slow cooling of austenite below the eutectoid temperature results in the formation of which microstructure?
a) Pearlite b) Bainite
c) Martensite d) Cementite

4) Which of the following components are manufactured by P/M technique?
a) Carbide cutting tool b) Friction Materials
c) Porous Bearings d) All of these

5) The Stress-Strain curve is related to _____test/phenomenon.
a) Creep Test b) Fatigue Test
c) Tensile test d) Impact test

6) During manufacturing of Self-lubricating bearing, which of the following is an important step?
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7) To detect internal cracks in steel forgings at higher depth which NDT is employed?
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c) Ultrasonic test
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c) Liquid & solid state
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13) Which of the following alloy is given modification treatment?
a) Al-Cu alloy
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c) Al-Si alloy
d) Cu-Al alloy

14) Main alloying element in stainless steel?
a) Chromium
b) Nickel
c) Copper
d) Zinc

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Metallurgy (MECHPCC-09)

Day & Date: Thursday, 07-05-2026 Max. Marks: 56
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Instructions: 1) Attempt any two questions from each section.
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Q.2 Solve the Following.

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a) What is Stainless Steel? Give types, compositions, properties & application. **04**

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c) Draw the complete Iron-Iron Carbide (Fe-Fe3C) equilibrium diagram. Label all the constituents and temperatures correctly with all three transformation reactions. **06**

Q.4 Solve the Following.

a) Draw & explain Cu-Zn equilibrium diagram. **04**

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SECTION – II

Q.5 Solve the Following.

a) Explain the process of Induction hardening with a neat sketch & its advantages, disadvantages and applications. **06**

b) Superimpose following Heat treatment processes on TTT diagram. (Any Four) **08**

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ii) Martempering
iii) Patenting
iv) Isoforming
v) Austempering

Q.6 a) Differentiate between Austempering and Martempering. **04**

b) Explain in Tensile test procedure with help of a neat sketch and Draw Stress-Strain curve for Ductile and Brittle materials. **04**

c) Explain the setup for the Ultrasonic test pointing out its advantages, limitations and applications. **06**

Q.7 Solve the Following.

a) Illustrate manufacturing of Cemented Carbide Cutting Tool by using Powder Metallurgy technique with help of Flow chart. **07**

b) Discuss Creep testing procedure and its outcome (Creep Curve) with the help of a neat sketch. **04**

c) List out different types of powder manufacturing and explain with neat sketch at least one method of powder manufacturing. **03**

SLR-QH-320

Seat No.	

Set R

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Metallurgy (MECHPCC-09)

Day & Date: Thursday, 07-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. 14

1) Which of the following components are manufactured by P/M technique?
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14) Slow cooling of austenite below the eutectoid temperature results in the formation of which microstructure?
a) Pearlite b) Bainite
c) Martensite d) Cementite

Seat No.	

Set **R**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Metallurgy (MECHPCC-09)

Day & Date: Thursday, 07-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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Q.2 Solve the Following.

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c) Draw an Eutectic Type phase diagram and explain micro-structural changes during cooling with suitable example. **05**

Q.3 Solve the Following.

a) What is Stainless Steel? Give types, compositions, properties & application. **04**

b) Draw the neat sketch for Nodular Cast Iron & Grey Cast Iron micro-structure. **04**

c) Draw the complete Iron-Iron Carbide (Fe-Fe3C) equilibrium diagram. Label all the constituents and temperatures correctly with all three transformation reactions. **06**

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b) Write a short note on Babbitts or White metal alloy with its properties, composition, microstructure and applications. **04**

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SECTION – II

Q.5 Solve the Following.

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b) Superimpose following Heat treatment processes on TTT diagram. (Any Four) **08**

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c) List out different types of powder manufacturing and explain with neat sketch at least one method of powder manufacturing. **03**

SLR-QH-320

Seat No.		Set	S

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Metallurgy (MECHPCC-09)

Day & Date: Thursday, 07-05-2026 Max. Marks: 70
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MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which of the following alloy is given modification treatment?
a) Al-Cu alloy b) Cu-Sn alloy
c) Al-Si alloy d) Cu-Al alloy

2) Main alloying element in stainless steel?
a) Chromium b) Nickel
c) Copper d) Zinc

3) Which of the following steel is non hardenable by HT?
a) OHNS b) 304 Stainless Steel
c) HCHC Steel d) High Carbon Steel

4) Nitriding treatment is carried out by heating the steel in the range of _____
a) 200°C - 300°C b) 500°C - 550°C
c) 900°C - 925°C d) 900°C - 950°C

5) Slow cooling of austenite below the eutectoid temperature results in the formation of which microstructure?
a) Pearlite b) Bainite
c) Martensite d) Cementite

6) Which of the following components are manufactured by P/M technique?
a) Carbide cutting tool b) Friction Materials
c) Porous Bearings d) All of these

7) The Stress-Strain curve is related to _____test/phenomenon.
a) Creep Test b) Fatigue Test
c) Tensile test d) Impact test

8) During manufacturing of Self-lubricating bearing, which of the following is an important step?
a) Sizing
b) Heat treatment
c) Inspection
d) Impregnation

9) To detect internal cracks in steel forgings at higher depth which NDT is employed?
a) DP test
b) MP test
c) Ultrasonic test
d) All above

10) Eutectic means complete solubility in _____.
a) Liquid state
b) Solid state
c) Liquid & solid state
d) Neither liquid nor solid

11) Malleablizing treatment is carried out on _____.
a) SG Iron
b) Grey Iron
c) White Iron
d) None of above

12) Eutectoid reaction occurs at _____.
a) 600°C
b) 723°C
c) 1147°C
d) 1443°C

13) Cast iron is used for machine beds because of its high _____.
a) Tensile strength
b) Endurance strength
c) Damping capacity
d) Compressive strength

14) Which of the following alloys is precipitation hardened?
a) Brass
b) Tin Bronze
c) Al-4.5%Cu
d) Silicon bronze

SLR-QH-320

Seat No.	

Set S

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Metallurgy (MECHPCC-09)

Day & Date: Thursday, 07-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Attempt any two questions from each section.
2) Figures to the right indicate full marks.
3) Make suitable assumptions if required and state them clearly.

SECTION – I

Q.2 Solve the Following.

a) Give brief classification of Metallic materials. **04**

b) Explain Plain carbon steels with types, properties, composition, microstructure and applications. **05**

c) Draw an Eutectic Type phase diagram and explain micro-structural changes during cooling with suitable example. **05**

Q.3 Solve the Following.

a) What is Stainless Steel? Give types, compositions, properties & application. **04**

b) Draw the neat sketch for Nodular Cast Iron & Grey Cast Iron micro-structure. **04**

c) Draw the complete Iron-Iron Carbide (Fe-Fe3C) equilibrium diagram. Label all the constituents and temperatures correctly with all three transformation reactions. **06**

Q.4 Solve the Following.

a) Draw & explain Cu-Zn equilibrium diagram. **04**

b) Write a short note on Babbitts or White metal alloy with its properties, composition, microstructure and applications. **04**

c) Discuss Composite materials with its types, advantages, and applications. **06**

SECTION – II

Q.5 Solve the Following.

a) Explain the process of Induction hardening with a neat sketch & its advantages, disadvantages and applications. **06**

b) Superimpose following Heat treatment processes on TTT diagram. (Any Four) **08**

i) Conventional Hardening
ii) Martempering
iii) Patenting
iv) Isoforming
v) Austempering

Q.6 a) Differentiate between Austempering and Martempering. **04**

b) Explain in Tensile test procedure with help of a neat sketch and Draw Stress-Strain curve for Ductile and Brittle materials. **04**

c) Explain the setup for the Ultrasonic test pointing out its advantages, limitations and applications. **06**

Q.7 Solve the Following.

a) Illustrate manufacturing of Cemented Carbide Cutting Tool by using Powder Metallurgy technique with help of Flow chart. **07**

b) Discuss Creep testing procedure and its outcome (Creep Curve) with the help of a neat sketch. **04**

c) List out different types of powder manufacturing and explain with neat sketch at least one method of powder manufacturing. **03**

SLR-QH-321

Seat No.	

Set P

T. Y. (B.Tech.) (Mechanical Engineering) (Sem - I) (New) (CBCS)
Examination: March/April – 2026
Metrology and Quality Control (MECHPEC-01A)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Multiple Choice Questions. **14**

1) The PDCA cycle stands for _____.
a) Plan, Do, Check, Act
b) Process, Design, Control, Apply
c) Plan, Design, Create, Analyze
d) Produce, Deliver, Control, Audit

2) Double sampling plan involves _____.
a) Two-stage decision-making b) Inspecting entire lot
c) Random rejection d) Checking only one item

3) In 100% inspection, all items are _____.
a) Randomly tested b) Fully checked
c) Checked only in batches d) Checked by sampling

4) The accuracy of a comparator depends on _____?
a) Calibration b) Operator skill
c) Environmental conditions d) All of the above

5) The least count of a standard Vernier caliper is generally?
a) 1 mm b) 0.5 mm
c) 0.02 mm d) 0.2 mm

6) Sine bar works on the principle of _____.
a) Hooke'slaw
b) Trigonometry of right triangle (sine function)
c) Differential principle
d) Geometric tolerancing

7) Which characteristic is critical when selecting a measuring instrument?
a) Accuracy, precision, sensitivity
b) Brand name only
c) Cost alone
d) Size of the instrument

8) The 80/20 rule in quality management means _____.
a) 80% of quality depends on 20% of employees
b) 80% of problems come from 20% of causes
c) 80% of customers generate 20% of revenue
d) 20% of defects are critical

9) C-chart is used for _____.
a) Number of defects per unit
b) Process mean
c) Range variation
d) Standard deviation

10) The main importance of metrology in manufacturing is _____.
a) To reduce machine costs
b) To improve measurement accuracy and product quality
c) To increase marketing
d) To reduce electricity consumption

11) Accuracy refers to _____.
a) Closeness of measurement to the true value
b) Repeatability of readings
c) Ability to detect small changes
d) Reliability of instrument

12) Six Sigma focuses on _____.
a) Increasing Raw material Use
b) Increasing machine speed
c) Reducing manpower
d) Reducing variability and defects

13) Comparators in metrology are mainly used for _____.
a) Direct length measurement
b) Comparing dimensions with a standard
c) Surface roughness measurement
d) Calibrating sine bars

14) The primary principle of TQM is _____.
a) Profit maximization
b) Customer focus and continuous improvement
c) Cost reduction only
d) Minimizing inspections

SLR-QH-321

Seat No.	

Set P

T. Y. (B.Tech.) (Mechanical Engineering) (Sem - I) (New) (CBCS)
Examination: March/April – 2026
Metrology and Quality Control (MECHPEC-01A)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Solve any Two questions from each section.
2) Figure on right indicates full marks.
3) Assume suitable data, diagrams if required.
4) Use of scientific calculator is allowed.

Section – I

Q.2 Solve. **14**

a) Define Metrology. Explain its importance, scope, and applications in manufacturing industries with suitable examples.

b) What are Slip gauges? Explain the concept of Wringing and their importance in calibration.

Q.3 Solve. **14**

a) Explain the construction and working principle of a Vernier Caliper with neat sketches. Discuss its least count and applications.

b) Explain the working principle of a Sine bar. How is it used for accurate angle measurement? Give one example.

Q.4 Write a short note. (Any Two) **14**

a) Mechanical Comparator: Dial indicator

b) Types of Measurement errors

c) Element of Gear Measurement with Measurement of Runout, Pitch

d) Characteristic of Measuring instruments: Precision, accuracy, and sensitivity

Section – II

Q.5 Solve. **14**

a) Define Quality Control and Quality Assurance. Differentiate between them with suitable examples.

b) List types of Charts used in Statistical Quality Control. Explain the various steps in construction of $\overline{X} - R$ control charts.

Q.6 Solve. **14**

a) Define Total Quality Management (TQM). How does it differ from traditional quality control approaches?

b) Compare 100% inspection with sampling inspection. Discuss their advantages, disadvantages, and applications.

Q.7 Solve (Any Two) **14**

a) Explain the concept of Six Sigma and the DMAIC approach used in process improvement.

b) What is the PDCA cycle? Explain each step with an example of its application in industry.

c) Write a short note:
1) Cause & Effect (Ishikawa) diagram
2) Histogram

d) 10 Samples of size 05 have been collected with following observation.

Sr.no.	1	2	3	4	5	6	7	8	9	10
X-bar	2.011	2.008	2.001	2.003	1.998	1.995	1.997	1.997	2.002	2.003
R	0.011	0.017	0.009	0.026	0.027	0.021	0.014	0.017	0.023	0.015

Given: A2=0.577, D3=0, D4=2.114

Draw Proper Control Chart & explain whether the process is in statistical control or not.

Seat No.	

Set **Q**

T. Y. (B.Tech.) (Mechanical Engineering) (Sem - I) (New) (CBCS)
Examination: March/April – 2026
Metrology and Quality Control (MECHPEC-01A)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Multiple Choice Questions. **14**

1) The 80/20 rule in quality management means _____.
a) 80% of quality depends on 20% of employees
b) 80% of problems come from 20% of causes
c) 80% of customers generate 20% of revenue
d) 20% of defects are critical

2) C-chart is used for _____.
a) Number of defects per unit
b) Process mean
c) Range variation
d) Standard deviation

3) The main importance of metrology in manufacturing is _____.
a) To reduce machine costs
b) To improve measurement accuracy and product quality
c) To increase marketing
d) To reduce electricity consumption

4) Accuracy refers to _____.
a) Closeness of measurement to the true value
b) Repeatability of readings
c) Ability to detect small changes
d) Reliability of instrument

5) Six Sigma focuses on _____.
a) Increasing Raw material Use
b) Increasing machine speed
c) Reducing manpower
d) Reducing variability and defects

6) Comparators in metrology are mainly used for _____.
- a) Direct length measurement
- b) Comparing dimensions with a standard
- c) Surface roughness measurement
- d) Calibrating sine bars

7) The primary principle of TQM is _____.
- a) Profit maximization
- b) Customer focus and continuous improvement
- c) Cost reduction only
- d) Minimizing inspections

8) The PDCA cycle stands for _____.
- a) Plan, Do, Check, Act
- b) Process, Design, Control, Apply
- c) Plan, Design, Create, Analyze
- d) Produce, Deliver, Control, Audit

9) Double sampling plan involves _____.
- a) Two-stage decision-making
- b) Inspecting entire lot
- c) Random rejection
- d) Checking only one item

10) In 100% inspection, all items are _____.
- a) Randomly tested
- b) Fully checked
- c) Checked only in batches
- d) Checked by sampling

11) The accuracy of a comparator depends on _____?
- a) Calibration
- b) Operator skill
- c) Environmental conditions
- d) All of the above

12) The least count of a standard Vernier caliper is generally?
- a) 1 mm
- b) 0.5 mm
- c) 0.02 mm
- d) 0.2 mm

13) Sine bar works on the principle of _____.
- a) Hooke'slaw
- b) Trigonometry of right triangle (sine function)
- c) Differential principle
- d) Geometric tolerancing

14) Which characteristic is critical when selecting a measuring instrument?
- a) Accuracy, precision, sensitivity
- b) Brand name only
- c) Cost alone
- d) Size of the instrument

SLR-QH-321

Seat No.	

Set Q

T. Y. (B.Tech.) (Mechanical Engineering) (Sem - I) (New) (CBCS)
Examination: March/April – 2026
Metrology and Quality Control (MECHPEC-01A)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Solve any Two questions from each section.
2) Figure on right indicates full marks.
3) Assume suitable data, diagrams if required.
4) Use of scientific calculator is allowed.

Section – I

Q.2 Solve. **14**

a) Define Metrology. Explain its importance, scope, and applications in manufacturing industries with suitable examples.

b) What are Slip gauges? Explain the concept of Wringing and their importance in calibration.

Q.3 Solve. **14**

a) Explain the construction and working principle of a Vernier Caliper with neat sketches. Discuss its least count and applications.

b) Explain the working principle of a Sine bar. How is it used for accurate angle measurement? Give one example.

Q.4 Write a short note. (Any Two) **14**

a) Mechanical Comparator: Dial indicator

b) Types of Measurement errors

c) Element of Gear Measurement with Measurement of Runout, Pitch

d) Characteristic of Measuring instruments: Precision, accuracy, and sensitivity

Section – II

Q.5 Solve. **14**

a) Define Quality Control and Quality Assurance. Differentiate between them with suitable examples.

b) List types of Charts used in Statistical Quality Control. Explain the various steps in construction of $\overline{X} - R$ control charts.

Q.6 Solve. **14**

a) Define Total Quality Management (TQM). How does it differ from traditional quality control approaches?

b) Compare 100% inspection with sampling inspection. Discuss their advantages, disadvantages, and applications.

Q.7 Solve (Any Two) **14**

a) Explain the concept of Six Sigma and the DMAIC approach used in process improvement.

b) What is the PDCA cycle? Explain each step with an example of its application in industry.

c) Write a short note:
1) Cause & Effect (Ishikawa) diagram
2) Histogram

d) 10 Samples of size 05 have been collected with following observation.

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X-bar	2.011	2.008	2.001	2.003	1.998	1.995	1.997	1.997	2.002	2.003
R	0.011	0.017	0.009	0.026	0.027	0.021	0.014	0.017	0.023	0.015

Given: A2=0.577, D3=0, D4=2.114

Draw Proper Control Chart & explain whether the process is in statistical control or not.

SLR-QH-321

Seat No.	

Set R

T. Y. (B.Tech.) (Mechanical Engineering) (Sem - I) (New) (CBCS)
Examination: March/April – 2026
Metrology and Quality Control (MECHPEC-01A)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Multiple Choice Questions. **14**

1) Accuracy refers to _____.
a) Closeness of measurement to the true value
b) Repeatability of readings
c) Ability to detect small changes
d) Reliability of instrument

2) Six Sigma focuses on _____.
a) Increasing Raw material Use
b) Increasing machine speed
c) Reducing manpower
d) Reducing variability and defects

3) Comparators in metrology are mainly used for _____.
a) Direct length measurement
b) Comparing dimensions with a standard
c) Surface roughness measurement
d) Calibrating sine bars

4) The primary principle of TQM is _____.
a) Profit maximization
b) Customer focus and continuous improvement
c) Cost reduction only
d) Minimizing inspections

5) The PDCA cycle stands for _____.
a) Plan, Do, Check, Act
b) Process, Design, Control, Apply
c) Plan, Design, Create, Analyze
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6) Double sampling plan involves _____.
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8) The accuracy of a comparator depends on _____?
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9) The least count of a standard Vernier caliper is generally?
a) 1 mm b) 0.5 mm
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10) Sine bar works on the principle of _____.
a) Hooke'slaw
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c) Differential principle
d) Geometric tolerancing

11) Which characteristic is critical when selecting a measuring instrument?
a) Accuracy, precision, sensitivity
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c) Cost alone
d) Size of the instrument

12) The 80/20 rule in quality management means _____.
a) 80% of quality depends on 20% of employees
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c) 80% of customers generate 20% of revenue
d) 20% of defects are critical

13) C-chart is used for _____.
a) Number of defects per unit
b) Process mean
c) Range variation
d) Standard deviation

14) The main importance of metrology in manufacturing is _____.
a) To reduce machine costs
b) To improve measurement accuracy and product quality
c) To increase marketing
d) To reduce electricity consumption

Seat No.	

Set **R**

T. Y. (B.Tech.) (Mechanical Engineering) (Sem - I) (New) (CBCS)
Examination: March/April – 2026
Metrology and Quality Control (MECHPEC-01A)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Solve any Two questions from each section.
2) Figure on right indicates full marks.
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4) Use of scientific calculator is allowed.

Section – I

Q.2 Solve. **14**

a) Define Metrology. Explain its importance, scope, and applications in manufacturing industries with suitable examples.

b) What are Slip gauges? Explain the concept of Wringing and their importance in calibration.

Q.3 Solve. **14**

a) Explain the construction and working principle of a Vernier Caliper with neat sketches. Discuss its least count and applications.

b) Explain the working principle of a Sine bar. How is it used for accurate angle measurement? Give one example.

Q.4 Write a short note. (Any Two) **14**

a) Mechanical Comparator: Dial indicator

b) Types of Measurement errors

c) Element of Gear Measurement with Measurement of Runout, Pitch

d) Characteristic of Measuring instruments: Precision, accuracy, and sensitivity

Section – II

Q.5 Solve. **14**

a) Define Quality Control and Quality Assurance. Differentiate between them with suitable examples.

b) List types of Charts used in Statistical Quality Control. Explain the various steps in construction of $\overline{X} - R$ control charts.

Q.6 Solve. **14**

a) Define Total Quality Management (TQM). How does it differ from traditional quality control approaches?

b) Compare 100% inspection with sampling inspection. Discuss their advantages, disadvantages, and applications.

Q.7 Solve (Any Two) **14**

a) Explain the concept of Six Sigma and the DMAIC approach used in process improvement.

b) What is the PDCA cycle? Explain each step with an example of its application in industry.

c) Write a short note:
1) Cause & Effect (Ishikawa) diagram
2) Histogram

d) 10 Samples of size 05 have been collected with following observation.

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X-bar	2.011	2.008	2.001	2.003	1.998	1.995	1.997	1.997	2.002	2.003
R	0.011	0.017	0.009	0.026	0.027	0.021	0.014	0.017	0.023	0.015

Given: A2=0.577, D3=0, D4=2.114

Draw Proper Control Chart & explain whether the process is in statistical control or not.

SLR-QH-321

Seat No.		Set	S

T. Y. (B.Tech.) (Mechanical Engineering) (Sem - I) (New) (CBCS)
Examination: March/April – 2026
Metrology and Quality Control (MECHPEC-01A)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

Duration: 30 Minutes Marks:14

Q.1 Multiple Choice Questions. **14**

1) Sine bar works on the principle of _____.
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   c) Reducing manpower
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8) Comparators in metrology are mainly used for _____.
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10) The PDCA cycle stands for _____.
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SLR-QH-321

Seat No.	

Set S

T. Y. (B.Tech.) (Mechanical Engineering) (Sem - I) (New) (CBCS)
Examination: March/April – 2026
Metrology and Quality Control (MECHPEC-01A)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Solve any Two questions from each section.
2) Figure on right indicates full marks.
3) Assume suitable data, diagrams if required.
4) Use of scientific calculator is allowed.

Section – I

Q.2 Solve. **14**

a) Define Metrology. Explain its importance, scope, and applications in manufacturing industries with suitable examples.

b) What are Slip gauges? Explain the concept of Wringing and their importance in calibration.

Q.3 Solve. **14**

a) Explain the construction and working principle of a Vernier Caliper with neat sketches. Discuss its least count and applications.

b) Explain the working principle of a Sine bar. How is it used for accurate angle measurement? Give one example.

Q.4 Write a short note. (Any Two) **14**

a) Mechanical Comparator: Dial indicator

b) Types of Measurement errors

c) Element of Gear Measurement with Measurement of Runout, Pitch

d) Characteristic of Measuring instruments: Precision, accuracy, and sensitivity

Section – II

Q.5 Solve. **14**

a) Define Quality Control and Quality Assurance. Differentiate between them with suitable examples.

b) List types of Charts used in Statistical Quality Control. Explain the various steps in construction of $\overline{X} - R$ control charts.

Q.6 Solve. **14**

a) Define Total Quality Management (TQM). How does it differ from traditional quality control approaches?

b) Compare 100% inspection with sampling inspection. Discuss their advantages, disadvantages, and applications.

Q.7 Solve (Any Two) **14**

a) Explain the concept of Six Sigma and the DMAIC approach used in process improvement.

b) What is the PDCA cycle? Explain each step with an example of its application in industry.

c) Write a short note:
1) Cause & Effect (Ishikawa) diagram
2) Histogram

d) 10 Samples of size 05 have been collected with following observation.

Sr.no.	1	2	3	4	5	6	7	8	9	10
X-bar	2.011	2.008	2.001	2.003	1.998	1.995	1.997	1.997	2.002	2.003
R	0.011	0.017	0.009	0.026	0.027	0.021	0.014	0.017	0.023	0.015

Given: A2=0.577, D3=0, D4=2.114

Draw Proper Control Chart & explain whether the process is in statistical control or not.

Seat No.	

Set **P**

T.Y. (B.Tech.) (Mechanical Engineering) (Sem - I) (New) (CBCS)
Examination: March/April – 2026
Internal Combustion Engines (MECHPEC-01B)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) In which of the following engine CRDI is used _____.
a) S.I.Engine b) C.I.Engine
c) Steam engine d) None of above

2) Spark plug is used in _____.
a) C.I.Engine b) S.I.Engine
c) Steam engine d) None of Above

3) Brake specific fuel consumption is defined as _____.
a) fuel consumption per hour
b) fuel consumption per km
c) fuel consumption per hour per brake power
d) fuel consumption per BHP

4) One of the major exhaust emissions from CI Engine compared to SI Engine is _____.
a) Oxides of nitrogen b) Particulates
c) Unburnt hydrocarbons d) CO and CO2

5) In which of the following engine supercharging is essential?
a) S.I.Engine b) C.I.Engine
c) Aircraft engine d) Marine engine

6) Supercharging air compressor is driven by _____.
a) Engine itself b) Exhaust gas turbine
c) Separate electric motor d) none of the above

7) Venturi in the carburetor results in _____.
a) increase in air velocity b) decrease in air velocity
c) decrease of fuel flow d) increase of manifold pressure

8) During idling, the fuel-air mixture in SI engines should be _____.
a) lean b) rich
c) stoichiometric d) may be rich or lean

9) Octane number of isooctane is _____.
a) 30 b) 60
c) 0 d) 100

10) In two stroke engine cycle is completed in _____.
a) 2 revolution of crankshaft b) 1 revolution of crankshaft
c) 3 revolution of crankshaft d) 4 revolution of crankshaft

11) Material used for piston is _____.
a) steel b) cast iron
c) white metal d) leaded bronze

12) Increasing the compression ratio in SI engines the knocking tendency _____.
a) Increases b) Not affected
c) Decreases d) None of the above

13) Brake power is measured by _____.
a) Morse test b) Burette test
c) Dynamometers d) Motoring test

14) Spark advance is usually specified in terms of _____.
a) engine speed in rev/min b) degrees of crank rotation
c) time in seconds d) none of the above

Seat No.	

Set **P**

T.Y. (B.Tech.) (Mechanical Engineering) (Sem - I) (New) (CBCS)
Examination: March/April – 2026
Internal Combustion Engines (MECHPEC-01B)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Solve any two questions from each Section.
2) Figures to the right indicate full marks.
3) Use of Scientific calculator is allowed.
4) Assume additional suitable data if necessary and state it clearly.
5) Use university graph paper & semi-log paper if required.

SECTION – I

Q.2 **a)** Compare S.I.Engine with C.I.Engine. **05**

b) Explain assumption made in air standard cycle and draw air standard Otto cycle on P-V plane. **05**

c) Draw ideal and actual valve timing diagram of four stroke petrol engine. **04**

Q.3 **a)** The venturi of simple carburetor has throat diameter of 20 mm and co-efficient of air flow is 0.8. The fuel orifice has a diameter of 1.14 mm and co-efficient of fuel flow is 0.65. The petrol surface is 5 mm below the throat. Find, **05**

1) The air fuel ratio for pressure drop of 0.08 bar when the nozzle lip is neglected
2) The air fuel ratio when the nozzle lip is taken in to account. Take density of air and fuel as 1.2 and 750 kg/m^3 respectively.

b) Classify fuel injection system used in Cl engines. Draw and explain any one type of fuel injection systems used in CI engines. **04**

c) Explain the working of MPFI system and its importance. **05**

Q.4 **a)** Compare supercharger with turbocharger. **05**

b) Explain difference in thermodynamic cycle between naturally aspirated engine and supercharged engine. **04**

c) Explain limitations of supercharging for S.I. and C.I. Engines. **05**

SECTION – II

Q.5 **a)** Explain briefly combustion phenomenon in CI engines. **05**

b) Explain **04**
1) Octane Number
2) Cetane Number

c) Explain knocking in SI engines. Explain various factors influencing knocking in S.I. engine. **05**

Q.6 **a)** What are the major pollutants found in the S.I. and C.I engine emissions. **05**

b) What is EGR? How does it help in reducing NOx emissions? **05**

c) Explain need of additives in fuels also enlist the names of additives used in SI and Cl engine fuels with their benefits. **04**

Q.7 **a)** A 6-cylinder gasoline engine operates on 4 stroke cycle. Bore of cylinder is 80mm and stroke 100mm. Clearance volume per cylinder is 70 CC. At 4000 RPM, Fuel consumption is 20kg/hr and the torque developed is 150Nm. Calculate: - **05**

1) BP
2) Brake mean effective pressure
3) Brake thermal efficiency

If CV of the fuel is 43000kJ/kg, find relative efficiency on brake power basis, assuming engine works on Constant volume cycle and adiabatic index for air =1.4.

b) Explain with neat sketch catalytic converter. **05**

c) Explain Heat Balance Sheet in detail. **04**

SLR-QH-322

Seat No.	

Set Q

T.Y. (B.Tech.) (Mechanical Engineering) (Sem - I) (New) (CBCS)
Examination: March/April – 2026
Internal Combustion Engines (MECHPEC-01B)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) During idling, the fuel-air mixture in SI engines should be _____.
a) lean b) rich
c) stoichiometric d) may be rich or lean

2) Octane number of isooctane is _____.
a) 30 b) 60
c) 0 d) 100

3) In two stroke engine cycle is completed in _____.
a) 2 revolution of crankshaft b) 1 revolution of crankshaft
c) 3 revolution of crankshaft d) 4 revolution of crankshaft

4) Material used for piston is _____.
a) steel b) cast iron
c) white metal d) leaded bronze

5) Increasing the compression ratio in SI engines the knocking tendency _____.
a) Increases b) Not affected
c) Decreases d) None of the above

6) Brake power is measured by _____.
a) Morse test b) Burette test
c) Dynamometers d) Motoring test

7) Spark advance is usually specified in terms of _____.
a) engine speed in rev/min b) degrees of crank rotation
c) time in seconds d) none of the above

8) In which of the following engine CRDI is used _____.
a) S.I.Engine b) C.I.Engine
c) Steam engine d) None of above

9) Spark plug is used in _____.
a) C.I.Engine b) S.I.Engine
c) Steam engine d) None of Above

10) Brake specific fuel consumption is defined as _____.
a) fuel consumption per hour
b) fuel consumption per km
c) fuel consumption per hour per brake power
d) fuel consumption per BHP

11) One of the major exhaust emissions from CI Engine compared to SI Engine is _____.
a) Oxides of nitrogen b) Particulates
c) Unburnt hydrocarbons d) CO and CO2

12) In which of the following engine supercharging is essential?
a) S.I.Engine b) C.I.Engine
c) Aircraft engine d) Marine engine

13) Supercharging air compressor is driven by _____.
a) Engine itself b) Exhaust gas turbine
c) Separate electric motor d) none of the above

14) Venturi in the carburetor results in _____.
a) increase in air velocity b) decrease in air velocity
c) decrease of fuel flow d) increase of manifold pressure

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Mechanical Engineering) (Sem - I) (New) (CBCS)
Examination: March/April – 2026
Internal Combustion Engines (MECHPEC-01B)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Solve any two questions from each Section.
2) Figures to the right indicate full marks.
3) Use of Scientific calculator is allowed.
4) Assume additional suitable data if necessary and state it clearly.
5) Use university graph paper & semi-log paper if required.

SECTION – I

Q.2 **a)** Compare S.I.Engine with C.I.Engine. **05**

b) Explain assumption made in air standard cycle and draw air standard Otto cycle on P-V plane. **05**

c) Draw ideal and actual valve timing diagram of four stroke petrol engine. **04**

Q.3 **a)** The venturi of simple carburetor has throat diameter of 20 mm and co-efficient of air flow is 0.8. The fuel orifice has a diameter of 1.14 mm and co-efficient of fuel flow is 0.65. The petrol surface is 5 mm below the throat. Find, **05**

1) The air fuel ratio for pressure drop of 0.08 bar when the nozzle lip is neglected
2) The air fuel ratio when the nozzle lip is taken in to account. Take density of air and fuel as 1.2 and 750 kg/m^3 respectively.

b) Classify fuel injection system used in Cl engines. Draw and explain any one type of fuel injection systems used in CI engines. **04**

c) Explain the working of MPFI system and its importance. **05**

Q.4 **a)** Compare supercharger with turbocharger. **05**

b) Explain difference in thermodynamic cycle between naturally aspirated engine and supercharged engine. **04**

c) Explain limitations of supercharging for S.I. and C.I. Engines. **05**

SECTION – II

Q.5 **a)** Explain briefly combustion phenomenon in CI engines. **05**

b) Explain **04**
1) Octane Number
2) Cetane Number

c) Explain knocking in SI engines. Explain various factors influencing knocking in S.I. engine. **05**

Q.6 **a)** What are the major pollutants found in the S.I. and C.I engine emissions. **05**

b) What is EGR? How does it help in reducing NOx emissions? **05**

c) Explain need of additives in fuels also enlist the names of additives used in SI and Cl engine fuels with their benefits. **04**

Q.7 **a)** A 6-cylinder gasoline engine operates on 4 stroke cycle. Bore of cylinder is 80mm and stroke 100mm. Clearance volume per cylinder is 70 CC. At 4000 RPM, Fuel consumption is 20kg/hr and the torque developed is 150Nm. Calculate: - **05**

1) BP
2) Brake mean effective pressure
3) Brake thermal efficiency

If CV of the fuel is 43000kJ/kg, find relative efficiency on brake power basis, assuming engine works on Constant volume cycle and adiabatic index for air =1.4.

b) Explain with neat sketch catalytic converter. **05**

c) Explain Heat Balance Sheet in detail. **04**

Seat No.	

Set **R**

T.Y. (B.Tech.) (Mechanical Engineering) (Sem - I) (New) (CBCS)
Examination: March/April – 2026
Internal Combustion Engines (MECHPEC-01B)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) Material used for piston is _____.
a) steel b) cast iron
c) white metal d) leaded bronze

2) Increasing the compression ratio in SI engines the knocking tendency _____.
a) Increases b) Not affected
c) Decreases d) None of the above

3) Brake power is measured by _____.
a) Morse test b) Burette test
c) Dynamometers d) Motoring test

4) Spark advance is usually specified in terms of _____.
a) engine speed in rev/min b) degrees of crank rotation
c) time in seconds d) none of the above

5) In which of the following engine CRDI is used _____.
a) S.I.Engine b) C.I.Engine
c) Steam engine d) None of above

6) Spark plug is used in _____.
a) C.I.Engine b) S.I.Engine
c) Steam engine d) None of Above

7) Brake specific fuel consumption is defined as _____.
a) fuel consumption per hour
b) fuel consumption per km
c) fuel consumption per hour per brake power
d) fuel consumption per BHP

8) One of the major exhaust emissions from CI Engine compared to SI Engine is _____.
a) Oxides of nitrogen b) Particulates
c) Unburnt hydrocarbons d) CO and CO2

9) In which of the following engine supercharging is essential?
a) S.I.Engine b) C.I.Engine
c) Aircraft engine d) Marine engine

10) Supercharging air compressor is driven by _____.
a) Engine itself b) Exhaust gas turbine
c) Separate electric motor d) none of the above

11) Venturi in the carburetor results in _____.
a) increase in air velocity b) decrease in air velocity
c) decrease of fuel flow d) increase of manifold pressure

12) During idling, the fuel-air mixture in SI engines should be _____.
a) lean b) rich
c) stoichiometric d) may be rich or lean

13) Octane number of isooctane is _____.
a) 30 b) 60
c) 0 d) 100

14) In two stroke engine cycle is completed in _____.
a) 2 revolution of crankshaft b) 1 revolution of crankshaft
c) 3 revolution of crankshaft d) 4 revolution of crankshaft

Seat No.	

Set **R**

T.Y. (B.Tech.) (Mechanical Engineering) (Sem - I) (New) (CBCS)
Examination: March/April – 2026
Internal Combustion Engines (MECHPEC-01B)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Solve any two questions from each Section.
2) Figures to the right indicate full marks.
3) Use of Scientific calculator is allowed.
4) Assume additional suitable data if necessary and state it clearly.
5) Use university graph paper & semi-log paper if required.

SECTION – I

Q.2 **a)** Compare S.I.Engine with C.I.Engine. **05**

b) Explain assumption made in air standard cycle and draw air standard Otto cycle on P-V plane. **05**

c) Draw ideal and actual valve timing diagram of four stroke petrol engine. **04**

Q.3 **a)** The venturi of simple carburetor has throat diameter of 20 mm and co-efficient of air flow is 0.8. The fuel orifice has a diameter of 1.14 mm and co-efficient of fuel flow is 0.65. The petrol surface is 5 mm below the throat. Find, **05**

1) The air fuel ratio for pressure drop of 0.08 bar when the nozzle lip is neglected
2) The air fuel ratio when the nozzle lip is taken in to account. Take density of air and fuel as 1.2 and 750 kg/m^3 respectively.

b) Classify fuel injection system used in Cl engines. Draw and explain any one type of fuel injection systems used in CI engines. **04**

c) Explain the working of MPFI system and its importance. **05**

Q.4 **a)** Compare supercharger with turbocharger. **05**

b) Explain difference in thermodynamic cycle between naturally aspirated engine and supercharged engine. **04**

c) Explain limitations of supercharging for S.I. and C.I. Engines. **05**

SECTION – II

Q.5 **a)** Explain briefly combustion phenomenon in CI engines. **05**

b) Explain **04**
1) Octane Number
2) Cetane Number

c) Explain knocking in SI engines. Explain various factors influencing knocking in S.I. engine. **05**

Q.6 **a)** What are the major pollutants found in the S.I. and C.I engine emissions. **05**

b) What is EGR? How does it help in reducing NOx emissions? **05**

c) Explain need of additives in fuels also enlist the names of additives used in SI and Cl engine fuels with their benefits. **04**

Q.7 **a)** A 6-cylinder gasoline engine operates on 4 stroke cycle. Bore of cylinder is 80mm and stroke 100mm. Clearance volume per cylinder is 70 CC. At 4000 RPM, Fuel consumption is 20kg/hr and the torque developed is 150Nm. Calculate: - **05**

1) BP
2) Brake mean effective pressure
3) Brake thermal efficiency

If CV of the fuel is 43000kJ/kg, find relative efficiency on brake power basis, assuming engine works on Constant volume cycle and adiabatic index for air =1.4.

b) Explain with neat sketch catalytic converter. **05**

c) Explain Heat Balance Sheet in detail. **04**

Seat No.	

Set **S**

T.Y. (B.Tech.) (Mechanical Engineering) (Sem - I) (New) (CBCS)
Examination: March/April – 2026
Internal Combustion Engines (MECHPEC-01B)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) Supercharging air compressor is driven by _____.
a) Engine itself b) Exhaust gas turbine
c) Separate electric motor d) none of the above

2) Venturi in the carburetor results in _____.
a) increase in air velocity b) decrease in air velocity
c) decrease of fuel flow d) increase of manifold pressure

3) During idling, the fuel-air mixture in SI engines should be _____.
a) lean b) rich
c) stoichiometric d) may be rich or lean

4) Octane number of isooctane is _____.
a) 30 b) 60
c) 0 d) 100

5) In two stroke engine cycle is completed in _____.
a) 2 revolution of crankshaft b) 1 revolution of crankshaft
c) 3 revolution of crankshaft d) 4 revolution of crankshaft

6) Material used for piston is _____.
a) steel b) cast iron
c) white metal d) leaded bronze

7) Increasing the compression ratio in SI engines the knocking tendency _____.
a) Increases b) Not affected
c) Decreases d) None of the above

8) Brake power is measured by _____.
a) Morse test b) Burette test
c) Dynamometers d) Motoring test

9) Spark advance is usually specified in terms of _____.
a) engine speed in rev/min b) degrees of crank rotation
c) time in seconds d) none of the above

10) In which of the following engine CRDI is used _____.
a) S.I.Engine b) C.I.Engine
c) Steam engine d) None of above

11) Spark plug is used in _____.
a) C.I.Engine b) S.I.Engine
c) Steam engine d) None of Above

12) Brake specific fuel consumption is defined as _____.
a) fuel consumption per hour
b) fuel consumption per km
c) fuel consumption per hour per brake power
d) fuel consumption per BHP

13) One of the major exhaust emissions from CI Engine compared to SI Engine is _____.
a) Oxides of nitrogen b) Particulates
c) Unburnt hydrocarbons d) CO and CO2

14) In which of the following engine supercharging is essential?
a) S.I.Engine b) C.I.Engine
c) Aircraft engine d) Marine engine

Seat No.	

Set **S**

T.Y. (B.Tech.) (Mechanical Engineering) (Sem - I) (New) (CBCS)
Examination: March/April – 2026
Internal Combustion Engines (MECHPEC-01B)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Solve any two questions from each Section.
2) Figures to the right indicate full marks.
3) Use of Scientific calculator is allowed.
4) Assume additional suitable data if necessary and state it clearly.
5) Use university graph paper & semi-log paper if required.

SECTION – I

Q.2 **a)** Compare S.I.Engine with C.I.Engine. **05**

b) Explain assumption made in air standard cycle and draw air standard Otto cycle on P-V plane. **05**

c) Draw ideal and actual valve timing diagram of four stroke petrol engine. **04**

Q.3 **a)** The venturi of simple carburetor has throat diameter of 20 mm and co-efficient of air flow is 0.8. The fuel orifice has a diameter of 1.14 mm and co-efficient of fuel flow is 0.65. The petrol surface is 5 mm below the throat. Find, **05**

1) The air fuel ratio for pressure drop of 0.08 bar when the nozzle lip is neglected
2) The air fuel ratio when the nozzle lip is taken in to account. Take density of air and fuel as 1.2 and 750 kg/m^3 respectively.

b) Classify fuel injection system used in Cl engines. Draw and explain any one type of fuel injection systems used in CI engines. **04**

c) Explain the working of MPFI system and its importance. **05**

Q.4 **a)** Compare supercharger with turbocharger. **05**

b) Explain difference in thermodynamic cycle between naturally aspirated engine and supercharged engine. **04**

c) Explain limitations of supercharging for S.I. and C.I. Engines. **05**

SECTION – II

Q.5 **a)** Explain briefly combustion phenomenon in CI engines. **05**

b) Explain **04**
1) Octane Number
2) Cetane Number

c) Explain knocking in SI engines. Explain various factors influencing knocking in S.I. engine. **05**

Q.6 **a)** What are the major pollutants found in the S.I. and C.I engine emissions. **05**

b) What is EGR? How does it help in reducing NOx emissions? **05**

c) Explain need of additives in fuels also enlist the names of additives used in SI and Cl engine fuels with their benefits. **04**

Q.7 **a)** A 6-cylinder gasoline engine operates on 4 stroke cycle. Bore of cylinder is 80mm and stroke 100mm. Clearance volume per cylinder is 70 CC. At 4000 RPM, Fuel consumption is 20kg/hr and the torque developed is 150Nm. Calculate: - **05**

1) BP
2) Brake mean effective pressure
3) Brake thermal efficiency

If CV of the fuel is 43000kJ/kg, find relative efficiency on brake power basis, assuming engine works on Constant volume cycle and adiabatic index for air =1.4.

b) Explain with neat sketch catalytic converter. **05**

c) Explain Heat Balance Sheet in detail. **04**

SLR-QH-324

Seat No.	

Set P

T. Y. (B.Tech.) (Mechanical Engineering) (Sem - I) (New) (CBCS)
Examination: March/April – 2026
Mechatronics Systems (MECHPEC-01D)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) Which of the following is a closed-loop system example?
a) Electric bulb
b) Washing machine with automatic control
c) Toaster
d) Manual hand pump

2) Transfer function is defined in terms of _____.
a) Output/Input b) Input/Output
c) Voltage/Power d) Torque/Current

3) Which sensor is used for distance measurement using sound waves?
a) Optical sensor b) Ultrasonic sensor
c) Temperature sensor d) Flow sensor

4) Stepper motors are mainly used where _____.
a) Continuous motion is required
b) Precise position control is required
c) Weight measurement
d) Temperature sensing

5) Piezoelectric actuators convert _____.
a) Electrical → Mechanical motion
b) Mechanical → Thermal
c) Magnetic → Electrical
d) Chemical → Heat

6) A microcontroller includes _____.
- a) CPU + Memory + I/O ports
- b) Only CPU
- c) CPU + Keyboard
- d) Memory + Hard disk

7) ATmega328P belongs to _____.
- a) 8085 family
- b) 8051 family
- c) Arduino Uno
- d) ARM processors

8) RS232 is used for _____.
- a) Mechanical motion
- b) Serial communication
- c) Power transmission
- d) Temperature control

9) OP-AMP stands for _____.
- a) Operational Amplifier
- b) Optical Amplifier
- c) Overload Amplifier
- d) Oscillating Amplifier

10) Which programming language is most common in PLC?
- a) Python
- d) Ladder Diagram
- c) COBOL
- d) Java

11) PLC is used mainly for _____.
- a) Web browsing
- b) Industrial automation
- c) Education
- d) Gaming

12) Shift register in PLC is used for _____.
- a) Counting speed
- b) Shifting data bit by bit
- c) Heat transfer
- d) Vibration control

13) SCADA stands for _____.
- a) System Control and Data Acquisition
- b) Supervisory Control and Data Acquisition
- c) Super Central Acquisition Device Automation
- d) Standard Control Analysis Data Application

14) Industry 4.0 mainly focuses on _____.
- a) Manual manufacturing
- b) Traditional machinery
- c) Smart automation & IoT
- d) Steam power technology

SLR-QH-324

Seat No.	

Set P

T.Y. (B.Tech.) (Mechanical Engineering) (Sem - I) (New) (CBCS)
Examination: March/April – 2026
Mechatronics systems (MECHPEC-01D)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figure on fight indicates full marks.
3) Assume suitable data, diagrams if required.
4) Use of nonprogrammable calculators is allowed.

Section – I

Q.2 Answer the following questions. (Any Two) **14**

a) Explain with neat block diagrams:
i) Open-loop control system
ii) Closed-loop control system
Also differentiate between them.

b) Classify sensors and explain any four sensors (displacement, temperature, optical, ultrasonic) with principle, construction & applications.

c) Compare microprocessor and microcontroller. Explain 8085 architecture with a neat block diagram.

Q.3 Answer the following questions. (Any Two) **14**

a) Define mechatronics. Explain the key elements of a mechatronics system with suitable examples.

b) Explain the construction, working, characteristics and applications of the following actuators:
i) Stepper Motor
ii) Hydraulic Actuator

c) Explain the features of Arduino Uno (ATmega328P) and write a basic program to interface any one sensor/actuator with Arduino.

Section – II

Q.4 Answer the following questions. (Any Two) **14**

a) Describe the following interfacing elements with neat diagrams and applications:
i) Motor Drivers
ii) Optocouplers
iii) Relays

b) Explain PLC architecture with a neat block diagram. Also explain the scan cycle and I/O processing.

c) What is SCADA? Explain its architecture, working and advantages in industrial automation.

Q.5 Answer the following questions. (Any Two) **14**

a) Explain ADC and DAC with working principles, block diagrams and applications in mechatronic systems.

b) Write ladder diagrams for the following and explain the logic:
i) Traffic light sequencing
ii) Temperature control system

c) Explain Industry 4.0 and IoT. Discuss their role in smart manufacturing with suitable examples.

Seat No.	

Set **Q**

T. Y. (B.Tech.) (Mechanical Engineering) (Sem - I) (New) (CBCS)
Examination: March/April – 2026
Mechatronics Systems (MECHPEC-01D)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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3) Figures to the right indicates full marks.
4) Assume suitable data whenever needed & mention it clearly.
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MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) RS232 is used for _____.
a) Mechanical motion b) Serial communication
c) Power transmission d) Temperature control

2) OP-AMP stands for _____.
a) Operational Amplifier b) Optical Amplifier
c) Overload Amplifier d) Oscillating Amplifier

3) Which programming language is most common in PLC?
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c) COBOL d) Java

4) PLC is used mainly for _____.
a) Web browsing b) Industrial automation
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5) Shift register in PLC is used for _____.
a) Counting speed b) Shifting data bit by bit
c) Heat transfer d) Vibration control

6) SCADA stands for _____.
a) System Control and Data Acquisition
b) Supervisory Control and Data Acquisition
c) Super Central Acquisition Device Automation
d) Standard Control Analysis Data Application

7) Industry 4.0 mainly focuses on _____.
a) Manual manufacturing b) Traditional machinery
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8) Which of the following is a closed-loop system example?
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9) Transfer function is defined in terms of _____.
a) Output/Input b) Input/Output
c) Voltage/Power d) Torque/Current

10) Which sensor is used for distance measurement using sound waves?
a) Optical sensor b) Ultrasonic sensor
c) Temperature sensor d) Flow sensor

11) Stepper motors are mainly used where _____.
a) Continuous motion is required
b) Precise position control is required
c) Weight measurement
d) Temperature sensing

12) Piezoelectric actuators convert _____.
a) Electrical → Mechanical motion
b) Mechanical → Thermal
c) Magnetic → Electrical
d) Chemical → Heat

13) A microcontroller includes _____.
a) CPU + Memory + I/O ports
b) Only CPU
c) CPU + Keyboard
d) Memory + Hard disk

14) ATmega328P belongs to _____.
a) 8085 family b) 8051 family
c) Arduino Uno d) ARM processors

SLR-QH-324

Seat No.	

Set Q

T.Y. (B.Tech.) (Mechanical Engineering) (Sem - I) (New) (CBCS)
Examination: March/April – 2026
Mechatronics systems (MECHPEC-01D)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figure on fight indicates full marks.
3) Assume suitable data, diagrams if required.
4) Use of nonprogrammable calculators is allowed.

Section – I

Q.2 Answer the following questions. (Any Two) **14**

a) Explain with neat block diagrams:
i) Open-loop control system
ii) Closed-loop control system
Also differentiate between them.

b) Classify sensors and explain any four sensors (displacement, temperature, optical, ultrasonic) with principle, construction & applications.

c) Compare microprocessor and microcontroller. Explain 8085 architecture with a neat block diagram.

Q.3 Answer the following questions. (Any Two) **14**

a) Define mechatronics. Explain the key elements of a mechatronics system with suitable examples.

b) Explain the construction, working, characteristics and applications of the following actuators:
i) Stepper Motor
ii) Hydraulic Actuator

c) Explain the features of Arduino Uno (ATmega328P) and write a basic program to interface any one sensor/actuator with Arduino.

Section – II

Q.4 Answer the following questions. (Any Two) **14**

a) Describe the following interfacing elements with neat diagrams and applications:
i) Motor Drivers
ii) Optocouplers
iii) Relays

b) Explain PLC architecture with a neat block diagram. Also explain the scan cycle and I/O processing.

c) What is SCADA? Explain its architecture, working and advantages in industrial automation.

Q.5 Answer the following questions. (Any Two) **14**

a) Explain ADC and DAC with working principles, block diagrams and applications in mechatronic systems.

b) Write ladder diagrams for the following and explain the logic:
i) Traffic light sequencing
ii) Temperature control system

c) Explain Industry 4.0 and IoT. Discuss their role in smart manufacturing with suitable examples.

Seat No.	

Set R

T. Y. (B.Tech.) (Mechanical Engineering) (Sem - I) (New) (CBCS)
Examination: March/April – 2026
Mechatronics Systems (MECHPEC-01D)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) PLC is used mainly for _____.
a) Web browsing b) Industrial automation
c) Education d) Gaming

2) Shift register in PLC is used for _____.
a) Counting speed b) Shifting data bit by bit
c) Heat transfer d) Vibration control

3) SCADA stands for _____.
a) System Control and Data Acquisition
b) Supervisory Control and Data Acquisition
c) Super Central Acquisition Device Automation
d) Standard Control Analysis Data Application

4) Industry 4.0 mainly focuses on _____.
a) Manual manufacturing b) Traditional machinery
c) Smart automation & IoT d) Steam power technology

5) Which of the following is a closed-loop system example?
a) Electric bulb
b) Washing machine with automatic control
c) Toaster
d) Manual hand pump

6) Transfer function is defined in terms of _____.
a) Output/Input b) Input/Output
c) Voltage/Power d) Torque/Current

7) Which sensor is used for distance measurement using sound waves?
a) Optical sensor
b) Ultrasonic sensor
c) Temperature sensor
d) Flow sensor

8) Stepper motors are mainly used where _____.
a) Continuous motion is required
b) Precise position control is required
c) Weight measurement
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9) Piezoelectric actuators convert _____.
a) Electrical → Mechanical motion
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c) Magnetic → Electrical
d) Chemical → Heat

10) A microcontroller includes _____.
a) CPU + Memory + I/O ports
b) Only CPU
c) CPU + Keyboard
d) Memory + Hard disk

11) ATmega328P belongs to _____.
a) 8085 family
b) 8051 family
c) Arduino Uno
d) ARM processors

12) RS232 is used for _____.
a) Mechanical motion
b) Serial communication
c) Power transmission
d) Temperature control

13) OP-AMP stands for _____.
a) Operational Amplifier
b) Optical Amplifier
c) Overload Amplifier
d) Oscillating Amplifier

14) Which programming language is most common in PLC?
a) Python
d) Ladder Diagram
c) COBOL
d) Java

SLR-QH-324

Seat No.	

Set R

T.Y. (B.Tech.) (Mechanical Engineering) (Sem - I) (New) (CBCS)
Examination: March/April – 2026
Mechatronics systems (MECHPEC-01D)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figure on fight indicates full marks.
3) Assume suitable data, diagrams if required.
4) Use of nonprogrammable calculators is allowed.

Section – I

Q.2 Answer the following questions. (Any Two) **14**

a) Explain with neat block diagrams:
i) Open-loop control system
ii) Closed-loop control system
Also differentiate between them.

b) Classify sensors and explain any four sensors (displacement, temperature, optical, ultrasonic) with principle, construction & applications.

c) Compare microprocessor and microcontroller. Explain 8085 architecture with a neat block diagram.

Q.3 Answer the following questions. (Any Two) **14**

a) Define mechatronics. Explain the key elements of a mechatronics system with suitable examples.

b) Explain the construction, working, characteristics and applications of the following actuators:
i) Stepper Motor
ii) Hydraulic Actuator

c) Explain the features of Arduino Uno (ATmega328P) and write a basic program to interface any one sensor/actuator with Arduino.

Section – II

Q.4 Answer the following questions. (Any Two) **14**

a) Describe the following interfacing elements with neat diagrams and applications:
i) Motor Drivers
ii) Optocouplers
iii) Relays

b) Explain PLC architecture with a neat block diagram. Also explain the scan cycle and I/O processing.

c) What is SCADA? Explain its architecture, working and advantages in industrial automation.

Q.5 Answer the following questions. (Any Two) **14**

a) Explain ADC and DAC with working principles, block diagrams and applications in mechatronic systems.

b) Write ladder diagrams for the following and explain the logic:
i) Traffic light sequencing
ii) Temperature control system

c) Explain Industry 4.0 and IoT. Discuss their role in smart manufacturing with suitable examples.

SLR-QH-324

Seat No.	

Set S

T. Y. (B.Tech.) (Mechanical Engineering) (Sem - I) (New) (CBCS)
Examination: March/April – 2026
Mechatronics Systems (MECHPEC-01D)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) A microcontroller includes _____.
a) CPU + Memory + I/O ports
b) Only CPU
c) CPU + Keyboard
d) Memory + Hard disk

2) ATmega328P belongs to _____.
a) 8085 family b) 8051 family
c) Arduino Uno d) ARM processors

3) RS232 is used for _____.
a) Mechanical motion b) Serial communication
c) Power transmission d) Temperature control

4) OP-AMP stands for _____.
a) Operational Amplifier b) Optical Amplifier
c) Overload Amplifier d) Oscillating Amplifier

5) Which programming language is most common in PLC?
a) Python d) Ladder Diagram
c) COBOL d) Java

6) PLC is used mainly for _____.
a) Web browsing b) Industrial automation
c) Education d) Gaming

7) Shift register in PLC is used for _____.
a) Counting speed b) Shifting data bit by bit
c) Heat transfer d) Vibration control

8) SCADA stands for _____.
a) System Control and Data Acquisition
b) Supervisory Control and Data Acquisition
c) Super Central Acquisition Device Automation
d) Standard Control Analysis Data Application

9) Industry 4.0 mainly focuses on _____.
a) Manual manufacturing b) Traditional machinery
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10) Which of the following is a closed-loop system example?
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b) Washing machine with automatic control
c) Toaster
d) Manual hand pump

11) Transfer function is defined in terms of _____.
a) Output/Input b) Input/Output
c) Voltage/Power d) Torque/Current

12) Which sensor is used for distance measurement using sound waves?
a) Optical sensor b) Ultrasonic sensor
c) Temperature sensor d) Flow sensor

13) Stepper motors are mainly used where _____.
a) Continuous motion is required
b) Precise position control is required
c) Weight measurement
d) Temperature sensing

14) Piezoelectric actuators convert _____.
a) Electrical → Mechanical motion
b) Mechanical → Thermal
c) Magnetic → Electrical
d) Chemical → Heat

SLR-QH-324

Seat No.	

Set S

T.Y. (B.Tech.) (Mechanical Engineering) (Sem - I) (New) (CBCS)
Examination: March/April – 2026
Mechatronics systems (MECHPEC-01D)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figure on fight indicates full marks.
3) Assume suitable data, diagrams if required.
4) Use of nonprogrammable calculators is allowed.

Section – I

Q.2 Answer the following questions. (Any Two) **14**

a) Explain with neat block diagrams:
i) Open-loop control system
ii) Closed-loop control system
Also differentiate between them.

b) Classify sensors and explain any four sensors (displacement, temperature, optical, ultrasonic) with principle, construction & applications.

c) Compare microprocessor and microcontroller. Explain 8085 architecture with a neat block diagram.

Q.3 Answer the following questions. (Any Two) **14**

a) Define mechatronics. Explain the key elements of a mechatronics system with suitable examples.

b) Explain the construction, working, characteristics and applications of the following actuators:
i) Stepper Motor
ii) Hydraulic Actuator

c) Explain the features of Arduino Uno (ATmega328P) and write a basic program to interface any one sensor/actuator with Arduino.

Section – II

Q.4 Answer the following questions. (Any Two) **14**

a) Describe the following interfacing elements with neat diagrams and applications:
i) Motor Drivers
ii) Optocouplers
iii) Relays

b) Explain PLC architecture with a neat block diagram. Also explain the scan cycle and I/O processing.

c) What is SCADA? Explain its architecture, working and advantages in industrial automation.

Q.5 Answer the following questions. (Any Two) **14**

a) Explain ADC and DAC with working principles, block diagrams and applications in mechatronic systems.

b) Write ladder diagrams for the following and explain the logic:
i) Traffic light sequencing
ii) Temperature control system

c) Explain Industry 4.0 and IoT. Discuss their role in smart manufacturing with suitable examples.

SLR-QH-325

Seat No.		Set	P

Marks Obtained		Signature of Examiner		Signature of Junior Supervisor	

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Creativity and Design Thinking (AEC-02)

Day & Date: Tuesday, 12-05-2026 Max. Marks: 50
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Mention Question Paper Set (P/Q/R/S) on Top of Page.
4) Use of non-programmable calculators is allowed.

Answer

Q.1 Multiple Choice Questions.

1) Innovation mainly focuses on _____.
a) Generating ideas only b) Implementing creative ideas
c) Copying others d) Marketing

2) Creativity and Innovation together lead to _____.
a) Routine performance b) Problem discovery
c) Practical novelty d) Mechanical repetition

3) A characteristic of a creative person is _____.
a) Rigidity b) Curiosity
c) Fearfulness d) Passivity

4) Which of the following represents a major *barrier* to creativity?
a) Time pressure b) Risk-taking
c) Playfulness d) Flexibility

5) The “Ideate” stage in design thinking focuses on _____.
a) Understanding users b) Generating solutions
c) Testing ideas d) Building prototypes

6) Design thinking is fundamentally _____.
a) User-centered b) Manager-centered
c) Engineer-centered d) Cost-centered

7) Which of these helps to *overcome* creative blocks?
a) Collaboration b) Fear of mistakes
c) Over-planning d) Isolation

8) A design thinker empathizes to _____.
a) Know customer feelings and needs
b) Find product cost
c) Estimate profit
d) Collect market data

9) The *Define* phase results in _____.
a) Problem statement b) Prototype
c) Survey d) Marketing plan

10) Barriers to creativity can be removed through _____.
a) Open communication b) Discouragement
c) Repetition d) Judgmental thinking

11) The last phase of design thinking is _____.
a) Prototype b) Test
c) Ideate d) Define

12) Which term best describes the ability to see connections between unrelated ideas?
a) Fluency b) Flexibility
c) Originality d) Association

13) One of the benefits of design thinking is _____.
a) Focusing on user-friendly solutions
b) Ignoring customers
c) Cost reduction only
d) Quick fixes

14) Divergent and convergent thinking together ensure _____.
a) Balance between idea generation and selection
b) Faster production
c) Market analysis
d) Less creativity

15) In brainstorming, criticism should be ____.
a) Encouraged b) Postponed
c) Ignored d) Repeated

16) SCAMPER is mainly used for _____.
a) Modifying existing ideas b) Market study
c) Testing materials d) Estimating cost

17) In mind mapping, central themes are _____.
a) Placed at center with branches outward
b) At the edges
c) Hidden
d) Random

18) TRIZ encourages _____.
a) Systematic innovation through contradictions
b) Copying existing patents
c) Brainstorm blocking
d) Linear analysis

19) Which is a creative ideation technique?
a) Storyboarding b) Checklist creation
c) Prototype testing d) Quality audit

20) Concept sketching helps _____.
a) Express ideas visually b) Replace written reports
c) Perform tests d) Manage finance

21) In SCAMPER, "C" stands for _____.
a) Combine b) Copy
c) Create d) Classify

22) The purpose of divergent thinking is to _____.
a) Explore many possibilities b) Select one answer
c) Limit imagination d) Finalize design

23) Which of the following tools is best suited for *organizing ideas?*
a) Mind map b) Pie chart
c) Spreadsheet d) Histogram

24) "Storytelling" in concept development helps designers _____.
a) Communicate user experiences effectively
b) Draw detailed schematics
c) Analyze budget
d) Fix prototypes

25) The last step of concept development is _____.
a) Visualization of ideas b) Brainstorming
c) TRIZ analysis d) Market feedback

26) Prototyping in design helps _____.
a) Convert abstract ideas into tangible models
b) Replace manufacturing
c) Finalize budgets
d) Avoid testing

27) Which prototype type is *cheapest* and fastest?
a) Low-fidelity b) High-fidelity
c) Final d) Medium

28) High-fidelity prototypes allow _____.
a) User interaction and realism
b) Concept only
c) Paper sketching
d) Cost saving only

29) The iterative approach focuses on _____.
a) Refining design through repeated feedback
b) Making single model
c) Reducing creativity
d) Avoiding testing

30) The first step in rapid prototyping is _____.
a) 3D CAD modeling b) Final assembly
c) Testing d) Polishing

31) Which tool is commonly used in rapid prototyping?
a) 3D printer b) Spreadsheet
c) CNC lathe d) Mind map

32) User testing is most crucial in which stage?
a) Prototype evaluation b) Ideation
c) Definition d) Empathize

33) A real-life application of creative design is _____.
a) Smart wearable devices b) Paper waste
c) Redundant designs d) Manual data entry

34) Brainstorming during prototype improvement helps _____.
a) Generate alternative solutions
b) Restrict ideas
c) Delay work
d) Stop iteration

35) Which of the following prototypes allows early visualization?
a) Sketch model b) CAD simulation
c) Clay model d) Flowchart

36) Customer-driven design ensures _____.
a) Meeting user needs b) Reducing quality
c) Ignoring testing d) Increasing cost

37) The final output of iterative design is _____.
a) Optimized product meeting specifications
b) Initial draft
c) Prototype sketch
d) Raw material

38) The goal of sustainable design is _____.
a) Minimize negative environmental impact
b) Increase short-term gain
c) Use non-renewable resources
d) Ignore life cycle

39) Which phase is crucial for sustainability decisions?
a) Design stage b) Disposal
c) Marketing d) Sales

40) Product life-cycle assessment includes _____.
a) Raw material to end-of-life impact
b) Only production cost
c) Marketing only
d) Storage cost

41) A product designed for durability supports _____.
a) Longevity principle b) Obsolescence
c) Short-term use d) High waste

42) Eco-friendly design considers _____.
a) Material selection and energy efficiency
b) Only packaging
c) Advertisement
d) Color

43) "Design for reuse" aims to _____.
a) Extend product life b) Destroy waste
c) Limit recycling d) Increase cost

44) Agile development in design allows _____.
a) Rapid response to change b) Strict stepwise control
c) No feedback d) Delayed iterations

45) Spiral model combines _____.
a) Prototyping and risk management
b) Linear and agile stages
c) Testing and marketing
d) Sales and production

46) The staged (waterfall) model is _____.
a) Sequential b) Iterative
c) Flexible d) Rapid

47) Case studies in sustainable design show _____.
a) Application of eco-friendly materials
b) Ignoring user needs
c) Over-production
d) Energy waste

48) The most important sustainability factor in manufacturing is _____.
a) Resource efficiency
b) Advertisement
c) Branding
d) Design color

49) Which practice promotes a circular economy?
a) Recycling and remanufacturing
b) Landfilling
c) Burning waste
d) Exporting scrap

50) Sustainable engineering mainly targets _____.
a) Balance between economy, society, and environment
b) Maximizing output only
c) Technological monopoly
d) Short-term gains

Seat No.		Set	Q

Marks Obtained		Signature of Examiner		Signature of Junior Supervisor	

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Creativity and Design Thinking (AEC-02)

Day & Date: Tuesday, 12-05-2026 Max. Marks: 50
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Mention Question Paper Set (P/Q/R/S) on Top of Page.
4) Use of non-programmable calculators is allowed.

Answer

Q.1 Multiple Choice Questions.

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a) Combine b) Copy
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44) Divergent and convergent thinking together ensure _____.
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49) Which is a creative ideation technique?

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50) Concept sketching helps _____.

a) Express ideas visually
b) Replace written reports
c) Perform tests
d) Manage finance

SLR-QH-325

Seat No.		Set	R

Marks Obtained		Signature of Examiner		Signature of Junior Supervisor	

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Creativity and Design Thinking (AEC-02)

Day & Date: Tuesday, 12-05-2026 Max. Marks: 50
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
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4) Use of non-programmable calculators is allowed.

Answer

Q.1 Multiple Choice Questions.

1) A product designed for durability supports _____.
a) Longevity principle b) Obsolescence
c) Short-term use d) High waste

2) Eco-friendly design considers _____.
a) Material selection and energy efficiency
b) Only packaging
c) Advertisement
d) Color

3) "Design for reuse" aims to _____.
a) Extend product life b) Destroy waste
c) Limit recycling d) Increase cost

4) Agile development in design allows _____.
a) Rapid response to change b) Strict stepwise control
c) No feedback d) Delayed iterations

5) Spiral model combines _____.
a) Prototyping and risk management
b) Linear and agile stages
c) Testing and marketing
d) Sales and production

6) The staged (waterfall) model is _____.
a) Sequential b) Iterative
c) Flexible d) Rapid

7) Case studies in sustainable design show _____.
a) Application of eco-friendly materials
b) Ignoring user needs
c) Over-production
d) Energy waste

8) The most important sustainability factor in manufacturing is _____.
a) Resource efficiency b) Advertisement
c) Branding d) Design color

9) Which practice promotes a circular economy?
a) Recycling and remanufacturing
b) Landfilling
c) Burning waste
d) Exporting scrap

10) Sustainable engineering mainly targets _____.
a) Balance between economy, society, and environment
b) Maximizing output only
c) Technological monopoly
d) Short-term gains

11) Innovation mainly focuses on _____.
a) Generating ideas only b) Implementing creative ideas
c) Copying others d) Marketing

12) Creativity and Innovation together lead to _____.
a) Routine performance b) Problem discovery
c) Practical novelty d) Mechanical repetition

13) A characteristic of a creative person is _____.
a) Rigidity b) Curiosity
c) Fearfulness d) Passivity

14) Which of the following represents a major *barrier* to creativity?
a) Time pressure b) Risk-taking
c) Playfulness d) Flexibility

15) The “Ideate” stage in design thinking focuses on _____.
a) Understanding users b) Generating solutions
c) Testing ideas d) Building prototypes

16) Design thinking is fundamentally _____.
a) User-centered b) Manager-centered
c) Engineer-centered d) Cost-centered

17) Which of these helps to *overcome* creative blocks?
a) Collaboration b) Fear of mistakes
c) Over-planning d) Isolation

18) A design thinker empathizes to _____.
a) Know customer feelings and needs
b) Find product cost
c) Estimate profit
d) Collect market data

19) The *Define* phase results in _____.
a) Problem statement b) Prototype
c) Survey d) Marketing plan

20) Barriers to creativity can be removed through _____.
a) Open communication b) Discouragement
c) Repetition d) Judgmental thinking

21) The last phase of design thinking is _____.
a) Prototype b) Test
c) Ideate d) Define

22) Which term best describes the ability to see connections between unrelated ideas?
a) Fluency b) Flexibility
c) Originality d) Association

23) One of the benefits of design thinking is _____.
a) Focusing on user-friendly solutions
b) Ignoring customers
c) Cost reduction only
d) Quick fixes

24) Divergent and convergent thinking together ensure _____.
a) Balance between idea generation and selection
b) Faster production
c) Market analysis
d) Less creativity

25) In brainstorming, criticism should be ____.
a) Encouraged b) Postponed
c) Ignored d) Repeated

26) SCAMPER is mainly used for _____.
a) Modifying existing ideas b) Market study
c) Testing materials d) Estimating cost

27) In mind mapping, central themes are _____.
a) Placed at center with branches outward
b) At the edges
c) Hidden
d) Random

28) TRIZ encourages _____.
a) Systematic innovation through contradictions
b) Copying existing patents
c) Brainstorm blocking
d) Linear analysis

29) Which is a creative ideation technique?
a) Storyboarding b) Checklist creation
c) Prototype testing d) Quality audit

30) Concept sketching helps _____.
a) Express ideas visually b) Replace written reports
c) Perform tests d) Manage finance

31) In SCAMPER, "C" stands for _____.
a) Combine b) Copy
c) Create d) Classify

32) The purpose of divergent thinking is to _____.
a) Explore many possibilities b) Select one answer
c) Limit imagination d) Finalize design

33) Which of the following tools is best suited for *organizing ideas?*
a) Mind map b) Pie chart
c) Spreadsheet d) Histogram

34) "Storytelling" in concept development helps designers _____.
a) Communicate user experiences effectively
b) Draw detailed schematics
c) Analyze budget
d) Fix prototypes

35) The last step of concept development is _____.
a) Visualization of ideas b) Brainstorming
c) TRIZ analysis d) Market feedback

36) Prototyping in design helps _____.
a) Convert abstract ideas into tangible models
b) Replace manufacturing
c) Finalize budgets
d) Avoid testing

37) Which prototype type is *cheapest* and fastest?
a) Low-fidelity b) High-fidelity
c) Final d) Medium

38) High-fidelity prototypes allow _____.
a) User interaction and realism
b) Concept only
c) Paper sketching
d) Cost saving only

39) The iterative approach focuses on _____.
a) Refining design through repeated feedback
b) Making single model
c) Reducing creativity
d) Avoiding testing

40) The first step in rapid prototyping is _____.
a) 3D CAD modeling b) Final assembly
c) Testing d) Polishing

41) Which tool is commonly used in rapid prototyping?
a) 3D printer b) Spreadsheet
c) CNC lathe d) Mind map

42) User testing is most crucial in which stage?
a) Prototype evaluation b) Ideation
c) Definition d) Empathize

43) A real-life application of creative design is _____.
a) Smart wearable devices b) Paper waste
c) Redundant designs d) Manual data entry

44) Brainstorming during prototype improvement helps _____.
a) Generate alternative solutions
b) Restrict ideas
c) Delay work
d) Stop iteration

45) Which of the following prototypes allows early visualization?
a) Sketch model b) CAD simulation
c) Clay model d) Flowchart

46) Customer-driven design ensures _____.
a) Meeting user needs b) Reducing quality
c) Ignoring testing d) Increasing cost

47) The final output of iterative design is _____.
a) Optimized product meeting specifications
b) Initial draft
c) Prototype sketch
d) Raw material

48) The goal of sustainable design is _____.

a) Minimize negative environmental impact
b) Increase short-term gain
c) Use non-renewable resources
d) Ignore life cycle

49) Which phase is crucial for sustainability decisions?

a) Design stage b) Disposal
c) Marketing d) Sales

50) Product life-cycle assessment includes _____.

a) Raw material to end-of-life impact
b) Only production cost
c) Marketing only
d) Storage cost

SLR-QH-325

Seat No.		Set	S

Marks Obtained		Signature of Examiner		Signature of Junior Supervisor	

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Creativity and Design Thinking (AEC-02)

Day & Date: Tuesday, 12-05-2026 Max. Marks: 50
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Mention Question Paper Set (P/Q/R/S) on Top of Page.
4) Use of non-programmable calculators is allowed.

Answer

Q.1 Multiple Choice Questions.

1) The last phase of design thinking is _____.
a) Prototype b) Test
c) Ideate d) Define

2) Which term best describes the ability to see connections between unrelated ideas?
a) Fluency b) Flexibility
c) Originality d) Association

3) One of the benefits of design thinking is _____.
a) Focusing on user-friendly solutions
b) Ignoring customers
c) Cost reduction only
d) Quick fixes

4) Divergent and convergent thinking together ensure _____.
a) Balance between idea generation and selection
b) Faster production
c) Market analysis
d) Less creativity

5) In brainstorming, criticism should be ____.
a) Encouraged b) Postponed
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6) SCAMPER is mainly used for _____.
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c) Testing materials d) Estimating cost

7) In mind mapping, central themes are _____.
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b) At the edges
c) Hidden
d) Random

8) TRIZ encourages _____.
a) Systematic innovation through contradictions
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c) Brainstorm blocking
d) Linear analysis

9) Which is a creative ideation technique?
a) Storyboarding b) Checklist creation
c) Prototype testing d) Quality audit

10) Concept sketching helps _____.
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c) Perform tests d) Manage finance

11) In SCAMPER, “C” stands for _____.
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12) The purpose of divergent thinking is to _____.
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b) Draw detailed schematics
c) Analyze budget
d) Fix prototypes

15) The last step of concept development is _____.
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17) Which prototype type is *cheapest* and fastest?
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b) Increase short-term gain
c) Use non-renewable resources
d) Ignore life cycle

29) Which phase is crucial for sustainability decisions?
a) Design stage b) Disposal
c) Marketing d) Sales

30) Product life-cycle assessment includes _____.
a) Raw material to end-of-life impact
b) Only production cost
c) Marketing only
d) Storage cost

31) A product designed for durability supports _____.
a) Longevity principle b) Obsolescence
c) Short-term use d) High waste

32) Eco-friendly design considers _____.
a) Material selection and energy efficiency
b) Only packaging
c) Advertisement
d) Color

33) “Design for reuse” aims to _____.
a) Extend product life b) Destroy waste
c) Limit recycling d) Increase cost

34) Agile development in design allows _____.
a) Rapid response to change b) Strict stepwise control
c) No feedback d) Delayed iterations

35) Spiral model combines _____.
a) Prototyping and risk management
b) Linear and agile stages
c) Testing and marketing
d) Sales and production

36) The staged (waterfall) model is _____.
a) Sequential b) Iterative
c) Flexible d) Rapid

37) Case studies in sustainable design show _____.
a) Application of eco-friendly materials
b) Ignoring user needs
c) Over-production
d) Energy waste

38) The most important sustainability factor in manufacturing is _____.
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c) Fearfulness d) Passivity

44) Which of the following represents a major *barrier* to creativity?
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c) Playfulness d) Flexibility

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47) Which of these helps to *overcome* creative blocks?
a) Collaboration b) Fear of mistakes
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48) A design thinker empathizes to _____.

a) Know customer feelings and needs
b) Find product cost
c) Estimate profit
d) Collect market data

49) The *Define* phase results in _____.

a) Problem statement
b) Prototype
c) Survey
d) Marketing plan

50) Barriers to creativity can be removed through _____.

a) Open communication
b) Discouragement
c) Repetition
d) Judgmental thinking

SLR-QH-327

Seat No.		Set	P

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Honors in Electric Vehicle Engineering
Battery Technology and Charging Infrastructure (Mech Hon - 03B)

Day & Date: Thursday, 14-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if required & state it clearly.
5) Use of nonprogrammable calculators is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 MCQ/ Objective Type Questions: 14

1) If a battery is charged at a 1C rate, how long will it take to fully charge?
a) 1 hour b) 2 hours
c) 30 minutes d) 10 hours

2) If a battery is discharged to 40% of its total capacity, what is its Depth of Discharge (DoD)?
a) 60% b) 40%
c) 100% d) 20%

3) _____ avoids the direct contact of the positive and negative plate in a lithium-ion battery?
a) Electrolyte b) Separator
c) Load d) Rectifier

4) Which is the electrolyte used in Li-ion battery?
a) Lead dioxide b) Lithium-based gel
c) Sulfur dioxide d) Cobalt

5) Which of these battery technologies has the highest theoretical energy density?
a) Lithium-Sulphur b) Li-Polymer
c) Lithium-air d) Sodium-ion

6) Li-metal batteries use which material as the anode?
a) Graphite b) Silicon
c) Pure lithium d) Copper oxide

7) Which of the following battery types is known for its solid electrolyte instead of liquid?

a) Lithium-ion
b) Li-Polymer
c) Solid-state Lithium
d) Lithium-air

8) What is the primary need for designing a battery pack in electric vehicles?

a) To reduce weight
b) To increase the speed
c) To store and manage electrical energy safely and efficiently
d) To reduce emissions

9) Which of the following is the first step in the battery pack development process?

a) Mechanical enclosure design
b) Cell selection and configuration
c) BMS integration
d) Thermal management

10) Which of the following is NOT a method of active thermal management in battery packs?

a) Liquid cooling
b) Forced air convection
c) Phase change material
d) Peltier cooling

11) Which cooling technique involves submerging battery components directly into a dielectric fluid?

a) Liquid cooling
b) Forced air convection
c) Immersion cooling
d) Heat sink convection

12) Which of the following correctly distinguishes an On-board charger from an Off-board charger?

a) On-board charger is faster than off-board charger
b) On-board charger is integrated inside the vehicle, while off-board charger is external
c) Off-board charger is located inside the vehicle
d) On-board charger only supports fast charging

13) Which of the following is an example of a fast charging standard commonly used in EVs?

a) CHAdeMO
b) Type-1
c) Type-2
d) IEC 60309

14) What is the primary function of thermal design in a battery pack?

a) Improve battery weight
b) Increase voltage output
c) Maintain optimal operating temperature
d) Reduce internal resistance

SLR-QH-327

Seat No.	

Set P

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Honors in Electric Vehicle Engineering
Battery Technology and Charging Infrastructure (Mech Hon - 03B)

Day & Date: Thursday, 14-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Attempt two questions from each section.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt the following.

a) Discuss the key parameters for selecting an EV battery. **05**

b) Explain the chemistry of Lithium Iron Phosphate (LFP) batteries. **05**

c) Explain Lithium-Polymer battery with a neat sketch. **04**

Q.3 Attempt the following.

a) Explain Li-ion battery chemistry with a neat sketch. **05**

b) Compare Lithium-Sulfur and Sodium-Ion batteries based on structure, electrode materials, electrolyte, and applications. **05**

c) Define the following terms related to battery performance and characteristics: **04**

i) State of Charge (SoC)
ii) C-Rate
iii) Specific Energy Density
iv) Energy Capacity

Q.4 Attempt the following.

a) Discuss the relationship between Battery Life-Cycles and EV Battery Life. **05**

b) Discuss the different types of Li-ion batteries. **05**

c) Discuss Solid-State Lithium Batteries with the help of a neat sketch. **04**

SECTION – II

Q.5 Attempt the following.

a)	Explain the need of a battery pack in electric vehicles.	**05**
b)	Explain the battery thermal management system.	**05**
c)	Discuss charging protocols used for EV chargers.	**04**

Q.6 Attempt the following.

a)	Explain Battery Pack Development Process.	**05**
b)	Write note on battery Swapping.	**05**
c)	Explain why thermal management of battery packs is important.	**04**

Q.7 Attempt the following.

a)	Compare active and passive thermal management techniques used in battery systems.	**05**
b)	Discuss AC and DC charging in detail.	**05**
c)	Describe the role of electrical design in battery pack performance.	**04**

Seat No.		Set	Q

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Honors in Electric Vehicle Engineering
Battery Technology and Charging Infrastructure (Mech Hon - 03B)

Day & Date: Thursday, 14-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if required & state it clearly.
5) Use of nonprogrammable calculators is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 MCQ/ Objective Type Questions: 14

1) What is the primary need for designing a battery pack in electric vehicles?
a) To reduce weight
b) To increase the speed
c) To store and manage electrical energy safely and efficiently
d) To reduce emissions

2) Which of the following is the first step in the battery pack development process?
a) Mechanical enclosure design
b) Cell selection and configuration
c) BMS integration
d) Thermal management

3) Which of the following is NOT a method of active thermal management in battery packs?
a) Liquid cooling b) Forced air convection
c) Phase change material d) Peltier cooling

4) Which cooling technique involves submerging battery components directly into a dielectric fluid?
a) Liquid cooling b) Forced air convection
c) Immersion cooling d) Heat sink convection

5) Which of the following correctly distinguishes an On-board charger from an Off-board charger?
   a) On-board charger is faster than off-board charger
   b) On-board charger is integrated inside the vehicle, while off-board charger is external
   c) Off-board charger is located inside the vehicle
   d) On-board charger only supports fast charging

6) Which of the following is an example of a fast charging standard commonly used in EVs?
   a) CHAdeMO
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   c) Type-2
   d) IEC 60309

7) What is the primary function of thermal design in a battery pack?
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   a) 60%
   b) 40%
   c) 100%
   d) 20%

10) _____ avoids the direct contact of the positive and negative plate in a lithium-ion battery?
   a) Electrolyte
   b) Separator
   c) Load
   d) Rectifier

11) Which is the electrolyte used in Li-ion battery?
   a) Lead dioxide
   b) Lithium-based gel
   c) Sulfur dioxide
   d) Cobalt

12) Which of these battery technologies has the highest theoretical energy density?
   a) Lithium-Sulphur
   b) Li-Polymer
   c) Lithium-air
   d) Sodium-ion

13) Li-metal batteries use which material as the anode?
   a) Graphite
   b) Silicon
   c) Pure lithium
   d) Copper oxide

14) Which of the following battery types is known for its solid electrolyte instead of liquid?

a) Lithium-ion
b) Li-Polymer
c) Solid-state Lithium
d) Lithium-air

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Honors in Electric Vehicle Engineering
Battery Technology and Charging Infrastructure (Mech Hon - 03B)

Day & Date: Thursday, 14-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Attempt two questions from each section.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt the following.

a) Discuss the key parameters for selecting an EV battery. **05**

b) Explain the chemistry of Lithium Iron Phosphate (LFP) batteries. **05**

c) Explain Lithium-Polymer battery with a neat sketch. **04**

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a) Explain Li-ion battery chemistry with a neat sketch. **05**

b) Compare Lithium-Sulfur and Sodium-Ion batteries based on structure, electrode materials, electrolyte, and applications. **05**

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Seat No.		Set	R

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Honors in Electric Vehicle Engineering
Battery Technology and Charging Infrastructure (Mech Hon - 03B)

Day & Date: Thursday, 14-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

Duration: 30 Minutes Marks:14

Q.1 MCQ/ Objective Type Questions: 14

1) Which cooling technique involves submerging battery components directly into a dielectric fluid?
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2) Which of the following correctly distinguishes an On-board charger from an Off-board charger?
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Seat No.	

Set | R

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Honors in Electric Vehicle Engineering
Battery Technology and Charging Infrastructure (Mech Hon - 03B)

Day & Date: Thursday, 14-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Attempt two questions from each section.
2) Figures to the right indicate full marks.

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a) Discuss the key parameters for selecting an EV battery. **05**

b) Explain the chemistry of Lithium Iron Phosphate (LFP) batteries. **05**

c) Explain Lithium-Polymer battery with a neat sketch. **04**

Q.3 Attempt the following.

a) Explain Li-ion battery chemistry with a neat sketch. **05**

b) Compare Lithium-Sulfur and Sodium-Ion batteries based on structure, electrode materials, electrolyte, and applications. **05**

c) Define the following terms related to battery performance and characteristics: **04**

i) State of Charge (SoC)
ii) C-Rate
iii) Specific Energy Density
iv) Energy Capacity

Q.4 Attempt the following.

a) Discuss the relationship between Battery Life-Cycles and EV Battery Life. **05**

b) Discuss the different types of Li-ion batteries. **05**

c) Discuss Solid-State Lithium Batteries with the help of a neat sketch. **04**

SECTION – II

Q.5 Attempt the following.

a)	Explain the need of a battery pack in electric vehicles.	**05**
b)	Explain the battery thermal management system.	**05**
c)	Discuss charging protocols used for EV chargers.	**04**

Q.6 Attempt the following.

a)	Explain Battery Pack Development Process.	**05**
b)	Write note on battery Swapping.	**05**
c)	Explain why thermal management of battery packs is important.	**04**

Q.7 Attempt the following.

a)	Compare active and passive thermal management techniques used in battery systems.	**05**
b)	Discuss AC and DC charging in detail.	**05**
c)	Describe the role of electrical design in battery pack performance.	**04**

SLR-QH-327

Seat No.		Set	S

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Honors in Electric Vehicle Engineering
Battery Technology and Charging Infrastructure (Mech Hon - 03B)

Day & Date: Thursday, 14-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if required & state it clearly.
5) Use of nonprogrammable calculators is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 MCQ/ Objective Type Questions: 14

1) Li-metal batteries use which material as the anode?
a) Graphite b) Silicon
c) Pure lithium d) Copper oxide

2) Which of the following battery types is known for its solid electrolyte instead of liquid?
a) Lithium-ion b) Li-Polymer
c) Solid-state Lithium d) Lithium-air

3) What is the primary need for designing a battery pack in electric vehicles?
a) To reduce weight
b) To increase the speed
c) To store and manage electrical energy safely and efficiently
d) To reduce emissions

4) Which of the following is the first step in the battery pack development process?
a) Mechanical enclosure design
b) Cell selection and configuration
c) BMS integration
d) Thermal management

5) Which of the following is NOT a method of active thermal management in battery packs?
a) Liquid cooling b) Forced air convection
c) Phase change material d) Peltier cooling

6) Which cooling technique involves submerging battery components directly into a dielectric fluid?

a) Liquid cooling
b) Forced air convection
c) Immersion cooling
d) Heat sink convection

7) Which of the following correctly distinguishes an On-board charger from an Off-board charger?

a) On-board charger is faster than off-board charger
b) On-board charger is integrated inside the vehicle, while off-board charger is external
c) Off-board charger is located inside the vehicle
d) On-board charger only supports fast charging

8) Which of the following is an example of a fast charging standard commonly used in EVs?

a) CHAdeMO
b) Type-1
c) Type-2
d) IEC 60309

9) What is the primary function of thermal design in a battery pack?

a) Improve battery weight
b) Increase voltage output
c) Maintain optimal operating temperature
d) Reduce internal resistance

10) If a battery is charged at a 1C rate, how long will it take to fully charge?

a) 1 hour
b) 2 hours
c) 30 minutes
d) 10 hours

11) If a battery is discharged to 40% of its total capacity, what is its Depth of Discharge (DoD)?

a) 60%
b) 40%
c) 100%
d) 20%

12) _____ avoids the direct contact of the positive and negative plate in a lithium-ion battery?

a) Electrolyte
b) Separator
c) Load
d) Rectifier

13) Which is the electrolyte used in Li-ion battery?

a) Lead dioxide
b) Lithium-based gel
c) Sulfur dioxide
d) Cobalt

14) Which of these battery technologies has the highest theoretical energy density?

a) Lithium-Sulphur
b) Li-Polymer
c) Lithium-air
d) Sodium-ion

SLR-QH-327

Seat No.	

Set S

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Honors in Electric Vehicle Engineering
Battery Technology and Charging Infrastructure (Mech Hon - 03B)

Day & Date: Thursday, 14-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Attempt two questions from each section.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt the following.

a) Discuss the key parameters for selecting an EV battery. **05**

b) Explain the chemistry of Lithium Iron Phosphate (LFP) batteries. **05**

c) Explain Lithium-Polymer battery with a neat sketch. **04**

Q.3 Attempt the following.

a) Explain Li-ion battery chemistry with a neat sketch. **05**

b) Compare Lithium-Sulfur and Sodium-Ion batteries based on structure, electrode materials, electrolyte, and applications. **05**

c) Define the following terms related to battery performance and characteristics: **04**

i) State of Charge (SoC)
ii) C-Rate
iii) Specific Energy Density
iv) Energy Capacity

Q.4 Attempt the following.

a) Discuss the relationship between Battery Life-Cycles and EV Battery Life. **05**

b) Discuss the different types of Li-ion batteries. **05**

c) Discuss Solid-State Lithium Batteries with the help of a neat sketch. **04**

SECTION – II

Q.5 Attempt the following.

a)	Explain the need of a battery pack in electric vehicles.	**05**
b)	Explain the battery thermal management system.	**05**
c)	Discuss charging protocols used for EV chargers.	**04**

Q.6 Attempt the following.

a)	Explain Battery Pack Development Process.	**05**
b)	Write note on battery Swapping.	**05**
c)	Explain why thermal management of battery packs is important.	**04**

Q.7 Attempt the following.

a)	Compare active and passive thermal management techniques used in battery systems.	**05**
b)	Discuss AC and DC charging in detail.	**05**
c)	Describe the role of electrical design in battery pack performance.	**04**

SLR-QH-328

Seat No.	

Set P

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Design of Machine Elements (BTN02501)

Day & Date: Saturday, 02-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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4) Make a suitable assumption whenever necessary & state it clearly

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) Stress concentration is due to _____.
a) variation is material property
b) variation of load
c) variation of factor of safety
d) variation in cross sectional area

2) Cotter joint is used to transmit _____.
a) Axial tensile load b) Axial shear load
c) Bending stress d) Torsional stress

3) Levers are subjected to _____.
a) Twisting moment b) Bending moment
c) Direct axial load d) Both a & b

4) Stress concentration in static loading is more serious in _____.
a) Ductile material
b) Brittle material
c) Equally serious in both cases
d) Depends on other factor

5) The width of the pulley should be _____.
a) equal to the width of belt
b) less than width of belt
c) greater than width of belt
d) None of the above

6) When the speed of belt increases, _____.
a) the coefficient of friction between the belt and pulley increases
b) the coefficient of friction between the belt and pulley decreases
c) the power transmitted will decrease
d) the power transmitted will increase

7) As per ASME code for shaft design, permissible shear stress for the shaft with key way is reduced by _____.
a) 20% b) 25%
c) 18% d) 30 %

8) The type of stresses developed in the key is/are _____.
a) shear stress alone
b) bearing stress alone
c) both shear and bearing stresses
d) shearing, bearing and bending stresses

9) Permissible twist in cam shaft is _____.
a) 1^0 b) 2.5^0
c) 0.25^0 d) 3^0

10) When a helical compression spring is subjected to an axial compressive load, the stress induced in the wire is _____.
a) tensile stress b) compressive stress
c) shear stress d) bending stress

11) Which of the following spring is used in mechanical wrist watch?
a) Helical compression spring b) Spiral spring
c) Torsion spring d) Leaf spring

12) A screw is specified by its _____.
a) major diameter b) minor diameter
c) pitch diameter d) pitch

13) In transverse fillet welded joint, the size of weld is equal to _____.
a) $0.5 \times$ Throat of weld b) Throat of weld
c) $\sqrt{2} \times$ Throat of weld d) $2 \times$ Throat of weld

14) The transverse fillet welded joints are designed for _____.
a) tensile strength b) compressive strength
c) bending strength d) shear strength

Seat No.	

Set **P**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April - 2026
Design of Machine Elements (BTN02501)

Day & Date: Saturday, 02-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Attempt any two questions from each section.
2) Figure to the right indicate full marks.
3) Make suitable assumptions wherever necessary and state it clearly.
4) Draw neat diagram wherever necessary.

Section – I

Q.2 **a)** Explain basic procedure of machine design. **06**

b) A cotter joint is used to connected two roads. The inside diameter of socket is 50 mm and outside diameter of the socket collar is 100 mm. The rods are subjected to a tensile load of 50 kN. The cotter is made of steel 30C8 (Syt = 400 N/mm^2) and the factor of safety is 4. The width of the cotter is five times of thickness. Calculate the width and thickness of the cotter on the basis of shear failure. **08**

Q.3 **a)** With the help of S-N curve, explain endurance limit and its significance in design. **07**

b) Draw and explain modified Goodman diagram. **07**

Q.4 **a)** What are the advantages of belt drive. **04**

b) A flat belt is used to drive reciprocating compressor running at 720 rpm which is driven by a 25 kW, 1440 rpm motor. The required center distance is 3 m. Select an open type, flat belt. Assume initial belt velocity as 18 m/s and use following Data: **10**

i) Load correction factor = 1.3
ii) Standard pully dia. 250, 280, 315, 355, 400, 450, 500
iii) Arc of contact factor (Fd)

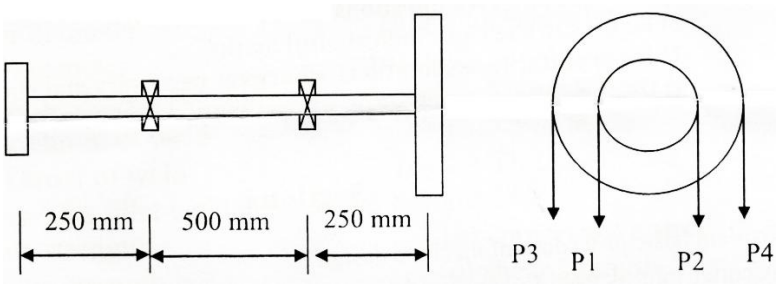
α_s	170	180
Fd	1.04	1.00

iv) Power rating per mm width per ply at 180^0 arc of contact and 5.08 m/s belt speed is 0.0118KW.

Section – II

Q.5 **a)** What are the design considerations in Forging? **06**

b) A shaft receives power of 7.5 KW from a motor and transmits it to a compressor at 360 rpm as shown in fig. Belt tensions act vertically downward and ratio of tension in tight side to lose side is 2.5:1. Yield strength of shaft material is 380 N/mm^2. Determine shaft diameter on strength basis. **08**

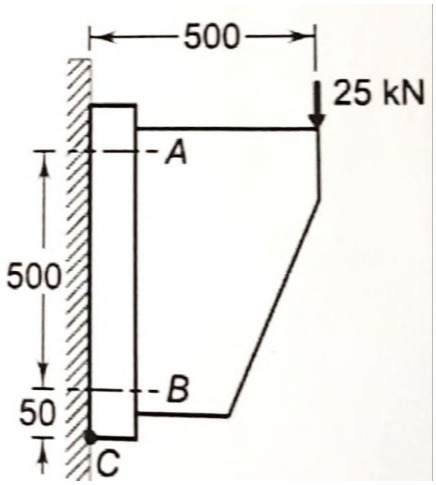


Q.6 **a)** What are the different types of springs? Explain with neat sketch leaf spring. **06**

b) Outside diameter of a helical spring is 75 mm and made from a wire of 6 mm diameter. If the permissible shear stress is 350 MPa and modulus of rigidity 84 MPa, find the axial load which the spring can carry and the deflection per active turn. **08**

Q.7 **a)** Compare welded and bolted joints. **04**

b) Four identical bolts, two at A and two at B, as shown in Fig are used to attach bracket to the wall. Assuming that the bracket is held against the wall and prevented from tilting about the point C by all four bolts and using an allowable tensile stress in the bolts as 35 N/mm^2, determine the size of the bolts on the basis of maximum shear stress theory. **10**



SLR-QH-328

Seat No.	

Set Q

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Design of Machine Elements (BTN02501)

Day & Date: Saturday, 02-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

Duration: 30 Minutes Marks:14

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

1) The type of stresses developed in the key is/are _____.
a) shear stress alone
b) bearing stress alone
c) both shear and bearing stresses
d) shearing, bearing and bending stresses

2) Permissible twist in cam shaft is _____.
a) 1^0 b) 2.5^0
c) 0.25^0 d) 3^0

3) When a helical compression spring is subjected to an axial compressive load, the stress induced in the wire is _____.
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4) Which of the following spring is used in mechanical wrist watch?
a) Helical compression spring b) Spiral spring
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5) A screw is specified by its _____.
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6) In transverse fillet welded joint, the size of weld is equal to _____.
a) $0.5 \times$ Throat of weld b) Throat of weld
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7) The transverse fillet welded joints are designed for _____.
   a) tensile strength
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8) Stress concentration is due to _____.
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14) As per ASME code for shaft design, permissible shear stress for the shaft with key way is reduced by _____.
   a) 20%
   b) 25%
   c) 18%
   d) 30 %

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April - 2026
Design of Machine Elements (BTN02501)

Day & Date: Saturday, 02-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Attempt any two questions from each section.
2) Figure to the right indicate full marks.
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Section – I

Q.2 **a)** Explain basic procedure of machine design. **06**

b) A cotter joint is used to connected two roads. The inside diameter of socket is 50 mm and outside diameter of the socket collar is 100 mm. The rods are subjected to a tensile load of 50 kN. The cotter is made of steel 30C8 (Syt = 400 N/mm^2) and the factor of safety is 4. The width of the cotter is five times of thickness. Calculate the width and thickness of the cotter on the basis of shear failure. **08**

Q.3 **a)** With the help of S-N curve, explain endurance limit and its significance in design. **07**

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b) A flat belt is used to drive reciprocating compressor running at 720 rpm which is driven by a 25 kW, 1440 rpm motor. The required center distance is 3 m. Select an open type, flat belt. Assume initial belt velocity as 18 m/s and use following Data: **10**

i) Load correction factor = 1.3
ii) Standard pully dia. 250, 280, 315, 355, 400, 450, 500
iii) Arc of contact factor (Fd)

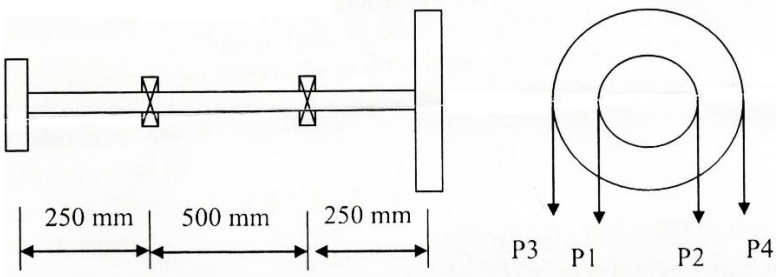
α_s	170	180
Fd	1.04	1.00

iv) Power rating per mm width per ply at 180^0 arc of contact and 5.08 m/s belt speed is 0.0118KW.

Section – II

Q.5 **a)** What are the design considerations in Forging? **06**

b) A shaft receives power of 7.5 KW from a motor and transmits it to a compressor at 360 rpm as shown in fig. Belt tensions act vertically downward and ratio of tension in tight side to lose side is 2.5:1. Yield strength of shaft material is 380 N/mm^2. Determine shaft diameter on strength basis. **08**

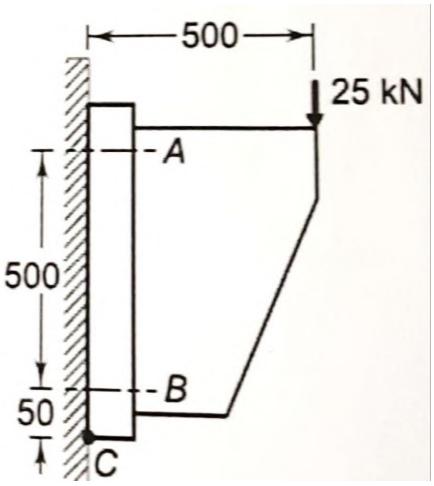


Q.6 **a)** What are the different types of springs? Explain with neat sketch leaf spring. **06**

b) Outside diameter of a helical spring is 75 mm and made from a wire of 6 mm diameter. If the permissible shear stress is 350 MPa and modulus of rigidity 84 MPa, find the axial load which the spring can carry and the deflection per active turn. **08**

Q.7 **a)** Compare welded and bolted joints. **04**

b) Four identical bolts, two at A and two at B, as shown in Fig are used to attach bracket to the wall. Assuming that the bracket is held against the wall and prevented from tilting about the point C by all four bolts and using an allowable tensile stress in the bolts as 35 N/mm^2, determine the size of the bolts on the basis of maximum shear stress theory. **10**



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Seat No.	

Set R

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Design of Machine Elements (BTN02501)

Day & Date: Saturday, 02-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

Duration: 30 Minutes Marks:14

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Seat No.	

Set **R**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April - 2026
Design of Machine Elements (BTN02501)

Day & Date: Saturday, 02-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Attempt any two questions from each section.
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Section – I

Q.2 **a)** Explain basic procedure of machine design. **06**

b) A cotter joint is used to connected two roads. The inside diameter of socket is 50 mm and outside diameter of the socket collar is 100 mm. The rods are subjected to a tensile load of 50 kN. The cotter is made of steel 30C8 (Syt = 400 N/mm^2) and the factor of safety is 4. The width of the cotter is five times of thickness. Calculate the width and thickness of the cotter on the basis of shear failure. **08**

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b) A flat belt is used to drive reciprocating compressor running at 720 rpm which is driven by a 25 kW, 1440 rpm motor. The required center distance is 3 m. Select an open type, flat belt. Assume initial belt velocity as 18 m/s and use following Data: **10**

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iii) Arc of contact factor (Fd)

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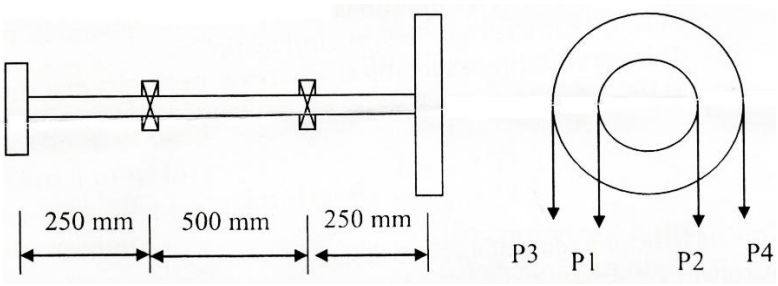
Fd	1.04	1.00

iv) Power rating per mm width per ply at 180^0 arc of contact and 5.08 m/s belt speed is 0.0118KW.

Section – II

Q.5 **a)** What are the design considerations in Forging? **06**

b) A shaft receives power of 7.5 KW from a motor and transmits it to a compressor at 360 rpm as shown in fig. Belt tensions act vertically downward and ratio of tension in tight side to lose side is 2.5:1. Yield strength of shaft material is 380 N/mm^2. Determine shaft diameter on strength basis. **08**



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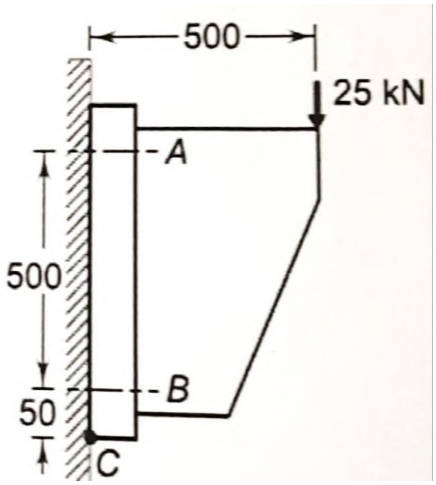

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Seat No.		Set	S

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Design of Machine Elements (BTN02501)

Day & Date: Saturday, 02-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make a suitable assumption whenever necessary & state it clearly

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) When the speed of belt increases, _____.
a) the coefficient of friction between the belt and pulley increases
b) the coefficient of friction between the belt and pulley decreases
c) the power transmitted will decrease
d) the power transmitted will increase

2) As per ASME code for shaft design, permissible shear stress for the shaft with key way is reduced by _____.
a) 20% b) 25%
c) 18% d) 30 %

3) The type of stresses developed in the key is/are _____.
a) shear stress alone
b) bearing stress alone
c) both shear and bearing stresses
d) shearing, bearing and bending stresses

4) Permissible twist in cam shaft is _____.
a) 1^0 b) 2.5^0
c) 0.25^0 d) 3^0

5) When a helical compression spring is subjected to an axial compressive load, the stress induced in the wire is _____.
a) tensile stress b) compressive stress
c) shear stress d) bending stress

6) Which of the following spring is used in mechanical wrist watch?
a) Helical compression spring
b) Spiral spring
c) Torsion spring
d) Leaf spring

7) A screw is specified by its _____.
a) major diameter
b) minor diameter
c) pitch diameter
d) pitch

8) In transverse fillet welded joint, the size of weld is equal to _____.
a) $0.5 \times$ Throat of weld
b) Throat of weld
c) $\sqrt{2} \times$ Throat of weld
d) $2 \times$ Throat of weld

9) The transverse fillet welded joints are designed for _____.
a) tensile strength
b) compressive strength
c) bending strength
d) shear strength

10) Stress concentration is due to _____.
a) variation is material property
b) variation of load
c) variation of factor of safety
d) variation in cross sectional area

11) Cotter joint is used to transmit _____.
a) Axial tensile load
b) Axial shear load
c) Bending stress
d) Torsional stress

12) Levers are subjected to _____.
a) Twisting moment
b) Bending moment
c) Direct axial load
d) Both a & b

13) Stress concentration in static loading is more serious in _____.
a) Ductile material
b) Brittle material
c) Equally serious in both cases
d) Depends on other factor

14) The width of the pulley should be _____.
a) equal to the width of belt
b) less than width of belt
c) greater than width of belt
d) None of the above

Seat No.	

Set | S

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April - 2026
Design of Machine Elements (BTN02501)

Day & Date: Saturday, 02-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Attempt any two questions from each section.
2) Figure to the right indicate full marks.
3) Make suitable assumptions wherever necessary and state it clearly.
4) Draw neat diagram wherever necessary.

Section – I

Q.2 **a)** Explain basic procedure of machine design. **06**

b) A cotter joint is used to connected two roads. The inside diameter of socket is 50 mm and outside diameter of the socket collar is 100 mm. The rods are subjected to a tensile load of 50 kN. The cotter is made of steel 30C8 (Syt = 400 N/mm^2) and the factor of safety is 4. The width of the cotter is five times of thickness. Calculate the width and thickness of the cotter on the basis of shear failure. **08**

Q.3 **a)** With the help of S-N curve, explain endurance limit and its significance in design. **07**

b) Draw and explain modified Goodman diagram. **07**

Q.4 **a)** What are the advantages of belt drive. **04**

b) A flat belt is used to drive reciprocating compressor running at 720 rpm which is driven by a 25 kW, 1440 rpm motor. The required center distance is 3 m. Select an open type, flat belt. Assume initial belt velocity as 18 m/s and use following Data: **10**

i) Load correction factor = 1.3
ii) Standard pully dia. 250, 280, 315, 355, 400, 450, 500
iii) Arc of contact factor (Fd)

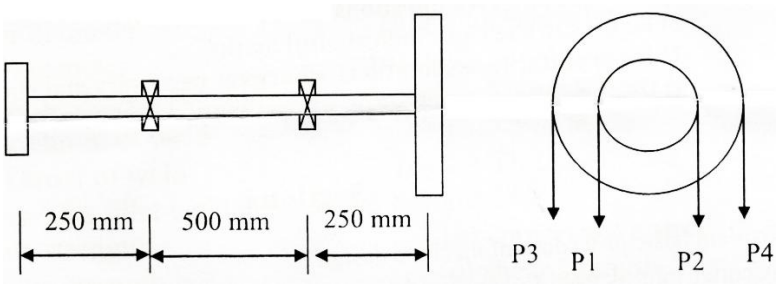
α_s	170	180
Fd	1.04	1.00

iv) Power rating per mm width per ply at 180^0 arc of contact and 5.08 m/s belt speed is 0.0118KW.

Section – II

Q.5 **a)** What are the design considerations in Forging? **06**

b) A shaft receives power of 7.5 KW from a motor and transmits it to a compressor at 360 rpm as shown in fig. Belt tensions act vertically downward and ratio of tension in tight side to lose side is 2.5:1. Yield strength of shaft material is 380 N/mm^2. Determine shaft diameter on strength basis. **08**

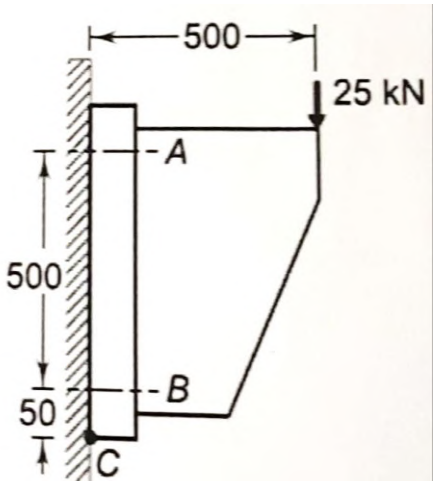


Q.6 **a)** What are the different types of springs? Explain with neat sketch leaf spring. **06**

b) Outside diameter of a helical spring is 75 mm and made from a wire of 6 mm diameter. If the permissible shear stress is 350 MPa and modulus of rigidity 84 MPa, find the axial load which the spring can carry and the deflection per active turn. **08**

Q.7 **a)** Compare welded and bolted joints. **04**

b) Four identical bolts, two at A and two at B, as shown in Fig are used to attach bracket to the wall. Assuming that the bracket is held against the wall and prevented from tilting about the point C by all four bolts and using an allowable tensile stress in the bolts as 35 N/mm^2, determine the size of the bolts on the basis of maximum shear stress theory. **10**



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Seat No.	

Set P

T.Y. (B.Tech.) (Mechanical Engineering) (Sem - I) (New/Old) (CBCS)
Examination: March/April – 2026
CAD-CAM-CAE (BTN02502)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Draw neat diagrams whenever necessary.
5) Assume suitable data if required.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. 14

1) The points that govern the shape of the curve in modelling are called as _____.
a) Control points b) Origins
c) End points d) Set point

2) More job variety can be well accommodated in case of _____.
a) Rigid automation b) Flexible automation
c) Continuous flow process d) None of these

3) Multiple pallets are used in CNC machine tools, basically for _____.
a) Increasing the cost of machine
b) Ease of handling the job
c) Increasing machine utilization
d) All of these

4) Moving an object across the screen parallel to its initial position is called as _____.
a) Movement b) Rotation
c) Translation d) Shifting

5) Miscellaneous command for coolant off in CNC is _____.
a) M09 b) M10
c) M11 d) M08

6) Volumetric and mass properties of an object can be easily obtained in case of _____.
a) Wireframe modelling b) Surface-modelling
c) Solid modelling d) All of these

7) In any curve representation, the shape associated with control points is called as _____.

a) Linear curve b) Rectangle
c) Line d) Control polygon

8) The concept of part families is used in _____.

a) JIT b) MRP
c) GT d) ERP

9) Which one of the following is an input device?

a) CPU b) Drum plotter
c) Joystick d) Monitor

10) In NC systems, MDI stands for _____.

a) Manual Data Integration b) Manual Data Interface
c) Manual Data Inspection d) Manual Data Input

11) Convex Hull is the property of Bezier curve.

a) True b) False

12) Satellite communications may be used in case of _____.

a) NC b) Stand-alone CNC
c) DNC d) All of these

13) From amongst the following, CNC lathe has _____.

a) X and V axis b) V and Z axis
c) X, V and Z axis d) X and Z axis

14) Preparatory code for incremental programming is _____.

a) G80 b) G70
c) G90 d) G91

Seat No.	

Set **P**

T.Y. (B.Tech.) (Mechanical Engineering) (Sem - I) (New/Old) (CBCS)
Examination: March/April – 2026
CAD-CAM-CAE (BTN02502)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Solve any two questions from Q.No.2, Q.No.3 & Q.No.4.
2) Q.No.5 is compulsory.
3) Solve any one question from Q.No.6 and Q.No.7.
4) Assume suitable data if required.
5) Draw neat diagram wherever necessary.
6) Figures to the right indicate full marks.

Section – I

Q.2 Solve any two Questions.

a) What is CAD/CAM discuss in detail product life cycle **05**

b) Explain with neat sketch, software configuration in CAD. **04**

c) What do you mean by geometric transformation? Explain any three. **05**

Q.3 a) A line PQ with end points P(2,3) & Q(7,8) is to be rotated about origin by 30° in clockwise direction determine the coordinates of the end points for the rotated line. **08**

b) Explain Group technology (GT). Discuss the advantages and disadvantages. **06**

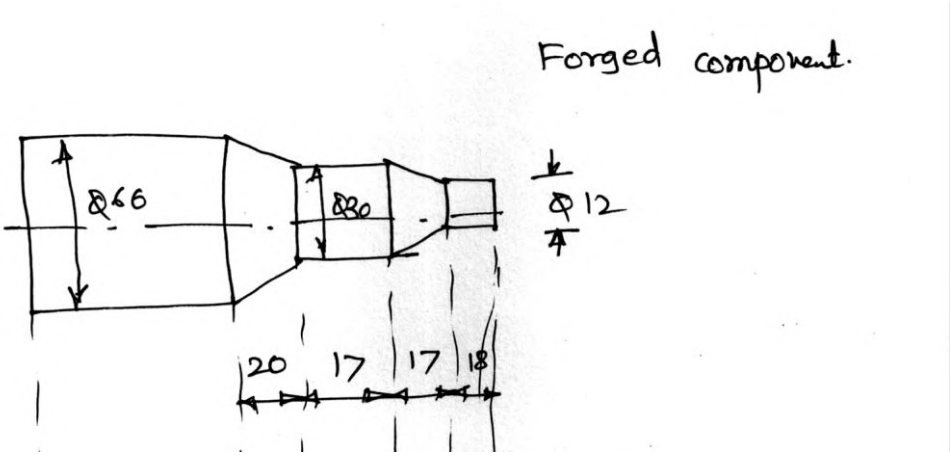
Q.4 a) What is RPT? Explain basic steps follows in the Rapid Prototype Technique (RPT) manufacturing. **05**

b) Write short note on Computer Aided Process Planning (CAPP) and Computer Integrated Manufacturing (CIM). **05**

c) Explain Boundary representation with neat sketch. **04**

Section – II

Q.5 **a)** Write a manual part program for finishing a forged component as shown in fig. Assume the speed and feed on the turning center are 600r.p.m and 0.65mm/rev. respectively. Assume 1 mm material is to be removed radially from external diameter. **10**



b) Explain work zero and machine zero system for NC machine. **04**

Q.6 **a)** Describe adaptive control system used in CNC system. Explain its types. **05**

b) Explain the axis designation for CNC lathe & milling. **04**

c) Write advantages and disadvantages of CNC system over NC system. **05**

Q.7 Write a short note (Any Three) **14**

a) DNC

b) ATC & APC

c) Canned cycle

d) Tool magazine

SLR-QH-329

Seat No.	

Set Q

T.Y. (B.Tech.) (Mechanical Engineering) (Sem - I) (New/Old) (CBCS)
Examination: March/April – 2026
CAD-CAM-CAE (BTN02502)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Draw neat diagrams whenever necessary.
5) Assume suitable data if required.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) The concept of part families is used in _____.
a) JIT b) MRP
c) GT d) ERP

2) Which one of the following is an input device?
a) CPU b) Drum plotter
c) Joystick d) Monitor

3) In NC systems, MDI stands for _____.
a) Manual Data Integration b) Manual Data Interface
c) Manual Data Inspection d) Manual Data Input

4) Convex Hull is the property of Bezier curve.
a) True b) False

5) Satellite communications may be used in case of _____.
a) NC b) Stand-alone CNC
c) DNC d) All of these

6) From amongst the following, CNC lathe has _____.
a) X and V axis b) V and Z axis
c) X, V and Z axis d) X and Z axis

7) Preparatory code for incremental programming is _____.
a) G80 b) G70
c) G90 d) G91

8) The points that govern the shape of the curve in modelling are called as _____.
a) Control points b) Origins
c) End points d) Set point

9) More job variety can be well accommodated in case of _____.
a) Rigid automation b) Flexible automation
c) Continuous flow process d) None of these

10) Multiple pallets are used in CNC machine tools, basically for _____.
a) Increasing the cost of machine
b) Ease of handling the job
c) Increasing machine utilization
d) All of these

11) Moving an object across the screen parallel to its initial position is called as _____.
a) Movement b) Rotation
c) Translation d) Shifting

12) Miscellaneous command for coolant off in CNC is _____.
a) M09 b) M10
c) M11 d) M08

13) Volumetric and mass properties of an object can be easily obtained in case of _____.
a) Wireframe modelling b) Surface-modelling
c) Solid modelling d) All of these

14) In any curve representation, the shape associated with control points is called as _____.
a) Linear curve b) Rectangle
c) Line d) Control polygon

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Mechanical Engineering) (Sem - I) (New/Old) (CBCS)
Examination: March/April – 2026
CAD-CAM-CAE (BTN02502)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Solve any two questions from Q.No.2, Q.No.3 & Q.No.4.
2) Q.No.5 is compulsory.
3) Solve any one question from Q.No.6 and Q.No.7.
4) Assume suitable data if required.
5) Draw neat diagram wherever necessary.
6) Figures to the right indicate full marks.

Section – I

Q.2 Solve any two Questions.

a) What is CAD/CAM discuss in detail product life cycle **05**

b) Explain with neat sketch, software configuration in CAD. **04**

c) What do you mean by geometric transformation? Explain any three. **05**

Q.3 a) A line PQ with end points P(2,3) & Q(7,8) is to be rotated about origin by 30° in clockwise direction determine the coordinates of the end points for the rotated line. **08**

b) Explain Group technology (GT). Discuss the advantages and disadvantages. **06**

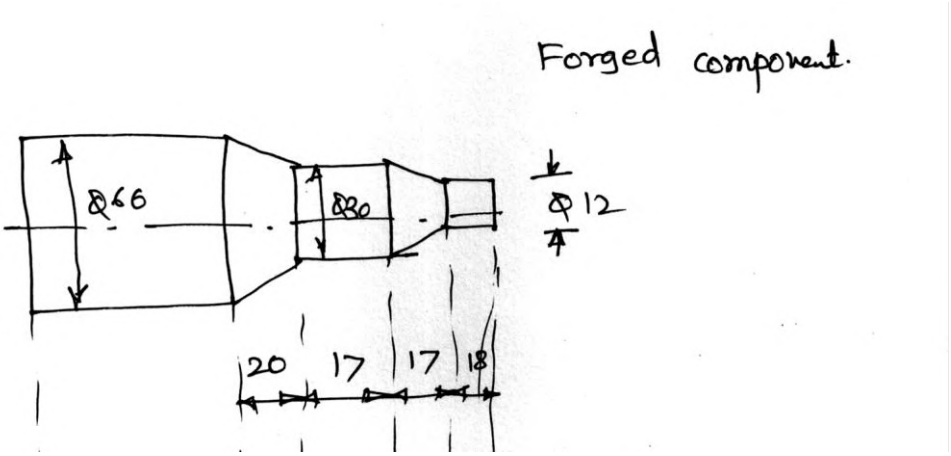
Q.4 a) What is RPT? Explain basic steps follows in the Rapid Prototype Technique (RPT) manufacturing. **05**

b) Write short note on Computer Aided Process Planning (CAPP) and Computer Integrated Manufacturing (CIM). **05**

c) Explain Boundary representation with neat sketch. **04**

Section – II

Q.5 **a)** Write a manual part program for finishing a forged component as shown in fig. Assume the speed and feed on the turning center are 600r.p.m and 0.65mm/rev. respectively. Assume 1 mm material is to be removed radially from external diameter. **10**



b) Explain work zero and machine zero system for NC machine. **04**

Q.6 **a)** Describe adaptive control system used in CNC system. Explain its types. **05**

b) Explain the axis designation for CNC lathe & milling. **04**

c) Write advantages and disadvantages of CNC system over NC system. **05**

Q.7 Write a short note (Any Three) **14**

a) DNC

b) ATC & APC

c) Canned cycle

d) Tool magazine

Seat No.	

Set **R**

T.Y. (B.Tech.) (Mechanical Engineering) (Sem - I) (New/Old) (CBCS)
Examination: March/April – 2026
CAD-CAM-CAE (BTN02502)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Draw neat diagrams whenever necessary.
5) Assume suitable data if required.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Convex Hull is the property of Bezier curve.
a) True b) False

2) Satellite communications may be used in case of _____.
a) NC b) Stand-alone CNC
c) DNC d) All of these

3) From amongst the following, CNC lathe has _____.
a) X and V axis b) V and Z axis
c) X, V and Z axis d) X and Z axis

4) Preparatory code for incremental programming is _____.
a) G80 b) G70
c) G90 d) G91

5) The points that govern the shape of the curve in modelling are called as _____.
a) Control points b) Origins
c) End points d) Set point

6) More job variety can be well accommodated in case of _____.
a) Rigid automation b) Flexible automation
c) Continuous flow process d) None of these

7) Multiple pallets are used in CNC machine tools, basically for _____.
a) Increasing the cost of machine
b) Ease of handling the job
c) Increasing machine utilization
d) All of these

8) Moving an object across the screen parallel to its initial position is called as _____.

a) Movement b) Rotation
c) Translation d) Shifting

9) Miscellaneous command for coolant off in CNC is _____.

a) M09 b) M10
c) M11 d) M08

10) Volumetric and mass properties of an object can be easily obtained in case of _____.

a) Wireframe modelling b) Surface-modelling
c) Solid modelling d) All of these

11) In any curve representation, the shape associated with control points is called as _____.

a) Linear curve b) Rectangle
c) Line d) Control polygon

12) The concept of part families is used in _____.

a) JIT b) MRP
c) GT d) ERP

13) Which one of the following is an input device?

a) CPU b) Drum plotter
c) Joystick d) Monitor

14) In NC systems, MDI stands for _____.

a) Manual Data Integration b) Manual Data Interface
c) Manual Data Inspection d) Manual Data Input

Seat No.	

Set **R**

T.Y. (B.Tech.) (Mechanical Engineering) (Sem - I) (New/Old) (CBCS)
Examination: March/April – 2026
CAD-CAM-CAE (BTN02502)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Solve any two questions from Q.No.2, Q.No.3 & Q.No.4.
2) Q.No.5 is compulsory.
3) Solve any one question from Q.No.6 and Q.No.7.
4) Assume suitable data if required.
5) Draw neat diagram wherever necessary.
6) Figures to the right indicate full marks.

Section – I

Q.2 Solve any two Questions.

a) What is CAD/CAM discuss in detail product life cycle **05**

b) Explain with neat sketch, software configuration in CAD. **04**

c) What do you mean by geometric transformation? Explain any three. **05**

Q.3 a) A line PQ with end points P(2,3) & Q(7,8) is to be rotated about origin by 30° in clockwise direction determine the coordinates of the end points for the rotated line. **08**

b) Explain Group technology (GT). Discuss the advantages and disadvantages. **06**

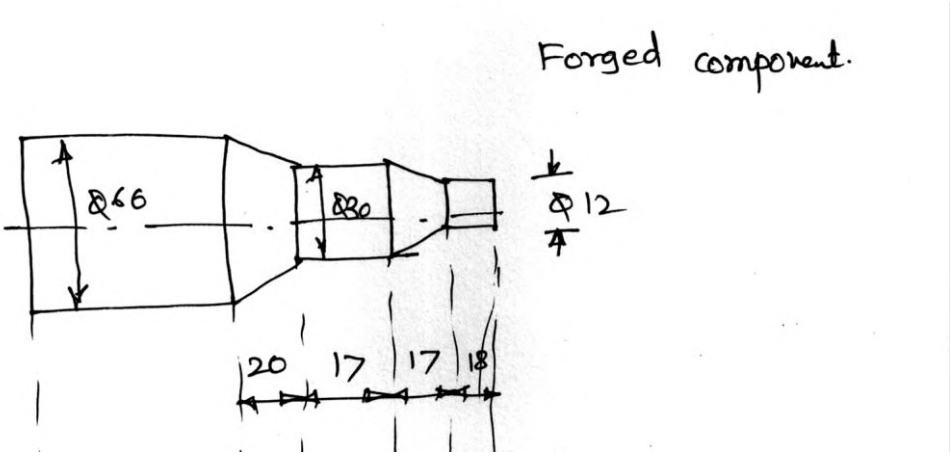
Q.4 a) What is RPT? Explain basic steps follows in the Rapid Prototype Technique (RPT) manufacturing. **05**

b) Write short note on Computer Aided Process Planning (CAPP) and Computer Integrated Manufacturing (CIM). **05**

c) Explain Boundary representation with neat sketch. **04**

Section – II

Q.5 **a)** Write a manual part program for finishing a forged component as shown in fig. Assume the speed and feed on the turning center are 600r.p.m and 0.65mm/rev. respectively. Assume 1 mm material is to be removed radially from external diameter. **10**



b) Explain work zero and machine zero system for NC machine. **04**

Q.6 **a)** Describe adaptive control system used in CNC system. Explain its types. **05**

b) Explain the axis designation for CNC lathe & milling. **04**

c) Write advantages and disadvantages of CNC system over NC system. **05**

Q.7 Write a short note (Any Three) **14**

a) DNC

b) ATC & APC

c) Canned cycle

d) Tool magazine

SLR-QH-329

Seat No.	

Set S

T.Y. (B.Tech.) (Mechanical Engineering) (Sem - I) (New/Old) (CBCS)
Examination: March/April – 2026
CAD-CAM-CAE (BTN02502)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Draw neat diagrams whenever necessary.
5) Assume suitable data if required.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. 14

1) Volumetric and mass properties of an object can be easily obtained in case of _____.
a) Wireframe modelling b) Surface-modelling
c) Solid modelling d) All of these

2) In any curve representation, the shape associated with control points is called as _____.
a) Linear curve b) Rectangle
c) Line d) Control polygon

3) The concept of part families is used in _____.
a) JIT b) MRP
c) GT d) ERP

4) Which one of the following is an input device?
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5) In NC systems, MDI stands for _____.
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c) Manual Data Inspection d) Manual Data Input

6) Convex Hull is the property of Bezier curve.
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7) Satellite communications may be used in case of _____.
a) NC b) Stand-alone CNC
c) DNC d) All of these

8) From amongst the following, CNC lathe has _____.
a) X and V axis
b) V and Z axis
c) X, V and Z axis
d) X and Z axis

9) Preparatory code for incremental programming is _____.
a) G80
b) G70
c) G90
d) G91

10) The points that govern the shape of the curve in modelling are called as _____.
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b) Origins
c) End points
d) Set point

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a) Rigid automation
b) Flexible automation
c) Continuous flow process
d) None of these

12) Multiple pallets are used in CNC machine tools, basically for _____.
a) Increasing the cost of machine
b) Ease of handling the job
c) Increasing machine utilization
d) All of these

13) Moving an object across the screen parallel to its initial position is called as _____.
a) Movement
b) Rotation
c) Translation
d) Shifting

14) Miscellaneous command for coolant off in CNC is _____.
a) M09
b) M10
c) M11
d) M08

Seat No.	

Set **S**

T.Y. (B.Tech.) (Mechanical Engineering) (Sem - I) (New/Old) (CBCS)
Examination: March/April – 2026
CAD-CAM-CAE (BTN02502)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Solve any two questions from Q.No.2, Q.No.3 & Q.No.4.
2) Q.No.5 is compulsory.
3) Solve any one question from Q.No.6 and Q.No.7.
4) Assume suitable data if required.
5) Draw neat diagram wherever necessary.
6) Figures to the right indicate full marks.

Section – I

Q.2 Solve any two Questions.

a) What is CAD/CAM discuss in detail product life cycle **05**

b) Explain with neat sketch, software configuration in CAD. **04**

c) What do you mean by geometric transformation? Explain any three. **05**

Q.3 a) A line PQ with end points P(2,3) & Q(7,8) is to be rotated about origin by 30° in clockwise direction determine the coordinates of the end points for the rotated line. **08**

b) Explain Group technology (GT). Discuss the advantages and disadvantages. **06**

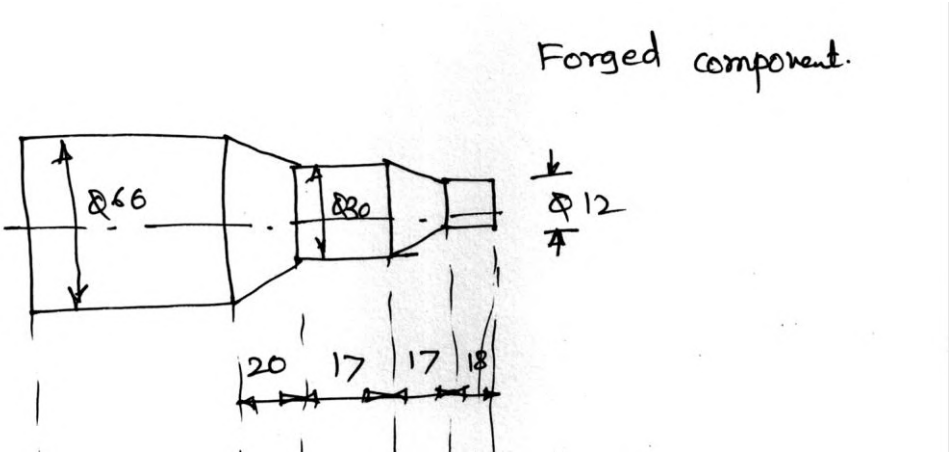
Q.4 a) What is RPT? Explain basic steps follows in the Rapid Prototype Technique (RPT) manufacturing. **05**

b) Write short note on Computer Aided Process Planning (CAPP) and Computer Integrated Manufacturing (CIM). **05**

c) Explain Boundary representation with neat sketch. **04**

Section – II

Q.5 **a)** Write a manual part program for finishing a forged component as shown in fig. Assume the speed and feed on the turning center are 600r.p.m and 0.65mm/rev. respectively. Assume 1 mm material is to be removed radially from external diameter. **10**



b) Explain work zero and machine zero system for NC machine. **04**

Q.6 **a)** Describe adaptive control system used in CNC system. Explain its types. **05**

b) Explain the axis designation for CNC lathe & milling. **04**

c) Write advantages and disadvantages of CNC system over NC system. **05**

Q.7 Write a short note (Any Three) **14**

a) DNC

b) ATC & APC

c) Canned cycle

d) Tool magazine

SLR-QH-330

Seat No.	

Set P

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Metallurgy (BTN02503)

Day & Date: Thursday, 07-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Isomorphous means complete solubility in _____.
a) Liquid state b) Solid state
c) Liquid & solid state d) Neither liquid nor solid state

2) Which of the following cast iron has highest tensile strength?
a) White iron b) Grey iron
c) SG iron d) Mottled iron

3) Which of the following are proeutectoid constituents present in steels between "A3 and A1 temperatures?
a) Ferrite b) Austenite
c) Cementite d) Pearlite

4) Which of the following steels are oil hardened?
a) HCHC steels b) HSLA Steel
c) Hadfield 'Mn' steel d) HSS steel

5) Which of the following steel cannot be hardened by heat treatment?
a) Austenitic stainless steel b) Ferritic stainless steel
c) Maraging Steel d) HCHC Steel

6) Which of the following are solid solutions?
a) Alpha in Brass b) Delta in iron
c) Delta in Bronze d) Martensite

7) Which of the following alloy is precipitation hardened?
a) Brass b) Tin bronze
c) Duralumin d) Aluminum bronze

8) Which of the following treatment is based on isothermal transformation of austenite?

a) Annealing
b) Normalizing
c) Patenting
d) Tempering

9) Nitriding treatment is carried out by heating the steel in the range of _____°C.

a) 200 - 300°C
b) 500 - 550°C
c) 650 - 700°C
d) Above A3 temp of steel

10) Powders of metal like Zn, Sn are manufactured by _____ method.

a) atomization
b) Electro deposition
c) Reduction
d) Condensation of metal vapours

11) During manufacturing of self-lubricated bearing, which of the following is the important step?

a) Sizing
b) Heat Treatment
c) Inspection
d) Impregnation

12) To produce tungsten powder which of the following method is employed?

a) Reduction method
b) Carbonyl method
c) Electro deposition
d) Atomization

13) Which hardness test is recommended to measure hardness of Razor blade?

a) Rockwell
b) Brinell
c) Shore's scleroscope
d) Vicker's

14) S-N curve is related to test/phenomenon _____.

a) Creep
b) Fatigue
c) Tensile test
d) Impact test

Seat No.	

Set **P**

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Metallurgy (BTN02503)

Day & Date: Thursday, 07-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Attempt any two questions from each Section.
2) Figures to the right indicate full marks.
3) Assume suitable data if required.
4) Use of scientific calculator is allowed.

SECTION – I

Q.2	**a)**	Explain Gibbs phase rule & its significance in metallurgical systems.	**07**
	b)	What are tool steels? What properties are essential in tool steel? Explain in detail composition, properties & application of HSS.	**07**
Q.3	**a)**	Explain classification of metallic materials.	**07**
	b)	Draw Fe-Fe3C diagram. Label all the phases & temperatures correctly.	**07**
Q.4	**a)**	Explain the effect of Ni, Cr, Mo and Tungsten on properties of steel.	**07**
	b)	Compare between Brasses and Bronzes.	**07**

SECTION – II

Q.5	**a)**	Draw TTT diagram for eutectoid steel & label all phases and temperature.	**07**
	b)	Enlist various methods of hardening.	**07**
Q.6	**a)**	What is the heat treatment? State objectives of annealing & types of annealing.	**07**
	b)	Explain various methods for powder compaction.	**07**
Q.7	**a)**	Enlist various methods for powder manufacturing in powder metallurgy.	**07**
	b)	Explain set up for ultrasonic test pointing out its advantages, limitation and application.	**07**

SLR-QH-330

Seat No.	

Set Q

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Metallurgy (BTN02503)

Day & Date: Thursday, 07-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. 14

1) Which of the following treatment is based on isothermal transformation of austenite?
a) Annealing b) Normalizing
c) Patenting d) Tempering

2) Nitriding treatment is carried out by heating the steel in the range of _____°C.
a) 200 - 300°C b) 500 - 550°C
c) 650 - 700°C d) Above A3 temp of steel

3) Powders of metal like Zn, Sn are manufactured by _____ method.
a) atomization
b) Electro deposition
c) Reduction
d) Condensation of metal vapours

4) During manufacturing of self-lubricated bearing, which of the following is the important step?
a) Sizing b) Heat Treatment
c) Inspection d) Impregnation

5) To produce tungsten powder which of the following method is employed?
a) Reduction method b) Carbonyl method
c) Electro deposition d) Atomization

6) Which hardness test is recommended to measure hardness of Razor blade?
a) Rockwell b) Brinell
c) Shore's scleroscope d) Vicker's

7) S-N curve is related to test/phenomenon _____.
a) Creep b) Fatigue
c) Tensile test d) Impact test

8) Isomorphous means complete solubility in _____.
a) Liquid state b) Solid state
c) Liquid & solid state d) Neither liquid nor solid state

9) Which of the following cast iron has highest tensile strength?
a) White iron b) Grey iron
c) SG iron d) Mottled iron

10) Which of the following are proeutectoid constituents present in steels between “A3 and A1 temperatures?
a) Ferrite b) Austenite
c) Cementite d) Pearlite

11) Which of the following steels are oil hardened?
a) HCHC steels b) HSLA Steel
c) Hadfield ‘Mn’ steel d) HSS steel

12) Which of the following steel cannot be hardened by heat treatment?
a) Austenitic stainless steel b) Ferritic stainless steel
c) Maraging Steel d) HCHC Steel

13) Which of the following are solid solutions?
a) Alpha in Brass b) Delta in iron
c) Delta in Bronze d) Martensite

14) Which of the following alloy is precipitation hardened?
a) Brass b) Tin bronze
c) Duralumin d) Aluminum bronze

Seat No.	

Set **Q**

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Metallurgy (BTN02503)

Day & Date: Thursday, 07-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Attempt any two questions from each Section.
2) Figures to the right indicate full marks.
3) Assume suitable data if required.
4) Use of scientific calculator is allowed.

SECTION – I

Q.2	**a)**	Explain Gibbs phase rule & its significance in metallurgical systems.	**07**
	b)	What are tool steels? What properties are essential in tool steel? Explain in detail composition, properties & application of HSS.	**07**
Q.3	**a)**	Explain classification of metallic materials.	**07**
	b)	Draw Fe-Fe3C diagram. Label all the phases & temperatures correctly.	**07**
Q.4	**a)**	Explain the effect of Ni, Cr, Mo and Tungsten on properties of steel.	**07**
	b)	Compare between Brasses and Bronzes.	**07**

SECTION – II

Q.5	**a)**	Draw TTT diagram for eutectoid steel & label all phases and temperature.	**07**
	b)	Enlist various methods of hardening.	**07**
Q.6	**a)**	What is the heat treatment? State objectives of annealing & types of annealing.	**07**
	b)	Explain various methods for powder compaction.	**07**
Q.7	**a)**	Enlist various methods for powder manufacturing in powder metallurgy.	**07**
	b)	Explain set up for ultrasonic test pointing out its advantages, limitation and application.	**07**

Seat No.	

Set **R**

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Metallurgy (BTN02503)

Day & Date: Thursday, 07-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) During manufacturing of self-lubricated bearing, which of the following is the important step?
a) Sizing b) Heat Treatment
c) Inspection d) Impregnation

2) To produce tungsten powder which of the following method is employed?
a) Reduction method b) Carbonyl method
c) Electro deposition d) Atomization

3) Which hardness test is recommended to measure hardness of Razor blade?
a) Rockwell b) Brinell
c) Shore's scleroscope d) Vicker's

4) S-N curve is related to test/phenomenon _____.
a) Creep b) Fatigue
c) Tensile test d) Impact test

5) Isomorphous means complete solubility in _____.
a) Liquid state b) Solid state
c) Liquid & solid state d) Neither liquid nor solid state

6) Which of the following cast iron has highest tensile strength?
a) White iron b) Grey iron
c) SG iron d) Mottled iron

7) Which of the following are proeutectoid constituents present in steels between "A3 and A1 temperatures?
a) Ferrite b) Austenite
c) Cementite d) Pearlite

8) Which of the following steels are oil hardened?
a) HCHC steels
b) HSLA Steel
c) Hadfield 'Mn' steel
d) HSS steel

9) Which of the following steel cannot be hardened by heat treatment?
a) Austenitic stainless steel
b) Ferritic stainless steel
c) Maraging Steel
d) HCHC Steel

10) Which of the following are solid solutions?
a) Alpha in Brass
b) Delta in iron
c) Delta in Bronze
d) Martensite

11) Which of the following alloy is precipitation hardened?
a) Brass
b) Tin bronze
c) Duralumin
d) Aluminum bronze

12) Which of the following treatment is based on isothermal transformation of austenite?
a) Annealing
b) Normalizing
c) Patenting
d) Tempering

13) Nitriding treatment is carried out by heating the steel in the range of _____°C.
a) 200 - 300°C
b) 500 - 550°C
c) 650 - 700°C
d) Above A3 temp of steel

14) Powders of metal like Zn, Sn are manufactured by _____ method.
a) atomization
b) Electro deposition
c) Reduction
d) Condensation of metal vapours

Seat No.	

Set **R**

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Metallurgy (BTN02503)

Day & Date: Thursday, 07-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Attempt any two questions from each Section.
2) Figures to the right indicate full marks.
3) Assume suitable data if required.
4) Use of scientific calculator is allowed.

SECTION – I

Q.2	**a)**	Explain Gibbs phase rule & its significance in metallurgical systems.	**07**
	b)	What are tool steels? What properties are essential in tool steel? Explain in detail composition, properties & application of HSS.	**07**
Q.3	**a)**	Explain classification of metallic materials.	**07**
	b)	Draw Fe-Fe3C diagram. Label all the phases & temperatures correctly.	**07**
Q.4	**a)**	Explain the effect of Ni, Cr, Mo and Tungsten on properties of steel.	**07**
	b)	Compare between Brasses and Bronzes.	**07**

SECTION – II

Q.5	**a)**	Draw TTT diagram for eutectoid steel & label all phases and temperature.	**07**
	b)	Enlist various methods of hardening.	**07**
Q.6	**a)**	What is the heat treatment? State objectives of annealing & types of annealing.	**07**
	b)	Explain various methods for powder compaction.	**07**
Q.7	**a)**	Enlist various methods for powder manufacturing in powder metallurgy.	**07**
	b)	Explain set up for ultrasonic test pointing out its advantages, limitation and application.	**07**

Seat No.	

Set **S**

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Metallurgy (BTN02503)

Day & Date: Thursday, 07-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which of the following are solid solutions?
a) Alpha in Brass b) Delta in iron
c) Delta in Bronze d) Martensite

2) Which of the following alloy is precipitation hardened?
a) Brass b) Tin bronze
c) Duralumin d) Aluminum bronze

3) Which of the following treatment is based on isothermal transformation of austenite?
a) Annealing b) Normalizing
c) Patenting d) Tempering

4) Nitriding treatment is carried out by heating the steel in the range of _____°C.
a) 200 - 300°C b) 500 - 550°C
c) 650 - 700°C d) Above A3 temp of steel

5) Powders of metal like Zn, Sn are manufactured by _____ method.
a) atomization
b) Electro deposition
c) Reduction
d) Condensation of metal vapours

6) During manufacturing of self-lubricated bearing, which of the following is the important step?
a) Sizing b) Heat Treatment
c) Inspection d) Impregnation

7) To produce tungsten powder which of the following method is employed?
a) Reduction method b) Carbonyl method
c) Electro deposition d) Atomization

8) Which hardness test is recommended to measure hardness of Razor blade?
a) Rockwell b) Brinell
c) Shore's scleroscope d) Vicker's

9) S-N curve is related to test/phenomenon _____.
a) Creep b) Fatigue
c) Tensile test d) Impact test

10) Isomorphous means complete solubility in _____.
a) Liquid state b) Solid state
c) Liquid & solid state d) Neither liquid nor solid state

11) Which of the following cast iron has highest tensile strength?
a) White iron b) Grey iron
c) SG iron d) Mottled iron

12) Which of the following are proeutectoid constituents present in steels between “A3 and A1 temperatures?
a) Ferrite b) Austenite
c) Cementite d) Pearlite

13) Which of the following steels are oil hardened?
a) HCHC steels b) HSLA Steel
c) Hadfield ‘Mn’ steel d) HSS steel

14) Which of the following steel cannot be hardened by heat treatment?
a) Austenitic stainless steel b) Ferritic stainless steel
c) Maraging Steel d) HCHC Steel

SLR-QH-330

Seat No.	

Set S

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Metallurgy (BTN02503)

Day & Date: Thursday, 07-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Attempt any two questions from each Section.
2) Figures to the right indicate full marks.
3) Assume suitable data if required.
4) Use of scientific calculator is allowed.

SECTION – I

Q.2	**a)**	Explain Gibbs phase rule & its significance in metallurgical systems.	**07**
	b)	What are tool steels? What properties are essential in tool steel? Explain in detail composition, properties & application of HSS.	**07**
Q.3	**a)**	Explain classification of metallic materials.	**07**
	b)	Draw Fe-Fe3C diagram. Label all the phases & temperatures correctly.	**07**
Q.4	**a)**	Explain the effect of Ni, Cr, Mo and Tungsten on properties of steel.	**07**
	b)	Compare between Brasses and Bronzes.	**07**

SECTION – II

Q.5	**a)**	Draw TTT diagram for eutectoid steel & label all phases and temperature.	**07**
	b)	Enlist various methods of hardening.	**07**
Q.6	**a)**	What is the heat treatment? State objectives of annealing & types of annealing.	**07**
	b)	Explain various methods for powder compaction.	**07**
Q.7	**a)**	Enlist various methods for powder manufacturing in powder metallurgy.	**07**
	b)	Explain set up for ultrasonic test pointing out its advantages, limitation and application.	**07**

SLR-QH-331

Seat No.	

Set P

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Industrial Engineering (BTN02504)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose correct option. **14**

1) The study of measurement of the dimensions and other physical characteristics is dealt in _____.
a) Material handling b) Time study
c) Anthropometry d) Work sampling

2) Travel chart indicate _____.
a) Frequency of movement b) Ideal time of man & machine
c) Manual movement d) Repetitive movement

3) In MTM unit of time measurement is _____.
a) TMU b) Minutes
c) Centiminutes d) Hour

4) Which type of layout is used in ship building & air craft industry?
a) Product type layout b) Process type layout
c) Fixed type layout d) Group layout

5) Flow Process chart is used in _____.
a) Work sampling b) Method study
c) String diagram d) Micromotion study

6) Selection of material handling equipment is an important decision as it affects _____ of handling system.
a) Cost b) Efficiency
c) Both cost and efficiency d) None of the above

7) Merit rating is useful for _____.
a) Industrial safety b) Machine allowance
c) Job evaluation d) Rewarding the person

8) In method study the symbol O (Circle) represents _____.
a) Delay b) Inspection
c) Operation d) Storage

9) Father of time study was _____.
a) F. B. Gilbert b) F. W. Taylor
c) H. L. Gantt d) Maynord

10) The assessment of the requirements of a job is known as _____.
a) Job evaluation b) Job grading
c) Job analysis d) Job assessment

11) Micro motion study is used in _____.
a) Flow process chart b) Activity chart
c) SIMO chart d) MTM

12) Group incentive scheme is suitable for _____.
a) Lathe operator b) Trainee engineer
c) Computer operator d) Assembly fitters

13) Basic fatigue allowance is _____.
a) 6% b) 7%
c) 4% d) 2%

14) Productivity of an enterprise refers to which of the following?
a) The ratio of gross income to gross expenditure
b) Rate of growth of capital
c) Yearly gross income
d) Turnover in specified period

Seat No.	

Set **P**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Industrial Engineering (BTN02504)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Solve any two questions from each section.
2) Figures to the right indicate full marks.
3) Use of calculator is allowed.
4) Assume additional suitable data, if necessary and mention it clearly.

Section – I

Q.2 **a)** What are the various types displays? Explain design consideration for operating the controls. **07**

b) Define Accident? Explain causes of accidents in short. **07**

Q.3 **a)** Write a short note on: **07**
i) String Diagram
ii) Two Handed Process Chart

b) Explain the steps of Method Study. What are the objectives of Method Study? **07**

Q.4 **a)** Define Productivity. Explain various factors affecting on Productivity. **07**

b) Explain the following: **07**
i) Gilbert Contribution
ii) F.W. Taylor Contribution

Section – II

Q.5 **a)** Write a short note on Performance Rating. What are the advantages? **07**

b) The element times (in minutes) for 4 cycle of an operation using a stop watch are presented below : **07**

Element	Cycle time in minutes			
	1	**2**	**3**	**4**
1	1.5	1.5	1.3	1.4
2	2.6	2.6	2.5	2.6
3	3.3	3.4	3.4	3.3
4	1.1	1.2	1.2	1.1
5	0.51	0.52	0.50	0.52

Calculate standard time for the operation if,

i) Element 2 and 4 are the machine element.
ii) For the other elements, the operator is rated at 100%.
iii) Total allowances are 14 % of the normal time.

Q.6 **a)** Write a short note on Selection of Material Handling Equipment's. **07**

b) Explain with neat sketch: **07**

1) Process Layout
2) Product Layout

Q.7 **a)** Define Job Evaluation. What are the objectives? Explain any one method in detail. **07**

b) Explain in brief about Job Analysis, Job Description and Job Specification. **07**

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Industrial Engineering (BTN02504)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose correct option. **14**

1) In method study the symbol O (Circle) represents _____.
a) Delay b) Inspection
c) Operation d) Storage

2) Father of time study was _____.
a) F. B. Gilbert b) F. W. Taylor
c) H. L. Gantt d) Maynord

3) The assessment of the requirements of a job is known as _____.
a) Job evaluation b) Job grading
c) Job analysis d) Job assessment

4) Micro motion study is used in _____.
a) Flow process chart b) Activity chart
c) SIMO chart d) MTM

5) Group incentive scheme is suitable for _____.
a) Lathe operator b) Trainee engineer
c) Computer operator d) Assembly fitters

6) Basic fatigue allowance is _____.
a) 6% b) 7%
c) 4% d) 2%

7) Productivity of an enterprise refers to which of the following?
a) The ratio of gross income to gross expenditure
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8) The study of measurement of the dimensions and other physical characteristics is dealt in _____.
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9) Travel chart indicate _____.
a) Frequency of movement b) Ideal time of man & machine
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10) In MTM unit of time measurement is _____.
a) TMU b) Minutes
c) Centiminutes d) Hour

11) Which type of layout is used in ship building & air craft industry?
a) Product type layout b) Process type layout
c) Fixed type layout d) Group layout

12) Flow Process chart is used in _____.
a) Work sampling b) Method study
c) String diagram d) Micromotion study

13) Selection of material handling equipment is an important decision as it affects _____ of handling system.
a) Cost b) Efficiency
c) Both cost and efficiency d) None of the above

14) Merit rating is useful for _____.
a) Industrial safety b) Machine allowance
c) Job evaluation d) Rewarding the person

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Industrial Engineering (BTN02504)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Solve any two questions from each section.
2) Figures to the right indicate full marks.
3) Use of calculator is allowed.
4) Assume additional suitable data, if necessary and mention it clearly.

Section – I

Q.2 **a)** What are the various types displays? Explain design consideration for operating the controls. **07**

b) Define Accident? Explain causes of accidents in short. **07**

Q.3 **a)** Write a short note on: **07**
i) String Diagram
ii) Two Handed Process Chart

b) Explain the steps of Method Study. What are the objectives of Method Study? **07**

Q.4 **a)** Define Productivity. Explain various factors affecting on Productivity. **07**

b) Explain the following: **07**
i) Gilbert Contribution
ii) F.W. Taylor Contribution

Section – II

Q.5 **a)** Write a short note on Performance Rating. What are the advantages? **07**

b) The element times (in minutes) for 4 cycle of an operation using a stop watch are presented below : **07**

Element	Cycle time in minutes			
	1	**2**	**3**	**4**
1	1.5	1.5	1.3	1.4
2	2.6	2.6	2.5	2.6
3	3.3	3.4	3.4	3.3
4	1.1	1.2	1.2	1.1
5	0.51	0.52	0.50	0.52

Calculate standard time for the operation if,

i) Element 2 and 4 are the machine element.
ii) For the other elements, the operator is rated at 100%.
iii) Total allowances are 14 % of the normal time.

Q.6 **a)** Write a short note on Selection of Material Handling Equipment's. **07**

b) Explain with neat sketch: **07**

1) Process Layout
2) Product Layout

Q.7 **a)** Define Job Evaluation. What are the objectives? Explain any one method in detail. **07**

b) Explain in brief about Job Analysis, Job Description and Job Specification. **07**

Seat No.	

Set **R**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Industrial Engineering (BTN02504)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose correct option. **14**

1) Micro motion study is used in _____.
a) Flow process chart b) Activity chart
c) SIMO chart d) MTM

2) Group incentive scheme is suitable for _____.
a) Lathe operator b) Trainee engineer
c) Computer operator d) Assembly fitters

3) Basic fatigue allowance is _____.
a) 6% b) 7%
c) 4% d) 2%

4) Productivity of an enterprise refers to which of the following?
a) The ratio of gross income to gross expenditure
b) Rate of growth of capital
c) Yearly gross income
d) Turnover in specified period

5) The study of measurement of the dimensions and other physical characteristics is dealt in _____.
a) Material handling b) Time study
c) Anthropometry d) Work sampling

6) Travel chart indicate _____.
a) Frequency of movement b) Ideal time of man & machine
c) Manual movement d) Repetitive movement

7) In MTM unit of time measurement is _____.
a) TMU b) Minutes
c) Centiminutes d) Hour

8) Which type of layout is used in ship building & air craft industry?
a) Product type layout b) Process type layout
c) Fixed type layout d) Group layout

9) Flow Process chart is used in _____.
a) Work sampling b) Method study
c) String diagram d) Micromotion study

10) Selection of material handling equipment is an important decision as it affects _____ of handling system.
a) Cost b) Efficiency
c) Both cost and efficiency d) None of the above

11) Merit rating is useful for _____.
a) Industrial safety b) Machine allowance
c) Job evaluation d) Rewarding the person

12) In method study the symbol O (Circle) represents _____.
a) Delay b) Inspection
c) Operation d) Storage

13) Father of time study was _____.
a) F. B. Gilbert b) F. W. Taylor
c) H. L. Gantt d) Maynord

14) The assessment of the requirements of a job is known as _____.
a) Job evaluation b) Job grading
c) Job analysis d) Job assessment

Seat No.	

Set **R**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Industrial Engineering (BTN02504)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Solve any two questions from each section.
2) Figures to the right indicate full marks.
3) Use of calculator is allowed.
4) Assume additional suitable data, if necessary and mention it clearly.

Section – I

Q.2 **a)** What are the various types displays? Explain design consideration for operating the controls. **07**

b) Define Accident? Explain causes of accidents in short. **07**

Q.3 **a)** Write a short note on: **07**
i) String Diagram
ii) Two Handed Process Chart

b) Explain the steps of Method Study. What are the objectives of Method Study? **07**

Q.4 **a)** Define Productivity. Explain various factors affecting on Productivity. **07**

b) Explain the following: **07**
i) Gilbert Contribution
ii) F.W. Taylor Contribution

Section – II

Q.5 **a)** Write a short note on Performance Rating. What are the advantages? **07**

b) The element times (in minutes) for 4 cycle of an operation using a stop watch are presented below : **07**

Element	Cycle time in minutes			
	1	**2**	**3**	**4**
1	1.5	1.5	1.3	1.4
2	2.6	2.6	2.5	2.6
3	3.3	3.4	3.4	3.3
4	1.1	1.2	1.2	1.1
5	0.51	0.52	0.50	0.52

Calculate standard time for the operation if,

i) Element 2 and 4 are the machine element.
ii) For the other elements, the operator is rated at 100%.
iii) Total allowances are 14 % of the normal time.

Q.6 **a)** Write a short note on Selection of Material Handling Equipment's. **07**

b) Explain with neat sketch: **07**

1) Process Layout
2) Product Layout

Q.7 **a)** Define Job Evaluation. What are the objectives? Explain any one method in detail. **07**

b) Explain in brief about Job Analysis, Job Description and Job Specification. **07**

Seat No.	

Set **S**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Industrial Engineering (BTN02504)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose correct option. **14**

1) Selection of material handling equipment is an important decision as it affects _____ of handling system.
a) Cost b) Efficiency
c) Both cost and efficiency d) None of the above

2) Merit rating is useful for _____.
a) Industrial safety b) Machine allowance
c) Job evaluation d) Rewarding the person

3) In method study the symbol O (Circle) represents _____.
a) Delay b) Inspection
c) Operation d) Storage

4) Father of time study was _____.
a) F. B. Gilbert b) F. W. Taylor
c) H. L. Gantt d) Maynord

5) The assessment of the requirements of a job is known as _____.
a) Job evaluation b) Job grading
c) Job analysis d) Job assessment

6) Micro motion study is used in _____.
a) Flow process chart b) Activity chart
c) SIMO chart d) MTM

7) Group incentive scheme is suitable for _____.
a) Lathe operator b) Trainee engineer
c) Computer operator d) Assembly fitters

8) Basic fatigue allowance is _____.
a) 6% b) 7%
c) 4% d) 2%

9) Productivity of an enterprise refers to which of the following?
a) The ratio of gross income to gross expenditure
b) Rate of growth of capital
c) Yearly gross income
d) Turnover in specified period

10) The study of measurement of the dimensions and other physical characteristics is dealt in _____.
a) Material handling b) Time study
c) Anthropometry d) Work sampling

11) Travel chart indicate _____.
a) Frequency of movement b) Ideal time of man & machine
c) Manual movement d) Repetitive movement

12) In MTM unit of time measurement is _____.
a) TMU b) Minutes
c) Centiminutes d) Hour

13) Which type of layout is used in ship building & air craft industry?
a) Product type layout b) Process type layout
c) Fixed type layout d) Group layout

14) Flow Process chart is used in _____.
a) Work sampling b) Method study
c) String diagram d) Micromotion study

SLR-QH-331

Seat No.	

Set S

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Industrial Engineering (BTN02504)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Solve any two questions from each section.
2) Figures to the right indicate full marks.
3) Use of calculator is allowed.
4) Assume additional suitable data, if necessary and mention it clearly.

Section – I

Q.2 **a)** What are the various types displays? Explain design consideration for operating the controls. **07**

b) Define Accident? Explain causes of accidents in short. **07**

Q.3 **a)** Write a short note on: **07**
i) String Diagram
ii) Two Handed Process Chart

b) Explain the steps of Method Study. What are the objectives of Method Study? **07**

Q.4 **a)** Define Productivity. Explain various factors affecting on Productivity. **07**

b) Explain the following: **07**
i) Gilbert Contribution
ii) F.W. Taylor Contribution

Section – II

Q.5 **a)** Write a short note on Performance Rating. What are the advantages? **07**

b) The element times (in minutes) for 4 cycle of an operation using a stop watch are presented below : **07**

Element	Cycle time in minutes			
	1	**2**	**3**	**4**
1	1.5	1.5	1.3	1.4
2	2.6	2.6	2.5	2.6
3	3.3	3.4	3.4	3.3
4	1.1	1.2	1.2	1.1
5	0.51	0.52	0.50	0.52

Calculate standard time for the operation if,

i) Element 2 and 4 are the machine element.
ii) For the other elements, the operator is rated at 100%.
iii) Total allowances are 14 % of the normal time.

Q.6 **a)** Write a short note on Selection of Material Handling Equipment's. **07**

b) Explain with neat sketch: **07**

1) Process Layout
2) Product Layout

Q.7 **a)** Define Job Evaluation. What are the objectives? Explain any one method in detail. **07**

b) Explain in brief about Job Analysis, Job Description and Job Specification. **07**

SLR-QH-333

Seat No.	

Set P

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Tool Engineering (BTN02515)

Day & Date: Tuesday, 12-05-2026 Max. Marks: 70
Time: 10:00 AM To 02:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions, if required and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Attempt the following single correct answer type questions. 14

1) Main purpose of punch holder plate _____. **01**
a) To guide punch
b) To press fit punch
c) Put on punch
d) To accommodate all punch

2) Blank size D in deep drawing is calculated based on _____. **01**
a) Radius on die
b) Product diameter and height
c) Die thickness
d) None of the above

3) Fixtures are used in connection with _____. **01**
a) drilling operation b) reaming operation
c) tapping operation d) milling operation

4) V-blocks (Vee locators) are used for clamping as well as locating when faces are inclined upto _____. **01**
a) 30° b) 12°
c) 9° d) 3°

5) $VT^n = C$ in this equation the value of n depends upon _____. **01**
a) Work material b) Tool material
c) Working conditions d) Type of chip produced

6) The cutting fluid mostly used for machining alloy steel is _____. **01**
a) water b) soluble oil
c) dry d) sulphurised mineral oil

7) Continuous chips are formed during machining of _____. **02**

a) medium carbon steel
b) brass
c) M.S.
d) Low carbon steel

8) Negative rakes are used for _____. **02**

a) Carbide tool
b) Heavy loads
c) Harder materials
d) Al - alloy

9) Jig and fixture are used for _____. **02**

a) Mass production
b) Increase machining accuracy
c) Only for batch production
d) None of these

10) A washer car be produced _____. **02**

a) Simple die
b) Progressive die
c) Compound die
d) Combination die

Seat No.	

Set **P**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Tool Engineering (BTN02515)

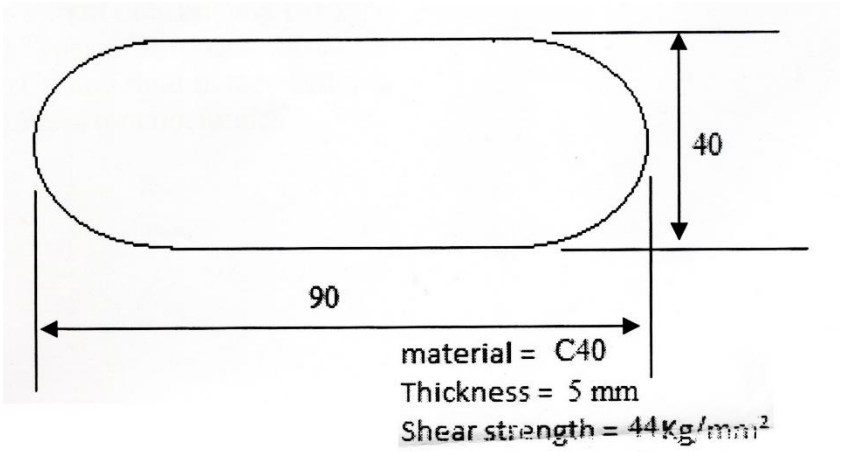
Day & Date: Tuesday, 12-05-2026 Max. Marks: 56
Time: 10:00 AM To 02:00 PM

Instructions: 1) Q. No.2 and Q. No.6 are compulsory.
2) Solve any two from Q. No. 3 to Q. No. 5 and Q. No. 7 to Q. No. 9 questions from each section.
3) Figures to right indicate full marks.
4) Make suitable assumptions if required and state it clearly.

SECTION – I

Q.2 Design press tool for the component shown in fig-I with following details. **14**

a) Cutting force
b) Punch and die size
c) Strip layout and % material utilization
d) Die clearance

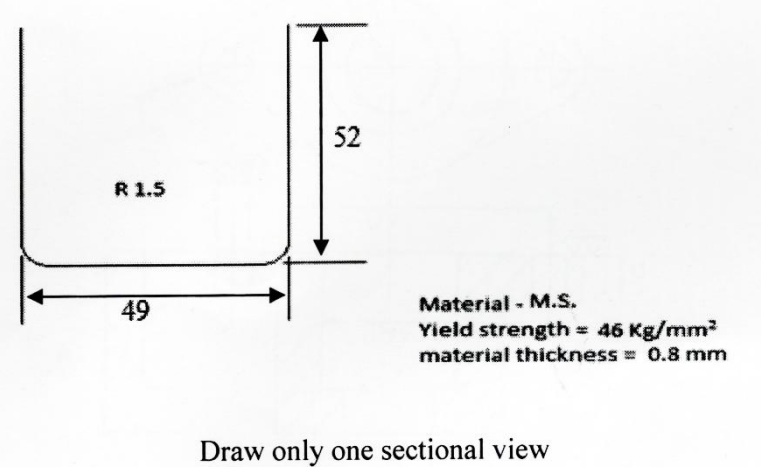


Draw only one sectional View

OR

Design a drawing tool for the component shown in fig- II and determine the following.

a) Blank size
b) No of draws
c) Ratio of draw
d) Die and punch clearance
e) Drawing force
f) Blanking holding force
g) Press capacity



Draw only one sectional view

Q.3 **a)** With neat sketch explain in brief about merchant circle. **04**

b) Prove that tan $\beta = \frac{r\cos\alpha}{1-r\sin\alpha}$ **03**

where $\beta =$ shear angle

$r =$ chip thickness ratio

$\propto =$ rake angle

Q.4 **a)** Define tool life. List factors affecting tool life explain in brief about tool failure criteria. **04**

d) Define the term machine-ability and list the factors on which machine-ability depends. **03**

Q.5 **Write a short note. (Any Two)** **07**

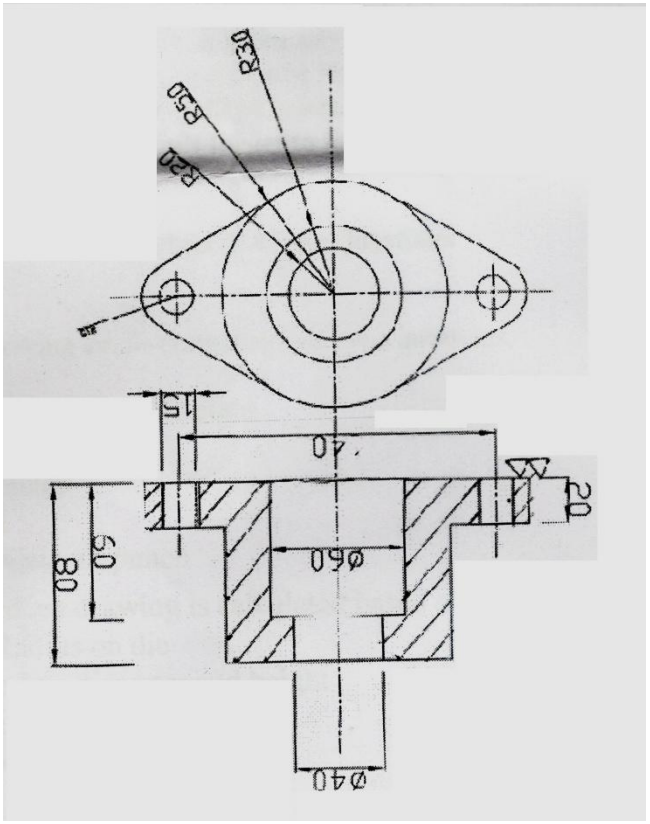
a) Types of strippers

b) Cutting fluid in metal cutting

c) Press tool operations

SECTION – II

Q.6 **a)** Design and draw drilling jig for drilling two holes of diameters 15 mm draw only one sectional view. **14**



OR

b) Design and draw milling fixture for ∗ ∇∇ marked surface as shown in above Fig.

Q.7 **a)** With neat sketch explain in brief about plane milling cutter Nomenclature and Geometry. **03**

b) Explain in brief about ASA and ORS system in metal cutting. **04**

Q.8 **a)** What is cost, how we can estimate cost and explain in brief about determination of sales prize? **04**

b) What do you know about EOQ explain with neat sketch? **03**

Q.9 **Write short notes on. (Any Two)** **07**

a) Fool proofing and redundant location

b) Diamond pin locator

c) B.E.A. analysis

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Tool Engineering (BTN02515)

Day & Date: Tuesday, 12-05-2026 Max. Marks: 70
Time: 10:00 AM To 02:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions, if required and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Attempt the following single correct answer type questions. 14

1) V-blocks (Vee locators) are used for clamping as well as locating when faces are inclined upto _____. **01**
a) 30° b) 12°
c) 9° d) 3°

2) $VT^n = C$ in this equation the value of n depends upon _____. **01**
a) Work material b) Tool material
c) Working conditions d) Type of chip produced

3) The cutting fluid mostly used for machining alloy steel is _____. **01**
a) water b) soluble oil
c) dry d) sulphurised mineral oil

4) Main purpose of punch holder plate _____. **01**
a) To guide punch
b) To press fit punch
c) Put on punch
d) To accommodate all punch

5) Blank size D in deep drawing is calculated based on _____. **01**
a) Radius on die
b) Product diameter and height
c) Die thickness
d) None of the above

6) Fixtures are used in connection with _____. **01**
a) drilling operation b) reaming operation
c) tapping operation d) milling operation

7) Continuous chips are formed during machining of _____. **02**

a) medium carbon steel
b) brass
c) M.S.
d) Low carbon steel

8) Negative rakes are used for _____. **02**

a) Carbide tool
b) Heavy loads
c) Harder materials
d) Al - alloy

9) Jig and fixture are used for _____. **02**

a) Mass production
b) Increase machining accuracy
c) Only for batch production
d) None of these

10) A washer car be produced _____. **02**

a) Simple die
b) Progressive die
c) Compound die
d) Combination die

Seat No.	

Set **Q**

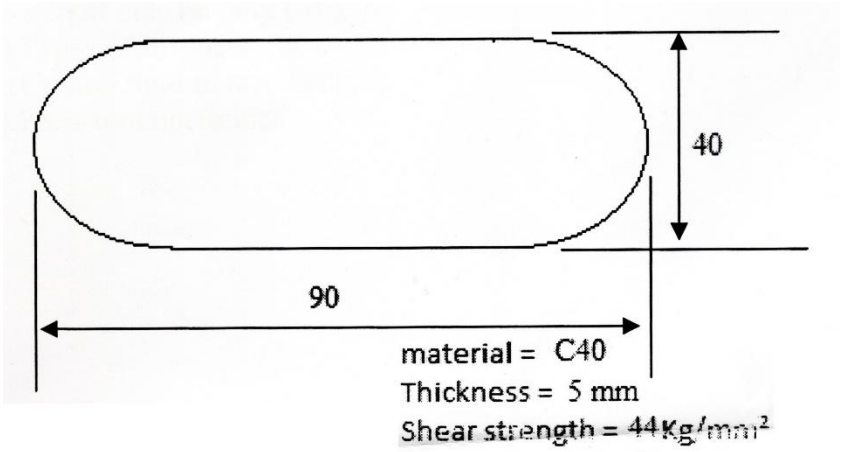
T.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Tool Engineering (BTN02515)

Day & Date: Tuesday, 12-05-2026 Max. Marks: 56
Time: 10:00 AM To 02:00 PM

Instructions: 1) Q. No.2 and Q. No.6 are compulsory.
2) Solve any two from Q. No. 3 to Q. No. 5 and Q. No. 7 to Q. No. 9 questions from each section.
3) Figures to right indicate full marks.
4) Make suitable assumptions if required and state it clearly.

SECTION – I

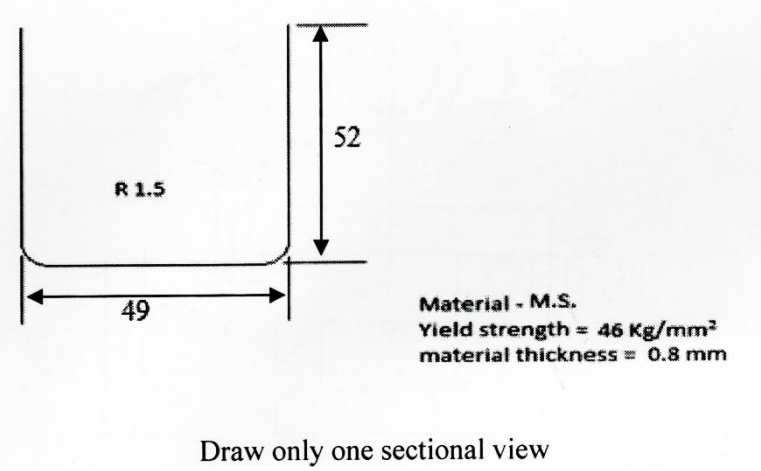
Q.2 Design press tool for the component shown in fig-I with following details. **14**
a) Cutting force
b) Punch and die size
c) Strip layout and % material utilization
d) Die clearance



Draw only one sectional View

OR

Design a drawing tool for the component shown in fig- II and determine the following.
a) Blank size
b) No of draws
c) Ratio of draw
d) Die and punch clearance
e) Drawing force
f) Blanking holding force
g) Press capacity



Draw only one sectional view

Q.3 **a)** With neat sketch explain in brief about merchant circle. **04**

b) Prove that tan $\beta = \frac{r\cos\alpha}{1-r\sin\alpha}$ **03**

where $\beta =$ shear angle

$r =$ chip thickness ratio

$\propto =$ rake angle

Q.4 **a)** Define tool life. List factors affecting tool life explain in brief about tool failure criteria. **04**

d) Define the term machine-ability and list the factors on which machine-ability depends. **03**

Q.5 **Write a short note. (Any Two)** **07**

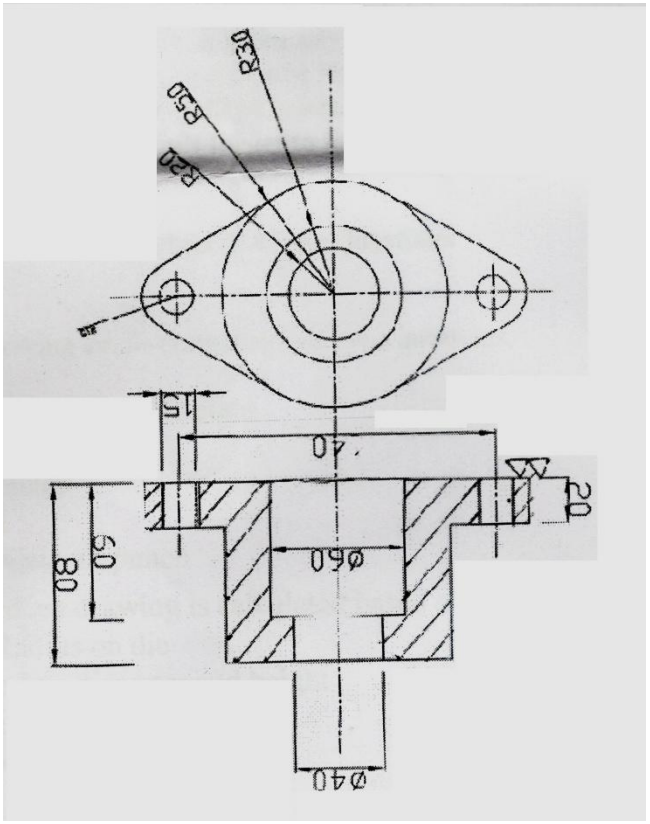
a) Types of strippers

b) Cutting fluid in metal cutting

c) Press tool operations

SECTION – II

Q.6 **a)** Design and draw drilling jig for drilling two holes of diameters 15 mm draw only one sectional view. **14**



OR

b) Design and draw milling fixture for ∗ ∇∇ marked surface as shown in above Fig.

Q.7 **a)** With neat sketch explain in brief about plane milling cutter Nomenclature and Geometry. **03**

b) Explain in brief about ASA and ORS system in metal cutting. **04**

Q.8 **a)** What is cost, how we can estimate cost and explain in brief about determination of sales prize? **04**

b) What do you know about EOQ explain with neat sketch? **03**

Q.9 **Write short notes on. (Any Two)** **07**

a) Fool proofing and redundant location

b) Diamond pin locator

c) B.E.A. analysis

Seat No.	

Set **R**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Tool Engineering (BTN02515)

Day & Date: Tuesday, 12-05-2026 Max. Marks: 70
Time: 10:00 AM To 02:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions, if required and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Attempt the following single correct answer type questions. 14

1) $VT^n = C$ in this equation the value of n depends upon _____. **01**
a) Work material b) Tool material
c) Working conditions d) Type of chip produced

2) The cutting fluid mostly used for machining alloy steel is _____. **01**
a) water b) soluble oil
c) dry d) sulphurised mineral oil

3) Main purpose of punch holder plate _____. **01**
a) To guide punch
b) To press fit punch
c) Put on punch
d) To accommodate all punch

4) Blank size D in deep drawing is calculated based on _____. **01**
a) Radius on die
b) Product diameter and height
c) Die thickness
d) None of the above

5) Fixtures are used in connection with _____. **01**
a) drilling operation b) reaming operation
c) tapping operation d) milling operation

6) V-blocks (Vee locators) are used for clamping as well as locating when faces are inclined upto _____. **01**
a) 30° b) 12°
c) 9° d) 3°

7) Continuous chips are formed during machining of _____. **02**

a) medium carbon steel
b) brass
c) M.S.
d) Low carbon steel

8) Negative rakes are used for _____. **02**

a) Carbide tool
b) Heavy loads
c) Harder materials
d) Al - alloy

9) Jig and fixture are used for _____. **02**

a) Mass production
b) Increase machining accuracy
c) Only for batch production
d) None of these

10) A washer car be produced _____. **02**

a) Simple die
b) Progressive die
c) Compound die
d) Combination die

Seat No.	

Set **R**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Tool Engineering (BTN02515)

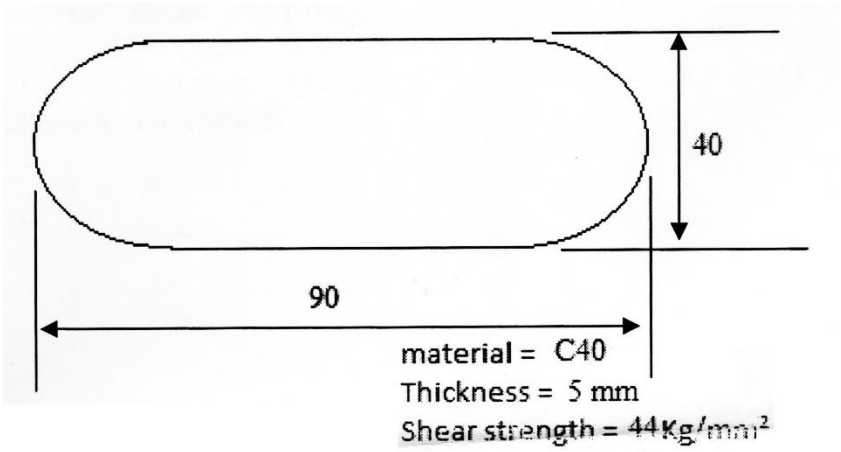
Day & Date: Tuesday, 12-05-2026 Max. Marks: 56
Time: 10:00 AM To 02:00 PM

Instructions: 1) Q. No.2 and Q. No.6 are compulsory.
2) Solve any two from Q. No. 3 to Q. No. 5 and Q. No. 7 to Q. No. 9 questions from each section.
3) Figures to right indicate full marks.
4) Make suitable assumptions if required and state it clearly.

SECTION – I

Q.2 Design press tool for the component shown in fig-I with following details. **14**

a) Cutting force
b) Punch and die size
c) Strip layout and % material utilization
d) Die clearance

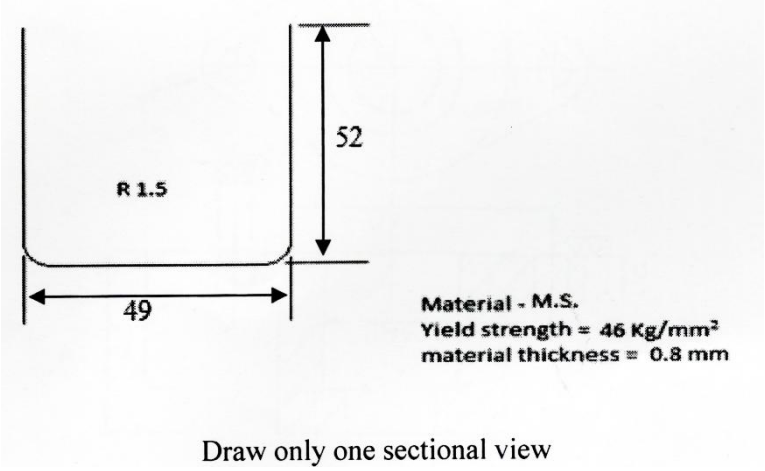


Draw only one sectional View

OR

Design a drawing tool for the component shown in fig- II and determine the following.

a) Blank size
b) No of draws
c) Ratio of draw
d) Die and punch clearance
e) Drawing force
f) Blanking holding force
g) Press capacity



Draw only one sectional view

Q.3 **a)** With neat sketch explain in brief about merchant circle. **04**

b) Prove that tan $\beta = \frac{r\cos\alpha}{1-r\sin\alpha}$ **03**

where $\beta =$ shear angle

$r =$ chip thickness ratio

$\propto =$ rake angle

Q.4 **a)** Define tool life. List factors affecting tool life explain in brief about tool failure criteria. **04**

d) Define the term machine-ability and list the factors on which machine-ability depends. **03**

Q.5 **Write a short note. (Any Two)** **07**

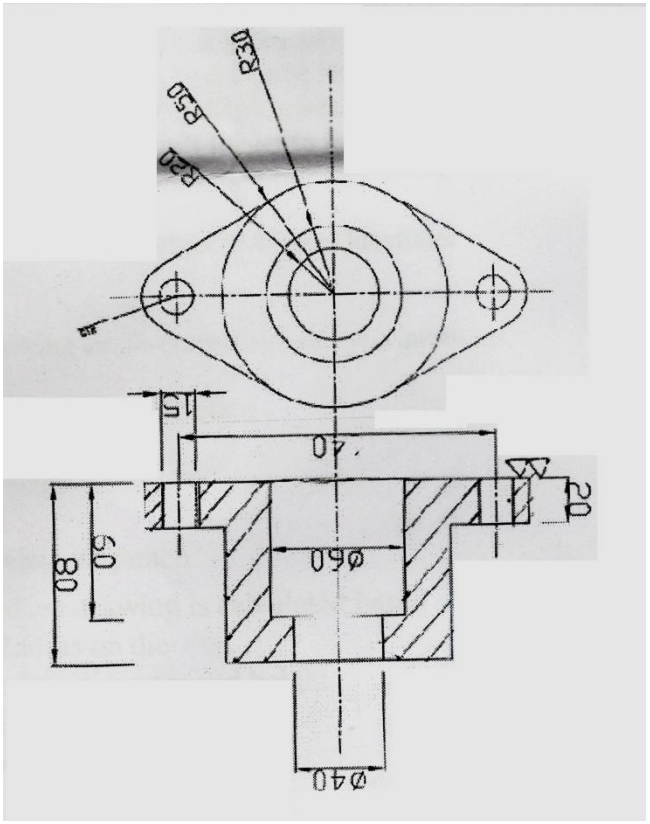
a) Types of strippers

b) Cutting fluid in metal cutting

c) Press tool operations

SECTION – II

Q.6 **a)** Design and draw drilling jig for drilling two holes of diameters 15 mm draw only one sectional view. **14**



OR

b) Design and draw milling fixture for ∗ ∇∇ marked surface as shown in above Fig.

Q.7 **a)** With neat sketch explain in brief about plane milling cutter Nomenclature and Geometry. **03**

b) Explain in brief about ASA and ORS system in metal cutting. **04**

Q.8 **a)** What is cost, how we can estimate cost and explain in brief about determination of sales prize? **04**

b) What do you know about EOQ explain with neat sketch? **03**

Q.9 **Write short notes on. (Any Two)** **07**

a) Fool proofing and redundant location

b) Diamond pin locator

c) B.E.A. analysis

Seat No.	

Set **S**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Tool Engineering (BTN02515)

Day & Date: Tuesday, 12-05-2026 Max. Marks: 70
Time: 10:00 AM To 02:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions, if required and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Attempt the following single correct answer type questions. **14**

1) The cutting fluid mostly used for machining alloy steel is _____. **01**
a) water b) soluble oil
c) dry d) sulphurised mineral oil

2) Main purpose of punch holder plate _____. **01**
a) To guide punch
b) To press fit punch
c) Put on punch
d) To accommodate all punch

3) Blank size D in deep drawing is calculated based on _____. **01**
a) Radius on die
b) Product diameter and height
c) Die thickness
d) None of the above

4) Fixtures are used in connection with _____. **01**
a) drilling operation b) reaming operation
c) tapping operation d) milling operation

5) V-blocks (Vee locators) are used for clamping as well as locating when faces are inclined upto _____. **01**
a) 30° b) 12°
c) 9° d) 3°

6) $VT^n = C$ in this equation the value of n depends upon _____. **01**
a) Work material b) Tool material
c) Working conditions d) Type of chip produced

7) Continuous chips are formed during machining of _____. **02**

a) medium carbon steel
b) brass
c) M.S.
d) Low carbon steel

8) Negative rakes are used for _____. **02**

a) Carbide tool
b) Heavy loads
c) Harder materials
d) Al - alloy

9) Jig and fixture are used for _____. **02**

a) Mass production
b) Increase machining accuracy
c) Only for batch production
d) None of these

10) A washer car be produced _____. **02**

a) Simple die
b) Progressive die
c) Compound die
d) Combination die

Seat No.	

Set **S**

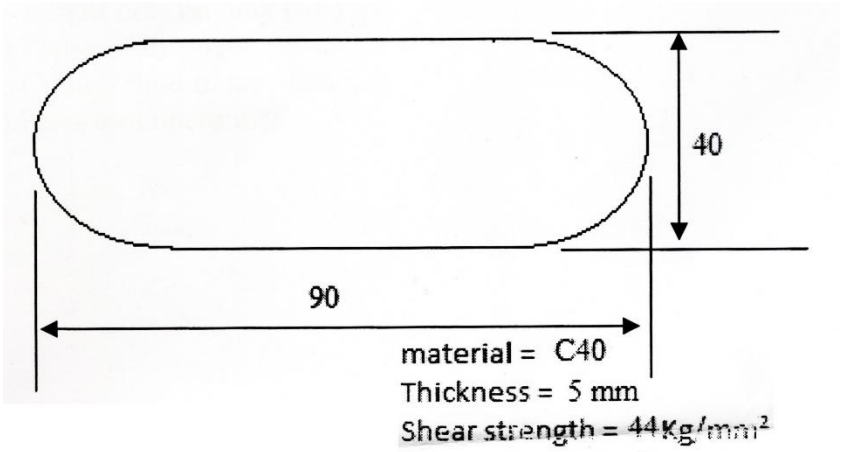
T.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Tool Engineering (BTN02515)

Day & Date: Tuesday, 12-05-2026 Max. Marks: 56
Time: 10:00 AM To 02:00 PM

Instructions: 1) Q. No.2 and Q. No.6 are compulsory.
2) Solve any two from Q. No. 3 to Q. No. 5 and Q. No. 7 to Q. No. 9 questions from each section.
3) Figures to right indicate full marks.
4) Make suitable assumptions if required and state it clearly.

SECTION – I

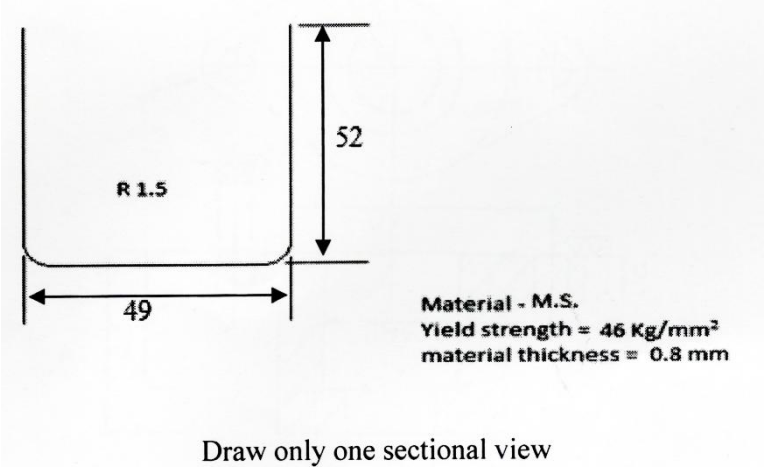
Q.2 Design press tool for the component shown in fig-I with following details. **14**
a) Cutting force
b) Punch and die size
c) Strip layout and % material utilization
d) Die clearance



Draw only one sectional View

OR

Design a drawing tool for the component shown in fig- II and determine the following.
a) Blank size
b) No of draws
c) Ratio of draw
d) Die and punch clearance
e) Drawing force
f) Blanking holding force
g) Press capacity



Draw only one sectional view

Q.3 **a)** With neat sketch explain in brief about merchant circle. **04**

b) Prove that tan $\beta = \frac{r\cos\alpha}{1-r\sin\alpha}$ **03**

where $\beta =$ shear angle

$r =$ chip thickness ratio

$\propto =$ rake angle

Q.4 **a)** Define tool life. List factors affecting tool life explain in brief about tool failure criteria. **04**

d) Define the term machine-ability and list the factors on which machine-ability depends. **03**

Q.5 **Write a short note. (Any Two)** **07**

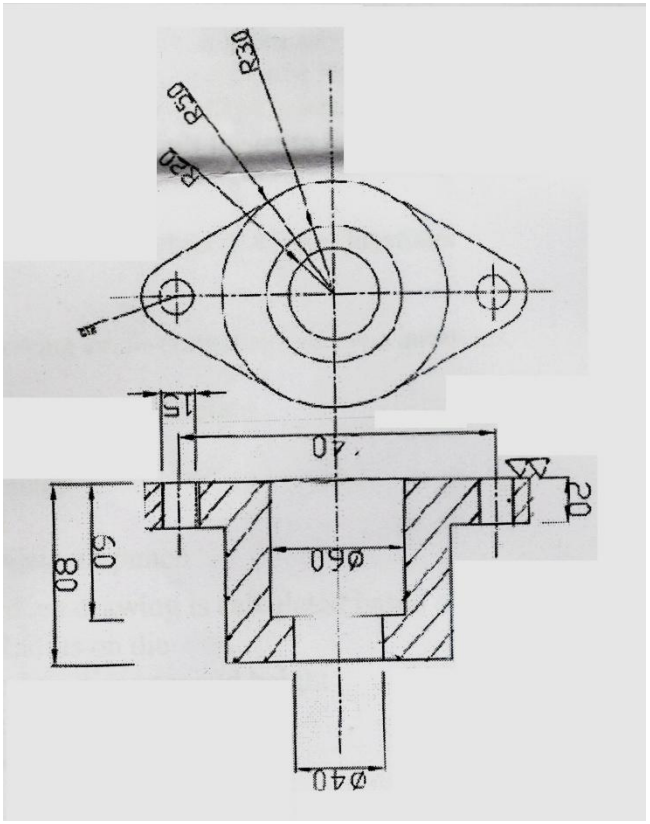
a) Types of strippers

b) Cutting fluid in metal cutting

c) Press tool operations

SECTION – II

Q.6 **a)** Design and draw drilling jig for drilling two holes of diameters 15 mm draw only one sectional view. **14**



OR

b) Design and draw milling fixture for ∗ ∇∇ marked surface as shown in above Fig.

Q.7 **a)** With neat sketch explain in brief about plane milling cutter Nomenclature and Geometry. **03**

b) Explain in brief about ASA and ORS system in metal cutting. **04**

Q.8 **a)** What is cost, how we can estimate cost and explain in brief about determination of sales prize? **04**

b) What do you know about EOQ explain with neat sketch? **03**

Q.9 **Write short notes on. (Any Two)** **07**

a) Fool proofing and redundant location

b) Diamond pin locator

c) B.E.A. analysis

SLR-QH-334

Seat No.		Set	P

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Industrial Hydraulics & Pneumatics (BTN02516)

Day & Date: Tuesday, 12-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Use of nonprogrammable calculator is allowed.
5) Assume suitable data if required & state it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 MCQ/Objective Type Questions: 14

1) The hydraulic system is _____.
a) less precise than pneumatic system
b) more precise than pneumatic system
c) both hydraulic and pneumatic systems are same on basis of precision
d) None of the above

2) Cushioning effect is concerned with _____.
a) Hydraulic system b) Pneumatic system
c) Both a) & b) d) None of the above

3) Quick exhaust valve is used for _____.
a) Single acting cylinder b) Double acting cylinder
c) Single/Double acting cylinder d) None of these

4) Which type of hydraulic cylinder has one piston connected to piston rod extended on both the sides of the cylinder?
a) telescopic cylinder b) tandem cylinder
c) both a) and b) d) None of the above

5) What is the difference between pressure relief valve and pressure reducing valve?
a) pressure reducing valve is connected between pump and tank line while pressure relief valve is connected between DCV and branch circuit
b) pressure relief valve is always normally opened
c) pressure reducing valve is connected between DCV and branch circuit while pressure relief valve is connected between pump and tank
d) None of these

6) In the hydraulic circuit, hydraulic cylinders can be operated sequentially using _____.

a) flow control valve
b) check valve
c) pressure relief valve
d) sequence valve

7) For controlling speed of forward stroke of the piston of pneumatic cylinder _____ should be preferred.

a) meter in circuit
b) meter out circuit
c) time delay circuit
d) None of these

8) The pressure sequence valve used in the pneumatic circuit is _____.

a) combination of adjustable pressure reducing valve and flow control valve
b) combination of adjustable pressure reducing valve and check valve
c) combination of the non-adjustable pressure relief valve and directional control valve
d) combination of the adjustable pressure relief valve and directional control valve

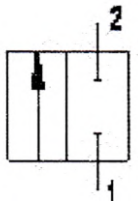
9) What is the function of a flow control valve?

a) flow control valve changes the direction of oil flow
b) flow control valve can adjust the flow rate of hydraulic oil
c) Both a) and b)
d) None of the above

10) Metallic seals are suitable for _____.

a) High pressure
b) High temperature
c) Extremely low temperature
d) All of the above

11) What is the name of the pneumatic valves?



a) Directional control valve
b) Roller valve
c) Pressure valve
d) Flow control valve

12) Which of the following is an element of time delay valve?

a) flow control valve
b) direction control valve
c) both a) and b)
d) None of the above

13) The air lubricator used to _____.

a) reduce wear on moving parts
b) reduce frictional losses
c) protect equipment from corrosion
d) all of the mentioned

14) Which of the following is a non-positive displacement pump?

a) Gear pump
b) Vane pump
c) Centrifugal pump
d) Reciprocating pump

Seat No.	

Set **P**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Industrial Hydraulics & Pneumatics (BTN02516)

Day & Date: Tuesday, 12-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Solve any Two questions from each section.
2) Figures to the right indicate full marks.
3) Assume additional suitable data if necessary and state it clearly.
4) Use of nonprogrammable calculator is allowed.

SECTION – I

Q.2	**a)**	Name any five basic components required in a hydraulic system and mention their functions.	**05**
	b)	State different types of accumulators. Explain weight loaded and spring loaded accumulators.	**05**
	c)	Illustrate with a neat sketch regenerative circuit.	**04**
Q.3	**a)**	With graphical symbol, explain construction and working the 4/3 direction control valve.	**05**
	b)	Differentiate between meter in and meter out circuit.	**05**
	c)	Classify actuators and explain any one type of hydraulic actuator in detail.	**04**
Q.4	**a)**	Explain with neat sketch sequencing circuit of double acting cylinder.	**05**
	b)	Explain construction and working of pilot operated pressure relief valve.	**05**
	c)	Draw the ISO symbol of the following: i) Pilot operated check valve ii) 4/2 DCV	**04**

SECTION – II

Q.5	**a)**	Differentiate features of hydraulic and pneumatic systems with mechanical systems.	**05**
	b)	Explain with neat sketch clamping circuit in pneumatics.	**05**
	c)	Explain pressure reducing valve with neat sketch.	**04**
Q.6	**a)**	How air compressor are classified. Discuss its selection criteria.	**05**
	b)	State types of rotary actuators. Explain in detail vane motor.	**05**
	c)	Explain Advantages & applications of pneumatic system.	**04**
Q.7	**a)**	Explain with neat sketch FRL unit used in pneumatic system.	**05**
	b)	Write a note on pneumatic power tools.	**05**
	c)	Illustrate with neat sketch time delay circuit.	**04**

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Industrial Hydraulics & Pneumatics (BTN02516)

Day & Date: Tuesday, 12-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Use of nonprogrammable calculator is allowed.
5) Assume suitable data if required & state it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

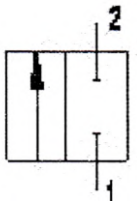
Q.1 MCQ/Objective Type Questions: 14

1) The pressure sequence valve used in the pneumatic circuit is _____.
a) combination of adjustable pressure reducing valve and flow control valve
b) combination of adjustable pressure reducing valve and check valve
c) combination of the non-adjustable pressure relief valve and directional control valve
d) combination of the adjustable pressure relief valve and directional control valve

2) What is the function of a flow control valve?
a) flow control valve changes the direction of oil flow
b) flow control valve can adjust the flow rate of hydraulic oil
c) Both a) and b)
d) None of the above

3) Metallic seals are suitable for _____.
a) High pressure b) High temperature
c) Extremely low temperature d) All of the above

4) What is the name of the pneumatic valves?



a) Directional control valve b) Roller valve
c) Pressure valve d) Flow control valve

5) Which of the following is an element of time delay valve?
a) flow control valve
b) direction control valve
c) both a) and b)
d) None of the above

6) The air lubricator used to _____.
a) reduce wear on moving parts
b) reduce frictional losses
c) protect equipment from corrosion
d) all of the mentioned

7) Which of the following is a non-positive displacement pump?
a) Gear pump
b) Vane pump
c) Centrifugal pump
d) Reciprocating pump

8) The hydraulic system is _____.
a) less precise than pneumatic system
b) more precise than pneumatic system
c) both hydraulic and pneumatic systems are same on basis of precision
d) None of the above

9) Cushioning effect is concerned with _____.
a) Hydraulic system
b) Pneumatic system
c) Both a) & b)
d) None of the above

10) Quick exhaust valve is used for _____.
a) Single acting cylinder
b) Double acting cylinder
c) Single/Double acting cylinder
d) None of these

11) Which type of hydraulic cylinder has one piston connected to piston rod extended on both the sides of the cylinder?
a) telescopic cylinder
b) tandem cylinder
c) both a) and b)
d) None of the above

12) What is the difference between pressure relief valve and pressure reducing valve?
a) pressure reducing valve is connected between pump and tank line while pressure relief valve is connected between DCV and branch circuit
b) pressure relief valve is always normally opened
c) pressure reducing valve is connected between DCV and branch circuit while pressure relief valve is connected between pump and tank
d) None of these

13) In the hydraulic circuit, hydraulic cylinders can be operated sequentially using _____.
a) flow control valve
b) check valve
c) pressure relief valve
d) sequence valve

14) For controlling speed of forward stroke of the piston of pneumatic cylinder _____ should be preferred.

a) meter in circuit
b) meter out circuit
c) time delay circuit
d) None of these

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Industrial Hydraulics & Pneumatics (BTN02516)

Day & Date: Tuesday, 12-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Solve any Two questions from each section.
2) Figures to the right indicate full marks.
3) Assume additional suitable data if necessary and state it clearly.
4) Use of nonprogrammable calculator is allowed.

SECTION – I

Q.2	**a)**	Name any five basic components required in a hydraulic system and mention their functions.	**05**
	b)	State different types of accumulators. Explain weight loaded and spring loaded accumulators.	**05**
	c)	Illustrate with a neat sketch regenerative circuit.	**04**
Q.3	**a)**	With graphical symbol, explain construction and working the 4/3 direction control valve.	**05**
	b)	Differentiate between meter in and meter out circuit.	**05**
	c)	Classify actuators and explain any one type of hydraulic actuator in detail.	**04**
Q.4	**a)**	Explain with neat sketch sequencing circuit of double acting cylinder.	**05**
	b)	Explain construction and working of pilot operated pressure relief valve.	**05**
	c)	Draw the ISO symbol of the following: i) Pilot operated check valve ii) 4/2 DCV	**04**

SECTION – II

Q.5	**a)**	Differentiate features of hydraulic and pneumatic systems with mechanical systems.	**05**
	b)	Explain with neat sketch clamping circuit in pneumatics.	**05**
	c)	Explain pressure reducing valve with neat sketch.	**04**
Q.6	**a)**	How air compressor are classified. Discuss its selection criteria.	**05**
	b)	State types of rotary actuators. Explain in detail vane motor.	**05**
	c)	Explain Advantages & applications of pneumatic system.	**04**
Q.7	**a)**	Explain with neat sketch FRL unit used in pneumatic system.	**05**
	b)	Write a note on pneumatic power tools.	**05**
	c)	Illustrate with neat sketch time delay circuit.	**04**

Seat No.		Set	R

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Industrial Hydraulics & Pneumatics (BTN02516)

Day & Date: Tuesday, 12-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

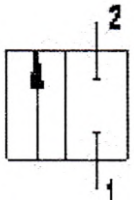
Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Use of nonprogrammable calculator is allowed.
5) Assume suitable data if required & state it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 MCQ/Objective Type Questions: 14

1) What is the name of the pneumatic valves?



a) Directional control valve b) Roller valve
c) Pressure valve d) Flow control valve

2) Which of the following is an element of time delay valve?
a) flow control valve b) direction control valve
c) both a) and b) d) None of the above

3) The air lubricator used to _____.
a) reduce wear on moving parts
b) reduce frictional losses
c) protect equipment from corrosion
d) all of the mentioned

4) Which of the following is a non-positive displacement pump?
a) Gear pump b) Vane pump
c) Centrifugal pump d) Reciprocating pump

5) The hydraulic system is _____.
a) less precise than pneumatic system
b) more precise than pneumatic system
c) both hydraulic and pneumatic systems are same on basis of precision
d) None of the above

6) Cushioning effect is concerned with _____.
   a) Hydraulic system
   b) Pneumatic system
   c) Both a) & b)
   d) None of the above

7) Quick exhaust valve is used for _____.
   a) Single acting cylinder
   b) Double acting cylinder
   c) Single/Double acting cylinder
   d) None of these

8) Which type of hydraulic cylinder has one piston connected to piston rod extended on both the sides of the cylinder?
   a) telescopic cylinder
   b) tandem cylinder
   c) both a) and b)
   d) None of the above

9) What is the difference between pressure relief valve and pressure reducing valve?
   a) pressure reducing valve is connected between pump and tank line while pressure relief valve is connected between DCV and branch circuit
   b) pressure relief valve is always normally opened
   c) pressure reducing valve is connected between DCV and branch circuit while pressure relief valve is connected between pump and tank
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10) In the hydraulic circuit, hydraulic cylinders can be operated sequentially using _____.
   a) flow control valve
   b) check valve
   c) pressure relief valve
   d) sequence valve

11) For controlling speed of forward stroke of the piston of pneumatic cylinder _____ should be preferred.
   a) meter in circuit
   b) meter out circuit
   c) time delay circuit
   d) None of these

12) The pressure sequence valve used in the pneumatic circuit is _____.
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   b) combination of adjustable pressure reducing valve and check valve
   c) combination of the non-adjustable pressure relief valve and directional control valve
   d) combination of the adjustable pressure relief valve and directional control valve

13) What is the function of a flow control valve?
   a) flow control valve changes the direction of oil flow
   b) flow control valve can adjust the flow rate of hydraulic oil
   c) Both a) and b)
   d) None of the above

14) Metallic seals are suitable for _____.

a) High pressure
b) High temperature
c) Extremely low temperature
d) All of the above

Seat No.	

Set **R**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Industrial Hydraulics & Pneumatics (BTN02516)

Day & Date: Tuesday, 12-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Solve any Two questions from each section.
2) Figures to the right indicate full marks.
3) Assume additional suitable data if necessary and state it clearly.
4) Use of nonprogrammable calculator is allowed.

SECTION – I

Q.2	**a)**	Name any five basic components required in a hydraulic system and mention their functions.	**05**
	b)	State different types of accumulators. Explain weight loaded and spring loaded accumulators.	**05**
	c)	Illustrate with a neat sketch regenerative circuit.	**04**
Q.3	**a)**	With graphical symbol, explain construction and working the 4/3 direction control valve.	**05**
	b)	Differentiate between meter in and meter out circuit.	**05**
	c)	Classify actuators and explain any one type of hydraulic actuator in detail.	**04**
Q.4	**a)**	Explain with neat sketch sequencing circuit of double acting cylinder.	**05**
	b)	Explain construction and working of pilot operated pressure relief valve.	**05**
	c)	Draw the ISO symbol of the following: i) Pilot operated check valve ii) 4/2 DCV	**04**

SECTION – II

Q.5	**a)**	Differentiate features of hydraulic and pneumatic systems with mechanical systems.	**05**
	b)	Explain with neat sketch clamping circuit in pneumatics.	**05**
	c)	Explain pressure reducing valve with neat sketch.	**04**
Q.6	**a)**	How air compressor are classified. Discuss its selection criteria.	**05**
	b)	State types of rotary actuators. Explain in detail vane motor.	**05**
	c)	Explain Advantages & applications of pneumatic system.	**04**
Q.7	**a)**	Explain with neat sketch FRL unit used in pneumatic system.	**05**
	b)	Write a note on pneumatic power tools.	**05**
	c)	Illustrate with neat sketch time delay circuit.	**04**

Seat No.		Set	S

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Industrial Hydraulics & Pneumatics (BTN02516)

Day & Date: Tuesday, 12-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

Duration: 30 Minutes Marks:14

Q.1 MCQ/Objective Type Questions: 14

1) In the hydraulic circuit, hydraulic cylinders can be operated sequentially using _____.
a) flow control valve b) check valve
c) pressure relief valve d) sequence valve

2) For controlling speed of forward stroke of the piston of pneumatic cylinder _____ should be preferred.
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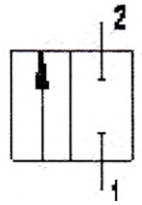
c) time delay circuit d) None of these

3) The pressure sequence valve used in the pneumatic circuit is _____.
a) combination of adjustable pressure reducing valve and flow control valve
b) combination of adjustable pressure reducing valve and check valve
c) combination of the non-adjustable pressure relief valve and directional control valve
d) combination of the adjustable pressure relief valve and directional control valve

4) What is the function of a flow control valve?
a) flow control valve changes the direction of oil flow
b) flow control valve can adjust the flow rate of hydraulic oil
c) Both a) and b)
d) None of the above

5) Metallic seals are suitable for _____.
a) High pressure b) High temperature
c) Extremely low temperature d) All of the above

6) What is the name of the pneumatic valves?



a) Directional control valve
b) Roller valve
c) Pressure valve
d) Flow control valve

7) Which of the following is an element of time delay valve?

a) flow control valve
b) direction control valve
c) both a) and b)
d) None of the above

8) The air lubricator used to _____.

a) reduce wear on moving parts
b) reduce frictional losses
c) protect equipment from corrosion
d) all of the mentioned

9) Which of the following is a non-positive displacement pump?

a) Gear pump
b) Vane pump
c) Centrifugal pump
d) Reciprocating pump

10) The hydraulic system is _____.

a) less precise than pneumatic system
b) more precise than pneumatic system
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d) None of the above

11) Cushioning effect is concerned with _____.

a) Hydraulic system
b) Pneumatic system
c) Both a) & b)
d) None of the above

12) Quick exhaust valve is used for _____.

a) Single acting cylinder
b) Double acting cylinder
c) Single/Double acting cylinder
d) None of these

13) Which type of hydraulic cylinder has one piston connected to piston rod extended on both the sides of the cylinder?

a) telescopic cylinder
b) tandem cylinder
c) both a) and b)
d) None of the above

14 What is the difference between pressure relief valve and pressure reducing valve?

a) pressure reducing valve is connected between pump and tank line while pressure relief valve is connected between DCV and branch circuit
b) pressure relief valve is always normally opened
c) pressure reducing valve is connected between DCV and branch circuit while pressure relief valve is connected between pump and tank
d) None of these

Seat No.	

Set **S**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Industrial Hydraulics & Pneumatics (BTN02516)

Day & Date: Tuesday, 12-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Solve any Two questions from each section.
2) Figures to the right indicate full marks.
3) Assume additional suitable data if necessary and state it clearly.
4) Use of nonprogrammable calculator is allowed.

SECTION – I

Q.2	**a)**	Name any five basic components required in a hydraulic system and mention their functions.	**05**
	b)	State different types of accumulators. Explain weight loaded and spring loaded accumulators.	**05**
	c)	Illustrate with a neat sketch regenerative circuit.	**04**
Q.3	**a)**	With graphical symbol, explain construction and working the 4/3 direction control valve.	**05**
	b)	Differentiate between meter in and meter out circuit.	**05**
	c)	Classify actuators and explain any one type of hydraulic actuator in detail.	**04**
Q.4	**a)**	Explain with neat sketch sequencing circuit of double acting cylinder.	**05**
	b)	Explain construction and working of pilot operated pressure relief valve.	**05**
	c)	Draw the ISO symbol of the following: i) Pilot operated check valve ii) 4/2 DCV	**04**

SECTION – II

Q.5	**a)**	Differentiate features of hydraulic and pneumatic systems with mechanical systems.	**05**
	b)	Explain with neat sketch clamping circuit in pneumatics.	**05**
	c)	Explain pressure reducing valve with neat sketch.	**04**
Q.6	**a)**	How air compressor are classified. Discuss its selection criteria.	**05**
	b)	State types of rotary actuators. Explain in detail vane motor.	**05**
	c)	Explain Advantages & applications of pneumatic system.	**04**
Q.7	**a)**	Explain with neat sketch FRL unit used in pneumatic system.	**05**
	b)	Write a note on pneumatic power tools.	**05**
	c)	Illustrate with neat sketch time delay circuit.	**04**

SLR-QH-336

Seat No.		Set	P

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Machine Vision (BTN02518)

Day & Date: Thursday, 14-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Select the correct alternative. **14**

1) An image which contains about 256 different intensity levels between black and white is a _____ image.
a) Color b) Binary
c) Grayscale d) Monochrome

2) The two most commonly used image sensors in modern cameras are _____.
a) CCD and CDI b) CCD and CMOS
c) CMOS and CDI d) RGB and HSV

3) Zero crossing of gradient represents location of corner in an image.
a) True b) False

4) Silhouette is obtained with back light source.
a) True b) False

5) Which of the following operation involves plotting an image histogram?
a) Corner detection b) Thresholding
c) Region growing d) None of the above

6) The process in which small part of image is compared with large image and located in large image, is called _____.
a) pattern recognition b) template matching
c) region growing d) split and merge technique

7) Charge to voltage converter for Individual pixel is employed in _____.
a) CCD camera b) CMOS camera
c) Vidicon Camera d) None of the above

8) Bin picking application of robot involves _____.
a) Identification and Servoing
b) Identification and inspection
c) Inspection and Servoing
d) None of the above

9) Seam tracking in continuous arc welding is an example of _____.
a) Visual servoing and navigation
b) Inspection
c) Identification
d) Inspection and identification

10) The application in which the purpose of machine vision system is to recognize and classify an object is called _____.
a) Inspection
b) Identification
c) Visual servoing and navigation
d) None of the above

11) Which of the following is a robot programming language _____.
a) SAIL b) MAIL
c) RAIL d) TAIL

12) An image which contains two distinct intensity levels between black and white is a _____ image.
a) Colour b) Grayscale
c) Binary d) Monochrome

13) The process of _____ is a technique which relates the location of pixels in the image array to the points in the scene.
a) Camera calibration b) Camera orientation
c) Camera adaptation d) Camera adjustment

14) The acronym AGV stands for _____.
a) Automatic Guided Vehicle b) Automated Guided Vehicle
c) Automated Gliding Vehicle d) Automatic Gliding Vehicle

Seat No.	

Set **P**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Machine Vision (BTN02518)

Day & Date: Thursday, 14-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Answer any two questions from Section I and Section II.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary and mention it clearly.
4) Use of non-programmable scientific calculator is allowed.

Section – I

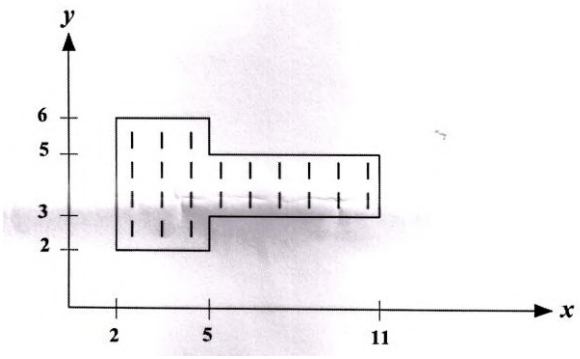
Q.2 **a)** With block diagram of Machine Vision system, state the objective of machine vision system. **07**

b) Explain with neat sketch successive approximation type AD converter. **07**

Q.3 **a)** Define an edge in an image and explain the process of edge detection. **07**

b) Discuss in detail image thresholding. **07**

Q.4 **a)** Determine the area, minimum aspect ratio, the diameter, perimeter, centroid and thinness measures of the image. **10**



b) Why do we need image processing? Explain. **04**

Section – II

Q.5 **a)** Explain the working of Harris corner detector. **07**

b) Draw neat sketch of CMOS image sensor and explain its working. **07**

Q.6 **a)** Explain in detail camera calibration. **07**

b) Explain in brief offline programming, teachthrough method and walkthrough method. **07**

Q.7 Write a short note on. (Any Three) **14**

a) Inspection application of machine vision in robotics.

b) Visual servoing and navigation application of machine vision in robotics.

c) Template matching

d) Image representation

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Machine Vision (BTN02518)

Day & Date: Thursday, 14-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Select the correct alternative. **14**

1) Bin picking application of robot involves _____.
a) Identification and Servoing
b) Identification and inspection
c) Inspection and Servoing
d) None of the above

2) Seam tracking in continuous arc welding is an example of _____.
a) Visual servoing and navigation
b) Inspection
c) Identification
d) Inspection and identification

3) The application in which the purpose of machine vision system is to recognize and classify an object is called _____.
a) Inspection
b) Identification
c) Visual servoing and navigation
d) None of the above

4) Which of the following is a robot programming language _____.
a) SAIL b) MAIL
c) RAIL d) TAIL

5) An image which contains two distinct intensity levels between black and white is a _____ image.
a) Colour b) Grayscale
c) Binary d) Monochrome

6) The process of _____ is a technique which relates the location of pixels in the image array to the points in the scene.
a) Camera calibration b) Camera orientation
c) Camera adaptation d) Camera adjustment

7) The acronym AGV stands for _____.
a) Automatic Guided Vehicle b) Automated Guided Vehicle
c) Automated Gliding Vehicle d) Automatic Gliding Vehicle

8) An image which contains about 256 different intensity levels between black and white is a _____ image.
a) Color b) Binary
c) Grayscale d) Monochrome

9) The two most commonly used image sensors in modern cameras are _____.
a) CCD and CDI b) CCD and CMOS
c) CMOS and CDI d) RGB and HSV

10) Zero crossing of gradient represents location of corner in an image.
a) True b) False

11) Silhouette is obtained with back light source.
a) True b) False

12) Which of the following operation involves plotting an image histogram?
a) Corner detection b) Thresholding
c) Region growing d) None of the above

13) The process in which small part of image is compared with large image and located in large image, is called _____.
a) pattern recognition b) template matching
c) region growing d) split and merge technique

14) Charge to voltage converter for Individual pixel is employed in _____.
a) CCD camera b) CMOS camera
c) Vidicon Camera d) None of the above

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Machine Vision (BTN02518)

Day & Date: Thursday, 14-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Answer any two questions from Section I and Section II.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary and mention it clearly.
4) Use of non-programmable scientific calculator is allowed.

Section – I

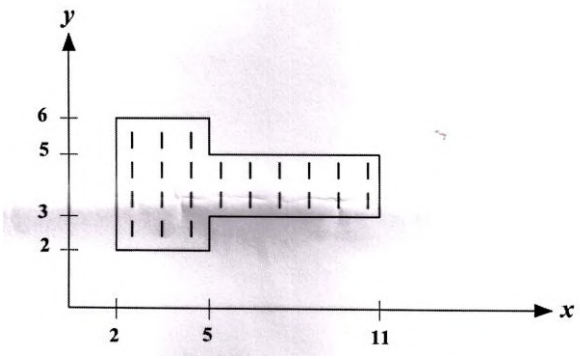
Q.2 **a)** With block diagram of Machine Vision system, state the objective of machine vision system. **07**

b) Explain with neat sketch successive approximation type AD converter. **07**

Q.3 **a)** Define an edge in an image and explain the process of edge detection. **07**

b) Discuss in detail image thresholding. **07**

Q.4 **a)** Determine the area, minimum aspect ratio, the diameter, perimeter, centroid and thinness measures of the image. **10**



b) Why do we need image processing? Explain. **04**

Section – II

Q.5 **a)** Explain the working of Harris corner detector. **07**

b) Draw neat sketch of CMOS image sensor and explain its working. **07**

Q.6 **a)** Explain in detail camera calibration. **07**

b) Explain in brief offline programming, teachthrough method and walkthrough method. **07**

Q.7 **Write a short note on. (Any Three)** **14**

a) Inspection application of machine vision in robotics.

b) Visual servoing and navigation application of machine vision in robotics.

c) Template matching

d) Image representation

Seat No.	

Set R

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Machine Vision (BTN02518)

Day & Date: Thursday, 14-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Select the correct alternative. **14**

1) Which of the following is a robot programming language _____.
a) SAIL b) MAIL
c) RAIL d) TAIL

2) An image which contains two distinct intensity levels between black and white is a _____ image.
a) Colour b) Grayscale
c) Binary d) Monochrome

3) The process of _____ is a technique which relates the location of pixels in the image array to the points in the scene.
a) Camera calibration b) Camera orientation
c) Camera adaptation d) Camera adjustment

4) The acronym AGV stands for _____.
a) Automatic Guided Vehicle b) Automated Guided Vehicle
c) Automated Gliding Vehicle d) Automatic Gliding Vehicle

5) An image which contains about 256 different intensity levels between black and white is a _____ image.
a) Color b) Binary
c) Grayscale d) Monochrome

6) The two most commonly used image sensors in modern cameras are _____.
a) CCD and CDI b) CCD and CMOS
c) CMOS and CDI d) RGB and HSV

7) Zero crossing of gradient represents location of corner in an image.
a) True b) False

8) Silhouette is obtained with back light source.
a) True b) False

9) Which of the following operation involves plotting an image histogram?
a) Corner detection b) Thresholding
c) Region growing d) None of the above

10) The process in which small part of image is compared with large image and located in large image, is called _____.
a) pattern recognition b) template matching
c) region growing d) split and merge technique

11) Charge to voltage converter for Individual pixel is employed in _____.
a) CCD camera b) CMOS camera
c) Vidicon Camera d) None of the above

12) Bin picking application of robot involves _____.
a) Identification and Servoing
b) Identification and inspection
c) Inspection and Servoing
d) None of the above

13) Seam tracking in continuous arc welding is an example of _____.
a) Visual servoing and navigation
b) Inspection
c) Identification
d) Inspection and identification

14) The application in which the purpose of machine vision system is to recognize and classify an object is called _____.
a) Inspection
b) Identification
c) Visual servoing and navigation
d) None of the above

Seat No.	

Set **R**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Machine Vision (BTN02518)

Day & Date: Thursday, 14-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Answer any two questions from Section I and Section II.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary and mention it clearly.
4) Use of non-programmable scientific calculator is allowed.

Section – I

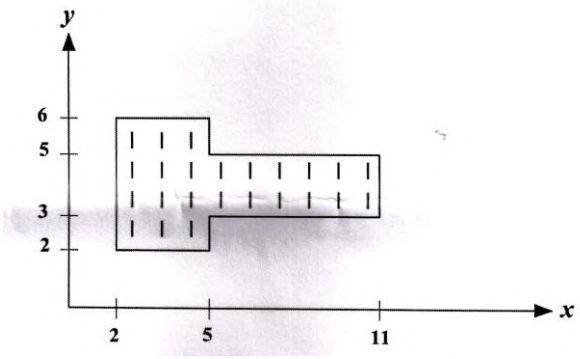
Q.2 **a)** With block diagram of Machine Vision system, state the objective of machine vision system. **07**

b) Explain with neat sketch successive approximation type AD converter. **07**

Q.3 **a)** Define an edge in an image and explain the process of edge detection. **07**

b) Discuss in detail image thresholding. **07**

Q.4 **a)** Determine the area, minimum aspect ratio, the diameter, perimeter, centroid and thinness measures of the image. **10**



b) Why do we need image processing? Explain. **04**

Section – II

Q.5 **a)** Explain the working of Harris corner detector. **07**

b) Draw neat sketch of CMOS image sensor and explain its working. **07**

Q.6 **a)** Explain in detail camera calibration. **07**

b) Explain in brief offline programming, teachthrough method and walkthrough method. **07**

Q.7 Write a short note on. (Any Three) **14**

a) Inspection application of machine vision in robotics.

b) Visual servoing and navigation application of machine vision in robotics.

c) Template matching

d) Image representation

Seat No.	

Set **S**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Machine Vision (BTN02518)

Day & Date: Thursday, 14-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Select the correct alternative. **14**

1) The process in which small part of image is compared with large image and located in large image, is called _____.
a) pattern recognition b) template matching
c) region growing d) split and merge technique

2) Charge to voltage converter for Individual pixel is employed in _____.
a) CCD camera b) CMOS camera
c) Vidicon Camera d) None of the above

3) Bin picking application of robot involves _____.
a) Identification and Servoing
b) Identification and inspection
c) Inspection and Servoing
d) None of the above

4) Seam tracking in continuous arc welding is an example of _____.
a) Visual servoing and navigation
b) Inspection
c) Identification
d) Inspection and identification

5) The application in which the purpose of machine vision system is to recognize and classify an object is called _____.
a) Inspection
b) Identification
c) Visual servoing and navigation
d) None of the above

6) Which of the following is a robot programming language _____.
a) SAIL b) MAIL
c) RAIL d) TAIL

7) An image which contains two distinct intensity levels between black and white is a _____ image.
a) Colour b) Grayscale
c) Binary d) Monochrome

8) The process of _____ is a technique which relates the location of pixels in the image array to the points in the scene.
a) Camera calibration b) Camera orientation
c) Camera adaptation d) Camera adjustment

9) The acronym AGV stands for _____.
a) Automatic Guided Vehicle b) Automated Guided Vehicle
c) Automated Gliding Vehicle d) Automatic Gliding Vehicle

10) An image which contains about 256 different intensity levels between black and white is a _____ image.
a) Color b) Binary
c) Grayscale d) Monochrome

11) The two most commonly used image sensors in modern cameras are _____.
a) CCD and CDI b) CCD and CMOS
c) CMOS and CDI d) RGB and HSV

12) Zero crossing of gradient represents location of corner in an image.
a) True b) False

13) Silhouette is obtained with back light source.
a) True b) False

14) Which of the following operation involves plotting an image histogram?
a) Corner detection b) Thresholding
c) Region growing d) None of the above

Seat No.	

Set **S**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Machine Vision (BTN02518)

Day & Date: Thursday, 14-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Answer any two questions from Section I and Section II.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary and mention it clearly.
4) Use of non-programmable scientific calculator is allowed.

Section – I

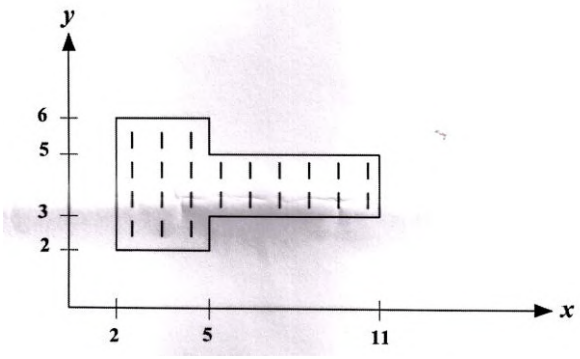
Q.2 **a)** With block diagram of Machine Vision system, state the objective of machine vision system. **07**

b) Explain with neat sketch successive approximation type AD converter. **07**

Q.3 **a)** Define an edge in an image and explain the process of edge detection. **07**

b) Discuss in detail image thresholding. **07**

Q.4 **a)** Determine the area, minimum aspect ratio, the diameter, perimeter, centroid and thinness measures of the image. **10**



b) Why do we need image processing? Explain. **04**

Section – II

Q.5 **a)** Explain the working of Harris corner detector. **07**

b) Draw neat sketch of CMOS image sensor and explain its working. **07**

Q.6 **a)** Explain in detail camera calibration. **07**

b) Explain in brief offline programming, teachthrough method and walkthrough method. **07**

Q.7 Write a short note on. (Any Three) **14**

a) Inspection application of machine vision in robotics.

b) Visual servoing and navigation application of machine vision in robotics.

c) Template matching

d) Image representation

SLR-QH-337

Seat No.		Set	P

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
3D Printing Material (BTN02519)

Day & Date: Thursday, 14-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.
5) Use of scientific calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which of the following is not Liquid-based RP system?
a) Stereolithography Apparatus (SLA)
b) Laminated Object Manufacturing (LOM)
c) Solid Ground Curing (SGC)
d) Solid Object Ultraviolet-Laser Printer (SOUP)

2) From following, the alternative name for RP is _____.
a) Additive Manufacturing b) Layer Manufacturing
c) Direct CAD Manufacturing d) All of the above

3) Which of the following is not subtractive process?
a) Milling b) Stereo-lithography
c) Sawing d) EDM

4) Which of the following aspects is mainly concerned with molding the final shape around the basic skeleton?
a) Functional aspect b) Operational aspect
c) Aesthetic aspect d) None of these

5) The STL files translate the part geometry from a CAD system to _____.
a) CNC machine b) CMM machine
c) RP machine d) CAPP machine

6) Which of the following addresses the need to design a product for safety?
a) Soft-Hard Review b) Effect Analysis
c) Experimental design d) None of these

7) The process of obtaining a geometric CAD model from 3D points acquired by scanning/digitizing existing parts/products is best known as _____.

a) Forward Engineering
b) Backward Engineering
c) Reverse Engineering
d) Product Engineering

8) In the entire reverse engineering process for product design, which one is the first step?

a) CAD model updating
b) CAD modeling
c) Data pre-processing
d) Data capturing

9) Which of the following RP system is not developed by 3D systems?

a) Selective Laser Sintering (SLS)
b) Multi-Jet Modeling System (MJM)
c) Paper Lamination Technology (PLT)
d) Stereolithography Apparatus (SLA)

10) Which of the following is used as base material in Stereolithography (SLA) process?

a) Thermoplastics, Metals powders
b) Thermoplastics, Eutectic metals
c) Photopolymer
d) Titanium alloys

11) What is the third step in Reverse Engineering?

a) Digitization of the object
b) Creation of CAD model
c) Prototype
d) None of these

12) Which of the following advantage does not possess by the rapid prototyping process over the traditional prototyping process?

a) It consumes less time
b) Gives better quality
c) Reduces product launch time
d) It's cheaper

13) Which of the following is the last step of the rapid prototyping process?

a) 3D Modeling
b) Data Conversion
c) Building
d) Postprocessing

14) Which of the following is the first step of the rapid prototyping process?

a) 3D Modeling
b) Data Conversion
c) Building
d) Postprocessing

Seat No.	

Set **P**

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
3D Printing Material (BTN02519)

Day & Date: Thursday, 14-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) In Section – I, Q. 2 is compulsory and attempt any two questions from the remaining questions.
2) In Section – II, Q. 6 is compulsory and attempt any two questions from the remaining questions.
3) Figures to the right indicate full marks.
4) Assume suitable data if required.
5) Use of scientific calculator is allowed.

Section – I

Q.2 Discuss various forms of raw material used in 3D Printing. **10**

Q.3 Enlist the different techniques to generate the powder. And explain with neat sketch Gas Atomization process. **09**

Q.4 Describe different application of 3D printing in the field of Medical, Aerospace and Automobile in detail. **09**

Q.5 What is meant by Performance Requirements in 3D printing? Discuss the significance of Performance Requirements to Material Requirements in 3D printing with example. **09**

Section – II

Q.6 Explain the product design concept with respect to 3D printing. **10**

Q.7 Compare Conventional Manufacturing Vs Additive Manufacturing. **09**

Q.8 Enlist different thermo plastic materials used in 3D Printer. Explain in detail applications and characteristics of any 2 materials. **09**

Q.9 Enlist different metal and alloy materials used in 3D Printer. Explain in detail applications and characteristics of any 03 metal and alloy materials. **09**

SLR-QH-337

Seat No.	

Set Q

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
3D Printing Material (BTN02519)

Day & Date: Thursday, 14-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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4) Make suitable assumptions if necessary and state them clearly.
5) Use of scientific calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) In the entire reverse engineering process for product design, which one is the first step?
a) CAD model updating b) CAD modeling
c) Data pre-processing d) Data capturing

2) Which of the following RP system is not developed by 3D systems?
a) Selective Laser Sintering (SLS)
b) Multi-Jet Modeling System (MJM)
c) Paper Lamination Technology (PLT)
d) Stereolithography Apparatus (SLA)

3) Which of the following is used as base material in Stereolithography (SLA) process?
a) Thermoplastics, Metals powders
b) Thermoplastics, Eutectic metals
c) Photopolymer
d) Titanium alloys

4) What is the third step in Reverse Engineering?
a) Digitization of the object b) Creation of CAD model
c) Prototype d) None of these

5) Which of the following advantage does not possess by the rapid prototyping process over the traditional prototyping process?
a) It consumes less time
b) Gives better quality
c) Reduces product launch time
d) It's cheaper

6) Which of the following is the last step of the rapid prototyping process?
a) 3D Modeling
b) Data Conversion
c) Building
d) Postprocessing

7) Which of the following is the first step of the rapid prototyping process?
a) 3D Modeling
b) Data Conversion
c) Building
d) Postprocessing

8) Which of the following is not Liquid-based RP system?
a) Stereolithography Apparatus (SLA)
b) Laminated Object Manufacturing (LOM)
c) Solid Ground Curing (SGC)
d) Solid Object Ultraviolet-Laser Printer (SOUP)

9) From following, the alternative name for RP is _____.
a) Additive Manufacturing
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d) All of the above

10) Which of the following is not subtractive process?
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c) Sawing
d) EDM

11) Which of the following aspects is mainly concerned with molding the final shape around the basic skeleton?
a) Functional aspect
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d) None of these

12) The STL files translate the part geometry from a CAD system to _____.
a) CNC machine
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c) RP machine
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13) Which of the following addresses the need to design a product for safety?
a) Soft-Hard Review
b) Effect Analysis
c) Experimental design
d) None of these

14) The process of obtaining a geometric CAD model from 3D points acquired by scanning/digitizing existing parts/products is best known as _____.
a) Forward Engineering
b) Backward Engineering
c) Reverse Engineering
d) Product Engineering

SLR-QH-337

Seat No.	

Set Q

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
3D Printing Material (BTN02519)

Day & Date: Thursday, 14-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) In Section – I, Q. 2 is compulsory and attempt any two questions from the remaining questions.
2) In Section – II, Q. 6 is compulsory and attempt any two questions from the remaining questions.
3) Figures to the right indicate full marks.
4) Assume suitable data if required.
5) Use of scientific calculator is allowed.

Section – I

Q.2 Discuss various forms of raw material used in 3D Printing. **10**

Q.3 Enlist the different techniques to generate the powder. And explain with neat sketch Gas Atomization process. **09**

Q.4 Describe different application of 3D printing in the field of Medical, Aerospace and Automobile in detail. **09**

Q.5 What is meant by Performance Requirements in 3D printing? Discuss the significance of Performance Requirements to Material Requirements in 3D printing with example. **09**

Section – II

Q.6 Explain the product design concept with respect to 3D printing. **10**

Q.7 Compare Conventional Manufacturing Vs Additive Manufacturing. **09**

Q.8 Enlist different thermo plastic materials used in 3D Printer. Explain in detail applications and characteristics of any 2 materials. **09**

Q.9 Enlist different metal and alloy materials used in 3D Printer. Explain in detail applications and characteristics of any 03 metal and alloy materials. **09**

Seat No.	

Set **R**

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
3D Printing Material (BTN02519)

Day & Date: Thursday, 14-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.
5) Use of scientific calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) What is the third step in Reverse Engineering?
a) Digitization of the object
b) Creation of CAD model
c) Prototype
d) None of these

2) Which of the following advantage does not possess by the rapid prototyping process over the traditional prototyping process?
a) It consumes less time
b) Gives better quality
c) Reduces product launch time
d) It's cheaper

3) Which of the following is the last step of the rapid prototyping process?
a) 3D Modeling
b) Data Conversion
c) Building
d) Postprocessing

4) Which of the following is the first step of the rapid prototyping process?
a) 3D Modeling
b) Data Conversion
c) Building
d) Postprocessing

5) Which of the following is not Liquid-based RP system?
a) Stereolithography Apparatus (SLA)
b) Laminated Object Manufacturing (LOM)
c) Solid Ground Curing (SGC)
d) Solid Object Ultraviolet-Laser Printer (SOUP)

6) From following, the alternative name for RP is _____.
a) Additive Manufacturing b) Layer Manufacturing
c) Direct CAD Manufacturing d) All of the above

7) Which of the following is not subtractive process?
a) Milling b) Stereo-lithography
c) Sawing d) EDM

8) Which of the following aspects is mainly concerned with molding the final shape around the basic skeleton?
a) Functional aspect b) Operational aspect
c) Aesthetic aspect d) None of these

9) The STL files translate the part geometry from a CAD system to _____.
a) CNC machine b) CMM machine
c) RP machine d) CAPP machine

10) Which of the following addresses the need to design a product for safety?
a) Soft-Hard Review b) Effect Analysis
c) Experimental design d) None of these

11) The process of obtaining a geometric CAD model from 3D points acquired by scanning/digitizing existing parts/products is best known as _____.
a) Forward Engineering b) Backward Engineering
c) Reverse Engineering d) Product Engineering

12) In the entire reverse engineering process for product design, which one is the first step?
a) CAD model updating b) CAD modeling
c) Data pre-processing d) Data capturing

13) Which of the following RP system is not developed by 3D systems?
a) Selective Laser Sintering (SLS)
b) Multi-Jet Modeling System (MJM)
c) Paper Lamination Technology (PLT)
d) Stereolithography Apparatus (SLA)

14) Which of the following is used as base material in Stereolithography (SLA) process?
a) Thermoplastics, Metals powders
b) Thermoplastics, Eutectic metals
c) Photopolymer
d) Titanium alloys

SLR-QH-337

Seat No.	

Set R

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
3D Printing Material (BTN02519)

Day & Date: Thursday, 14-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) In Section – I, Q. 2 is compulsory and attempt any two questions from the remaining questions.
2) In Section – II, Q. 6 is compulsory and attempt any two questions from the remaining questions.
3) Figures to the right indicate full marks.
4) Assume suitable data if required.
5) Use of scientific calculator is allowed.

Section – I

Q.2 Discuss various forms of raw material used in 3D Printing. **10**

Q.3 Enlist the different techniques to generate the powder. And explain with neat sketch Gas Atomization process. **09**

Q.4 Describe different application of 3D printing in the field of Medical, Aerospace and Automobile in detail. **09**

Q.5 What is meant by Performance Requirements in 3D printing? Discuss the significance of Performance Requirements to Material Requirements in 3D printing with example. **09**

Section – II

Q.6 Explain the product design concept with respect to 3D printing. **10**

Q.7 Compare Conventional Manufacturing Vs Additive Manufacturing. **09**

Q.8 Enlist different thermo plastic materials used in 3D Printer. Explain in detail applications and characteristics of any 2 materials. **09**

Q.9 Enlist different metal and alloy materials used in 3D Printer. Explain in detail applications and characteristics of any 03 metal and alloy materials. **09**

Seat No.	

Set **S**

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
3D Printing Material (BTN02519)

Day & Date: Thursday, 14-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.
5) Use of scientific calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which of the following addresses the need to design a product for safety?
a) Soft-Hard Review b) Effect Analysis
c) Experimental design d) None of these

2) The process of obtaining a geometric CAD model from 3D points acquired by scanning/digitizing existing parts/products is best known as _____.
a) Forward Engineering b) Backward Engineering
c) Reverse Engineering d) Product Engineering

3) In the entire reverse engineering process for product design, which one is the first step?
a) CAD model updating b) CAD modeling
c) Data pre-processing d) Data capturing

4) Which of the following RP system is not developed by 3D systems?
a) Selective Laser Sintering (SLS)
b) Multi-Jet Modeling System (MJM)
c) Paper Lamination Technology (PLT)
d) Stereolithography Apparatus (SLA)

5) Which of the following is used as base material in Stereolithography (SLA) process?
a) Thermoplastics, Metals powders
b) Thermoplastics, Eutectic metals
c) Photopolymer
d) Titanium alloys

6) What is the third step in Reverse Engineering?
a) Digitization of the object
b) Creation of CAD model
c) Prototype
d) None of these

7) Which of the following advantage does not possess by the rapid prototyping process over the traditional prototyping process?
a) It consumes less time
b) Gives better quality
c) Reduces product launch time
d) It's cheaper

8) Which of the following is the last step of the rapid prototyping process?
a) 3D Modeling
b) Data Conversion
c) Building
d) Postprocessing

9) Which of the following is the first step of the rapid prototyping process?
a) 3D Modeling
b) Data Conversion
c) Building
d) Postprocessing

10) Which of the following is not Liquid-based RP system?
a) Stereolithography Apparatus (SLA)
b) Laminated Object Manufacturing (LOM)
c) Solid Ground Curing (SGC)
d) Solid Object Ultraviolet-Laser Printer (SOUP)

11) From following, the alternative name for RP is _____.
a) Additive Manufacturing
b) Layer Manufacturing
c) Direct CAD Manufacturing
d) All of the above

12) Which of the following is not subtractive process?
a) Milling
b) Stereo-lithography
c) Sawing
d) EDM

13) Which of the following aspects is mainly concerned with molding the final shape around the basic skeleton?
a) Functional aspect
b) Operational aspect
c) Aesthetic aspect
d) None of these

14) The STL files translate the part geometry from a CAD system to _____.
a) CNC machine
b) CMM machine
c) RP machine
d) CAPP machine

SLR-QH-337

Seat No.	

Set S

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
3D Printing Material (BTN02519)

Day & Date: Thursday, 14-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) In Section – I, Q. 2 is compulsory and attempt any two questions from the remaining questions.
2) In Section – II, Q. 6 is compulsory and attempt any two questions from the remaining questions.
3) Figures to the right indicate full marks.
4) Assume suitable data if required.
5) Use of scientific calculator is allowed.

Section – I

Q.2 Discuss various forms of raw material used in 3D Printing. **10**

Q.3 Enlist the different techniques to generate the powder. And explain with neat sketch Gas Atomization process. **09**

Q.4 Describe different application of 3D printing in the field of Medical, Aerospace and Automobile in detail. **09**

Q.5 What is meant by Performance Requirements in 3D printing? Discuss the significance of Performance Requirements to Material Requirements in 3D printing with example. **09**

Section – II

Q.6 Explain the product design concept with respect to 3D printing. **10**

Q.7 Compare Conventional Manufacturing Vs Additive Manufacturing. **09**

Q.8 Enlist different thermo plastic materials used in 3D Printer. Explain in detail applications and characteristics of any 2 materials. **09**

Q.9 Enlist different metal and alloy materials used in 3D Printer. Explain in detail applications and characteristics of any 03 metal and alloy materials. **09**

SLR-QH-338

Seat No.		Set	P

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Energy Conservation, Management and Audit (BTN02520)

Day & Date: Thursday, 14-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) The world's first 100% solar powered airport located at _____.
a) Cochin, Kerala b) Bengaluru, Karnataka
c) Chennai, Tamil Nadu d) Mumbai, Maharashtra

2) Which country has the largest share of the global coal reserves?
a) Russia b) China
c) USA d) India

3) Select the important factor for the site selection of a thermal power plant.
a) Distance from the populated area
b) Availability of fuel
c) Availability' of water
d) Cost of plant

4) Which of the following is highest contributor to the air pollution?
a) Carbon Monoxide b) Hydro Carbons
c) Sulphur Oxides d) Particulates

5) Kilowatt-hour (kWh) is a unit of?
a) Current b) Power
c) Energy d) Resistance

6) Recovery of waste heat from hot fluid to fluid is called _____.
a) thermo compressor b) waste heat recovery boiler
c) heat Pump d) economizer

7) Energy consumption per un _____.
a) Energy Ratio b) Energy intensity
c) Per capita consumption d) None

8) "The judicious and effective use of energy to maximize profits and enhance Competitive positions". This can be the definition of _____.
   a) Energy conservation
   b) Energy management
   c) Energy policy
   d) Energy Audit

9) Primary or final energy consumption means _____.
   a) Total energy demand of the country
   b) Energy demand for commercial purpose
   c) Energy demand for industrial purpose
   d) Energy demand of residential and municipal

10) Sunlight, air, soil, and water are examples of _____.
   a) Renewable resources
   b) Non- renewable resources
   c) Conventional resources
   d) Non-natural resources

11) Which of the following is not part of energy monitoring _____.
   a) data recording
   b) data analysis
   c) data reporting
   d) energy efficiency equipment financing

12) Which of the following is a disadvantage of most of the renewable energy Sources?
   a) Unreliable supply
   b) Highly polluting
   c) High waste disposal cost
   d) High running cost

13) Which is not a Primary energy resources _____.
   a) Petroleum products
   b) Electrical Energy
   c) Geothermal Energy
   d) Biomass like wood

14) Name the Act, which is proposed to bring the qualitative transformation of the electricity sector _____.
   a) Regulatory Commission Act 1998
   b) Indian Electricity Act 1910
   c) Supply Act 1948
   d) Electricity Act 2003

Seat No.	

Set **P**

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Energy Conservation, Management and Audit (BTN02520)

Day & Date: Thursday, 14-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Attempt any two questions from each section.
2) Figures to the right indicate full marks.
3) Assume suitable data if required.

Section – I

Q.2 Solve.

a) Why renewable energy is important? Discuss the relevance of renewable energy for national energy security policy. **07**

b) Describe Current energy scenario - World. **07**

Q.3 Solve.

a) Importance Energy Audit in Indian Industry. **07**

b) Why Pre-audit and Post-audit is important during Energy audit? **07**

Q.4 Answer the following questions. (Any Four) **14**

a) Write Standard Energy Audit Report Format.

b) Discuss Responsibilities of Energy Auditor.

c) Describe Current energy scenario - India.

d) Explain Preliminary Energy Audit.

e) Write a short note on Energy action Planning.

Section – II

Q.5 Solve.

a) Explain in detail direct method and indirect method for binding out boiler efficiency. **07**

b) Explain Energy Conservation opportunities in HVAC and Furnace. **07**

Q.6 Solve.

a) Explain Different Financial Analysis Techniques. **07**

b) What are the direct and indirect benefits of waste heat recovery? **07**

Q.7 Write Short Notes. (Any Four) **14**

a) Explain Energy Performance Assessment of pump.

b) List the energy saving opportunities in pumping system.

c) Time Value of Money.

d) Simple Payback Period.

e) Explain Energy Conservation opportunities in Steam System.

Seat No.	

Set **Q**

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Energy Conservation, Management and Audit (BTN02520)

Day & Date: Thursday, 14-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) "The judicious and effective use of energy to maximize profits and enhance Competitive positions". This can be the definition of _____.
a) Energy conservation b) Energy management
c) Energy policy d) Energy Audit

2) Primary or final energy consumption means _____.
a) Total energy demand of the country
b) Energy demand for commercial purpose
c) Energy demand for industrial purpose
d) Energy demand of residential and municipal

3) Sunlight, air, soil, and water are examples of _____.
a) Renewable resources b) Non- renewable resources
c) Conventional resources d) Non-natural resources

4) Which of the following is not part of energy monitoring _____.
a) data recording
b) data analysis
c) data reporting
d) energy efficiency equipment financing

5) Which of the following is a disadvantage of most of the renewable energy Sources?
a) Unreliable supply b) Highly polluting
c) High waste disposal cost d) High running cost

6) Which is not a Primary energy resources _____.
a) Petroleum products b) Electrical Energy
c) Geothermal Energy d) Biomass like wood

7) Name the Act, which is proposed to bring the qualitative transformation of the electricity sector _____.
   a) Regulatory Commission Act 1998
   b) Indian Electricity Act 1910
   c) Supply Act 1948
   d) Electricity Act 2003

8) The world's first 100% solar powered airport located at _____.
   a) Cochin, Kerala
   b) Bengaluru, Karnataka
   c) Chennai, Tamil Nadu
   d) Mumbai, Maharashtra

9) Which country has the largest share of the global coal reserves?
   a) Russia
   b) China
   c) USA
   d) India

10) Select the important factor for the site selection of a thermal power plant.
   a) Distance from the populated area
   b) Availability of fuel
   c) Availability' of water
   d) Cost of plant

11) Which of the following is highest contributor to the air pollution?
   a) Carbon Monoxide
   b) Hydro Carbons
   c) Sulphur Oxides
   d) Particulates

12) Kilowatt-hour (kWh) is a unit of?
   a) Current
   b) Power
   c) Energy
   d) Resistance

13) Recovery of waste heat from hot fluid to fluid is called _____.
   a) thermo compressor
   b) waste heat recovery boiler
   c) heat Pump
   d) economizer

14) Energy consumption per un _____.
   a) Energy Ratio
   b) Energy intensity
   c) Per capita consumption
   d) None

Seat No.	

Set **Q**

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Energy Conservation, Management and Audit (BTN02520)

Day & Date: Thursday, 14-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Attempt any two questions from each section.
2) Figures to the right indicate full marks.
3) Assume suitable data if required.

Section – I

Q.2 Solve.

a) Why renewable energy is important? Discuss the relevance of renewable energy for national energy security policy. **07**

b) Describe Current energy scenario - World. **07**

Q.3 Solve.

a) Importance Energy Audit in Indian Industry. **07**

b) Why Pre-audit and Post-audit is important during Energy audit? **07**

Q.4 Answer the following questions. (Any Four) **14**

a) Write Standard Energy Audit Report Format.

b) Discuss Responsibilities of Energy Auditor.

c) Describe Current energy scenario - India.

d) Explain Preliminary Energy Audit.

e) Write a short note on Energy action Planning.

Section – II

Q.5 Solve.

a) Explain in detail direct method and indirect method for binding out boiler efficiency. **07**

b) Explain Energy Conservation opportunities in HVAC and Furnace. **07**

Q.6 Solve.

a) Explain Different Financial Analysis Techniques. **07**

b) What are the direct and indirect benefits of waste heat recovery? **07**

Q.7 Write Short Notes. (Any Four) **14**

a) Explain Energy Performance Assessment of pump.

b) List the energy saving opportunities in pumping system.

c) Time Value of Money.

d) Simple Payback Period.

e) Explain Energy Conservation opportunities in Steam System.

Seat No.		Set	R

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Energy Conservation, Management and Audit (BTN02520)

Day & Date: Thursday, 14-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which of the following is not part of energy monitoring _____.
a) data recording
b) data analysis
c) data reporting
d) energy efficiency equipment financing

2) Which of the following is a disadvantage of most of the renewable energy Sources?
a) Unreliable supply b) Highly polluting
c) High waste disposal cost d) High running cost

3) Which is not a Primary energy resources _____.
a) Petroleum products b) Electrical Energy
c) Geothermal Energy d) Biomass like wood

4) Name the Act, which is proposed to bring the qualitative transformation of the electricity sector _____.
a) Regulatory Commission Act 1998
b) Indian Electricity Act 1910
c) Supply Act 1948
d) Electricity Act 2003

5) The world's first 100% solar powered airport located at _____.
a) Cochin, Kerala b) Bengaluru, Karnataka
c) Chennai, Tamil Nadu d) Mumbai, Maharashtra

6) Which country has the largest share of the global coal reserves?
a) Russia b) China
c) USA d) India

7) Select the important factor for the site selection of a thermal power plant.
a) Distance from the populated area
b) Availability of fuel
c) Availability' of water
d) Cost of plant

8) Which of the following is highest contributor to the air pollution?
a) Carbon Monoxide b) Hydro Carbons
c) Sulphur Oxides d) Particulates

9) Kilowatt-hour (kWh) is a unit of?
a) Current b) Power
c) Energy d) Resistance

10) Recovery of waste heat from hot fluid to fluid is called _____.
a) thermo compressor b) waste heat recovery boiler
c) heat Pump d) economizer

11) Energy consumption per un _____.
a) Energy Ratio b) Energy intensity
c) Per capita consumption d) None

12) "The judicious and effective use of energy to maximize profits and enhance Competitive positions". This can be the definition of _____.
a) Energy conservation b) Energy management
c) Energy policy d) Energy Audit

13) Primary or final energy consumption means _____.
a) Total energy demand of the country
b) Energy demand for commercial purpose
c) Energy demand for industrial purpose
d) Energy demand of residential and municipal

14) Sunlight, air, soil, and water are examples of _____.
a) Renewable resources b) Non- renewable resources
c) Conventional resources d) Non-natural resources

Seat No.	

Set **R**

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Energy Conservation, Management and Audit (BTN02520)

Day & Date: Thursday, 14-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Attempt any two questions from each section.
2) Figures to the right indicate full marks.
3) Assume suitable data if required.

Section – I

Q.2 Solve.

a) Why renewable energy is important? Discuss the relevance of renewable energy for national energy security policy. **07**

b) Describe Current energy scenario - World. **07**

Q.3 Solve.

a) Importance Energy Audit in Indian Industry. **07**

b) Why Pre-audit and Post-audit is important during Energy audit? **07**

Q.4 Answer the following questions. (Any Four) **14**

a) Write Standard Energy Audit Report Format.

b) Discuss Responsibilities of Energy Auditor.

c) Describe Current energy scenario - India.

d) Explain Preliminary Energy Audit.

e) Write a short note on Energy action Planning.

Section – II

Q.5 Solve.

a) Explain in detail direct method and indirect method for binding out boiler efficiency. **07**

b) Explain Energy Conservation opportunities in HVAC and Furnace. **07**

Q.6 Solve.

a) Explain Different Financial Analysis Techniques. **07**

b) What are the direct and indirect benefits of waste heat recovery? **07**

Q.7 Write Short Notes. (Any Four) **14**

a) Explain Energy Performance Assessment of pump.

b) List the energy saving opportunities in pumping system.

c) Time Value of Money.

d) Simple Payback Period.

e) Explain Energy Conservation opportunities in Steam System.

Seat No.		Set	S

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Energy Conservation, Management and Audit (BTN02520)

Day & Date: Thursday, 14-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Recovery of waste heat from hot fluid to fluid is called _____.
a) thermo compressor b) waste heat recovery boiler
c) heat Pump d) economizer

2) Energy consumption per un _____.
a) Energy Ratio b) Energy intensity
c) Per capita consumption d) None

3) "The judicious and effective use of energy to maximize profits and enhance Competitive positions". This can be the definition of _____.
a) Energy conservation b) Energy management
c) Energy policy d) Energy Audit

4) Primary or final energy consumption means _____.
a) Total energy demand of the country
b) Energy demand for commercial purpose
c) Energy demand for industrial purpose
d) Energy demand of residential and municipal

5) Sunlight, air, soil, and water are examples of _____.
a) Renewable resources b) Non- renewable resources
c) Conventional resources d) Non-natural resources

6) Which of the following is not part of energy monitoring _____.
a) data recording
b) data analysis
c) data reporting
d) energy efficiency equipment financing

7) Which of the following is a disadvantage of most of the renewable energy Sources?

a) Unreliable supply
b) Highly polluting
c) High waste disposal cost
d) High running cost

8) Which is not a Primary energy resources _____.

a) Petroleum products
b) Electrical Energy
c) Geothermal Energy
d) Biomass like wood

9) Name the Act, which is proposed to bring the qualitative transformation of the electricity sector _____.

a) Regulatory Commission Act 1998
b) Indian Electricity Act 1910
c) Supply Act 1948
d) Electricity Act 2003

10) The world's first 100% solar powered airport located at _____.

a) Cochin, Kerala
b) Bengaluru, Karnataka
c) Chennai, Tamil Nadu
d) Mumbai, Maharashtra

11) Which country has the largest share of the global coal reserves?

a) Russia
b) China
c) USA
d) India

12) Select the important factor for the site selection of a thermal power plant.

a) Distance from the populated area
b) Availability of fuel
c) Availability' of water
d) Cost of plant

13) Which of the following is highest contributor to the air pollution?

a) Carbon Monoxide
b) Hydro Carbons
c) Sulphur Oxides
d) Particulates

14) Kilowatt-hour (kWh) is a unit of?

a) Current
b) Power
c) Energy
d) Resistance

Seat No.	

Set **S**

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Energy Conservation, Management and Audit (BTN02520)

Day & Date: Thursday, 14-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Attempt any two questions from each section.
2) Figures to the right indicate full marks.
3) Assume suitable data if required.

Section – I

Q.2 Solve.

a) Why renewable energy is important? Discuss the relevance of renewable energy for national energy security policy. **07**

b) Describe Current energy scenario - World. **07**

Q.3 Solve.

a) Importance Energy Audit in Indian Industry. **07**

b) Why Pre-audit and Post-audit is important during Energy audit? **07**

Q.4 Answer the following questions. (Any Four) **14**

a) Write Standard Energy Audit Report Format.

b) Discuss Responsibilities of Energy Auditor.

c) Describe Current energy scenario - India.

d) Explain Preliminary Energy Audit.

e) Write a short note on Energy action Planning.

Section – II

Q.5 Solve.

a) Explain in detail direct method and indirect method for binding out boiler efficiency. **07**

b) Explain Energy Conservation opportunities in HVAC and Furnace. **07**

Q.6 Solve.

a) Explain Different Financial Analysis Techniques. **07**

b) What are the direct and indirect benefits of waste heat recovery? **07**

Q.7 Write Short Notes. (Any Four) **14**

a) Explain Energy Performance Assessment of pump.

b) List the energy saving opportunities in pumping system.

c) Time Value of Money.

d) Simple Payback Period.

e) Explain Energy Conservation opportunities in Steam System.

SLR-QH-339

Seat No.	

Set P

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Introduction to Electric and Hybrid Electric Vehicles (BTN02521)

Day & Date: Thursday, 14-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) In February 2019, the union Cabinet cleared RS 10,000- crore Programme under _____ Scheme.
a) FAME-II b) ARAI
c) NACP d) VRDE

2) For EV Specific energy limits _____.
a) Vehicle Specific Power b) Vehicle Cost
c) Vehicle Efficiency d) Vehicle Range

3) Gradeability is defined as the maximum angle that the vehicle can overcome in the whole speed range _____.
a) Grade b) raise
c) slope d) plan

4) In series hybrid vehicle is coupled with the internal combustion Engine to produce electricity for propulsion _____.
a) Diesel engine b) hydrogen engine
c) generator d) gas engine

5) Hybrid Vehicle converts energy that is normally lost through braking into electrical energy. What is the term is used for this recycling of energy?
a) Perpetual Motion b) Regenerative Braking
c) Kinetic Conversion d) Hybrid Alchemy

6) The frame of an induction motor is made of _____.
a) Silicon steel b) Aluminum
c) Stainless steel d) Cast iron

7) Which of the following is not type of hybrid vehicle?
a) Plug in Hybrid
b) Parallel Hybrid
c) Series Hybrid
d) Natural Gas for Vehicle

8) Which of the following has not effected in speed torque control of traction motor?
a) Voltage
b) Flux
c) Torque
d) none of these

9) Which one of the following methods would give a lower than the actual value of regulation of the alternator?
a) EMF method
b) ASA method
c) ZPF method
d) MMF method

10) Which starting method is the best method in Induction motor?
a) Reactance starting
b) Direct online starting
c) Star-Delta starting
d) Autotransformer starting

11) Which of the following motor can be referred as a universal motor?
a) Permanent magnet motor
b) DC shunt motor
c) DC series motor
d) DC compound motor

12) Type-A chopper is used for obtaining which type of mode?
a) Reverse motoring mode
b) Motoring mode
c) Reverse regenerative braking mode
d) Regenerative braking mode

13) Calculate the synchronous speed of three phase Induction Motor with four poles and 50Hz operating Supply _____.
a) 1000 rpm
b) 1200 rpm
c) 1500 rpm
d) 2000 rpm

14) Braking and Idling Losses are _____ in Urban driving even higher in more congested driving.
a) Extremely High
b) Extremely Low
c) Both a) & b)
d) Neither a) or b)

Seat No.	

Set **P**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Introduction to Electric and Hybrid Electric Vehicles (BTN02521)

Day & Date: Thursday, 14-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Attempt any two questions from section I & II.
2) Figures to the right indicate full marks.

Section – I

Q.2 **a)** Explain in short the history related scenarios for getting disappeared after short success in 1920 and resurge for Electric Vehicles. **08**

b) Distinguish between the fast charging and slow charging. **06**

Q.3 **a)** Explain the tractive effort and transmissoin requirements in Electric Vehicles. **08**

b) Discuss the Traction Motor Characteristics. **06**

Q.4 **a)** Explain with neat sketch of Plug-In Hybrid Electric Vehicle. **08**

b) Explain Parallel Hybrid Electric Drive train with neat Sketch. **06**

Section – II

Q.5 **a)** What is BLDC Motor? State advantages & disadvantages of BLDC Motors. **08**

b) Describe with neat sketch construction & working of DC Motor. **06**

Q.6 **a)** Explain the working principle and working of VFDs with a neat diagram, state the different advantages and limitations of VFDs. **08**

b) Discuss the principle operation of chopper also state the nature of output of current and voltage through waveform. **06**

Q.7 **a)** Define the following: **08**
i) Drive Cycle
ii) Energy efficiency
iii) Idling
iv) Deceleration

b) Explain the need of drive cycle and discuss about standard drive Cycle. **06**

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Introduction to Electric and Hybrid Electric Vehicles (BTN02521)

Day & Date: Thursday, 14-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which of the following has not effected in speed torque control of traction motor?
a) Voltage b) Flux
c) Torque d) none of these

2) Which one of the following methods would give a lower than the actual value of regulation of the alternator?
a) EMF method b) ASA method
c) ZPF method d) MMF method

3) Which starting method is the best method in Induction motor?
a) Reactance starting b) Direct online starting
c) Star-Delta starting d) Autotransformer starting

4) Which of the following motor can be referred as a universal motor?
a) Permanent magnet motor b) DC shunt motor
c) DC series motor d) DC compound motor

5) Type-A chopper is used for obtaining which type of mode?
a) Reverse motoring mode
b) Motoring mode
c) Reverse regenerative braking mode
d) Regenerative braking mode

6) Calculate the synchronous speed of three phase Induction Motor with four poles and 50Hz operating Supply _____.
a) 1000 rpm b) 1200 rpm
c) 1500 rpm d) 2000 rpm

7) Braking and Idling Losses are _____ in Urban driving even higher in more congested driving.
a) Extremely High b) Extremely Low
c) Both a) & b) d) Neither a) or b)

8) In February 2019, the union Cabinet cleared RS 10,000- crore Programme under _____ Scheme.
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c) NACP d) VRDE

9) For EV Specific energy limits _____.
a) Vehicle Specific Power b) Vehicle Cost
c) Vehicle Efficiency d) Vehicle Range

10) Gradeability is defined as the maximum angle that the vehicle can overcome in the whole speed range _____.
a) Grade b) raise
c) slope d) plan

11) In series hybrid vehicle is coupled with the internal combustion Engine to produce electricity for propulsion _____.
a) Diesel engine b) hydrogen engine
c) generator d) gas engine

12) Hybrid Vehicle converts energy that is normally lost through braking into electrical energy. What is the term is used for this recycling of energy?
a) Perpetual Motion b) Regenerative Braking
c) Kinetic Conversion d) Hybrid Alchemy

13) The frame of an induction motor is made of _____.
a) Silicon steel b) Aluminum
c) Stainless steel d) Cast iron

14) Which of the following is not type of hybrid vehicle?
a) Plug in Hybrid b) Parallel Hybrid
c) Series Hybrid d) Natural Gas for Vehicle

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Introduction to Electric and Hybrid Electric Vehicles (BTN02521)

Day & Date: Thursday, 14-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Attempt any two questions from section I & II.
2) Figures to the right indicate full marks.

Section – I

Q.2 **a)** Explain in short the history related scenarios for getting disappeared after short success in 1920 and resurge for Electric Vehicles. **08**

b) Distinguish between the fast charging and slow charging. **06**

Q.3 **a)** Explain the tractive effort and transmissoin requirements in Electric Vehicles. **08**

b) Discuss the Traction Motor Characteristics. **06**

Q.4 **a)** Explain with neat sketch of Plug-In Hybrid Electric Vehicle. **08**

b) Explain Parallel Hybrid Electric Drive train with neat Sketch. **06**

Section – II

Q.5 **a)** What is BLDC Motor? State advantages & disadvantages of BLDC Motors. **08**

b) Describe with neat sketch construction & working of DC Motor. **06**

Q.6 **a)** Explain the working principle and working of VFDs with a neat diagram, state the different advantages and limitations of VFDs. **08**

b) Discuss the principle operation of chopper also state the nature of output of current and voltage through waveform. **06**

Q.7 **a)** Define the following: **08**
i) Drive Cycle
ii) Energy efficiency
iii) Idling
iv) Deceleration

b) Explain the need of drive cycle and discuss about standard drive Cycle. **06**

Seat No.	

Set R

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Introduction to Electric and Hybrid Electric Vehicles (BTN02521)

Day & Date: Thursday, 14-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which of the following motor can be referred as a universal motor?
a) Permanent magnet motor b) DC shunt motor
c) DC series motor d) DC compound motor

2) Type-A chopper is used for obtaining which type of mode?
a) Reverse motoring mode
b) Motoring mode
c) Reverse regenerative braking mode
d) Regenerative braking mode

3) Calculate the synchronous speed of three phase Induction Motor with four poles and 50Hz operating Supply _____.
a) 1000 rpm b) 1200 rpm
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c) Both a) & b) d) Neither a) or b)

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6) For EV Specific energy limits _____.
a) Vehicle Specific Power b) Vehicle Cost
c) Vehicle Efficiency d) Vehicle Range

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10) The frame of an induction motor is made of _____.

a) Silicon steel b) Aluminum
c) Stainless steel d) Cast iron

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12) Which of the following has not effected in speed torque control of traction motor?

a) Voltage b) Flux
c) Torque d) none of these

13) Which one of the following methods would give a lower than the actual value of regulation of the alternator?

a) EMF method b) ASA method
c) ZPF method d) MMF method

14) Which starting method is the best method in Induction motor?

a) Reactance starting b) Direct online starting
c) Star-Delta starting d) Autotransformer starting

Seat No.	

Set **R**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Introduction to Electric and Hybrid Electric Vehicles (BTN02521)

Day & Date: Thursday, 14-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Attempt any two questions from section I & II.
2) Figures to the right indicate full marks.

Section – I

Q.2 **a)** Explain in short the history related scenarios for getting disappeared after short success in 1920 and resurge for Electric Vehicles. **08**

b) Distinguish between the fast charging and slow charging. **06**

Q.3 **a)** Explain the tractive effort and transmissoin requirements in Electric Vehicles. **08**

b) Discuss the Traction Motor Characteristics. **06**

Q.4 **a)** Explain with neat sketch of Plug-In Hybrid Electric Vehicle. **08**

b) Explain Parallel Hybrid Electric Drive train with neat Sketch. **06**

Section – II

Q.5 **a)** What is BLDC Motor? State advantages & disadvantages of BLDC Motors. **08**

b) Describe with neat sketch construction & working of DC Motor. **06**

Q.6 **a)** Explain the working principle and working of VFDs with a neat diagram, state the different advantages and limitations of VFDs. **08**

b) Discuss the principle operation of chopper also state the nature of output of current and voltage through waveform. **06**

Q.7 **a)** Define the following: **08**
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ii) Energy efficiency
iii) Idling
iv) Deceleration

b) Explain the need of drive cycle and discuss about standard drive Cycle. **06**

Seat No.	

Set **S**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Introduction to Electric and Hybrid Electric Vehicles (BTN02521)

Day & Date: Thursday, 14-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) The frame of an induction motor is made of _____.
a) Silicon steel b) Aluminum
c) Stainless steel d) Cast iron

2) Which of the following is not type of hybrid vehicle?
a) Plug in Hybrid b) Parallel Hybrid
c) Series Hybrid d) Natural Gas for Vehicle

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c) Kinetic Conversion d) Hybrid Alchemy

SLR-QH-339

Seat No.		Set	S

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Introduction to Electric and Hybrid Electric Vehicles (BTN02521)

Day & Date: Thursday, 14-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Attempt any two questions from section I & II.
2) Figures to the right indicate full marks.

Section – I

Q.2 **a)** Explain in short the history related scenarios for getting disappeared after short success in 1920 and resurge for Electric Vehicles. **08**

b) Distinguish between the fast charging and slow charging. **06**

Q.3 **a)** Explain the tractive effort and transmissoin requirements in Electric Vehicles. **08**

b) Discuss the Traction Motor Characteristics. **06**

Q.4 **a)** Explain with neat sketch of Plug-In Hybrid Electric Vehicle. **08**

b) Explain Parallel Hybrid Electric Drive train with neat Sketch. **06**

Section – II

Q.5 **a)** What is BLDC Motor? State advantages & disadvantages of BLDC Motors. **08**

b) Describe with neat sketch construction & working of DC Motor. **06**

Q.6 **a)** Explain the working principle and working of VFDs with a neat diagram, state the different advantages and limitations of VFDs. **08**

b) Discuss the principle operation of chopper also state the nature of output of current and voltage through waveform. **06**

Q.7 **a)** Define the following: **08**
i) Drive Cycle
ii) Energy efficiency
iii) Idling
iv) Deceleration

b) Explain the need of drive cycle and discuss about standard drive Cycle. **06**

SLR-QH-344

Seat No.	

Set P

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Professional Ethics & Human Value (BTN02512)

Day & Date: Sunday, 10-05-2026 Max. Marks: 50
Time: 10:00 AM To 12:00 PM

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

MCQ/Objective Type Questions

Duration: 20 Minutes Marks:10

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

1) Professional ethics primarily refers to _____.
a) Personal hobbies
b) Standards of behavior expected in a profession
c) Religious gridlines
d) Social media etiquette

2) Professional values are important because they _____.
a) Reduce work quality
b) Promote trust and credibility
c) Slow down productivity
d) Encourage personal gain

3) One of the basic desires of every human being is to be always ____.
a) Happy b) Sad
c) Laugh d) Earn money

4) _____ is defined as the duty, obligation or even authority.
a) Work b) Responsibility
c) Democracy d) Authority

5) The participation of human beings is seen in two forms _____.
a) Prosperity & Work b) Behavior & Wealth
c) Behavior & Work d) Values & Understanding

6) Courage is the tendency to accept and face _____.
a) Self confidence
b) Physical courage
c) Risks and difficult tasks in rational ways
d) Social courage

7) Which value promotes treating everyone fairly?

a) Favoritism
b) Respect
c) Equality
d) Corruption

8) Which of the following best defines empathy?

a) Feeling superior to others
b) Understanding other's feelings
c) Ignoring emotional cues
d) Forcing opinions on people

9) Which of the following is a core professional value?

a) Integrity
b) Dishonesty
c) Bias
d) Manipulation

10) Value and skills should go hand in hand.

a) True
b) False
c) Can not tell
d) Wrong question

Seat No.	

Set **P**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Professional Ethics & Human Value (BTN02512)

Day & Date: Sunday, 10-05-2026 Max. Marks: 40
Time: 10:00 AM To 12:00 PM

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

Q.2 Explain in details the difference between Moral & Ethics. **10**

OR

Distinguish between Kohlberg's and Gilligan's approach to Ethical (Moral) Judgements.

Q.3 Explain the concept of Moral Courage. Why is moral courage necessary for upholding ethical values in challenges situations? **10**

OR

Explain the role of Engineer as Manager.

Q.4 **Write short notes on (Any Four)** **20**

a) Empathy as a professional value
b) Integrity on professional life
c) Plagiarism and intellectual honesty
d) Honesty
e) Respect for other
f) Character
g) Intellectual property rights

SLR-QH-344

Seat No.	

Set Q

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Professional Ethics & Human Value (BTN02512)

Day & Date: Sunday, 10-05-2026 Max. Marks: 50
Time: 10:00 AM To 12:00 PM

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

Duration: 20 Minutes Marks:10

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a) True b) False
c) Can not tell d) Wrong question

6) Professional ethics primarily refers to _____.
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b) Standards of behavior expected in a profession
c) Religious gridlines
d) Social media etiquette

7) Professional values are important because they _____.
a) Reduce work quality
b) Promote trust and credibility
c) Slow down productivity
d) Encourage personal gain

8) One of the basic desires of every human being is to be always ____.
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10) The participation of human beings is seen in two forms _____.
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Seat No.	

Set **Q**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Professional Ethics & Human Value (BTN02512)

Day & Date: Sunday, 10-05-2026 Max. Marks: 40
Time: 10:00 AM To 12:00 PM

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

Q.2 Explain in details the difference between Moral & Ethics. **10**

OR

Distinguish between Kohlberg's and Gilligan's approach to Ethical (Moral) Judgements.

Q.3 Explain the concept of Moral Courage. Why is moral courage necessary for upholding ethical values in challenges situations? **10**

OR

Explain the role of Engineer as Manager.

Q.4 **Write short notes on (Any Four)** **20**

a) Empathy as a professional value
b) Integrity on professional life
c) Plagiarism and intellectual honesty
d) Honesty
e) Respect for other
f) Character
g) Intellectual property rights

Seat No.	

Set **R**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Professional Ethics & Human Value (BTN02512)

Day & Date: Sunday, 10-05-2026 Max. Marks: 50
Time: 10:00 AM To 12:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 20 Minutes Marks:10

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

1) Which of the following is a core professional value?
a) Integrity b) Dishonesty
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   b) Understanding other's feelings
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Seat No.	

Set **R**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Professional Ethics & Human Value (BTN02512)

Day & Date: Sunday, 10-05-2026 Max. Marks: 40
Time: 10:00 AM To 12:00 PM

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a) Empathy as a professional value
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c) Plagiarism and intellectual honesty
d) Honesty
e) Respect for other
f) Character
g) Intellectual property rights

Seat No.	

Set | S

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Professional Ethics & Human Value (BTN02512)

Day & Date: Sunday, 10-05-2026 Max. Marks: 50
Time: 10:00 AM To 12:00 PM

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

MCQ/Objective Type Questions

Duration: 20 Minutes Marks:10

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

1) One of the basic desires of every human being is to be always ____.
a) Happy b) Sad
c) Laugh d) Earn money

2) _____ is defined as the duty, obligation or even authority.
a) Work b) Responsibility
c) Democracy d) Authority

3) The participation of human beings is seen in two forms _____.
a) Prosperity & Work b) Behavior & Wealth
c) Behavior & Work d) Values & Understanding

4) Courage is the tendency to accept and face _____.
a) Self confidence
b) Physical courage
c) Risks and difficult tasks in rational ways
d) Social courage

5) Which value promotes treating everyone fairly?
a) Favoritism b) Respect
c) Equality d) Corruption

6) Which of the following best defines empathy?
a) Feeling superior to others
b) Understanding other's feelings
c) Ignoring emotional cues
d) Forcing opinions on people

7) Which of the following is a core professional value?
a) Integrity
b) Dishonesty
c) Bias
d) Manipulation

8) Value and skills should go hand in hand.
a) True
b) False
c) Can not tell
d) Wrong question

9) Professional ethics primarily refers to _____.
a) Personal hobbies
b) Standards of behavior expected in a profession
c) Religious gridlines
d) Social media etiquette

10) Professional values are important because they _____.
a) Reduce work quality
b) Promote trust and credibility
c) Slow down productivity
d) Encourage personal gain

SLR-QH-344

Seat No.	

Set S

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Professional Ethics & Human Value (BTN02512)

Day & Date: Sunday, 10-05-2026 Max. Marks: 40
Time: 10:00 AM To 12:00 PM

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

Q.2 Explain in details the difference between Moral & Ethics. **10**

OR

Distinguish between Kohlberg's and Gilligan's approach to Ethical (Moral) Judgements.

Q.3 Explain the concept of Moral Courage. Why is moral courage necessary for upholding ethical values in challenges situations? **10**

OR

Explain the role of Engineer as Manager.

Q.4 Write short notes on (Any Four) **20**

a) Empathy as a professional value
b) Integrity on professional life
c) Plagiarism and intellectual honesty
d) Honesty
e) Respect for other
f) Character
g) Intellectual property rights

SLR-QH-345

Seat No.	

Set P

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Transmission System Design (MECHPCC-10)

Day & Date: Friday, 15-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. 14

1) Which type of gear has teeth parallel to the axis?
a) Helical b) Bevel
c) Spur d) Worm

2) The primary failure mode in spur gears due to repeated loading is _____.
a) Corrosion b) Fatigue
c) Wear d) Plastic deformation

3) Helical gears are preferred over spur gears because they _____.
a) Are cheaper b) Run smoothly
c) Have no thrust d) Are easier to manufacture

4) Helical gears produce which additional force component?
a) Radial b) Tangential
c) Axial d) Centrifugal

5) Worm gears are mainly used for _____.
a) High speed transmission b) Parallel shafts
c) Large speed reduction d) Low torque

6) In worm gear drives, efficiency decreases due to _____.
a) Impact loading b) Friction
c) Misalignment d) Vibration

7) Bevel gears are used to transmit motion between _____.
a) Parallel shafts b) Intersecting shafts
c) Skew shafts d) Flexible shafts

8) The pitch surface of bevel gears is _____.
a) Cylindrical b) Conical
c) Flat d) Spherical

9) Rolling contact bearings reduce friction by _____.
a) Sliding b) Rolling action
c) Lubrication only d) Magnetic effect

10) In a bearing no. 6310, the digit 6 designates _____.
a) Bore size b) Series of bearing
c) Type of bearing d) None of these

11) In uniform wear theory of clutch, the assumption is _____.
a) Pressure is constant b) Wear rate is constant
c) Temperature is constant d) Speed is constant

12) Bearing life is commonly expressed in terms of _____.
a) Time b) Speed
c) Number of revolutions d) Load cycles

13) Which property of bearing material allows it to accommodate small dirt particles without causing damage?
a) Hardness b) Embeddability
c) Fatigue strength d) Toughness

14) Which type of brake is commonly used in automobiles?
a) Band brake b) Disc brake
c) Cone brake d) Block brake

Seat No.	

Set **P**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Transmission System Design (MECHPCC-10)

Day & Date: Friday, 15-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Attempt any two questions from each Section I & II.
2) Figures to the right indicate full marks.
4) Assume suitable data if necessary and mention it clearly.

SECTION – I

Q.2 **a)** **Define the following** **03**
i) Beam strength of gear tooth
ii) Wear strength of gear tooth
iii) Gear ratio

b) What are the various types of gear tooth failures? State their causes and remedies. **04**

c) A 20° full-depth involute spur gears used to transmit 12 kW power from an electric motor running at 1440 rpm to machine running at 500 rpm. The number of teeth on pinion is 25. The pinion as well as the gear is made of alloy steel (Sut = 800 N/mm^2). The velocity factor is to be used to account for dynamic load. The service factor and factor of safety are 1.25 and 1.5 respectively. The face width of the gear is 10 times module. The gears are to be case hardened to 500 BHN. Design pair of gears. Assume velocity as 5 m/s. **07**

$Cv = 6/(6 + v), Y$ for 25 teeth $= 0.3393$

Q.3 **a)** Give the expression for virtual number of teeth for helical gears. **04**

b) Differentiate between spur gear and helical gear on the basis of design equations. **03**

c) A pair of parallel helical gears consists of a 20 teeth pinion meshing with a 100 teeth gear. The pinion rotates at 1440 rpm. The normal pressure angle is 20°, while the helix angle is 25°. The face width is 40 mm and the normal module is 4 mm. The pinion as well as the gear is made of steel 40C8 (Sut = 600 N/mm^2) and heat treated to a surface hardness of 300 BHN. The service factor and the factor of safety are 1.5 and 2 respectively. Assume that the velocity factor accounts for the dynamic load and calculate the power transmitting capacity of gears. Y27 = 0.3475 **07**

Q.4 **a)** A worm gear box with an effective surface area of 1.5 m^2 is operating in still air with a heat transfer coefficient of 16 W/m^2 °C. The temperature rise of the lubricating oil above the atmospheric temperature is limited to 50°C. The worm gears are designated as, $1/40/10/7$. The worm shaft is rotating at 1440 rpm and the normal pressure angle is 20°. Calculate power transmitting capacity based on the thermal considerations. Assume $\mu = 0.020$. **07**

b) A pair of worm and worm wheel is designated as $2/52/10/4$. The worm is transmitting 5 kW power at 1000 r.p.m. to the worm shaft. The coefficient of friction is 0.035 and the normal pressure angle is 20°. Calculate the tangential, axial and radial components of the resultant gear force acting on the worm and worm wheel. **07**

SECTION – II

Q.5 **a)** Explain the terminology for bevel gears. **04**

b) Explain the working principle of hydrodynamic bearing. **03**

c) A pair of straight bevel gears, mounted on shafts which are intersecting at right angles, consists of a 24 teeth pinion meshing with a 32 teeth gear. The pinion shaft is connected to an electric motor developing 12.5 kW rated power at 1440 rpm. The starting torque of the motor is 150% of the rated torque. The pressure angle is 20°. Both gears are made of case hardened steel (Sut = 750 N/mm^2). The teeth on gears are generated and finished by grinding and lapping processes to meet the requirements of Class-3 Grade. The factor of safety in the preliminary stages of gear design is 2. In the initial stages of gear design, assume that velocity factor accounts for the dynamic load and that the pitch line velocity is 7.5 m/s. Estimate the module based on beam strength and calculate the main dimensions. **07**

Q.6 **a)** Explain the step-by-step procedure for selecting a rolling contact bearing from a manufacturer's catalogue. **07**

b) A ball bearing is operating on a work cycle consisting of three parts - a radial load of 3500 N at 1440 rpm for one quarter cycle, a radial load of 5500 N at 720 rpm for one half cycle, and radial load of 3000 N at 1440 rpm for the remaining cycle. The expected life of the bearing is 12000 hrs. Calculate the dynamic load carrying capacity of the bearing. **07**

Q.7 **a)** A plate clutch consists of one pair of contacting surfaces. The inner and outer diameters of the friction disk are 100 and 200 mm respectively. The coefficient of friction is 0.2 and the permissible intensity of pressure is 1 N/mm^2. Assuming uniform-wear theory, calculate the power-transmitting capacity of the clutch at 1000 rpm. **07**

b) A solid cast iron disk, 1 m in diameter and 0.25 m thick, is used as a flywheel. It is rotating at 400 rpm. It is brought to rest in 1.5 s by means of a brake. 7200 kg/m3- density of cast iron. **07**

Calculate:

i) The energy absorbed by the brake; and

ii) The torque capacity of the brake

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Transmission System Design (MECHPCC-10)

Day & Date: Friday, 15-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) The pitch surface of bevel gears is _____.
a) Cylindrical b) Conical
c) Flat d) Spherical

2) Rolling contact bearings reduce friction by _____.
a) Sliding b) Rolling action
c) Lubrication only d) Magnetic effect

3) In a bearing no. 6310, the digit 6 designates _____.
a) Bore size b) Series of bearing
c) Type of bearing d) None of these

4) In uniform wear theory of clutch, the assumption is _____.
a) Pressure is constant b) Wear rate is constant
c) Temperature is constant d) Speed is constant

5) Bearing life is commonly expressed in terms of _____.
a) Time b) Speed
c) Number of revolutions d) Load cycles

6) Which property of bearing material allows it to accommodate small dirt particles without causing damage?
a) Hardness b) Embeddability
c) Fatigue strength d) Toughness

7) Which type of brake is commonly used in automobiles?
a) Band brake b) Disc brake
c) Cone brake d) Block brake

8) Which type of gear has teeth parallel to the axis?
a) Helical b) Bevel
c) Spur d) Worm

9) The primary failure mode in spur gears due to repeated loading is _____.
a) Corrosion b) Fatigue
c) Wear d) Plastic deformation

10) Helical gears are preferred over spur gears because they _____.
a) Are cheaper b) Run smoothly
c) Have no thrust d) Are easier to manufacture

11) Helical gears produce which additional force component?
a) Radial b) Tangential
c) Axial d) Centrifugal

12) Worm gears are mainly used for _____.
a) High speed transmission b) Parallel shafts
c) Large speed reduction d) Low torque

13) In worm gear drives, efficiency decreases due to _____.
a) Impact loading b) Friction
c) Misalignment d) Vibration

14) Bevel gears are used to transmit motion between _____.
a) Parallel shafts b) Intersecting shafts
c) Skew shafts d) Flexible shafts

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Transmission System Design (MECHPCC-10)

Day & Date: Friday, 15-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Attempt any two questions from each Section I & II.
2) Figures to the right indicate full marks.
4) Assume suitable data if necessary and mention it clearly.

SECTION – I

Q.2 **a)** **Define the following** **03**
i) Beam strength of gear tooth
ii) Wear strength of gear tooth
iii) Gear ratio

b) What are the various types of gear tooth failures? State their causes and remedies. **04**

c) A 20° full-depth involute spur gears used to transmit 12 kW power from an electric motor running at 1440 rpm to machine running at 500 rpm. The number of teeth on pinion is 25. The pinion as well as the gear is made of alloy steel (Sut = 800 N/mm^2). The velocity factor is to be used to account for dynamic load. The service factor and factor of safety are 1.25 and 1.5 respectively. The face width of the gear is 10 times module. The gears are to be case hardened to 500 BHN. Design pair of gears. Assume velocity as 5 m/s. **07**

$Cv = 6/(6 + v), Y$ for 25 teeth $= 0.3393$

Q.3 **a)** Give the expression for virtual number of teeth for helical gears. **04**

b) Differentiate between spur gear and helical gear on the basis of design equations. **03**

c) A pair of parallel helical gears consists of a 20 teeth pinion meshing with a 100 teeth gear. The pinion rotates at 1440 rpm. The normal pressure angle is 20°, while the helix angle is 25°. The face width is 40 mm and the normal module is 4 mm. The pinion as well as the gear is made of steel 40C8 (Sut = 600 N/mm^2) and heat treated to a surface hardness of 300 BHN. The service factor and the factor of safety are 1.5 and 2 respectively. Assume that the velocity factor accounts for the dynamic load and calculate the power transmitting capacity of gears. Y27 = 0.3475 **07**

Q.4 **a)** A worm gear box with an effective surface area of 1.5 m^2 is operating in still air with a heat transfer coefficient of 16 W/m^2 °C. The temperature rise of the lubricating oil above the atmospheric temperature is limited to 50°C. The worm gears are designated as, $1/40/10/7$. The worm shaft is rotating at 1440 rpm and the normal pressure angle is 20°. Calculate power transmitting capacity based on the thermal considerations. Assume $\mu = 0.020$. **07**

b) A pair of worm and worm wheel is designated as $2/52/10/4$. The worm is transmitting 5 kW power at 1000 r.p.m. to the worm shaft. The coefficient of friction is 0.035 and the normal pressure angle is 20°. Calculate the tangential, axial and radial components of the resultant gear force acting on the worm and worm wheel. **07**

SECTION – II

Q.5 **a)** Explain the terminology for bevel gears. **04**

b) Explain the working principle of hydrodynamic bearing. **03**

c) A pair of straight bevel gears, mounted on shafts which are intersecting at right angles, consists of a 24 teeth pinion meshing with a 32 teeth gear. The pinion shaft is connected to an electric motor developing 12.5 kW rated power at 1440 rpm. The starting torque of the motor is 150% of the rated torque. The pressure angle is 20°. Both gears are made of case hardened steel (Sut = 750 N/mm^2). The teeth on gears are generated and finished by grinding and lapping processes to meet the requirements of Class-3 Grade. The factor of safety in the preliminary stages of gear design is 2. In the initial stages of gear design, assume that velocity factor accounts for the dynamic load and that the pitch line velocity is 7.5 m/s. Estimate the module based on beam strength and calculate the main dimensions. **07**

Q.6 **a)** Explain the step-by-step procedure for selecting a rolling contact bearing from a manufacturer's catalogue. **07**

b) A ball bearing is operating on a work cycle consisting of three parts - a radial load of 3500 N at 1440 rpm for one quarter cycle, a radial load of 5500 N at 720 rpm for one half cycle, and radial load of 3000 N at 1440 rpm for the remaining cycle. The expected life of the bearing is 12000 hrs. Calculate the dynamic load carrying capacity of the bearing. **07**

Q.7 **a)** A plate clutch consists of one pair of contacting surfaces. The inner and outer diameters of the friction disk are 100 and 200 mm respectively. The coefficient of friction is 0.2 and the permissible intensity of pressure is 1 N/mm^2. Assuming uniform-wear theory, calculate the power-transmitting capacity of the clutch at 1000 rpm. **07**

b) A solid cast iron disk, 1 m in diameter and 0.25 m thick, is used as a flywheel. It is rotating at 400 rpm. It is brought to rest in 1.5 s by means of a brake. 7200 kg/m3- density of cast iron. **07**

Calculate:

i) The energy absorbed by the brake; and

ii) The torque capacity of the brake

SLR-QH-345

Seat No.	

Set R

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Transmission System Design (MECHPCC-10)

Day & Date: Friday, 15-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. 14

1) In uniform wear theory of clutch, the assumption is _____.
a) Pressure is constant b) Wear rate is constant
c) Temperature is constant d) Speed is constant

2) Bearing life is commonly expressed in terms of _____.
a) Time b) Speed
c) Number of revolutions d) Load cycles

3) Which property of bearing material allows it to accommodate small dirt particles without causing damage?
a) Hardness b) Embeddability
c) Fatigue strength d) Toughness

4) Which type of brake is commonly used in automobiles?
a) Band brake b) Disc brake
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5) Which type of gear has teeth parallel to the axis?
a) Helical b) Bevel
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6) The primary failure mode in spur gears due to repeated loading is _____.
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7) Helical gears are preferred over spur gears because they _____.
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8) Helical gears produce which additional force component?
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9) Worm gears are mainly used for _____.
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c) Large speed reduction d) Low torque

10) In worm gear drives, efficiency decreases due to _____.
a) Impact loading b) Friction
c) Misalignment d) Vibration

11) Bevel gears are used to transmit motion between _____.
a) Parallel shafts b) Intersecting shafts
c) Skew shafts d) Flexible shafts

12) The pitch surface of bevel gears is _____.
a) Cylindrical b) Conical
c) Flat d) Spherical

13) Rolling contact bearings reduce friction by _____.
a) Sliding b) Rolling action
c) Lubrication only d) Magnetic effect

14) In a bearing no. 6310, the digit 6 designates _____.
a) Bore size b) Series of bearing
c) Type of bearing d) None of these

Seat No.	

Set **R**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Transmission System Design (MECHPCC-10)

Day & Date: Friday, 15-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Attempt any two questions from each Section I & II.
2) Figures to the right indicate full marks.
4) Assume suitable data if necessary and mention it clearly.

SECTION – I

Q.2 **a)** **Define the following** **03**
i) Beam strength of gear tooth
ii) Wear strength of gear tooth
iii) Gear ratio

b) What are the various types of gear tooth failures? State their causes and remedies. **04**

c) A 20° full-depth involute spur gears used to transmit 12 kW power from an electric motor running at 1440 rpm to machine running at 500 rpm. The number of teeth on pinion is 25. The pinion as well as the gear is made of alloy steel (Sut = 800 N/mm^2). The velocity factor is to be used to account for dynamic load. The service factor and factor of safety are 1.25 and 1.5 respectively. The face width of the gear is 10 times module. The gears are to be case hardened to 500 BHN. Design pair of gears. Assume velocity as 5 m/s. **07**

$Cv = 6/(6 + v), Y$ for 25 teeth $= 0.3393$

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c) A pair of parallel helical gears consists of a 20 teeth pinion meshing with a 100 teeth gear. The pinion rotates at 1440 rpm. The normal pressure angle is 20°, while the helix angle is 25°. The face width is 40 mm and the normal module is 4 mm. The pinion as well as the gear is made of steel 40C8 (Sut = 600 N/mm^2) and heat treated to a surface hardness of 300 BHN. The service factor and the factor of safety are 1.5 and 2 respectively. Assume that the velocity factor accounts for the dynamic load and calculate the power transmitting capacity of gears. Y27 = 0.3475 **07**

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SECTION – II

Q.5 **a)** Explain the terminology for bevel gears. **04**

b) Explain the working principle of hydrodynamic bearing. **03**

c) A pair of straight bevel gears, mounted on shafts which are intersecting at right angles, consists of a 24 teeth pinion meshing with a 32 teeth gear. The pinion shaft is connected to an electric motor developing 12.5 kW rated power at 1440 rpm. The starting torque of the motor is 150% of the rated torque. The pressure angle is 20°. Both gears are made of case hardened steel (Sut = 750 N/mm^2). The teeth on gears are generated and finished by grinding and lapping processes to meet the requirements of Class-3 Grade. The factor of safety in the preliminary stages of gear design is 2. In the initial stages of gear design, assume that velocity factor accounts for the dynamic load and that the pitch line velocity is 7.5 m/s. Estimate the module based on beam strength and calculate the main dimensions. **07**

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b) A ball bearing is operating on a work cycle consisting of three parts - a radial load of 3500 N at 1440 rpm for one quarter cycle, a radial load of 5500 N at 720 rpm for one half cycle, and radial load of 3000 N at 1440 rpm for the remaining cycle. The expected life of the bearing is 12000 hrs. Calculate the dynamic load carrying capacity of the bearing. **07**

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b) A solid cast iron disk, 1 m in diameter and 0.25 m thick, is used as a flywheel. It is rotating at 400 rpm. It is brought to rest in 1.5 s by means of a brake. 7200 kg/m3- density of cast iron. **07**

Calculate:

i) The energy absorbed by the brake; and

ii) The torque capacity of the brake

Seat No.	

Set **S**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Transmission System Design (MECHPCC-10)

Day & Date: Friday, 15-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) In worm gear drives, efficiency decreases due to _____.
a) Impact loading b) Friction
c) Misalignment d) Vibration

2) Bevel gears are used to transmit motion between _____.
a) Parallel shafts b) Intersecting shafts
c) Skew shafts d) Flexible shafts

3) The pitch surface of bevel gears is _____.
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5) In a bearing no. 6310, the digit 6 designates _____.
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c) Type of bearing d) None of these

6) In uniform wear theory of clutch, the assumption is _____.
a) Pressure is constant b) Wear rate is constant
c) Temperature is constant d) Speed is constant

7) Bearing life is commonly expressed in terms of _____.
a) Time b) Speed
c) Number of revolutions d) Load cycles

8) Which property of bearing material allows it to accommodate small dirt particles without causing damage?

a) Hardness
b) Embeddability
c) Fatigue strength
d) Toughness

9) Which type of brake is commonly used in automobiles?

a) Band brake
b) Disc brake
c) Cone brake
d) Block brake

10) Which type of gear has teeth parallel to the axis?

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b) Bevel
c) Spur
d) Worm

11) The primary failure mode in spur gears due to repeated loading is _____.

a) Corrosion
b) Fatigue
c) Wear
d) Plastic deformation

12) Helical gears are preferred over spur gears because they _____.

a) Are cheaper
b) Run smoothly
c) Have no thrust
d) Are easier to manufacture

13) Helical gears produce which additional force component?

a) Radial
b) Tangential
c) Axial
d) Centrifugal

14) Worm gears are mainly used for _____.

a) High speed transmission
b) Parallel shafts
c) Large speed reduction
d) Low torque

Seat No.	

Set | S

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Transmission System Design (MECHPCC-10)

Day & Date: Friday, 15-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Attempt any two questions from each Section I & II.
2) Figures to the right indicate full marks.
4) Assume suitable data if necessary and mention it clearly.

SECTION – I

Q.2 **a)** **Define the following** **03**
i) Beam strength of gear tooth
ii) Wear strength of gear tooth
iii) Gear ratio

b) What are the various types of gear tooth failures? State their causes and remedies. **04**

c) A 20° full-depth involute spur gears used to transmit 12 kW power from an electric motor running at 1440 rpm to machine running at 500 rpm. The number of teeth on pinion is 25. The pinion as well as the gear is made of alloy steel (Sut = 800 N/mm^2). The velocity factor is to be used to account for dynamic load. The service factor and factor of safety are 1.25 and 1.5 respectively. The face width of the gear is 10 times module. The gears are to be case hardened to 500 BHN. Design pair of gears. Assume velocity as 5 m/s. **07**

$Cv = 6/(6 + v), Y$ for 25 teeth $= 0.3393$

Q.3 **a)** Give the expression for virtual number of teeth for helical gears. **04**

b) Differentiate between spur gear and helical gear on the basis of design equations. **03**

c) A pair of parallel helical gears consists of a 20 teeth pinion meshing with a 100 teeth gear. The pinion rotates at 1440 rpm. The normal pressure angle is 20°, while the helix angle is 25°. The face width is 40 mm and the normal module is 4 mm. The pinion as well as the gear is made of steel 40C8 (Sut = 600 N/mm^2) and heat treated to a surface hardness of 300 BHN. The service factor and the factor of safety are 1.5 and 2 respectively. Assume that the velocity factor accounts for the dynamic load and calculate the power transmitting capacity of gears. Y27 = 0.3475 **07**

Q.4 **a)** A worm gear box with an effective surface area of 1.5 m^2 is operating in still air with a heat transfer coefficient of 16 W/m^2 °C. The temperature rise of the lubricating oil above the atmospheric temperature is limited to 50°C. The worm gears are designated as, $1/40/10/7$. The worm shaft is rotating at 1440 rpm and the normal pressure angle is 20°. Calculate power transmitting capacity based on the thermal considerations. Assume $\mu = 0.020$. **07**

b) A pair of worm and worm wheel is designated as $2/52/10/4$. The worm is transmitting 5 kW power at 1000 r.p.m. to the worm shaft. The coefficient of friction is 0.035 and the normal pressure angle is 20°. Calculate the tangential, axial and radial components of the resultant gear force acting on the worm and worm wheel. **07**

SECTION – II

Q.5 **a)** Explain the terminology for bevel gears. **04**

b) Explain the working principle of hydrodynamic bearing. **03**

c) A pair of straight bevel gears, mounted on shafts which are intersecting at right angles, consists of a 24 teeth pinion meshing with a 32 teeth gear. The pinion shaft is connected to an electric motor developing 12.5 kW rated power at 1440 rpm. The starting torque of the motor is 150% of the rated torque. The pressure angle is 20°. Both gears are made of case hardened steel (Sut = 750 N/mm^2). The teeth on gears are generated and finished by grinding and lapping processes to meet the requirements of Class-3 Grade. The factor of safety in the preliminary stages of gear design is 2. In the initial stages of gear design, assume that velocity factor accounts for the dynamic load and that the pitch line velocity is 7.5 m/s. Estimate the module based on beam strength and calculate the main dimensions. **07**

Q.6 **a)** Explain the step-by-step procedure for selecting a rolling contact bearing from a manufacturer's catalogue. **07**

b) A ball bearing is operating on a work cycle consisting of three parts - a radial load of 3500 N at 1440 rpm for one quarter cycle, a radial load of 5500 N at 720 rpm for one half cycle, and radial load of 3000 N at 1440 rpm for the remaining cycle. The expected life of the bearing is 12000 hrs. Calculate the dynamic load carrying capacity of the bearing. **07**

Q.7 **a)** A plate clutch consists of one pair of contacting surfaces. The inner and outer diameters of the friction disk are 100 and 200 mm respectively. The coefficient of friction is 0.2 and the permissible intensity of pressure is 1 N/mm^2. Assuming uniform-wear theory, calculate the power-transmitting capacity of the clutch at 1000 rpm. **07**

b) A solid cast iron disk, 1 m in diameter and 0.25 m thick, is used as a flywheel. It is rotating at 400 rpm. It is brought to rest in 1.5 s by means of a brake. 7200 kg/m3- density of cast iron. **07**

Calculate:

i) The energy absorbed by the brake; and

ii) The torque capacity of the brake

SLR-QH-346

Seat No.	

Set P

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Heat Transfer (MECHPCC-11)

Day & Date: Monday, 18-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) Steady state heat transfer means _____.
a) Temperature remains constant with time
b) Temperature increases with time
c) Temperature decreases with time
d) None

2) The unit of thermal conductivity is _____.
a) W/mK b) W/m^2K
c) W/kgK d) J/mK

3) A body that reflects entire radiation incident on it is_____.
a) Black body b) Grey body
c) White body d) Transparent body

4) At thermal equilibrium, absorptivity is _____ emissivity.
a) greater than b) less than
c) equal to d) zero

5) Which number is important in forced convection?
a) Mach number b) Reynolds number
c) Grashof number d) Weber number

6) Use of fins is recommended to _____.
a) decrease heat transfer
b) increase heat transfer
c) maintain constant heat transfer
d) None

7) Convective heat transfer follows _____.
a) Fourier's law b) Newton's law of cooling
c) Stefan-Boltzmann law d) None

8) Dropwise condensation occurs on _____.
a) Smooth clean surface b) Oily surface
c) Rough surface d) None

9) In a finned heat exchanger, why does heat transfer efficiency decrease if the number of fins becomes excessively large?
a) Because more fins always reduce the surface area available for heat transfer
b) Because closely spaced fins restrict airflow and reduce convective heat transfer
c) Because fins stop conducting heat once their number exceeds a certain limit
d) Because additional fins increase radiation losses significantly

10) An automobile radiator is a _____.
a) Parallel flow heat exchanger b) Counter flow heat exchanger
c) Cross flow heat exchanger d) Regenerator

11) The relation between absorptivity (α), reflectivity (ρ) and transmissivity (T) is _____.
a) $\alpha + \rho + \mathrm{T} = 1$ b) $\alpha - \rho + \mathrm{T} = 1$
c) $\alpha + \rho - \mathrm{T} = 1$ d) $\alpha - \rho - \mathrm{T} = 1$

12) Grashof number is associated with _____.
a) Forced convection b) Natural convection
c) Radiation d) Conduction

13) The critical radius of insulation for a cylinder is _____.
a) k/h b) h/k
c) 2k/h d) k/2h

14) Thermal diffusivity has units of _____.
a) m^2/s b) W/mK
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Seat No.	

Set **P**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Heat Transfer (MECHPCC-11)

Day & Date: Monday, 18-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Attempt any two questions from each Section I & II.
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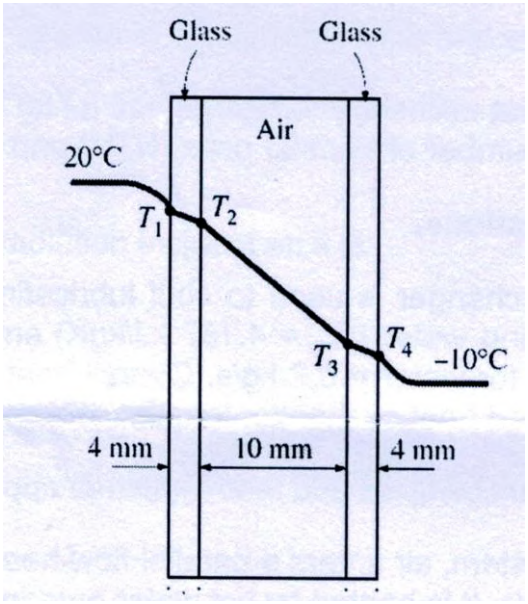
3) Assume suitable data if necessary and mention it clearly.
4) Use of non-programmable calculators is allowed.

SECTION – I

Q.2 Attempt the following questions. **05**

a) Derive expression for temperature distribution in a one-dimensional steady-state conduction through a plane wall.

b) Consider a 1-m-high and 1.5-m-wide double-pane window consisting of two 4-mm-thick layers of glass (k = 0.78 W/m°C) separated by a 10-mm-wide stagnant air space (k = 0.026 W/m°C). Determine the steady rate of heat transfer. The temperature of its inner surface for a day during which the room is maintained at 20°C while the temperature outdoors is 10°C. Take the convection heat transfer coefficients on the inner and outer surfaces of the window to be h_1 = 10 W/m^2°C and h_2 = 40 W/m^2°C. **05**



c) Describe the modes of heat transfer along with an example for each mode. **04**

Q.3 Attempt the following questions.

a) Explain critical radius of insulation. **04**

b) Determine the number of aluminum pin fins (k = 200 W/mK) required to achieve a total heat transfer rate of 10 W from a surface maintained at 100°C. Each pin has a length of 3 cm and a diameter of 0.25 cm, and is exposed to a surrounding medium at 30°C with a convection heat transfer coefficient of 35 W/m^2°C. **05**

c) An insulated steam pipe of 160 mm inner diameter and 180 mm outer diameter is covered with insulation of 40 mm thickness and carries steam at 200°C. k_{pipe} = 29 W/m°C and $k_{insulation}$ = 0.23 W/m°C h_i = 11.6 W/m^2°C and h_0 = 23.2 W/m^2°C. If the temperature of the air surrounding the pipe is 25°C, calculate the rate of heat loss to the surrounding from the pipe of 5 m length. Also find the interface temperatures also. **05**

Q.4 Attempt the following questions.

a) State Stefan-Boltzmann law and define emissive power and emissivity. **04**

b) Calculate the net radiant heat exchange per area for two large parallel plates at temperatures of 900°C and 500°C respectively. Emissivities for hot and cold plates are 0.45 and 0.65 respectively. **05**

c) State Plank's Law of radiation and hence derive Wein's displacement law. **05**

SECTION – II

Q.5 Attempt the following questions.

a) Explain thermal boundary layer concept and its significance in heat transfer. **04**

b) Using dimensional analysis, show that: $Nu = f(Re, Pr)$ **05**

c) A vertical plate measuring 0.5 m high and 0.3 m wide is maintained at a uniform surface temperature of 100 °C. The surrounding air is at 25 °C. Assume the plate is exposed to natural convection on one side. Calculate the average heat transfer coefficient and the heat transfer rate from the plate. Use air properties as - k = 0.028 W/mK, $\nu = 2.2 \times 10^{-5}$ m^2/s, $P_r = 0.71$. Use the following correlation: **05**

$$Nu = 0.1\,(Gr.Pr)^{1/3}$$

Q.6 Attempt the following questions.

a) Describe filmwise and dropwise condensation with comparison. **04**

b) Explain pool boiling curve and different regimes of boiling. **05**

c) Derive expression for heat exchanger effectiveness (ε) for parallel flow heat exchanger, in terms of number of transfer units (NTU) and capacity ratio R. **05**

Q.7 Attempt the following questions.

a) A Counter flow heat exchanger is used to cool lubricating oil (C_{ph} = 2.13 kJ/kgK) from 100°C to 60°C using water (C_{pc} = 4.187 kJ/kgK) entering at 30°C. Mass flow rates: for oil = 0.1 kg/s, for water = 0.2 kg/s. Overall heat transfer coefficient = 380 W/m^{2}K. Calculate required heat exchanger area. **05**

b) Describe types of heat exchangers and their industrial applications. **04**

c) In an air-conditioning system, air enters a parallel-flow heat exchanger at 10 °C with a mass flow rate of 3 kg/s. It is heated by hot water entering at 95 °C with a mass flow rate of 1 kg/s. The specific heats are: $C_{p,air}$ = 1005 J/kgK, $C_{p,water}$ = 4187 J/kgK. The overall heat transfer coefficient times area is UA = 2000 W/K. Using the NTU-effectiveness method, determine: **05**

i) The effectiveness of the heat exchanger
ii) The heat transfer rate
iii) The outlet temperatures of both the air and the water streams

SLR-QH-346

Seat No.	

Set Q

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Heat Transfer (MECHPCC-11)

Day & Date: Monday, 18-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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3) Figures to the right indicates full marks.
4) Assume suitable data if necessary and mention it clearly.
5) Use of non-programmable calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) Dropwise condensation occurs on _____.
a) Smooth clean surface b) Oily surface
c) Rough surface d) None

2) In a finned heat exchanger, why does heat transfer efficiency decrease if the number of fins becomes excessively large?
a) Because more fins always reduce the surface area available for heat transfer
b) Because closely spaced fins restrict airflow and reduce convective heat transfer
c) Because fins stop conducting heat once their number exceeds a certain limit
d) Because additional fins increase radiation losses significantly

3) An automobile radiator is a _____.
a) Parallel flow heat exchanger b) Counter flow heat exchanger
c) Cross flow heat exchanger d) Regenerator

4) The relation between absorptivity (α), reflectivity (ρ) and transmissivity (T) is _____.
a) $\alpha + \rho + \mathrm{T} = 1$ b) $\alpha - \rho + \mathrm{T} = 1$
c) $\alpha + \rho - \mathrm{T} = 1$ d) $\alpha - \rho - \mathrm{T} = 1$

5) Grashof number is associated with _____.
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6) The critical radius of insulation for a cylinder is _____.
a) k/h b) h/k
c) 2k/h d) k/2h

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Seat No.	

Set **Q**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Heat Transfer (MECHPCC-11)

Day & Date: Monday, 18-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Attempt any two questions from each Section I & II.
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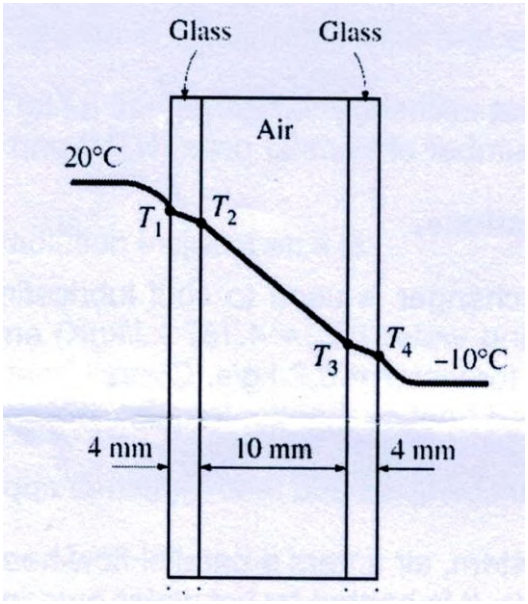
SECTION – I

Q.2 Attempt the following questions. **05**

a) Derive expression for temperature distribution in a one-dimensional steady-state conduction through a plane wall.

b) Consider a 1-m-high and 1.5-m-wide double-pane window consisting of two 4-mm-thick layers of glass (k = 0.78 W/m°C) separated by a 10-mm-wide stagnant air space (k = 0.026 W/m°C). Determine the steady rate of heat transfer. The temperature of its inner surface for a day during which the room is maintained at 20°C while the temperature outdoors is 10°C. Take the convection heat transfer coefficients on the inner and outer surfaces of the window to be h_1 = 10 W/m^2°C and h_2 = 40 W/m^2°C. **05**



c) Describe the modes of heat transfer along with an example for each mode. **04**

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a) Explain critical radius of insulation. **04**

b) Determine the number of aluminum pin fins (k = 200 W/mK) required to achieve a total heat transfer rate of 10 W from a surface maintained at 100°C. Each pin has a length of 3 cm and a diameter of 0.25 cm, and is exposed to a surrounding medium at 30°C with a convection heat transfer coefficient of 35 W/m^2°C. **05**

c) An insulated steam pipe of 160 mm inner diameter and 180 mm outer diameter is covered with insulation of 40 mm thickness and carries steam at 200°C. k_{pipe} = 29 W/m°C and $k_{insulation}$ = 0.23 W/m°C h_i = 11.6 W/m^2°C and h_0 = 23.2 W/m^2°C. If the temperature of the air surrounding the pipe is 25°C, calculate the rate of heat loss to the surrounding from the pipe of 5 m length. Also find the interface temperatures also. **05**

Q.4 Attempt the following questions.

a) State Stefan-Boltzmann law and define emissive power and emissivity. **04**

b) Calculate the net radiant heat exchange per area for two large parallel plates at temperatures of 900°C and 500°C respectively. Emissivities for hot and cold plates are 0.45 and 0.65 respectively. **05**

c) State Plank's Law of radiation and hence derive Wein's displacement law. **05**

SECTION – II

Q.5 Attempt the following questions.

a) Explain thermal boundary layer concept and its significance in heat transfer. **04**

b) Using dimensional analysis, show that: $Nu = f(Re, Pr)$ **05**

c) A vertical plate measuring 0.5 m high and 0.3 m wide is maintained at a uniform surface temperature of 100 °C. The surrounding air is at 25 °C. Assume the plate is exposed to natural convection on one side. Calculate the average heat transfer coefficient and the heat transfer rate from the plate. Use air properties as - k = 0.028 W/mK, $\nu = 2.2 \times 10^{-5}$ m^2/s, $P_r = 0.71$. Use the following correlation: **05**

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b) Explain pool boiling curve and different regimes of boiling. **05**

c) Derive expression for heat exchanger effectiveness (ε) for parallel flow heat exchanger, in terms of number of transfer units (NTU) and capacity ratio R. **05**

Q.7 Attempt the following questions.

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b) Describe types of heat exchangers and their industrial applications. **04**

c) In an air-conditioning system, air enters a parallel-flow heat exchanger at 10 °C with a mass flow rate of 3 kg/s. It is heated by hot water entering at 95 °C with a mass flow rate of 1 kg/s. The specific heats are: $C_{p,air}$ = 1005 J/kgK, $C_{p,water}$ = 4187 J/kgK. The overall heat transfer coefficient times area is UA = 2000 W/K. Using the NTU-effectiveness method, determine: **05**

i) The effectiveness of the heat exchanger
ii) The heat transfer rate
iii) The outlet temperatures of both the air and the water streams

Seat No.	

Set **R**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Heat Transfer (MECHPCC-11)

Day & Date: Monday, 18-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

Duration: 30 Minutes Marks:14

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

1) The relation between absorptivity (α), reflectivity (ρ) and transmissivity (T) is _____.
a) $\alpha + \rho + T = 1$ b) $\alpha - \rho + T = 1$
c) $\alpha + \rho - T = 1$ d) $\alpha - \rho - T = 1$

2) Grashof number is associated with _____.
a) Forced convection b) Natural convection
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3) The critical radius of insulation for a cylinder is _____.
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Seat No.	

Set **R**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Heat Transfer (MECHPCC-11)

Day & Date: Monday, 18-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Attempt any two questions from each Section I & II.
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SECTION – I

Q.2 Attempt the following questions. **05**

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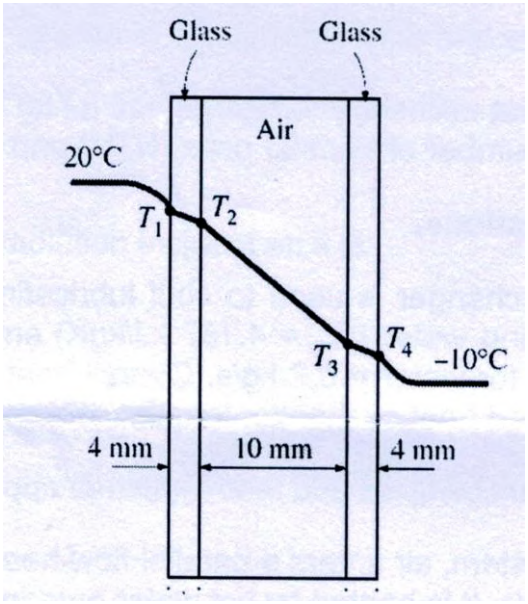
b) Consider a 1-m-high and 1.5-m-wide double-pane window consisting of two 4-mm-thick layers of glass (k = 0.78 W/m°C) separated by a 10-mm-wide stagnant air space (k = 0.026 W/m°C). Determine the steady rate of heat transfer. The temperature of its inner surface for a day during which the room is maintained at 20°C while the temperature outdoors is 10°C. Take the convection heat transfer coefficients on the inner and outer surfaces of the window to be h_1 = 10 W/m^2°C and h_2 = 40 W/m^2°C. **05**



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b) Determine the number of aluminum pin fins (k = 200 W/mK) required to achieve a total heat transfer rate of 10 W from a surface maintained at 100°C. Each pin has a length of 3 cm and a diameter of 0.25 cm, and is exposed to a surrounding medium at 30°C with a convection heat transfer coefficient of 35 W/m^2°C. **05**

c) An insulated steam pipe of 160 mm inner diameter and 180 mm outer diameter is covered with insulation of 40 mm thickness and carries steam at 200°C. k_{pipe} = 29 W/m°C and $k_{insulation}$ = 0.23 W/m°C h_i = 11.6 W/m^2°C and h_0 = 23.2 W/m^2°C. If the temperature of the air surrounding the pipe is 25°C, calculate the rate of heat loss to the surrounding from the pipe of 5 m length. Also find the interface temperatures also. **05**

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SECTION – II

Q.5 Attempt the following questions.

a) Explain thermal boundary layer concept and its significance in heat transfer. **04**

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c) A vertical plate measuring 0.5 m high and 0.3 m wide is maintained at a uniform surface temperature of 100 °C. The surrounding air is at 25 °C. Assume the plate is exposed to natural convection on one side. Calculate the average heat transfer coefficient and the heat transfer rate from the plate. Use air properties as - k = 0.028 W/mK, $\nu = 2.2 \times 10^{-5}$ m^2/s, $P_r = 0.71$. Use the following correlation: **05**

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i) The effectiveness of the heat exchanger
ii) The heat transfer rate
iii) The outlet temperatures of both the air and the water streams

Seat No.	

Set **S**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Heat Transfer (MECHPCC-11)

Day & Date: Monday, 18-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) Use of fins is recommended to _____.
a) decrease heat transfer
b) increase heat transfer
c) maintain constant heat transfer
d) None

2) Convective heat transfer follows _____.
a) Fourier's law b) Newton's law of cooling
c) Stefan-Boltzmann law d) None

3) Dropwise condensation occurs on _____.
a) Smooth clean surface b) Oily surface
c) Rough surface d) None

4) In a finned heat exchanger, why does heat transfer efficiency decrease if the number of fins becomes excessively large?
a) Because more fins always reduce the surface area available for heat transfer
b) Because closely spaced fins restrict airflow and reduce convective heat transfer
c) Because fins stop conducting heat once their number exceeds a certain limit
d) Because additional fins increase radiation losses significantly

5) An automobile radiator is a _____.
a) Parallel flow heat exchanger b) Counter flow heat exchanger
c) Cross flow heat exchanger d) Regenerator

6) The relation between absorptivity (α), reflectivity (ρ) and transmissivity (τ) is _____.

a) $\alpha + \rho + \tau = 1$ b) $\alpha - \rho + \tau = 1$
c) $\alpha + \rho - \tau = 1$ d) $\alpha - \rho - \tau = 1$

7) Grashof number is associated with _____.

a) Forced convection b) Natural convection
c) Radiation d) Conduction

8) The critical radius of insulation for a cylinder is _____.

a) k/h b) h/k
c) 2k/h d) k/2h

9) Thermal diffusivity has units of _____.

a) m^2/s b) W/mK
c) J/kgK d) W/m^2K

10) Steady state heat transfer means _____.

a) Temperature remains constant with time
b) Temperature increases with time
c) Temperature decreases with time
d) None

11) The unit of thermal conductivity is _____.

a) W/mK b) W/m^2K
c) W/kgK d) J/mK

12) A body that reflects entire radiation incident on it is_____.

a) Black body b) Grey body
c) White body d) Transparent body

13) At thermal equilibrium, absorptivity is _____ emissivity.

a) greater than b) less than
c) equal to d) zero

14) Which number is important in forced convection?

a) Mach number b) Reynolds number
c) Grashof number d) Weber number

Seat No.	

Set **S**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Heat Transfer (MECHPCC-11)

Day & Date: Monday, 18-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

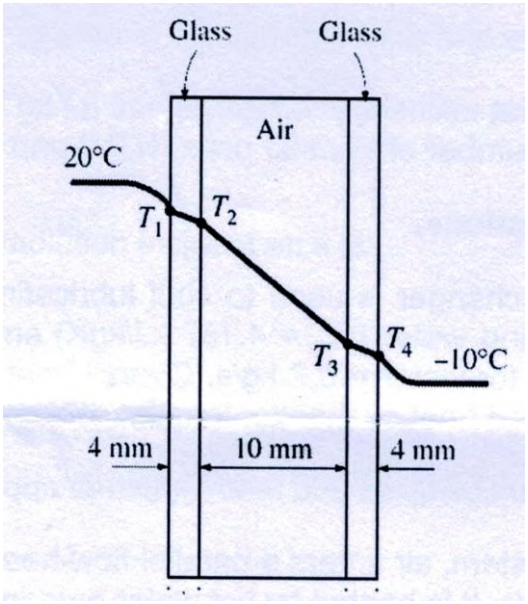
Instructions: 1) Attempt any two questions from each Section I & II.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary and mention it clearly.
4) Use of non-programmable calculators is allowed.

SECTION – I

Q.2 Attempt the following questions. **05**

a) Derive expression for temperature distribution in a one-dimensional steady-state conduction through a plane wall.

b) Consider a 1-m-high and 1.5-m-wide double-pane window consisting of two 4-mm-thick layers of glass (k = 0.78 W/m°C) separated by a 10-mm-wide stagnant air space (k = 0.026 W/m°C). Determine the steady rate of heat transfer. The temperature of its inner surface for a day during which the room is maintained at 20°C while the temperature outdoors is 10°C. Take the convection heat transfer coefficients on the inner and outer surfaces of the window to be h_1 = 10 W/m^2°C and h_2 = 40 W/m^2°C. **05**



c) Describe the modes of heat transfer along with an example for each mode. **04**

Q.3 Attempt the following questions.

a) Explain critical radius of insulation. **04**

b) Determine the number of aluminum pin fins (k = 200 W/mK) required to achieve a total heat transfer rate of 10 W from a surface maintained at 100°C. Each pin has a length of 3 cm and a diameter of 0.25 cm, and is exposed to a surrounding medium at 30°C with a convection heat transfer coefficient of 35 W/m^2°C. **05**

c) An insulated steam pipe of 160 mm inner diameter and 180 mm outer diameter is covered with insulation of 40 mm thickness and carries steam at 200°C. k_{pipe} = 29 W/m°C and $k_{insulation}$ = 0.23 W/m°C h_i = 11.6 W/m^2°C and h_0 = 23.2 W/m^2°C. If the temperature of the air surrounding the pipe is 25°C, calculate the rate of heat loss to the surrounding from the pipe of 5 m length. Also find the interface temperatures also. **05**

Q.4 Attempt the following questions.

a) State Stefan-Boltzmann law and define emissive power and emissivity. **04**

b) Calculate the net radiant heat exchange per area for two large parallel plates at temperatures of 900°C and 500°C respectively. Emissivities for hot and cold plates are 0.45 and 0.65 respectively. **05**

c) State Plank's Law of radiation and hence derive Wein's displacement law. **05**

SECTION – II

Q.5 Attempt the following questions.

a) Explain thermal boundary layer concept and its significance in heat transfer. **04**

b) Using dimensional analysis, show that: $Nu = f(Re, Pr)$ **05**

c) A vertical plate measuring 0.5 m high and 0.3 m wide is maintained at a uniform surface temperature of 100 °C. The surrounding air is at 25 °C. Assume the plate is exposed to natural convection on one side. Calculate the average heat transfer coefficient and the heat transfer rate from the plate. Use air properties as - k = 0.028 W/mK, $\nu = 2.2 \times 10^{-5}$ m^2/s, $P_r = 0.71$. Use the following correlation: **05**

$$Nu = 0.1\,(Gr.Pr)^{1/3}$$

Q.6 Attempt the following questions.

a) Describe filmwise and dropwise condensation with comparison. **04**

b) Explain pool boiling curve and different regimes of boiling. **05**

c) Derive expression for heat exchanger effectiveness (ε) for parallel flow heat exchanger, in terms of number of transfer units (NTU) and capacity ratio R. **05**

Q.7 Attempt the following questions.

a) A Counter flow heat exchanger is used to cool lubricating oil (C_{ph} = 2.13 kJ/kgK) from 100°C to 60°C using water (C_{pc} = 4.187 kJ/kgK) entering at 30°C. Mass flow rates: for oil = 0.1 kg/s, for water = 0.2 kg/s. Overall heat transfer coefficient = 380 W/m^{2}K. Calculate required heat exchanger area. **05**

b) Describe types of heat exchangers and their industrial applications. **04**

c) In an air-conditioning system, air enters a parallel-flow heat exchanger at 10 °C with a mass flow rate of 3 kg/s. It is heated by hot water entering at 95 °C with a mass flow rate of 1 kg/s. The specific heats are: $C_{p,air}$ = 1005 J/kgK, $C_{p,water}$ = 4187 J/kgK. The overall heat transfer coefficient times area is UA = 2000 W/K. Using the NTU-effectiveness method, determine: **05**

i) The effectiveness of the heat exchanger
ii) The heat transfer rate
iii) The outlet temperatures of both the air and the water streams

SLR-QH-347

Seat No.	

Set P

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Instrumentation and Control Engineering (MECHPCC-12)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

Duration: 30 Minutes Marks:14

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

1) The largest change in the measurand which produces no instrument response is called _____.
a) dead zone b) dynamic error
c) fidelity d) threshold

2) Spring of a transducer deflects 0.4 mm when subjected to a force of 8 KN. Find the sensitivity _____.
a) 0.05 mm/KN b) 20 KN/mm
c) 0.32 mm/KN d) 0.005 mm/KN

3) Unit of thermoelectric power is _____.
a) mV/°C b) °C / mV
c) mA /°C d) °C / m

4) Which thermocouple type is usually preferred in the cryogenic range?
a) J type b) K type
c) T type d) S type

5) A permanent magnet is used in _____ tachometer.
a) inductive pickup b) capacitive pickup
c) mechanical d) photoelectric pickup

6) Hot wire anemometer is a variable _____ transducer.
a) resistance b) inductance
c) capacitance d) frequency

7) Which condition is essential in the operation of Mcleod gauge?
a) isobaric b) adiabatic
c) isothermal d) isochoric

8) A comparator is an essential feature of _____.
a) manual system b) open loop system
c) any system d) feedback control system

9) In block diagram algebra, series blocks are _____.
a) added b) integrated
c) multiplied d) subtracted

10) Which of the following cannot be used alone?
a) P – action b) D – action
c) I – action d) ON/OFF action

11) 'Centroid' of asymptotes is a point which _____.
a) may be real or complex
b) is real but may or may not lie on the root locus
c) is real and always lies on the root locus
d) is always imaginary

12) The part of R.L. in the right half plane represents the _____ system.
a) unstable b) marginally stable
c) stable d) oscillatory

13) At the phase cross-over frequency, the phase angle is _____.
a) -90° b) 90°
c) -180° d) 180°

14) If a system has two poles at the origin, then the phase angle contribution by them is _____.
a) 180° b) -180°
c) -90° d) 90°

Seat No.	

Set **P**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Instrumentation and Control Engineering (MECHPCC-12)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Solve any two questions from each section.
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3) Assume additional suitable data if necessary and state if clearly.
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5) Use university graph paper & semi-log paper if required.

Section – I

Q.2 **a)** Explain with a block diagram, 'Generalised Measurement System'. **08**

b) Explain for thermocouples, law of intermediate temperature. **06**

Q.3 **a)** Explain with a neat sketch working of 'Hot Wire Anemometer.' **06**

b) Explain in brief **04**
i) threshold
ii) dead time

c) Differentiate between 'R.T.D.' and 'Thermistor'. **04**

Q.4 **a)** Explain the working principle of flashing light Stroboscope. **06**

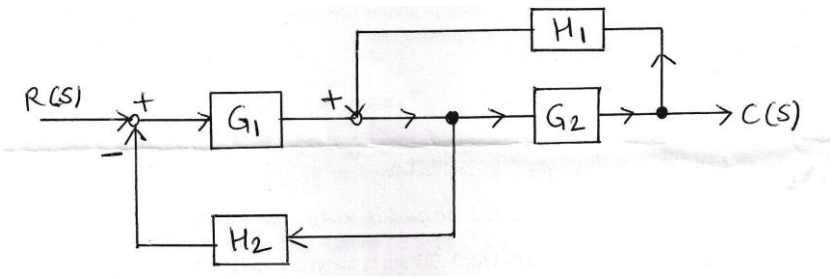
b) Explain with a neat sketch 'Pirani Gauge'. **04**

c) Describe various standards of measurement. **04**

Section – II

Q.5 **a)** Explain a closed loop control system with a suitable example. **04**

b) Reduce the following block diagram to get T.F. C(S) / R(S). **06**



c) State the general predictions to identify the break-away points on the real axis in root locus. **04**

Q.6 **a)** For a control system represented by, **10**

$$G(S)H(S) = \frac{K(S+1)(S+5)}{S^2+8S+25}$$

Sketch the complete Root Locus and comment on the system stability.

b) Explain with a graph, P+D controller. What do you mean by 'Derivative Time'? **04**

Q.7 **a)** For a unity feedback control system given by, **10**

$$G(S) = \frac{200}{S(S+2)(S+20)}$$

Sketch the Bode Plots and comment on the system stability

b) Explain the following terms. **04**

i) gain crossover frequency
ii) phase crossover frequency

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Instrumentation and Control Engineering (MECHPCC-12)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) A comparator is an essential feature of _____.
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2) In block diagram algebra, series blocks are _____.
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13) Hot wire anemometer is a variable _____ transducer.

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c) capacitance
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a) isobaric
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Seat No.	

Set **Q**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Instrumentation and Control Engineering (MECHPCC-12)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Solve any two questions from each section.
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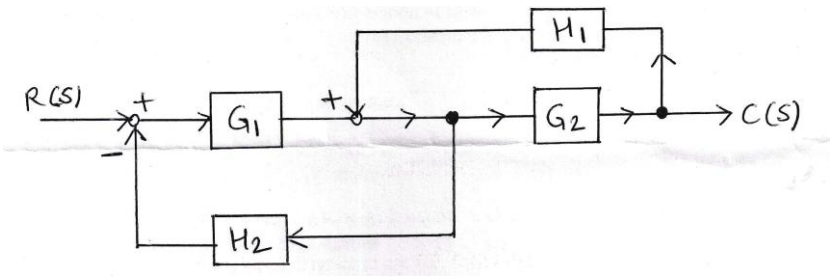

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$$G(S) = \frac{200}{S(S+2)(S+20)}$$

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b) Explain the following terms. **04**

i) gain crossover frequency
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Seat No.	

Set **R**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Instrumentation and Control Engineering (MECHPCC-12)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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Seat No.	

Set **R**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Instrumentation and Control Engineering (MECHPCC-12)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Solve any two questions from each section.
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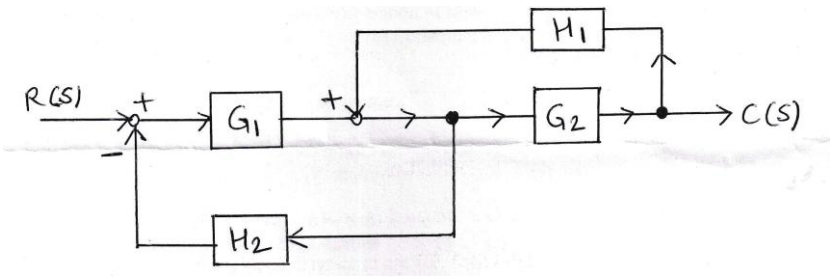

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Seat No.	

Set **S**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Instrumentation and Control Engineering (MECHPCC-12)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 70
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MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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Seat No.	

Set **S**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Instrumentation and Control Engineering (MECHPCC-12)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Solve any two questions from each section.
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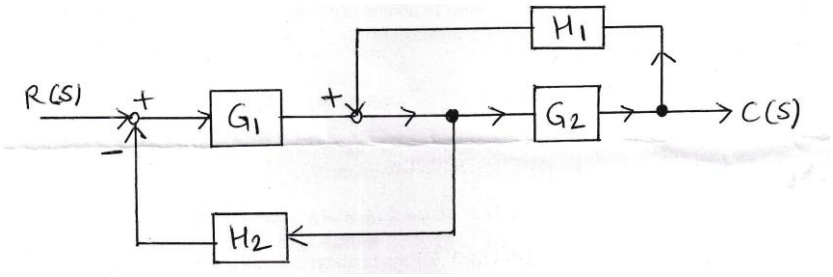
Q.5 **a)** Explain a closed loop control system with a suitable example. **04**

b) Reduce the following block diagram to get T.F. C(S) / R(S). **06**



c) State the general predictions to identify the break-away points on the real axis in root locus. **04**

Q.6 **a)** For a control system represented by, **10**

$$G(S)H(S) = \frac{K(S+1)(S+5)}{S^2+8S+25}$$

Sketch the complete Root Locus and comment on the system stability.

b) Explain with a graph, P+D controller. What do you mean by 'Derivative Time'? **04**

Q.7 **a)** For a unity feedback control system given by, **10**

$$G(S) = \frac{200}{S(S+2)(S+20)}$$

Sketch the Bode Plots and comment on the system stability

b) Explain the following terms. **04**

i) gain crossover frequency
ii) phase crossover frequency

SLR-QH-349

Seat No.	

Set P

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Tool engineering (MECHPEC – 02B)

Day & Date: Friday, 22-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) Merchant's circle diagram (MCD) in machining deals with _____.
a) cutting force components
b) cutting tool geometry
c) mechanism of chip formation
d) cutting temperature

2) Forces due to metal cutting are measured by _____.
a) Rotameter b) Dynamometer
c) Tachometer d) Micrometer

3) The point angle is HSS twist drill is _____.
a) 60 b) 120
c) 118 d) 128

4) Chip thickness ratio is _____.
a) always less than 1.0 b) equal to or less than 1.0
c) more than 1.0 d) None of these

5) In cutting tools, crater wear develops at _____.
a) the auxiliary b) the tool nose
c) the rake surface d) the principal flank

6) Which of the following tools are generally manufactured by Powder metallurgy?
a) High carbon steel b) Cemented carbides
c) Abrasives d) Low carbon steel

7) Drill jigs are used to hold the workpiece when _____.
a) counterboring and countersinking
b) spot facing and tapping
c) drilling and reaming
d) all of these

8) A body which is free in space has _____ freedom of rotations.
a) 2 b) 3
c) 6 d) 0

9) In press operation, For Blanking _____.
a) Punch Size = Component size – Clearance
b) Die size = Component size
c) Option a) & b) are correct
d) Option a) & b) are not correct

10) Which of the following forming processes is suitable for making utensils and cup shaped objects?
a) Deep drawing b) Wire drawing
c) Forging d) Rolling

11) Punching a number of holes in a sheet is known as _____.
a) Parting b) Perforating
c) Notching d) Lancing

12) Depreciation is a process of _____.
a) Allocation of Cost b) Reduction in Liability
c) Valuation of Assets d) Increasing Asset Value

13) Break-even analysis is used in “Make or Buy” decision.
a) True b) False
c) Partially false d) None of the above

14) A fixture does NOT _____.
a) Hold the workpiece b) Guide the tool
c) Locate the workpiece d) Provide support

Seat No.	

Set **P**

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Tool engineering (MECHPEC – 02B)

Day & Date: Friday, 22-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

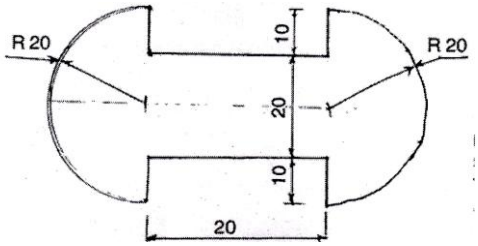
Instructions: 1) Question no. 2 is compulsory in section I, and solve any two questions from the remaining. (Q. No. 3, 4 & 5)
2) Question no. 6 is compulsory in section II, and solve any two questions from the remaining. (Q. No. 7, 8 & 9)
3) Assume suitable data, diagrams if required.
4) Use of scientific calculator is allowed.

SECTION – I

Q.2 a) Design a press tool for the component shown in figure below giving following details. **14**

i) Cutting force
ii) Clearance between punch and die
iii) Stripping force and no of bolts and bolt size need for die clamping
iv) Strip layout and % material utilization

Material: MS, Thickness: 3 mm, Shear Strength: 350 N/mm^2
All dimensions shown in the figure are in “mm”

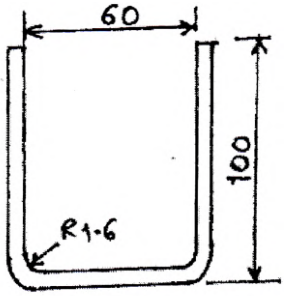


Also draw one sectional view of assembly of press tool and part name.

OR

b) Design a draw tool for given component Fig-II also calculate the following (draw one sectional view of assembly)

i) Blank size
ii) No of draws
iii) draw ratio
iv) drawing force
v) Blank force
vi) die and punch clearance



Material: MS, Yield Stress: 250 N/mm^2,
Thickness: 2 mm
All dimensions in the figure are in "mm"

Draw only ONE sectional View along with part list.

Q.3 **a)** What is tool dynamometer explain it. **03**

b) In an orthogonal cutting operation following data have been observed: **04**
Uncut chip thickness, t = 0.127 mm width of cut, b = 6.35 mm
Cutting speed V = 2m/s Rake angle, $\alpha = 10°$ Cutting force Fc = 567 N
Thrust force FT = 227 N Chip thickness tc = 0.228 mm
Determine: Shear angle

Q.4 **a)** What are the cutting tool materials. Explain it. **03**

b) Explain nomenclature of twist drill. **04**

Q.5 Write a short note. (Any Two) **07**

a) Tool Signature

b) Heat generation during machining & coolants

c) Tool Wear

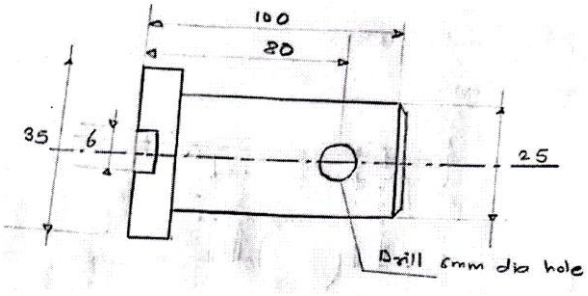
d) Machinability

SECTION – II

Q.6 **a)** Design a drill jig for a component shown in figure below for 6 mm diameter hole. **14**

OR

b) Design a milling fixture for a component shown in figure below for slot of 6 mm on head.



Q.7 **a)** A fixture costing Rs.2,000/-, the old fixture which originally cost Rs. 1,400/- has scrap value of Rs. 500/. The new fixture will save 20 paise/piece and % of overhead charged to this fixture is 30%. Taking M = 3%, T = 24%, I = 16% and amortization is 1.5 years. Calculate no. of pieces which must be produced to break even. So that, the fixture may pay for insert in one year. **04**

b) Explain in brief about geometry of plain milling cutter. **03**

Q.8 **a)** Draw tool geometry of a single point cutting tool and explain the same. **04**

b) Types of jig bush **03**

Q.9 **Write a short note. (Any Two)** **07**

a) Types of press tool operations

b) Difference between jig & fixture

c) Fool Proofing of jig or fixture

SLR-QH-349

Seat No.	

Set Q

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Tool engineering (MECHPEC – 02B)

Day & Date: Friday, 22-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) A body which is free in space has _____ freedom of rotations.
a) 2 b) 3
c) 6 d) 0

2) In press operation, For Blanking _____.
a) Punch Size = Component size – Clearance
b) Die size = Component size
c) Option a) & b) are correct
d) Option a) & b) are not correct

3) Which of the following forming processes is suitable for making utensils and cup shaped objects?
a) Deep drawing b) Wire drawing
c) Forging d) Rolling

4) Punching a number of holes in a sheet is known as _____.
a) Parting b) Perforating
c) Notching d) Lancing

5) Depreciation is a process of _____.
a) Allocation of Cost b) Reduction in Liability
c) Valuation of Assets d) Increasing Asset Value

6) Break-even analysis is used in "Make or Buy" decision.
a) True b) False
c) Partially false d) None of the above

7) A fixture does NOT _____.
a) Hold the workpiece b) Guide the tool
c) Locate the workpiece d) Provide support

8) Merchant's circle diagram (MCD) in machining deals with _____.
a) cutting force components
b) cutting tool geometry
c) mechanism of chip formation
d) cutting temperature

9) Forces due to metal cutting are measured by _____.
a) Rotameter b) Dynamometer
c) Tachometer d) Micrometer

10) The point angle is HSS twist drill is _____.
a) 60 b) 120
c) 118 d) 128

11) Chip thickness ratio is _____.
a) always less than 1.0 b) equal to or less than 1.0
c) more than 1.0 d) None of these

12) In cutting tools, crater wear develops at _____.
a) the auxiliary b) the tool nose
c) the rake surface d) the principal flank

13) Which of the following tools are generally manufactured by Powder metallurgy?
a) High carbon steel b) Cemented carbides
c) Abrasives d) Low carbon steel

14) Drill jigs are used to hold the workpiece when _____.
a) counterboring and countersinking
b) spot facing and tapping
c) drilling and reaming
d) all of these

Seat No.	

Set **Q**

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Tool engineering (MECHPEC – 02B)

Day & Date: Friday, 22-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

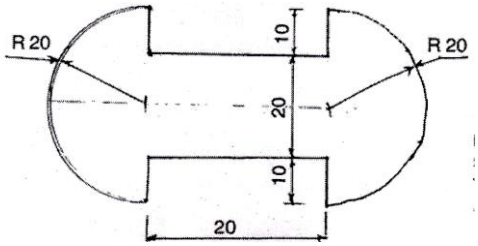
Instructions: 1) Question no. 2 is compulsory in section I, and solve any two questions from the remaining. (Q. No. 3, 4 & 5)
2) Question no. 6 is compulsory in section II, and solve any two questions from the remaining. (Q. No. 7, 8 & 9)
3) Assume suitable data, diagrams if required.
4) Use of scientific calculator is allowed.

SECTION – I

Q.2 a) Design a press tool for the component shown in figure below giving following details. **14**

i) Cutting force
ii) Clearance between punch and die
iii) Stripping force and no of bolts and bolt size need for die clamping
iv) Strip layout and % material utilization

Material: MS, Thickness: 3 mm, Shear Strength: 350 N/mm^2
All dimensions shown in the figure are in “mm”

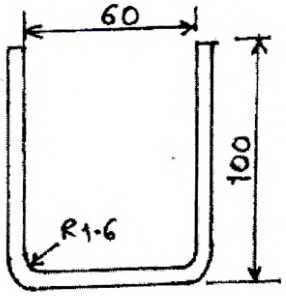


Also draw one sectional view of assembly of press tool and part name.

OR

b) Design a draw tool for given component Fig-II also calculate the following (draw one sectional view of assembly)

i) Blank size
ii) No of draws
iii) draw ratio
iv) drawing force
v) Blank force
vi) die and punch clearance



Material: MS, Yield Stress: 250 N/mm^2,
Thickness: 2 mm
All dimensions in the figure are in "mm"

Draw only ONE sectional View along with part list.

Q.3 **a)** What is tool dynamometer explain it. **03**

b) In an orthogonal cutting operation following data have been observed: **04**
Uncut chip thickness, t = 0.127 mm width of cut, b = 6.35 mm
Cutting speed V = 2m/s Rake angle, $\alpha = 10°$ Cutting force Fc = 567 N
Thrust force FT = 227 N Chip thickness tc = 0.228 mm
Determine: Shear angle

Q.4 **a)** What are the cutting tool materials. Explain it. **03**

b) Explain nomenclature of twist drill. **04**

Q.5 Write a short note. (Any Two) **07**

a) Tool Signature

b) Heat generation during machining & coolants

c) Tool Wear

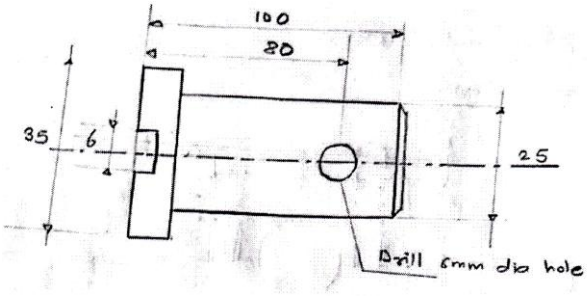
d) Machinability

SECTION – II

Q.6 **a)** Design a drill jig for a component shown in figure below for 6 mm diameter hole. **14**

OR

b) Design a milling fixture for a component shown in figure below for slot of 6 mm on head.



Q.7 **a)** A fixture costing Rs.2,000/-, the old fixture which originally cost Rs. 1,400/- has scrap value of Rs. 500/. The new fixture will save 20 paise/piece and % of overhead charged to this fixture is 30%. Taking M = 3%, T = 24%, I = 16% and amortization is 1.5 years. Calculate no. of pieces which must be produced to break even. So that, the fixture may pay for insert in one year. **04**

b) Explain in brief about geometry of plain milling cutter. **03**

Q.8 **a)** Draw tool geometry of a single point cutting tool and explain the same. **04**

b) Types of jig bush **03**

Q.9 **Write a short note. (Any Two)** **07**

a) Types of press tool operations

b) Difference between jig & fixture

c) Fool Proofing of jig or fixture

Seat No.	

Set **R**

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Tool engineering (MECHPEC – 02B)

Day & Date: Friday, 22-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

Duration: 30 Minutes Marks:14

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

1) Punching a number of holes in a sheet is known as _____.
a) Parting b) Perforating
c) Notching d) Lancing

2) Depreciation is a process of _____.
a) Allocation of Cost b) Reduction in Liability
c) Valuation of Assets d) Increasing Asset Value

3) Break-even analysis is used in "Make or Buy" decision.
a) True b) False
c) Partially false d) None of the above

4) A fixture does NOT _____.
a) Hold the workpiece b) Guide the tool
c) Locate the workpiece d) Provide support

5) Merchant's circle diagram (MCD) in machining deals with _____.
a) cutting force components
b) cutting tool geometry
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d) cutting temperature

6) Forces due to metal cutting are measured by _____.
a) Rotameter b) Dynamometer
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7) The point angle is HSS twist drill is _____.
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8) Chip thickness ratio is _____.
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10) Which of the following tools are generally manufactured by Powder metallurgy?
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13) In press operation, For Blanking _____.
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14) Which of the following forming processes is suitable for making utensils and cup shaped objects?
a) Deep drawing b) Wire drawing
c) Forging d) Rolling

Seat No.	

Set **R**

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Tool engineering (MECHPEC – 02B)

Day & Date: Friday, 22-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Question no. 2 is compulsory in section I, and solve any two questions from the remaining. (Q. No. 3, 4 & 5)
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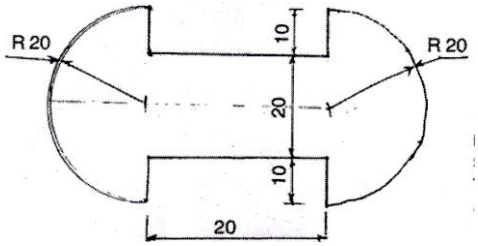
SECTION – I

Q.2 a) Design a press tool for the component shown in figure below giving following details. **14**

i) Cutting force
ii) Clearance between punch and die
iii) Stripping force and no of bolts and bolt size need for die clamping
iv) Strip layout and % material utilization

Material: MS, Thickness: 3 mm, Shear Strength: 350 N/mm^2
All dimensions shown in the figure are in “mm”

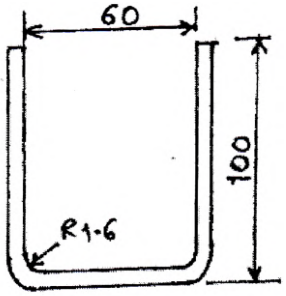


Also draw one sectional view of assembly of press tool and part name.

OR

b) Design a draw tool for given component Fig-II also calculate the following (draw one sectional view of assembly)

i) Blank size
ii) No of draws
iii) draw ratio
iv) drawing force
v) Blank force
vi) die and punch clearance



Material: MS, Yield Stress: 250 N/mm^2,
Thickness: 2 mm
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Draw only ONE sectional View along with part list.

Q.3 **a)** What is tool dynamometer explain it. **03**

b) In an orthogonal cutting operation following data have been observed: **04**
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Cutting speed V = 2m/s Rake angle, $\alpha = 10°$ Cutting force Fc = 567 N
Thrust force FT = 227 N Chip thickness tc = 0.228 mm
Determine: Shear angle

Q.4 **a)** What are the cutting tool materials. Explain it. **03**

b) Explain nomenclature of twist drill. **04**

Q.5 Write a short note. (Any Two) **07**

a) Tool Signature

b) Heat generation during machining & coolants

c) Tool Wear

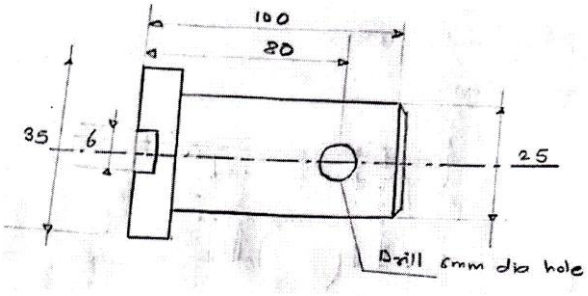
d) Machinability

SECTION – II

Q.6 **a)** Design a drill jig for a component shown in figure below for 6 mm diameter hole. **14**

OR

b) Design a milling fixture for a component shown in figure below for slot of 6 mm on head.



Q.7 **a)** A fixture costing Rs.2,000/-, the old fixture which originally cost Rs. 1,400/- has scrap value of Rs. 500/. The new fixture will save 20 paise/piece and % of overhead charged to this fixture is 30%. Taking M = 3%, T = 24%, I = 16% and amortization is 1.5 years. Calculate no. of pieces which must be produced to break even. So that, the fixture may pay for insert in one year. **04**

b) Explain in brief about geometry of plain milling cutter. **03**

Q.8 **a)** Draw tool geometry of a single point cutting tool and explain the same. **04**

b) Types of jig bush **03**

Q.9 **Write a short note. (Any Two)** **07**

a) Types of press tool operations

b) Difference between jig & fixture

c) Fool Proofing of jig or fixture

SLR-QH-349

Seat No.	

Set S

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Tool engineering (MECHPEC – 02B)

Day & Date: Friday, 22-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

Duration: 30 Minutes Marks:14

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

1) Which of the following tools are generally manufactured by Powder metallurgy?
a) High carbon steel b) Cemented carbides
c) Abrasives d) Low carbon steel

2) Drill jigs are used to hold the workpiece when _____.
a) counterboring and countersinking
b) spot facing and tapping
c) drilling and reaming
d) all of these

3) A body which is free in space has _____ freedom of rotations.
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c) 6 d) 0

4) In press operation, For Blanking _____.
a) Punch Size = Component size – Clearance
b) Die size = Component size
c) Option a) & b) are correct
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5) Which of the following forming processes is suitable for making utensils and cup shaped objects?
a) Deep drawing b) Wire drawing
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6) Punching a number of holes in a sheet is known as _____.
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7) Depreciation is a process of _____.
a) Allocation of Cost
b) Reduction in Liability
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8) Break-even analysis is used in “Make or Buy” decision.
a) True
b) False
c) Partially false
d) None of the above

9) A fixture does NOT _____.
a) Hold the workpiece
b) Guide the tool
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10) Merchant’s circle diagram (MCD) in machining deals with _____.
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11) Forces due to metal cutting are measured by _____.
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12) The point angle is HSS twist drill is _____.
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13) Chip thickness ratio is _____.
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14) In cutting tools, crater wear develops at _____.
a) the auxiliary
b) the tool nose
c) the rake surface
d) the principal flank

Seat No.	

Set **S**

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Tool engineering (MECHPEC – 02B)

Day & Date: Friday, 22-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

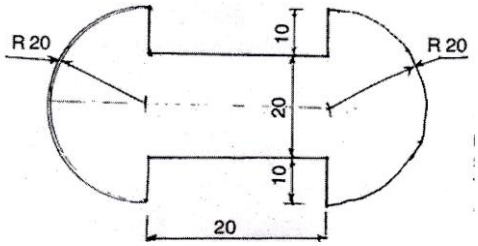
Instructions: 1) Question no. 2 is compulsory in section I, and solve any two questions from the remaining. (Q. No. 3, 4 & 5)
2) Question no. 6 is compulsory in section II, and solve any two questions from the remaining. (Q. No. 7, 8 & 9)
3) Assume suitable data, diagrams if required.
4) Use of scientific calculator is allowed.

SECTION – I

Q.2 a) Design a press tool for the component shown in figure below giving following details. **14**

i) Cutting force
ii) Clearance between punch and die
iii) Stripping force and no of bolts and bolt size need for die clamping
iv) Strip layout and % material utilization

Material: MS, Thickness: 3 mm, Shear Strength: 350 N/mm^2
All dimensions shown in the figure are in “mm”

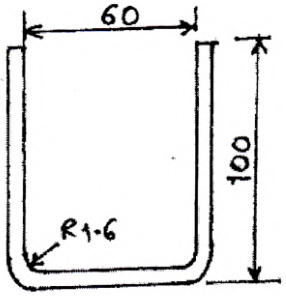


Also draw one sectional view of assembly of press tool and part name.

OR

b) Design a draw tool for given component Fig-II also calculate the following (draw one sectional view of assembly)

i) Blank size
ii) No of draws
iii) draw ratio
iv) drawing force
v) Blank force
vi) die and punch clearance



Material: MS, Yield Stress: 250 N/mm^2,
Thickness: 2 mm
All dimensions in the figure are in "mm"

Draw only ONE sectional View along with part list.

Q.3 **a)** What is tool dynamometer explain it. **03**

b) In an orthogonal cutting operation following data have been observed: **04**
Uncut chip thickness, t = 0.127 mm width of cut, b = 6.35 mm
Cutting speed V = 2m/s Rake angle, $\alpha = 10°$ Cutting force Fc = 567 N
Thrust force FT = 227 N Chip thickness tc = 0.228 mm
Determine: Shear angle

Q.4 **a)** What are the cutting tool materials. Explain it. **03**

b) Explain nomenclature of twist drill. **04**

Q.5 Write a short note. (Any Two) **07**

a) Tool Signature

b) Heat generation during machining & coolants

c) Tool Wear

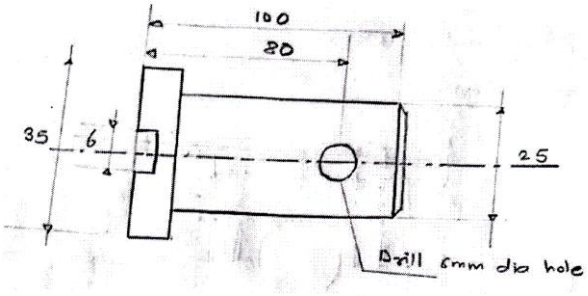
d) Machinability

SECTION – II

Q.6 **a)** Design a drill jig for a component shown in figure below for 6 mm diameter hole. **14**

OR

b) Design a milling fixture for a component shown in figure below for slot of 6 mm on head.



Q.7 **a)** A fixture costing Rs.2,000/-, the old fixture which originally cost Rs. 1,400/- has scrap value of Rs. 500/. The new fixture will save 20 paise/piece and % of overhead charged to this fixture is 30%. Taking M = 3%, T = 24%, I = 16% and amortization is 1.5 years. Calculate no. of pieces which must be produced to break even. So that, the fixture may pay for insert in one year. **04**

b) Explain in brief about geometry of plain milling cutter. **03**

Q.8 **a)** Draw tool geometry of a single point cutting tool and explain the same. **04**

b) Types of jig bush **03**

Q.9 **Write a short note. (Any Two)** **07**

a) Types of press tool operations

b) Difference between jig & fixture

c) Fool Proofing of jig or fixture

SLR-QH-350

Seat No.	

Set P

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Automobile Engineering (MECHPEC – 02C)

Day & Date: Friday, 22-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Multiple Choice Questions. **14**

1) A car with front engine rear wheel drive (FR) is climbing a steep slope. Which component mainly ensures torque multiplication for climbing?
a) Differential b) Propeller shaft
c) Gearbox d) Clutch

2) A vehicle shifts from FWD to AWD for off-road driving. What is the primary advantage gained?
a) Reduced fuel consumption
b) Lower vehicle weight
c) Higher top speed
d) Improved traction on uneven surfaces

3) If a vehicle body is made from aluminum instead of steel, what is the most likely performance impact?
a) Improved fuel efficiency due to reduced weight
b) Increased rolling resistance
c) Increased gradient resistance
d) Reduced acceleration

4) For a vehicle climbing a gradient, which parameter directly determines its ability to climb?
a) Air resistance b) Gradeability
c) Wheelbase d) Suspension stiffness

5) In a multi-plate clutch system, why are multiple plates used instead of a single plate?
   a) To reduce torque capacity
   b) To increase frictional surface area
   c) To reduce weight
   d) To simplify construction

6) In a synchromesh gearbox, what is the main purpose of synchronizers?
   a) Increase torque
   b) Match speeds of gears before engagement
   c) Reduce engine speed
   d) Increase fuel efficiency

7) For true rolling condition in steering, which condition must be satisfied?
   a) All wheels rotate at same speed
   b) All wheels have same diameter
   c) All wheels must roll about a common instantaneous center
   d) Wheels must be identical

8) If camber angle is excessively positive, what is the likely consequence?
   a) Even tyre wear
   b) Increased inner tyre wear
   c) Increased outer tyre wear
   d) No tyre wear

9) During sudden braking, dynamic weight transfer shifts load _____.
   a) From front to rear
   b) To sides only
   c) Equally distributed
   d) From rear to front

10) In an independent suspension system, what is the main advantage compared to rigid axle?
   a) Better ride comfort due to independent wheel movement
   b) Increased unsprung mass
   c) Reduced stability
   d) Increased tyre wear

11) A vehicle with rear engine rear wheel drive (RR) shows oversteering at high speeds. What is the primary reason?
   a) Excess load on front axle
   b) Excess load on rear axle reducing stability
   c) Low engine power
   d) High air resistance

12) Why is dynamic weight transfer important during braking?
   a) It increases engine power
   b) It affects braking efficiency and stability
   c) It reduces fuel consumption
   d) It increases speed

13) If tractive effort is less than total resistance, what will happen?

a) Vehicle accelerates
b) Vehicle decelerates
c) Vehicle maintains speed
d) Vehicle stops immediately

14) If aerodynamic drag is reduced by streamlining the body, what is the expected outcome?

a) Increase in rolling resistance
b) Decrease in fuel efficiency
c) Reduction in power required at high speed
d) Increase in gradient resistance

Seat No.	

Set **P**

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Automobile Engineering (MECHPEC – 02C)

Day & Date: Friday, 22-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Solve any Two questions from each section.
2) Figure on fight indicates full marks.
3) Assume suitable data, diagrams if required.
4) Use of non-programmable calculator is allowed.

Section – I

Q.2 **a)** Explain AWD Layout with its merits and demerits. **05**

b) Explain resistance to vehicle motion, Air, Rolling and Gradient resistance. **05**

c) Explain Hotch Kiss Drive layout. **04**

Q.3 **a)** Explain multi plate clutch for its construction and working. **05**

b) Explain synchromesh mesh gear box for its construction and working. **05**

c) Classify automobile body types with its features, and example. **04**

Q.4 **a)** The coefficient of rolling resistance for a truck weighing 8500 kg is 0.02 and coefficient of air resistance is 0.026 in the formula $R = KrW + KaAV^2$, N, where A is frontal area in m^2 and V is speed of truck in km/hr. The transmission efficiency in top gear of 5:1 is 85% and that in second gear of 18:1 is 75%. The frontal area is (L × B) (1500 cm × 2500 cm). If the truck has maximum speed of 76 km/hr in top gear, **08**
calculate:
i) Engine BP required
ii) the engine speed if the driving wheels have an effective diameter of 0.850 m.
iii) the maximum grade the truck can negotiate at the above engine speed in second gear and
iv) the maximum draw bar pull available on level at above engine speed in second gear.

b) Explain final drive and differential gear box for its construction and working. **06**

Section – II

Q.5 **a)** Explain steering geometry for front steering wheels. **04**
A vehicle has the following data: Wheelbase L = 2.5 m, Track width W = 1.5 m, Pivot center distance 1.35 m, Inner wheel angle θ =30°. Determine the outer wheel

b) Angle for correct steering. Verify the Ackermann steering condition is satisfied. **06**
Calculate the turning radii of all four wheels (inner front, outer front, inner rear, outer rear)

c) Explain the concept of understeer and oversteer. **04**

Q.6 **a)** Explain construction and working of dram and disk brake system. **05**

b) Explain Mac Pherson Strut independent suspension system. **05**

c) Explain air suspension system and its advantages. **04**

Q.7 **a)** Explain the difference between dependent and independent suspension system. **04**

b) Explain Anti-lock Braking System (ABS) and its working principle. **04**

c) A car weight 15 kN and wheel base 3m, the center of gravity is 1.5m in front of real axle and 0.8m above ground level. The car is having brakes on all four wheels. The coefficient of adhesion between the road and wheels is 0.5. If the car is moving up on the road having gradient 1:10, **06**
Calculate:

i) Load distribution between front and rear axle.
ii) Distance at which the car can stopped while going up at speed of 60km/hr, when only rear brakes are applied.

Seat No.	

Set **Q**

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Automobile Engineering (MECHPEC – 02C)

Day & Date: Friday, 22-05-2026 Max. Marks: 70
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MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Multiple Choice Questions. **14**

1) If camber angle is excessively positive, what is the likely consequence?
a) Even tyre wear b) Increased inner tyre wear
c) Increased outer tyre wear d) No tyre wear

2) During sudden braking, dynamic weight transfer shifts load _____.
a) From front to rear b) To sides only
c) Equally distributed d) From rear to front

3) In an independent suspension system, what is the main advantage compared to rigid axle?
a) Better ride comfort due to independent wheel movement
b) Increased unsprung mass
c) Reduced stability
d) Increased tyre wear

4) A vehicle with rear engine rear wheel drive (RR) shows oversteering at high speeds. What is the primary reason?
a) Excess load on front axle
b) Excess load on rear axle reducing stability
c) Low engine power
d) High air resistance

5) Why is dynamic weight transfer important during braking?
a) It increases engine power
b) It affects braking efficiency and stability
c) It reduces fuel consumption
d) It increases speed

6) If tractive effort is less than total resistance, what will happen?
a) Vehicle accelerates
b) Vehicle decelerates
c) Vehicle maintains speed
d) Vehicle stops immediately

7) If aerodynamic drag is reduced by streamlining the body, what is the expected outcome?
a) Increase in rolling resistance
b) Decrease in fuel efficiency
c) Reduction in power required at high speed
d) Increase in gradient resistance

8) A car with front engine rear wheel drive (FR) is climbing a steep slope. Which component mainly ensures torque multiplication for climbing?
a) Differential
b) Propeller shaft
c) Gearbox
d) Clutch

9) A vehicle shifts from FWD to AWD for off-road driving. What is the primary advantage gained?
a) Reduced fuel consumption
b) Lower vehicle weight
c) Higher top speed
d) Improved traction on uneven surfaces

10) If a vehicle body is made from aluminum instead of steel, what is the most likely performance impact?
a) Improved fuel efficiency due to reduced weight
b) Increased rolling resistance
c) Increased gradient resistance
d) Reduced acceleration

11) For a vehicle climbing a gradient, which parameter directly determines its ability to climb?
a) Air resistance
b) Gradeability
c) Wheelbase
d) Suspension stiffness

12) In a multi-plate clutch system, why are multiple plates used instead of a single plate?
a) To reduce torque capacity
b) To increase frictional surface area
c) To reduce weight
d) To simplify construction

13) In a synchromesh gearbox, what is the main purpose of synchronizers?
a) Increase torque
b) Match speeds of gears before engagement
c) Reduce engine speed
d) Increase fuel efficiency

14) For true rolling condition in steering, which condition must be satisfied?

a) All wheels rotate at same speed
b) All wheels have same diameter
c) All wheels must roll about a common instantaneous center
d) Wheels must be identical

Seat No.	

Set **Q**

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Automobile Engineering (MECHPEC – 02C)

Day & Date: Friday, 22-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Solve any Two questions from each section.
2) Figure on fight indicates full marks.
3) Assume suitable data, diagrams if required.
4) Use of non-programmable calculator is allowed.

Section – I

Q.2 **a)** Explain AWD Layout with its merits and demerits. **05**

b) Explain resistance to vehicle motion, Air, Rolling and Gradient resistance. **05**

c) Explain Hotch Kiss Drive layout. **04**

Q.3 **a)** Explain multi plate clutch for its construction and working. **05**

b) Explain synchromesh mesh gear box for its construction and working. **05**

c) Classify automobile body types with its features, and example. **04**

Q.4 **a)** The coefficient of rolling resistance for a truck weighing 8500 kg is 0.02 and coefficient of air resistance is 0.026 in the formula $R = KrW + KaAV^2$, N, where A is frontal area in m^2 and V is speed of truck in km/hr. The transmission efficiency in top gear of 5:1 is 85% and that in second gear of 18:1 is 75%. The frontal area is (L × B) (1500 cm × 2500 cm). If the truck has maximum speed of 76 km/hr in top gear, **08**
calculate:
i) Engine BP required
ii) the engine speed if the driving wheels have an effective diameter of 0.850 m.
iii) the maximum grade the truck can negotiate at the above engine speed in second gear and
iv) the maximum draw bar pull available on level at above engine speed in second gear.

b) Explain final drive and differential gear box for its construction and working. **06**

Section – II

Q.5	**a)**	Explain steering geometry for front steering wheels. A vehicle has the following data: Wheelbase L = 2.5 m, Track width W = 1.5 m, Pivot center distance 1.35 m, Inner wheel angle θ =30°. Determine the outer wheel	**04**
	b)	Angle for correct steering. Verify the Ackermann steering condition is satisfied. Calculate the turning radii of all four wheels (inner front, outer front, inner rear, outer rear)	**06**
	c)	Explain the concept of understeer and oversteer.	**04**
Q.6	**a)**	Explain construction and working of dram and disk brake system.	**05**
	b)	Explain Mac Pherson Strut independent suspension system.	**05**
	c)	Explain air suspension system and its advantages.	**04**
Q.7	**a)**	Explain the difference between dependent and independent suspension system.	**04**
	b)	Explain Anti-lock Braking System (ABS) and its working principle.	**04**
	c)	A car weight 15 kN and wheel base 3m, the center of gravity is 1.5m in front of real axle and 0.8m above ground level. The car is having brakes on all four wheels. The coefficient of adhesion between the road and wheels is 0.5. If the car is moving up on the road having gradient 1:10, Calculate: i) Load distribution between front and rear axle. ii) Distance at which the car can stopped while going up at speed of 60km/hr, when only rear brakes are applied.	**06**

SLR-QH-350

Seat No.	

Set R

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Automobile Engineering (MECHPEC – 02C)

Day & Date: Friday, 22-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

Duration: 30 Minutes Marks:14

Q.1 Multiple Choice Questions. **14**

1) A vehicle with rear engine rear wheel drive (RR) shows oversteering at high speeds. What is the primary reason?
a) Excess load on front axle
b) Excess load on rear axle reducing stability
c) Low engine power
d) High air resistance

2) Why is dynamic weight transfer important during braking?
a) It increases engine power
b) It affects braking efficiency and stability
c) It reduces fuel consumption
d) It increases speed

3) If tractive effort is less than total resistance, what will happen?
a) Vehicle accelerates b) Vehicle decelerates
c) Vehicle maintains speed d) Vehicle stops immediately

4) If aerodynamic drag is reduced by streamlining the body, what is the expected outcome?
a) Increase in rolling resistance
b) Decrease in fuel efficiency
c) Reduction in power required at high speed
d) Increase in gradient resistance

5) A car with front engine rear wheel drive (FR) is climbing a steep slope. Which component mainly ensures torque multiplication for climbing?
a) Differential b) Propeller shaft
c) Gearbox d) Clutch

6) A vehicle shifts from FWD to AWD for off-road driving. What is the primary advantage gained?
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b) Lower vehicle weight
c) Higher top speed
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7) If a vehicle body is made from aluminum instead of steel, what is the most likely performance impact?
a) Improved fuel efficiency due to reduced weight
b) Increased rolling resistance
c) Increased gradient resistance
d) Reduced acceleration

8) For a vehicle climbing a gradient, which parameter directly determines its ability to climb?
a) Air resistance
b) Gradeability
c) Wheelbase
d) Suspension stiffness

9) In a multi-plate clutch system, why are multiple plates used instead of a single plate?
a) To reduce torque capacity
b) To increase frictional surface area
c) To reduce weight
d) To simplify construction

10) In a synchromesh gearbox, what is the main purpose of synchronizers?
a) Increase torque
b) Match speeds of gears before engagement
c) Reduce engine speed
d) Increase fuel efficiency

11) For true rolling condition in steering, which condition must be satisfied?
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c) All wheels must roll about a common instantaneous center
d) Wheels must be identical

12) If camber angle is excessively positive, what is the likely consequence?
a) Even tyre wear
b) Increased inner tyre wear
c) Increased outer tyre wear
d) No tyre wear

13) During sudden braking, dynamic weight transfer shifts load _____.
a) From front to rear
b) To sides only
c) Equally distributed
d) From rear to front

14) In an independent suspension system, what is the main advantage compared to rigid axle?

a) Better ride comfort due to independent wheel movement
b) Increased unsprung mass
c) Reduced stability
d) Increased tyre wear

Seat No.	

Set **R**

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Automobile Engineering (MECHPEC – 02C)

Day & Date: Friday, 22-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Solve any Two questions from each section.
2) Figure on fight indicates full marks.
3) Assume suitable data, diagrams if required.
4) Use of non-programmable calculator is allowed.

Section – I

Q.2 **a)** Explain AWD Layout with its merits and demerits. **05**

b) Explain resistance to vehicle motion, Air, Rolling and Gradient resistance. **05**

c) Explain Hotch Kiss Drive layout. **04**

Q.3 **a)** Explain multi plate clutch for its construction and working. **05**

b) Explain synchromesh mesh gear box for its construction and working. **05**

c) Classify automobile body types with its features, and example. **04**

Q.4 **a)** The coefficient of rolling resistance for a truck weighing 8500 kg is 0.02 and coefficient of air resistance is 0.026 in the formula $R = KrW + KaAV^2$, N, where A is frontal area in m^2 and V is speed of truck in km/hr. The transmission efficiency in top gear of 5:1 is 85% and that in second gear of 18:1 is 75%. The frontal area is (L × B) (1500 cm × 2500 cm). If the truck has maximum speed of 76 km/hr in top gear, **08**
calculate:
i) Engine BP required
ii) the engine speed if the driving wheels have an effective diameter of 0.850 m.
iii) the maximum grade the truck can negotiate at the above engine speed in second gear and
iv) the maximum draw bar pull available on level at above engine speed in second gear.

b) Explain final drive and differential gear box for its construction and working. **06**

Section – II

Q.5 **a)** Explain steering geometry for front steering wheels. **04**
A vehicle has the following data: Wheelbase L = 2.5 m, Track width W = 1.5 m, Pivot center distance 1.35 m, Inner wheel angle θ =30°. Determine the outer wheel

b) Angle for correct steering. Verify the Ackermann steering condition is satisfied. **06**
Calculate the turning radii of all four wheels (inner front, outer front, inner rear, outer rear)

c) Explain the concept of understeer and oversteer. **04**

Q.6 **a)** Explain construction and working of dram and disk brake system. **05**

b) Explain Mac Pherson Strut independent suspension system. **05**

c) Explain air suspension system and its advantages. **04**

Q.7 **a)** Explain the difference between dependent and independent suspension system. **04**

b) Explain Anti-lock Braking System (ABS) and its working principle. **04**

c) A car weight 15 kN and wheel base 3m, the center of gravity is 1.5m in front of real axle and 0.8m above ground level. The car is having brakes on all four wheels. The coefficient of adhesion between the road and wheels is 0.5. If the car is moving up on the road having gradient 1:10, **06**
Calculate:

i) Load distribution between front and rear axle.
ii) Distance at which the car can stopped while going up at speed of 60km/hr, when only rear brakes are applied.

Seat No.	

Set **S**

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Automobile Engineering (MECHPEC – 02C)

Day & Date: Friday, 22-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Multiple Choice Questions. **14**

1) In a synchromesh gearbox, what is the main purpose of synchronizers?
a) Increase torque
b) Match speeds of gears before engagement
c) Reduce engine speed
d) Increase fuel efficiency

2) For true rolling condition in steering, which condition must be satisfied?
a) All wheels rotate at same speed
b) All wheels have same diameter
c) All wheels must roll about a common instantaneous center
d) Wheels must be identical

3) If camber angle is excessively positive, what is the likely consequence?
a) Even tyre wear b) Increased inner tyre wear
c) Increased outer tyre wear d) No tyre wear

4) During sudden braking, dynamic weight transfer shifts load _____.
a) From front to rear b) To sides only
c) Equally distributed d) From rear to front

5) In an independent suspension system, what is the main advantage compared to rigid axle?
a) Better ride comfort due to independent wheel movement
b) Increased unsprung mass
c) Reduced stability
d) Increased tyre wear

6) A vehicle with rear engine rear wheel drive (RR) shows oversteering at high speeds. What is the primary reason?
a) Excess load on front axle
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7) Why is dynamic weight transfer important during braking?
a) It increases engine power
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8) If tractive effort is less than total resistance, what will happen?
a) Vehicle accelerates
b) Vehicle decelerates
c) Vehicle maintains speed
d) Vehicle stops immediately

9) If aerodynamic drag is reduced by streamlining the body, what is the expected outcome?
a) Increase in rolling resistance
b) Decrease in fuel efficiency
c) Reduction in power required at high speed
d) Increase in gradient resistance

10) A car with front engine rear wheel drive (FR) is climbing a steep slope. Which component mainly ensures torque multiplication for climbing?
a) Differential
b) Propeller shaft
c) Gearbox
d) Clutch

11) A vehicle shifts from FWD to AWD for off-road driving. What is the primary advantage gained?
a) Reduced fuel consumption
b) Lower vehicle weight
c) Higher top speed
d) Improved traction on uneven surfaces

12) If a vehicle body is made from aluminum instead of steel, what is the most likely performance impact?
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c) Increased gradient resistance
d) Reduced acceleration

13) For a vehicle climbing a gradient, which parameter directly determines its ability to climb?
a) Air resistance
b) Gradeability
c) Wheelbase
d) Suspension stiffness

14) In a multi-plate clutch system, why are multiple plates used instead of a single plate?

a) To reduce torque capacity
b) To increase frictional surface area
c) To reduce weight
d) To simplify construction

SLR-QH-350

Seat No.	

Set S

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Automobile Engineering (MECHPEC – 02C)

Day & Date: Friday, 22-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Solve any Two questions from each section.
2) Figure on fight indicates full marks.
3) Assume suitable data, diagrams if required.
4) Use of non-programmable calculator is allowed.

Section – I

Q.2 **a)** Explain AWD Layout with its merits and demerits. **05**

b) Explain resistance to vehicle motion, Air, Rolling and Gradient resistance. **05**

c) Explain Hotch Kiss Drive layout. **04**

Q.3 **a)** Explain multi plate clutch for its construction and working. **05**

b) Explain synchromesh mesh gear box for its construction and working. **05**

c) Classify automobile body types with its features, and example. **04**

Q.4 **a)** The coefficient of rolling resistance for a truck weighing 8500 kg is 0.02 and coefficient of air resistance is 0.026 in the formula $R = KrW + KaAV^2$, N, where A is frontal area in m^2 and V is speed of truck in km/hr. The transmission efficiency in top gear of 5:1 is 85% and that in second gear of 18:1 is 75%. The frontal area is (L × B) (1500 cm × 2500 cm). If the truck has maximum speed of 76 km/hr in top gear, **08**
calculate:
i) Engine BP required
ii) the engine speed if the driving wheels have an effective diameter of 0.850 m.
iii) the maximum grade the truck can negotiate at the above engine speed in second gear and
iv) the maximum draw bar pull available on level at above engine speed in second gear.

b) Explain final drive and differential gear box for its construction and working. **06**

Section – II

Q.5 **a)** Explain steering geometry for front steering wheels. **04**
A vehicle has the following data: Wheelbase L = 2.5 m, Track width W = 1.5 m, Pivot center distance 1.35 m, Inner wheel angle θ =30°. Determine the outer wheel

b) Angle for correct steering. Verify the Ackermann steering condition is satisfied. **06**
Calculate the turning radii of all four wheels (inner front, outer front, inner rear, outer rear)

c) Explain the concept of understeer and oversteer. **04**

Q.6 **a)** Explain construction and working of dram and disk brake system. **05**

b) Explain Mac Pherson Strut independent suspension system. **05**

c) Explain air suspension system and its advantages. **04**

Q.7 **a)** Explain the difference between dependent and independent suspension system. **04**

b) Explain Anti-lock Braking System (ABS) and its working principle. **04**

c) A car weight 15 kN and wheel base 3m, the center of gravity is 1.5m in front of real axle and 0.8m above ground level. The car is having brakes on all four wheels. The coefficient of adhesion between the road and wheels is 0.5. If the car is moving up on the road having gradient 1:10, **06**
Calculate:

i) Load distribution between front and rear axle.
ii) Distance at which the car can stopped while going up at speed of 60km/hr, when only rear brakes are applied.

SLR-QH-351

Seat No.	

Set P

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
CAD-CAM-CAE (MECHPEC – 02D)

Day & Date: Friday, 22-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) Which of the following is not a part of CAD hardware?
a) Graphical display terminal b) Keyboards
c) Computer program d) Peripheral equipment

2) Integration of all business functions of enterprise is _____.
a) CIM b) CAD CAM
c) CAE d) None of these

3) Which geometric transformation does not change the basic dimensions of the graphics objects transformed?
a) Scaling b) Transition
c) Rotation d) Both b) and c)

4) IGES is _____.
a) Neutral file format b) Data format
c) Operating system d) All of the above

5) For the modeling of sheet metal parts of a car body, which one of the following may be generally recommended?
a) Wireframe modeling b) Surface modeling
c) Solid modeling d) None of these

6) FANUC is the name of _____.
a) CNC tool b) CNC controller
c) CNC job holding device d) None of these

7) Which curve exhibits better local control?
a) Bezier b) Benazir
c) B-spline d) All of these

8) Among these which is Drawing interchange file format.
a) DXF b) UCS
c) CAD d) None of these

9) The process of building the structure matrix [K] from the element stiffness matrices [K]e is called, _____.
a) assembly b) decomposition
c) interpolation d) Extrapolation

10) APT stands for _____.
a) Automatically programmed tool
b) Auto power tool
c) Automatically punched tape
d) All

11) CAPP involves use of computer in _____.
a) Planning the processes b) Determine cutting conditions
c) Setting time standards d) All of these

12) In case of closed loop control system _____ is used.
a) Servo motors b) Stepper motors
c) DC motors d) All of these

13) The predefined sequence of movement of machine parts in CNC, stored in MCU is called as _____.
a) Machine cycles b) Operation cycles
c) Canned cycles d) None of these

14) The equipment used for the measurement of tool-offsets is called as _____.
a) Vernier b) Micrometer
c) CMM d) Tool presetter

Seat No.	

Set **P**

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
CAD-CAM-CAE (MECHPEC – 02D)

Day & Date: Friday, 22-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Solve any Two questions from the Section - I.
2) Question No.5 compulsory and from the remaining attempt any one from Section - II.
3) Figure on fight indicates full marks.
4) Draw neat diagram where necessary.
5) Use of non-programmable scientific calculator is allowed.

Section – I

Q.2 Solve following Questions.

a) Describe Product Lifecycle Management (PLM) and explain how CAD, CAM, and CAE tools support effective PLM implementation. **07**

b) What do you mean by standardization in graphic software? Explain in brief GKS, PHIGS and IGES. **07**

Q.3 Solve following Questions.

a) Perform a counter clockwise 30° rotation of triangle EFG with E (4, 3), F (10, 3) and G (4, 7) about vertex point E. **08**

b) Discuss the role of GT in CAPP. Hence, discuss the importance of CAPP in industry. **06**

Q.4 Write a short notes. (Any Three) **14**

a) List of latest FEA Software's & their applications in Domain.

b) Computer Integrated Manufacturing (CIM).

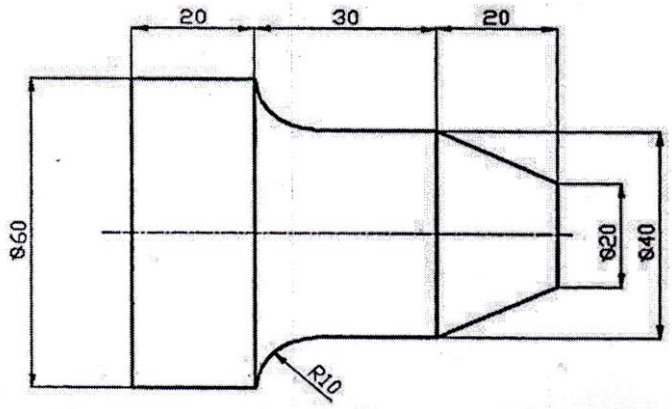
c) Automations.

d) Properties of Bezier curves.

Section – II

Q.5 Solve following Questions.

a) With reference to component drawing given below prepare CNC part program using G & M codes Prepare: **10**
Assume suitable Job zero/Machine zero/home position of tool etc. and state it clearly.
Tool material: H.S.S Work Material: M.S.
Spindle speed: 2000 rpm Feed rate: 400 mm/min
All dimensions are in mm.



b) Explain tool length and cutter radius compensation in part programming. **04**

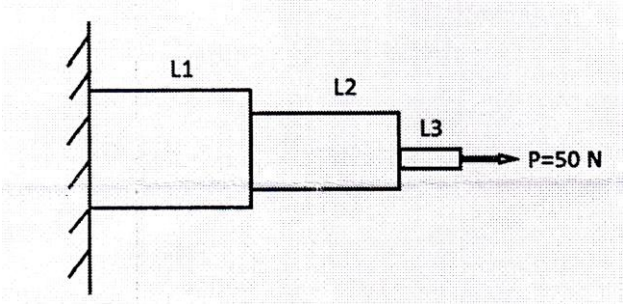
Q.6 Solve following Questions.

a) What is CNC? Write advantages and disadvantages of CNC system over NC system. **07**

b) Elaborate the steps in NC manufacturing. **07**

Q.7 Solve following Questions.

a) Determine the nodal displacement, stresses, and strains in stepped bar **08**



Where, $A_1 = 50\ mm^2$ $A_2 = 20\ mm^2$ $A_3 = 10mm^2$ $L_1 = L_2 = L_3 = 10\ mm$
$E = 200\ GPa$

b) Describe general steps of the FEM. **06**

Seat No.	

Set **Q**

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
CAD-CAM-CAE (MECHPEC – 02D)

Day & Date: Friday, 22-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) Among these which is Drawing interchange file format.
a) DXF b) UCS
c) CAD d) None of these

2) The process of building the structure matrix [K] from the element stiffness matrices [K]e is called, _____.
a) assembly b) decomposition
c) interpolation d) Extrapolation

3) APT stands for _____.
a) Automatically programmed tool
b) Auto power tool
c) Automatically punched tape
d) All

4) CAPP involves use of computer in _____.
a) Planning the processes b) Determine cutting conditions
c) Setting time standards d) All of these

5) In case of closed loop control system _____ is used.
a) Servo motors b) Stepper motors
c) DC motors d) All of these

6) The predefined sequence of movement of machine parts in CNC, stored in MCU is called as _____.
a) Machine cycles b) Operation cycles
c) Canned cycles d) None of these

7) The equipment used for the measurement of tool-offsets is called as _____.
a) Vernier b) Micrometer
c) CMM d) Tool presetter

8) Which of the following is not a part of CAD hardware?
a) Graphical display terminal b) Keyboards
c) Computer program d) Peripheral equipment

9) Integration of all business functions of enterprise is _____.
a) CIM b) CAD CAM
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10) Which geometric transformation does not change the basic dimensions of the graphics objects transformed?
a) Scaling b) Transition
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11) IGES is _____.
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c) Operating system d) All of the above

12) For the modeling of sheet metal parts of a car body, which one of the following may be generally recommended?
a) Wireframe modeling b) Surface modeling
c) Solid modeling d) None of these

13) FANUC is the name of _____.
a) CNC tool b) CNC controller
c) CNC job holding device d) None of these

14) Which curve exhibits better local control?
a) Bezier b) Benazir
c) B-spline d) All of these

SLR-QH-351

Seat No.	

Set Q

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
CAD-CAM-CAE (MECHPEC – 02D)

Day & Date: Friday, 22-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Solve any Two questions from the Section - I.
2) Question No.5 compulsory and from the remaining attempt any one from Section - II.
3) Figure on fight indicates full marks.
4) Draw neat diagram where necessary.
5) Use of non-programmable scientific calculator is allowed.

Section – I

Q.2 Solve following Questions.

a) Describe Product Lifecycle Management (PLM) and explain how CAD, CAM, and CAE tools support effective PLM implementation. **07**

b) What do you mean by standardization in graphic software? Explain in brief GKS, PHIGS and IGES. **07**

Q.3 Solve following Questions.

a) Perform a counter clockwise 30° rotation of triangle EFG with E (4, 3), F (10, 3) and G (4, 7) about vertex point E. **08**

b) Discuss the role of GT in CAPP. Hence, discuss the importance of CAPP in industry. **06**

Q.4 Write a short notes. (Any Three) **14**

a) List of latest FEA Software's & their applications in Domain.

b) Computer Integrated Manufacturing (CIM).

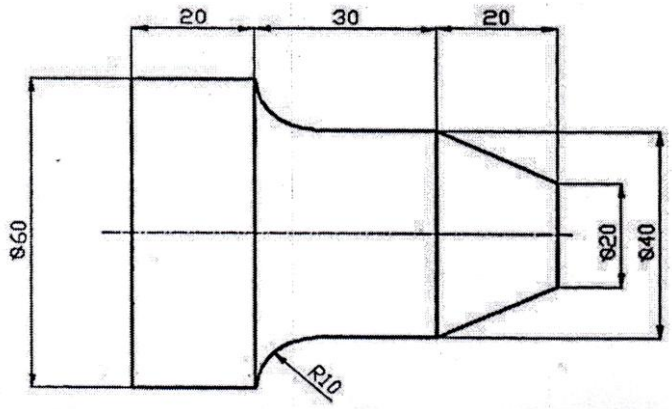
c) Automations.

d) Properties of Bezier curves.

Section – II

Q.5 Solve following Questions.

a) With reference to component drawing given below prepare CNC part program using G & M codes Prepare: **10**
Assume suitable Job zero/Machine zero/home position of tool etc. and state it clearly.
Tool material: H.S.S Work Material: M.S.
Spindle speed: 2000 rpm Feed rate: 400 mm/min
All dimensions are in mm.



b) Explain tool length and cutter radius compensation in part programming. **04**

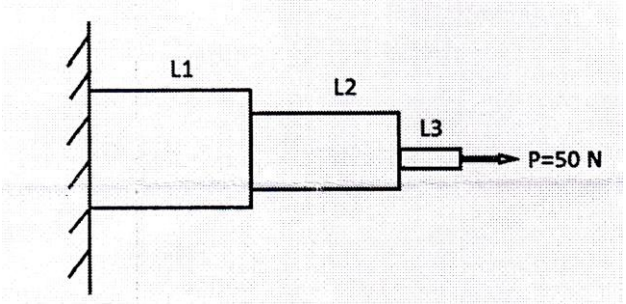
Q.6 Solve following Questions.

a) What is CNC? Write advantages and disadvantages of CNC system over NC system. **07**

b) Elaborate the steps in NC manufacturing. **07**

Q.7 Solve following Questions.

a) Determine the nodal displacement, stresses, and strains in stepped bar **08**



Where, $A_1 = 50\ mm^2$ $A_2 = 20\ mm^2$ $A_3 = 10mm^2$ $L_1 = L_2 = L_3 = 10\ mm$
$E = 200\ GPa$

b) Describe general steps of the FEM. **06**

Seat No.	

Set R

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
CAD-CAM-CAE (MECHPEC – 02D)

Day & Date: Friday, 22-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) CAPP involves use of computer in _____.
a) Planning the processes b) Determine cutting conditions
c) Setting time standards d) All of these

2) In case of closed loop control system _____ is used.
a) Servo motors b) Stepper motors
c) DC motors d) All of these

3) The predefined sequence of movement of machine parts in CNC, stored in MCU is called as _____.
a) Machine cycles b) Operation cycles
c) Canned cycles d) None of these

4) The equipment used for the measurement of tool-offsets is called as _____.
a) Vernier b) Micrometer
c) CMM d) Tool presetter

5) Which of the following is not a part of CAD hardware?
a) Graphical display terminal b) Keyboards
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6) Integration of all business functions of enterprise is _____.
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7) Which geometric transformation does not change the basic dimensions of the graphics objects transformed?
a) Scaling b) Transition
c) Rotation d) Both b) and c)

8) IGES is _____.
a) Neutral file format b) Data format
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9) For the modeling of sheet metal parts of a car body, which one of the following may be generally recommended?
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10) FANUC is the name of _____.
a) CNC tool b) CNC controller
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11) Which curve exhibits better local control?
a) Bezier b) Benazir
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12) Among these which is Drawing interchange file format.
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13) The process of building the structure matrix [K] from the element stiffness matrices [K]e is called, _____.
a) assembly b) decomposition
c) interpolation d) Extrapolation

14) APT stands for _____.
a) Automatically programmed tool
b) Auto power tool
c) Automatically punched tape
d) All

Seat No.	

Set **R**

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
CAD-CAM-CAE (MECHPEC – 02D)

Day & Date: Friday, 22-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Solve any Two questions from the Section - I.
2) Question No.5 compulsory and from the remaining attempt any one from Section - II.
3) Figure on fight indicates full marks.
4) Draw neat diagram where necessary.
5) Use of non-programmable scientific calculator is allowed.

Section – I

Q.2 Solve following Questions.

a) Describe Product Lifecycle Management (PLM) and explain how CAD, CAM, and CAE tools support effective PLM implementation. **07**

b) What do you mean by standardization in graphic software? Explain in brief GKS, PHIGS and IGES. **07**

Q.3 Solve following Questions.

a) Perform a counter clockwise 30° rotation of triangle EFG with E (4, 3), F (10, 3) and G (4, 7) about vertex point E. **08**

b) Discuss the role of GT in CAPP. Hence, discuss the importance of CAPP in industry. **06**

Q.4 Write a short notes. (Any Three) **14**

a) List of latest FEA Software's & their applications in Domain.

b) Computer Integrated Manufacturing (CIM).

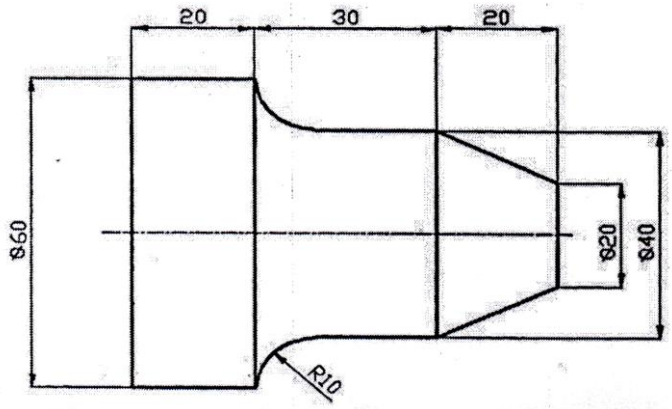
c) Automations.

d) Properties of Bezier curves.

Section – II

Q.5 Solve following Questions.

a) With reference to component drawing given below prepare CNC part program using G & M codes Prepare: **10**
Assume suitable Job zero/Machine zero/home position of tool etc. and state it clearly.
Tool material: H.S.S Work Material: M.S.
Spindle speed: 2000 rpm Feed rate: 400 mm/min
All dimensions are in mm.



b) Explain tool length and cutter radius compensation in part programming. **04**

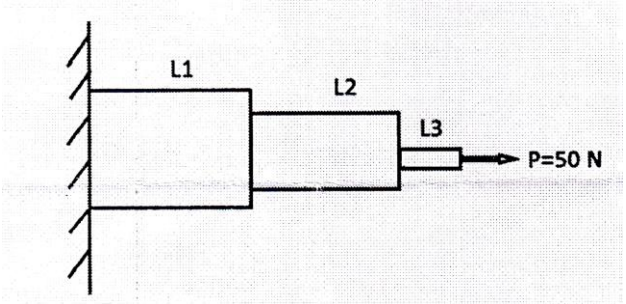
Q.6 Solve following Questions.

a) What is CNC? Write advantages and disadvantages of CNC system over NC system. **07**

b) Elaborate the steps in NC manufacturing. **07**

Q.7 Solve following Questions.

a) Determine the nodal displacement, stresses, and strains in stepped bar **08**



Where, $A_1 = 50\ mm^2$ $A_2 = 20\ mm^2$ $A_3 = 10mm^2$ $L_1 = L_2 = L_3 = 10\ mm$
$E = 200\ GPa$

b) Describe general steps of the FEM. **06**

Seat No.	

Set **S**

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
CAD-CAM-CAE (MECHPEC – 02D)

Day & Date: Friday, 22-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) FANUC is the name of _____.
a) CNC tool b) CNC controller
c) CNC job holding device d) None of these

2) Which curve exhibits better local control?
a) Bezier b) Benazir
c) B-spline d) All of these

3) Among these which is Drawing interchange file format.
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4) The process of building the structure matrix [K] from the element stiffness matrices [K]e is called, _____.
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c) Operating system d) All of the above

14) For the modeling of sheet metal parts of a car body, which one of the following may be generally recommended?
a) Wireframe modeling b) Surface modeling
c) Solid modeling d) None of these

SLR-QH-351

Seat No.	

Set S

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
CAD-CAM-CAE (MECHPEC – 02D)

Day & Date: Friday, 22-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Solve any Two questions from the Section - I.
2) Question No.5 compulsory and from the remaining attempt any one from Section - II.
3) Figure on fight indicates full marks.
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5) Use of non-programmable scientific calculator is allowed.

Section – I

Q.2 Solve following Questions.

a) Describe Product Lifecycle Management (PLM) and explain how CAD, CAM, and CAE tools support effective PLM implementation. **07**

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Q.4 Write a short notes. (Any Three) **14**

a) List of latest FEA Software's & their applications in Domain.

b) Computer Integrated Manufacturing (CIM).

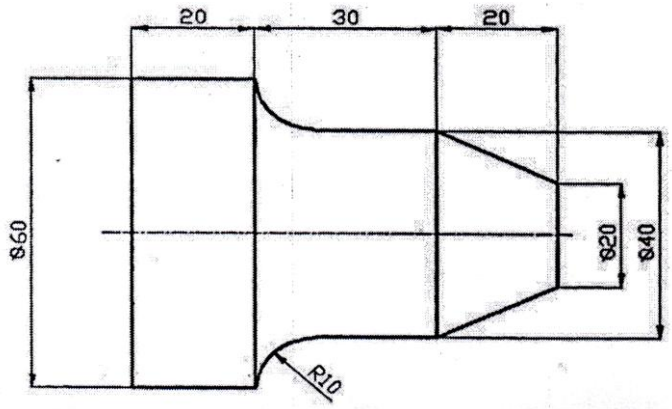
c) Automations.

d) Properties of Bezier curves.

Section – II

Q.5 Solve following Questions.

a) With reference to component drawing given below prepare CNC part program using G & M codes Prepare: **10**
Assume suitable Job zero/Machine zero/home position of tool etc. and state it clearly.
Tool material: H.S.S Work Material: M.S.
Spindle speed: 2000 rpm Feed rate: 400 mm/min
All dimensions are in mm.



b) Explain tool length and cutter radius compensation in part programming. **04**

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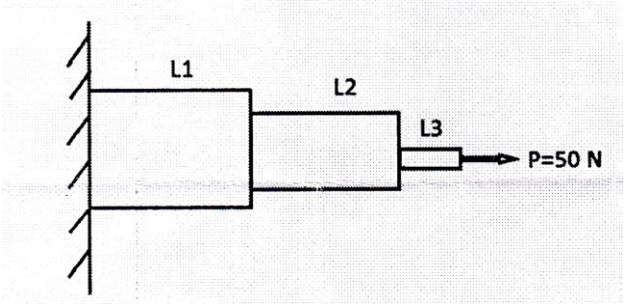
Q.7 Solve following Questions.

a) Determine the nodal displacement, stresses, and strains in stepped bar **08**



Where, $A_1 = 50\ mm^2$ $A_2 = 20\ mm^2$ $A_3 = 10mm^2$ $L_1 = L_2 = L_3 = 10\ mm$
$E = 200\ GPa$

b) Describe general steps of the FEM. **06**

SLR-QH-352

Seat No.		Set	P

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Finite Element Method (MECHPEC – 03A)

Day & Date: Monday, 25-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) In an _____ element the value of the field variable remains unchanged in the circumferential direction.
a) 1D and 2D b) beam
c) solid d) axisymmetric

2) In thermal analysis problems the primary field variable is _____.
a) temperature b) heat flux
c) stress d) displacement

3) Formula for Galerkin method is _____.
a) $f(x)R(x)dx = 0$ b) $\int R(x)dx = 0$
c) $R(x) = 0$ d) $\int \mathrm{R}^2(x)dx = 0$

4) Multiplex elements are those elements which _____.
a) have higher order interpolation polynomials
b) have sides parallel to coordinate system
c) have sides parallel to coordinate system and use higher order interpolation polynomials
d) have polynomials with only linear and constant terms

5) The potential energy in a spring is given by the equation _____.
a) $\pi = \frac{1}{2}KU^2 - FU$ b) $\pi = Mc^2$
c) $\pi = Mg$ d) $\pi = Mk^2$

6) An element in which the order of the geometry interpolation function is higher than the order of the displacement interpolation function is called _____.

a) Iso-parametric element
b) Super parametric element
c) Sub parametric element
d) Laplacian element

7) The sum of the natural coordinates L_1, L_2, L_3 for triangular element is always _____.

a) equal to 1
b) zero
c) equal to -1
d) varies from -1 to 1

8) The variational method involves the concept of minimization of _____.

a) kinetic energy
b) thermal energy
c) strain energy
d) potential energy

9) Interpolation function for a 2 noded simplex 1-D element is _____.

a) $a_1 + a_2 x$
b) $a_1 + a_2 x + a_3 x^2$
c) $a_1 + a_2 x + a_3 y$
d) None of the above

10) Which of the following is a weighted residual method?

a) Galerkin's method
b) Rayleigh-Ritz method
c) Potential energy method
d) All the above

11) Improvement in the accuracy of finite element mesh by increasing the order of interpolation function used in the elements is _____.

a) h-refinement
b) p-refinement
c) mesh refinement
d) p-h refinement

12) The analysis concerned with the prediction of natural frequencies is called _____.

a) harmonic analysis
b) modal analysis
c) static analysis
d) transient analysis

13) Post processing means _____.

a) Meshing
b) Solving
c) Result analysis
d) Discretization

14) In _____ element the value of field variable remains unchanged in the circumferential direction.

a) 1D and 2D
b) Beam
c) Truss
d) Axisymmetric

Seat No.	

Set **P**

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Finite Element Method (MECHPEC – 03A)

Day & Date: Monday, 25-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Solve any Two questions from each section.
2) Figure on fight indicates full marks.
3) Assume suitable data, if required.
4) Use of non-programable scientific calculator is allowed.

Section – I

Q.2 Solve.

a) Obtain shape functions for 2 node 1-D truss element. **07**

b) Explain General FEM procedure. **07**

Q.3 Solve.

a) Obtain solution of differential equation by using Galerkin's method. **07**

$$\frac{\partial^2 u}{\partial x^2} + 3x\frac{\partial u}{\partial x} - 6u = 0, 0 \leqslant x \leqslant 1$$

Take boundary conditions as $u(0) = 1\, u'(0) = 0.1$

b) Explain Simplex, Complex and Multiplex elements. **07**

Q.4 Solve.

a) Find nodal displacement in stepped bar as shown in figure 1. **07**
Take A_1 = 40 mm^2, A_2 = 20 mm^2
$L_1 = L_2$ = 200 mm, E = 200×10^3 MPa

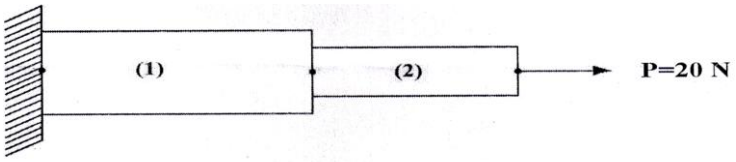


Figure 1:

b) Explain properties of stiffness matrix. **07**

Section – II

Q.5 Solve.

a) A stepped bar is subjected to an axial load of P = 10 KN as shown in Figure below. If the material of the stepped bar is steel with a Young's modulus of $E = 2 \times 10^7$ N/cm^2, find the stresses developed in each of the steps. Apply Boundary conditions by Penalty method. **12**

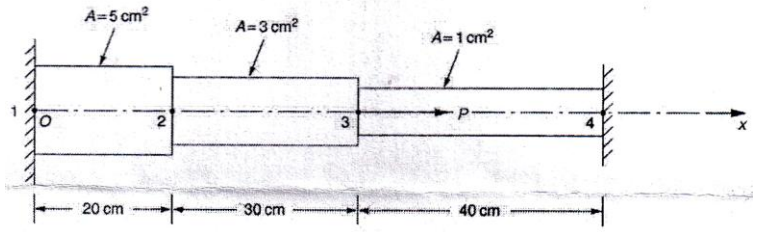


Figure 2:

b) Explain Brick elements. **02**

Q.6 Solve.

a) Calculate the value of field variable at the point $A(2.0, 2.0)$, which is located inside the triangle as shown in figure 3. **07**
The nodal values for field variable are $U_i = 2, U_j = 1$ and $U_k = 3$

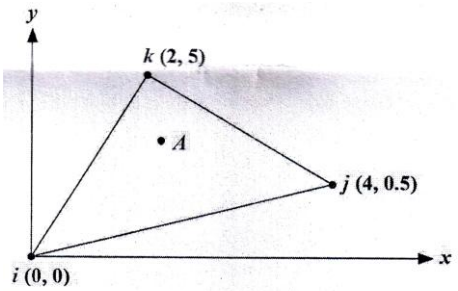


Figure 3:

b) What is convergence study? Why is it necessary to do a convergence study in FEA? **07**

Q.7 Write short note on (Any Three) **14**

a) Transient response analysis

b) Harmonic analysis

c) Explicit analysis

d) Distortion of elements

SLR-QH-352

Seat No.	

Set Q

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Finite Element Method (MECHPEC – 03A)

Day & Date: Monday, 25-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) The variational method involves the concept of minimization of _____.
a) kinetic energy b) thermal energy
c) strain energy d) potential energy

2) Interpolation function for a 2 noded simplex 1-D element is _____.
a) $a_1 + a_2 x$ b) $a_1 + a_2 x + a_3 x^2$
c) $a_1 + a_2 x + a_3 y$ d) None of the above

3) Which of the following is a weighted residual method?
a) Galerkin's method b) Rayleigh-Ritz method
c) Potential energy method d) All the above

4) Improvement in the accuracy of finite element mesh by increasing the order of interpolation function used in the elements is _____.
a) h-refinement b) p-refinement
c) mesh refinement d) p-h refinement

5) The analysis concerned with the prediction of natural frequencies is called _____.
a) harmonic analysis b) modal analysis
c) static analysis d) transient analysis

6) Post processing means _____.
a) Meshing b) Solving
c) Result analysis d) Discretization

7) In _____ element the value of field variable remains unchanged in the circumferential direction.

a) 1D and 2D
b) Beam
c) Truss
d) Axisymmetric

8) In an _____ element the value of the field variable remains unchanged in the circumferential direction.

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9) In thermal analysis problems the primary field variable is _____.

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c) stress
d) displacement

10) Formula for Galerkin method is _____.

a) $f(x)R(x)dx = 0$
b) $\int R(x)dx = 0$
c) $R(x) = 0$
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11) Multiplex elements are those elements which _____.

a) have higher order interpolation polynomials
b) have sides parallel to coordinate system
c) have sides parallel to coordinate system and use higher order interpolation polynomials
d) have polynomials with only linear and constant terms

12) The potential energy in a spring is given by the equation _____.

a) $\pi = \frac{1}{2}KU^2 - FU$
b) $\pi = Mc^2$
c) $\pi = Mg$
d) $\pi = Mk^2$

13) An element in which the order of the geometry interpolation function is higher than the order of the displacement interpolation function is called _____.

a) Iso-parametric element
b) Super parametric element
c) Sub parametric element
d) Laplacian element

14) The sum of the natural coordinates L_1, L_2, L_3 for triangular element is always _____.

a) equal to 1
b) zero
c) equal to -1
d) varies from -1 to 1

Seat No.	

Set **Q**

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Finite Element Method (MECHPEC – 03A)

Day & Date: Monday, 25-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Solve any Two questions from each section.
2) Figure on fight indicates full marks.
3) Assume suitable data, if required.
4) Use of non-programable scientific calculator is allowed.

Section – I

Q.2 Solve.

a) Obtain shape functions for 2 node 1-D truss element. **07**

b) Explain General FEM procedure. **07**

Q.3 Solve.

a) Obtain solution of differential equation by using Galerkin's method. **07**

$$\frac{\partial^2 u}{\partial x^2} + 3x\frac{\partial u}{\partial x} - 6u = 0, 0 \leqslant x \leqslant 1$$

Take boundary conditions as $u(0) = 1\, u'(0) = 0.1$

b) Explain Simplex, Complex and Multiplex elements. **07**

Q.4 Solve.

a) Find nodal displacement in stepped bar as shown in figure 1. **07**
Take A_1 = 40 mm^2, A_2 = 20 mm^2
$L_1 = L_2$ = 200 mm, E = 200×10^3 MPa

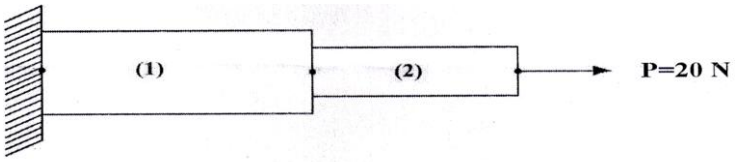

Figure 1:

b) Explain properties of stiffness matrix. **07**

Section – II

Q.5 Solve.

a) A stepped bar is subjected to an axial load of P = 10 KN as shown in Figure below. If the material of the stepped bar is steel with a Young's modulus of $E = 2 \times 10^7$ N/cm^2, find the stresses developed in each of the steps. Apply Boundary conditions by Penalty method. **12**

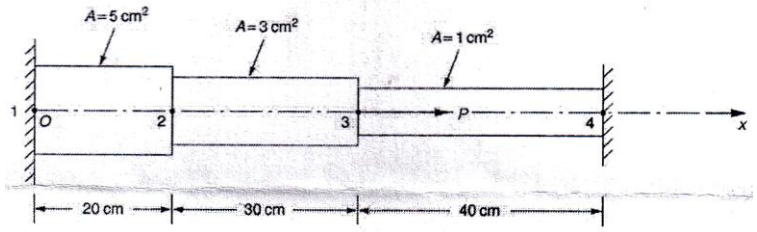

Figure 2:

b) Explain Brick elements. **02**

Q.6 Solve.

a) Calculate the value of field variable at the point $A(2.0, 2.0)$, which is located inside the triangle as shown in figure 3. **07**
The nodal values for field variable are $U_i = 2, U_j = 1$ and $U_k = 3$

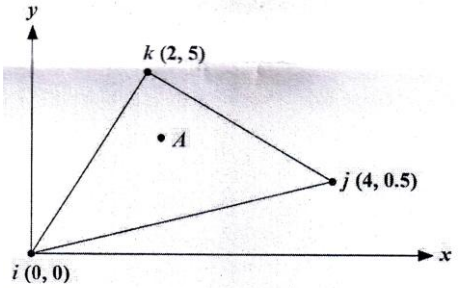

Figure 3:

b) What is convergence study? Why is it necessary to do a convergence study in FEA? **07**

Q.7 Write short note on (Any Three) **14**

a) Transient response analysis

b) Harmonic analysis

c) Explicit analysis

d) Distortion of elements

Seat No.	

Set **R**

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Finite Element Method (MECHPEC – 03A)

Day & Date: Monday, 25-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) Improvement in the accuracy of finite element mesh by increasing the order of interpolation function used in the elements is _____.
a) h-refinement b) p-refinement
c) mesh refinement d) p-h refinement

2) The analysis concerned with the prediction of natural frequencies is called _____.
a) harmonic analysis b) modal analysis
c) static analysis d) transient analysis

3) Post processing means _____.
a) Meshing b) Solving
c) Result analysis d) Discretization

4) In _____ element the value of field variable remains unchanged in the circumferential direction.
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a) temperature b) heat flux
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7) Formula for Galerkin method is _____.

a) $f(x)R(x)dx = 0$ b) $\int R(x)dx = 0$

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11) The sum of the natural coordinates L_1, L_2, L_3 for triangular element is always _____.

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c) $a_1 + a_2x + a_3y$ d) None of the above

14) Which of the following is a weighted residual method?

a) Galerkin's method b) Rayleigh-Ritz method
c) Potential energy method d) All the above

Seat No.	

Set **R**

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Finite Element Method (MECHPEC – 03A)

Day & Date: Monday, 25-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Solve any Two questions from each section.
2) Figure on fight indicates full marks.
3) Assume suitable data, if required.
4) Use of non-programable scientific calculator is allowed.

Section – I

Q.2 Solve.

a) Obtain shape functions for 2 node 1-D truss element. **07**

b) Explain General FEM procedure. **07**

Q.3 Solve.

a) Obtain solution of differential equation by using Galerkin's method. **07**

$$\frac{\partial^2 u}{\partial x^2} + 3x\frac{\partial u}{\partial x} - 6u = 0, 0 \leqslant x \leqslant 1$$

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a) Find nodal displacement in stepped bar as shown in figure 1. **07**
Take A_1 = 40 mm^2, A_2 = 20 mm^2
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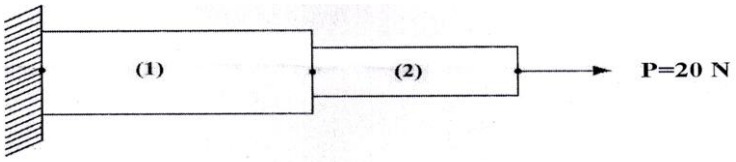

Figure 1:

b) Explain properties of stiffness matrix. **07**

Section – II

Q.5 Solve.

a) A stepped bar is subjected to an axial load of P = 10 KN as shown in Figure below. If the material of the stepped bar is steel with a Young's modulus of $E = 2 \times 10^7$ N/cm^2, find the stresses developed in each of the steps. Apply Boundary conditions by Penalty method. **12**

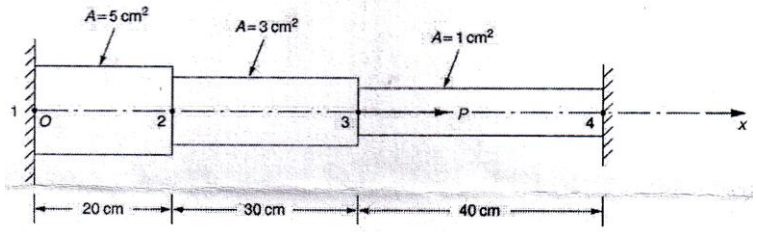

Figure 2:

b) Explain Brick elements. **02**

Q.6 Solve.

a) Calculate the value of field variable at the point $A(2.0, 2.0)$, which is located inside the triangle as shown in figure 3. **07**
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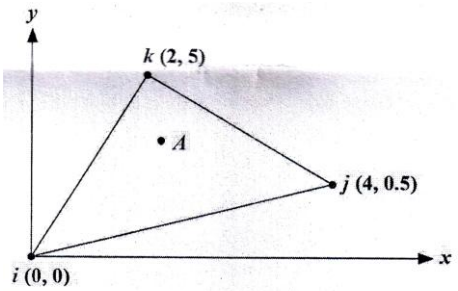

Figure 3:

b) What is convergence study? Why is it necessary to do a convergence study in FEA? **07**

Q.7 Write short note on (Any Three) **14**

a) Transient response analysis

b) Harmonic analysis

c) Explicit analysis

d) Distortion of elements

Seat No.	

Set **S**

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Finite Element Method (MECHPEC – 03A)

Day & Date: Monday, 25-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

Duration: 30 Minutes Marks:14

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1) An element in which the order of the geometry interpolation function is higher than the order of the displacement interpolation function is called _____.
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3) The variational method involves the concept of minimization of _____.
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Seat No.	

Set **S**

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Finite Element Method (MECHPEC – 03A)

Day & Date: Monday, 25-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Solve any Two questions from each section.
2) Figure on fight indicates full marks.
3) Assume suitable data, if required.
4) Use of non-programable scientific calculator is allowed.

Section – I

Q.2 Solve.

a) Obtain shape functions for 2 node 1-D truss element. **07**

b) Explain General FEM procedure. **07**

Q.3 Solve.

a) Obtain solution of differential equation by using Galerkin's method. **07**

$$\frac{\partial^2 u}{\partial x^2} + 3x\frac{\partial u}{\partial x} - 6u = 0, 0 \leqslant x \leqslant 1$$

Take boundary conditions as $u(0) = 1\, u'(0) = 0.1$

b) Explain Simplex, Complex and Multiplex elements. **07**

Q.4 Solve.

a) Find nodal displacement in stepped bar as shown in figure 1. **07**
Take A_1 = 40 mm^2, A_2 = 20 mm^2
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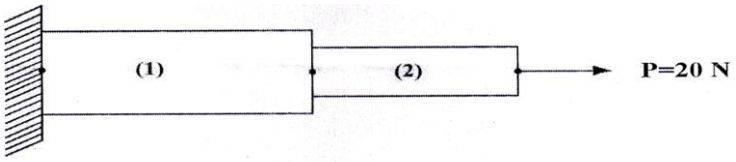

Figure 1:

b) Explain properties of stiffness matrix. **07**

Section – II

Q.5 Solve.

a) A stepped bar is subjected to an axial load of P = 10 KN as shown in Figure below. If the material of the stepped bar is steel with a Young's modulus of $E = 2 \times 10^7$ N/cm^2, find the stresses developed in each of the steps. Apply Boundary conditions by Penalty method. **12**

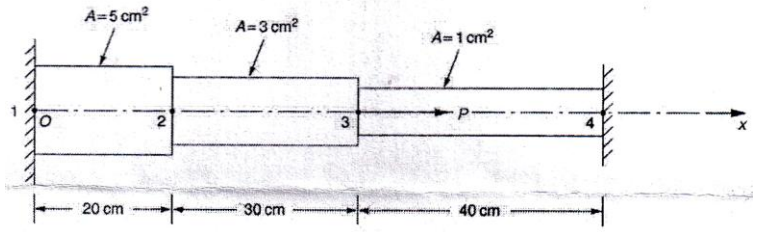

Figure 2:

b) Explain Brick elements. **02**

Q.6 Solve.

a) Calculate the value of field variable at the point $A(2.0, 2.0)$, which is located inside the triangle as shown in figure 3. **07**
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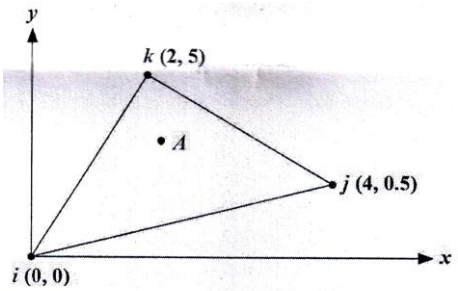

Figure 3:

b) What is convergence study? Why is it necessary to do a convergence study in FEA? **07**

Q.7 Write short note on (Any Three) **14**

a) Transient response analysis

b) Harmonic analysis

c) Explicit analysis

d) Distortion of elements

SLR-QH-353

Seat No.	

Set P

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Industrial Engineering (MECHPEC – 03B)

Day & Date: Monday, 25-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) Objectives of method study are _____.
a) To measure employees performance
b) Estimation of wages
c) Effective utilization of resources
d) Improved layout

2) In method study the symbol □ (rectangle) represents.
a) Inspection b) Operation
c) Storage d) Delay

3) What is the therblig for Grasp?
a) V b) ∩
c) O d) Ω

4) Time scale is used in _____ chart
a) Outline process chart b) Flow process chart
c) Multipal activity chart d) Travel chart

5) Analysis of work into basic human motion is required in _____.
a) Time study b) Analytical Estimation
c) PMTS d) Work sampling

6) Critical examination carried out through _____.
a) cumulative stop watch b) work sampling technique
c) question process d) Chart Technique

7) In Cycle graph path movement of the worker is traced by _____.
a) templates b) string
c) continuous source of light d) Sunlight

8) Plant location selection process involves _____.
a) Region selection b) Ergonomics
c) Merit rating d) None of the above

9) Which of the following is not an Inventory?
a) Raw material b) Finished Product
c) Consumable d) Machine

10) Path of movement of men, material etc. can be better visualized by _____.
a) flow diagram b) SIMO chart
c) Template d) string diagram

11) The study of measurement of dimensions and other physical Characteristics is _____.
a) Anthropometry b) Time study
c) Work sampling d) Material handling

12) Start and stop of the machine is an example _____ element.
a) constant b) Variable
c) Foreign d) Occational

13) One TMU is _____ minutes.
a) 0.0001 b) 0.006
c) 0.0006 d) 0.001

14) Merit rating is used for _____.
a) Performance appraisal b) Job evaluation
c) Industrial safety d) Machine allowance

SLR-QH-353

Seat No.	

Set P

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Industrial Engineering (MECHPEC – 03B)

Day & Date: Monday, 25-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Solve any Two questions from each section.
2) Figure on fight indicates full marks.
3) Assume suitable data, if required.

Section – I

Q.2 Solve. **07**

a) Explain in detail cycle graph & Cronocycle graph with neat sketch.

b) What is meant by micro motion study and explain SIMO chart. **07**

Q.3 Solve.

a) Distinguish between string diagram & Flow diagram. **07**

b) Explain different productivity improvement techniques. **07**

Q.4 Solve.

a) Describe types of display for ergonomics and Anthropometry. **07**

b) Explain with figure multiple activity chart. **07**

Section – II

Q.5 Solve.

a) Explain PMTS with advantages and Limitations. **07**

b) Describe advantages & Disadvantages of urban and Rural area. **07**

Q.6 Solve.

a) Explain various work measurement techniques. Explain synthetic data techniques. **07**

b) What are the different types of layout? Explain any one. **07**

Q.7 Solve.

a) Explain different types of allowances. **07**

b) Describe the objectives and advantages of Job evaluation and Merit rating. **07**

Seat No.	

Set **Q**

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Industrial Engineering (MECHPEC – 03B)

Day & Date: Monday, 25-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) Plant location selection process involves _____.
a) Region selection b) Ergonomics
c) Merit rating d) None of the above

2) Which of the following is not an Inventory?
a) Raw material b) Finished Product
c) Consumable d) Machine

3) Path of movement of men, material etc. can be better visualized by _____.
a) flow diagram b) SIMO chart
c) Template d) string diagram

4) The study of measurement of dimensions and other physical Characteristics is _____.
a) Anthropometry b) Time study
c) Work sampling d) Material handling

5) Start and stop of the machine is an example _____ element.
a) constant b) Variable
c) Foreign d) Occational

6) One TMU is _____ minutes.
a) 0.0001 b) 0.006
c) 0.0006 d) 0.001

7) Merit rating is used for _____.
a) Performance appraisal b) Job evaluation
c) Industrial safety d) Machine allowance

8) Objectives of method study are _____.
a) To measure employees performance
b) Estimation of wages
c) Effective utilization of resources
d) Improved layout

9) In method study the symbol □ (rectangle) represents.
a) Inspection b) Operation
c) Storage d) Delay

10) What is the therblig for Grasp?
a) V b) ∩
c) O d) Ω

11) Time scale is used in _____ chart
a) Outline process chart b) Flow process chart
c) Multipal activity chart d) Travel chart

12) Analysis of work into basic human motion is required in _____.
a) Time study b) Analytical Estimation
c) PMTS d) Work sampling

13) Critical examination carried out through _____.
a) cumulative stop watch b) work sampling technique
c) question process d) Chart Technique

14) In Cycle graph path movement of the worker is traced by _____.
a) templates b) string
c) continuous source of light d) Sunlight

SLR-QH-353

Seat No.	

Set Q

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Industrial Engineering (MECHPEC – 03B)

Day & Date: Monday, 25-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Solve any Two questions from each section.
2) Figure on fight indicates full marks.
3) Assume suitable data, if required.

Section – I

Q.2 Solve. **07**

a) Explain in detail cycle graph & Cronocycle graph with neat sketch.

b) What is meant by micro motion study and explain SIMO chart. **07**

Q.3 Solve.

a) Distinguish between string diagram & Flow diagram. **07**

b) Explain different productivity improvement techniques. **07**

Q.4 Solve.

a) Describe types of display for ergonomics and Anthropometry. **07**

b) Explain with figure multiple activity chart. **07**

Section – II

Q.5 Solve.

a) Explain PMTS with advantages and Limitations. **07**

b) Describe advantages & Disadvantages of urban and Rural area. **07**

Q.6 Solve.

a) Explain various work measurement techniques. Explain synthetic data techniques. **07**

b) What are the different types of layout? Explain any one. **07**

Q.7 Solve.

a) Explain different types of allowances. **07**

b) Describe the objectives and advantages of Job evaluation and Merit rating. **07**

SLR-QH-353

Seat No.	

Set R

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Industrial Engineering (MECHPEC – 03B)

Day & Date: Monday, 25-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) The study of measurement of dimensions and other physical Characteristics is _____.
a) Anthropometry b) Time study
c) Work sampling d) Material handling

2) Start and stop of the machine is an example _____ element.
a) constant b) Variable
c) Foreign d) Occational

3) One TMU is _____ minutes.
a) 0.0001 b) 0.006
c) 0.0006 d) 0.001

4) Merit rating is used for _____.
a) Performance appraisal b) Job evaluation
c) Industrial safety d) Machine allowance

5) Objectives of method study are _____.
a) To measure employees performance
b) Estimation of wages
c) Effective utilization of resources
d) Improved layout

6) In method study the symbol Δ (rectangle) represents.
a) Inspection b) Operation
c) Storage d) Delay

7) What is the therblig for Grasp?
a) V b) ∩
c) O d) Ω

8) Time scale is used in _____ chart
a) Outline process chart b) Flow process chart
c) Multipal activity chart d) Travel chart

9) Analysis of work into basic human motion is required in _____.
a) Time study b) Analytical Estimation
c) PMTS d) Work sampling

10) Critical examination carried out through _____.
a) cumulative stop watch b) work sampling technique
c) question process d) Chart Technique

11) In Cycle graph path movement of the worker is traced by _____.
a) templates b) string
c) continuous source of light d) Sunlight

12) Plant location selection process involves _____.
a) Region selection b) Ergonomics
c) Merit rating d) None of the above

13) Which of the following is not an Inventory?
a) Raw material b) Finished Product
c) Consumable d) Machine

14) Path of movement of men, material etc. can be better visualized by _____.
a) flow diagram b) SIMO chart
c) Template d) string diagram

SLR-QH-353

Seat No.	

Set R

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Industrial Engineering (MECHPEC – 03B)

Day & Date: Monday, 25-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Solve any Two questions from each section.
2) Figure on fight indicates full marks.
3) Assume suitable data, if required.

Section – I

Q.2 Solve. **07**

a) Explain in detail cycle graph & Cronocycle graph with neat sketch.

b) What is meant by micro motion study and explain SIMO chart. **07**

Q.3 Solve.

a) Distinguish between string diagram & Flow diagram. **07**

b) Explain different productivity improvement techniques. **07**

Q.4 Solve.

a) Describe types of display for ergonomics and Anthropometry. **07**

b) Explain with figure multiple activity chart. **07**

Section – II

Q.5 Solve.

a) Explain PMTS with advantages and Limitations. **07**

b) Describe advantages & Disadvantages of urban and Rural area. **07**

Q.6 Solve.

a) Explain various work measurement techniques. Explain synthetic data techniques. **07**

b) What are the different types of layout? Explain any one. **07**

Q.7 Solve.

a) Explain different types of allowances. **07**

b) Describe the objectives and advantages of Job evaluation and Merit rating. **07**

Seat No.	

Set **S**

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Industrial Engineering (MECHPEC – 03B)

Day & Date: Monday, 25-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) Critical examination carried out through _____.
a) cumulative stop watch b) work sampling technique
c) question process d) Chart Technique

2) In Cycle graph path movement of the worker is traced by _____.
a) templates b) string
c) continuous source of light d) Sunlight

3) Plant location selection process involves _____.
a) Region selection b) Ergonomics
c) Merit rating d) None of the above

4) Which of the following is not an Inventory?
a) Raw material b) Finished Product
c) Consumable d) Machine

5) Path of movement of men, material etc. can be better visualized by _____.
a) flow diagram b) SIMO chart
c) Template d) string diagram

6) The study of measurement of dimensions and other physical Characteristics is _____.
a) Anthropometry b) Time study
c) Work sampling d) Material handling

7) Start and stop of the machine is an example _____ element.
a) constant b) Variable
c) Foreign d) Occational

8) One TMU is _____ minutes.
a) 0.0001 b) 0.006
c) 0.0006 d) 0.001

9) Merit rating is used for _____.
a) Performance appraisal b) Job evaluation
c) Industrial safety d) Machine allowance

10) Objectives of method study are _____.
a) To measure employees performance
b) Estimation of wages
c) Effective utilization of resources
d) Improved layout

11) In method study the symbol □ (rectangle) represents.
a) Inspection b) Operation
c) Storage d) Delay

12) What is the therblig for Grasp?
a) V b) ∩
c) O d) Ω

13) Time scale is used in _____ chart
a) Outline process chart b) Flow process chart
c) Multipal activity chart d) Travel chart

14) Analysis of work into basic human motion is required in _____.
a) Time study b) Analytical Estimation
c) PMTS d) Work sampling

SLR-QH-353

Seat No.		Set	S

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Industrial Engineering (MECHPEC – 03B)

Day & Date: Monday, 25-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Solve any Two questions from each section.
2) Figure on fight indicates full marks.
3) Assume suitable data, if required.

Section – I

Q.2 Solve. **07**

a) Explain in detail cycle graph & Cronocycle graph with neat sketch.

b) What is meant by micro motion study and explain SIMO chart. **07**

Q.3 Solve.

a) Distinguish between string diagram & Flow diagram. **07**

b) Explain different productivity improvement techniques. **07**

Q.4 Solve.

a) Describe types of display for ergonomics and Anthropometry. **07**

b) Explain with figure multiple activity chart. **07**

Section – II

Q.5 Solve.

a) Explain PMTS with advantages and Limitations. **07**

b) Describe advantages & Disadvantages of urban and Rural area. **07**

Q.6 Solve.

a) Explain various work measurement techniques. Explain synthetic data techniques. **07**

b) What are the different types of layout? Explain any one. **07**

Q.7 Solve.

a) Explain different types of allowances. **07**

b) Describe the objectives and advantages of Job evaluation and Merit rating. **07**

SLR-QH-354

Seat No.	

Set P

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026
Power Plant and Energy Engineering (MECHPEC – 03C)

Day & Date: Monday, 25-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) Kinetic energy that results from the oscillation of water is called _____.
a) Wave energy b) Tidal energy
c) Ocean thermal energy d) Hydro energy

2) Identify the non-renewable energy resource from the following: _____.
a) Wave power b) Fuel cells
c) Wind power d) Coal

3) Flat rate tariff is charged on what basis?
a) Connected load b) Units consumed
c) Maximum demand d) Both a) and b)

4) The Function of solar collectors to convert _____.
a) Solar energy into electricity
b) Solar energy into radiations
c) Solar energy into thermal energy
d) None of these

5) A load curve is a plot of _____.
a) Load versus generation capacity
b) Load versus current
c) Load versus cost of power
d) Load versus time

6) Reflecting mirrors used for exploiting solar energy are called _____.
a) Mantle b) Ponds
c) Diffusers d) Heliostats

7) The wind speed is measured using an instrument called _____.
a) Pyranometer b) Manometer
c) Anemometer d) Wind vane

8) The objective of energy management includes _____.
a) Minimising energy costs
b) Minimising waste
c) Minimising environmental degradation
d) All the above

9) The geothermal energy is the _____ from the earth.
a) Heat b) Light
c) Photons d) Protons

10) An Inspection survey and analysis of energy flows for energy conservation in a building is called as _____.
a) Energy Management b) Energy Audit
c) Energy Conservation d) None of above

11) Which of the following power plant have longest physical life?
a) Thermal power plant b) Nuclear power plant
c) Hydroelectric power plant d) Diesel power plant

12) What is the Acceptance Angle Pyrheliometer _____.
a) 5° b) 8°
c) 4° d) 10°

13) Economiser is used to heat _____.
a) Feed water b) Air
c) Flue gases d) All of the above

14) Load factor during a period is _____.
a) Average Load / Installed Capacity
b) Average Load / Maximum Load
c) Maximum Load / Average Load
d) Maximum Load / Installed Capacity

Seat No.	

Set **P**

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026
Power Plant and Energy Engineering (MECHPEC – 03C)

Day & Date: Monday, 25-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Solve any Two questions from each section.
2) Figure on fight indicates full marks.
3) Assume additional suitable data, if necessary and mention it required.
4) Use of a calculator is allowed.

Section – I

Q.2 Solve.

a) Explain in detail Selection of size and no. of generating units for Power Plants. **07**

b) What is Depreciation Cost? Explain Straight Line Method of Depreciation with figure. **07**

Q.3 Solve.

a) The load supplied by a power station is given below: **07**

Time (Hr.)	$0-6$	$6-12$	$12-14$	$14-18$	$18-24$
Load (MW)	40	95	75	105	65

Draw the load curve & load duration curve. Determine average load, load factor and plant capacity factor if plant capacity is 150 MW.

b) Define Load Curve. Explain Industrial and Street Light load curves with neat sketch. **07**

Q.4 a) Explain the Organization of Power Sector in India with a neat sketch. **05**

b) Write a short note on: **04**
i) NPCIL
ii) PGCIL

c) Write down the difference between Renewable & Non-Renewable Energy Sources **05**

Section – II

Q.5 Solve.

a) What is Wave Energy? Explain Dolphin type Wave Machine with a neat sketch. **07**

b) What is OTEC? Explain Closed OTEC Cycle Power Plant. **07**

Q.6 Solve.

a) What is Energy Conservation? Write a short note on Energy Conservation Act 2001. **07**

b) What is meant by Energy Audit? Explain any two Energy Audit methods in detail. **07**

Q.7 Solve.

a) Write a short note on Pyrheliometer. **04**

b) Explain construction and working of Liquid Flat Plate Collector with neat sketch. **05**

c) List down types of Solar Concentrators. Explain any two with neat sketch. **05**

Seat No.	

Set **Q**

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026
Power Plant and Energy Engineering (MECHPEC – 03C)

Day & Date: Monday, 25-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) The objective of energy management includes _____.
a) Minimising energy costs
b) Minimising waste
c) Minimising environmental degradation
d) All the above

2) The geothermal energy is the _____ from the earth.
a) Heat b) Light
c) Photons d) Protons

3) An Inspection survey and analysis of energy flows for energy conservation in a building is called as _____.
a) Energy Management b) Energy Audit
c) Energy Conservation d) None of above

4) Which of the following power plant have longest physical life?
a) Thermal power plant b) Nuclear power plant
c) Hydroelectric power plant d) Diesel power plant

5) What is the Acceptance Angle Pyrheliometer _____.
a) 5° b) 8°
c) 4° d) 10°

6) Economiser is used to heat _____.
a) Feed water b) Air
c) Flue gases d) All of the above

7) Load factor during a period is _____.
a) Average Load / Installed Capacity
b) Average Load / Maximum Load
c) Maximum Load / Average Load
d) Maximum Load / Installed Capacity

8) Kinetic energy that results from the oscillation of water is called _____.
a) Wave energy
b) Tidal energy
c) Ocean thermal energy
d) Hydro energy

9) Identify the non-renewable energy resource from the following: _____.
a) Wave power
b) Fuel cells
c) Wind power
d) Coal

10) Flat rate tariff is charged on what basis?
a) Connected load
b) Units consumed
c) Maximum demand
d) Both a) and b)

11) The Function of solar collectors to convert _____.
a) Solar energy into electricity
b) Solar energy into radiations
c) Solar energy into thermal energy
d) None of these

12) A load curve is a plot of _____.
a) Load versus generation capacity
b) Load versus current
c) Load versus cost of power
d) Load versus time

13) Reflecting mirrors used for exploiting solar energy are called _____.
a) Mantle
b) Ponds
c) Diffusers
d) Heliostats

14) The wind speed is measured using an instrument called _____.
a) Pyranometer
b) Manometer
c) Anemometer
d) Wind vane

Seat No.	

Set **Q**

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026
Power Plant and Energy Engineering (MECHPEC – 03C)

Day & Date: Monday, 25-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Solve any Two questions from each section.
2) Figure on fight indicates full marks.
3) Assume additional suitable data, if necessary and mention it required.
4) Use of a calculator is allowed.

Section – I

Q.2 Solve.

a) Explain in detail Selection of size and no. of generating units for Power Plants. **07**

b) What is Depreciation Cost? Explain Straight Line Method of Depreciation with figure. **07**

Q.3 Solve.

a) The load supplied by a power station is given below: **07**

Time (Hr.)	$0-6$	$6-12$	$12-14$	$14-18$	$18-24$
Load (MW)	40	95	75	105	65

Draw the load curve & load duration curve. Determine average load, load factor and plant capacity factor if plant capacity is 150 MW.

b) Define Load Curve. Explain Industrial and Street Light load curves with neat sketch. **07**

Q.4 a) Explain the Organization of Power Sector in India with a neat sketch. **05**

b) Write a short note on: **04**
i) NPCIL
ii) PGCIL

c) Write down the difference between Renewable & Non-Renewable Energy Sources **05**

Section – II

Q.5 Solve.

a) What is Wave Energy? Explain Dolphin type Wave Machine with a neat sketch. **07**

b) What is OTEC? Explain Closed OTEC Cycle Power Plant. **07**

Q.6 Solve.

a) What is Energy Conservation? Write a short note on Energy Conservation Act 2001. **07**

b) What is meant by Energy Audit? Explain any two Energy Audit methods in detail. **07**

Q.7 Solve.

a) Write a short note on Pyrheliometer. **04**

b) Explain construction and working of Liquid Flat Plate Collector with neat sketch. **05**

c) List down types of Solar Concentrators. Explain any two with neat sketch. **05**

Seat No.	

Set R

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026
Power Plant and Energy Engineering (MECHPEC – 03C)

Day & Date: Monday, 25-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) Which of the following power plant have longest physical life?
a) Thermal power plant b) Nuclear power plant
c) Hydroelectric power plant d) Diesel power plant

2) What is the Acceptance Angle Pyrheliometer _____.
a) 5° b) 8°
c) 4° d) 10°

3) Economiser is used to heat _____.
a) Feed water b) Air
c) Flue gases d) All of the above

4) Load factor during a period is _____.
a) Average Load / Installed Capacity
b) Average Load / Maximum Load
c) Maximum Load / Average Load
d) Maximum Load / Installed Capacity

5) Kinetic energy that results from the oscillation of water is called _____.
a) Wave energy b) Tidal energy
c) Ocean thermal energy d) Hydro energy

6) Identify the non-renewable energy resource from the following: _____.
a) Wave power b) Fuel cells
c) Wind power d) Coal

7) Flat rate tariff is charged on what basis?
a) Connected load b) Units consumed
c) Maximum demand d) Both a) and b)

8) The Function of solar collectors to convert _____.
   a) Solar energy into electricity
   b) Solar energy into radiations
   c) Solar energy into thermal energy
   d) None of these

9) A load curve is a plot of _____.
   a) Load versus generation capacity
   b) Load versus current
   c) Load versus cost of power
   d) Load versus time

10) Reflecting mirrors used for exploiting solar energy are called _____.
   a) Mantle b) Ponds
   c) Diffusers d) Heliostats

11) The wind speed is measured using an instrument called _____.
   a) Pyranometer b) Manometer
   c) Anemometer d) Wind vane

12) The objective of energy management includes _____.
   a) Minimising energy costs
   b) Minimising waste
   c) Minimising environmental degradation
   d) All the above

13) The geothermal energy is the _____ from the earth.
   a) Heat b) Light
   c) Photons d) Protons

14) An Inspection survey and analysis of energy flows for energy conservation in a building is called as _____.
   a) Energy Management b) Energy Audit
   c) Energy Conservation d) None of above

SLR-QH-354

Seat No.	

Set R

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026
Power Plant and Energy Engineering (MECHPEC – 03C)

Day & Date: Monday, 25-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Solve any Two questions from each section.
2) Figure on fight indicates full marks.
3) Assume additional suitable data, if necessary and mention it required.
4) Use of a calculator is allowed.

Section – I

Q.2 Solve.

a) Explain in detail Selection of size and no. of generating units for Power Plants. **07**

b) What is Depreciation Cost? Explain Straight Line Method of Depreciation with figure. **07**

Q.3 Solve.

a) The load supplied by a power station is given below: **07**

Time (Hr.)	$0-6$	$6-12$	$12-14$	$14-18$	$18-24$
Load (MW)	40	95	75	105	65

Draw the load curve & load duration curve. Determine average load, load factor and plant capacity factor if plant capacity is 150 MW.

b) Define Load Curve. Explain Industrial and Street Light load curves with neat sketch. **07**

Q.4 a) Explain the Organization of Power Sector in India with a neat sketch. **05**

b) Write a short note on: **04**
i) NPCIL
ii) PGCIL

c) Write down the difference between Renewable & Non-Renewable Energy Sources **05**

Section – II

Q.5 Solve.

a) What is Wave Energy? Explain Dolphin type Wave Machine with a neat sketch. **07**

b) What is OTEC? Explain Closed OTEC Cycle Power Plant. **07**

Q.6 Solve.

a) What is Energy Conservation? Write a short note on Energy Conservation Act 2001. **07**

b) What is meant by Energy Audit? Explain any two Energy Audit methods in detail. **07**

Q.7 Solve.

a) Write a short note on Pyrheliometer. **04**

b) Explain construction and working of Liquid Flat Plate Collector with neat sketch. **05**

c) List down types of Solar Concentrators. Explain any two with neat sketch. **05**

Seat No.	

Set **S**

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026
Power Plant and Energy Engineering (MECHPEC – 03C)

Day & Date: Monday, 25-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) Reflecting mirrors used for exploiting solar energy are called _____.
a) Mantle b) Ponds
c) Diffusers d) Heliostats

2) The wind speed is measured using an instrument called _____.
a) Pyranometer b) Manometer
c) Anemometer d) Wind vane

3) The objective of energy management includes _____.
a) Minimising energy costs
b) Minimising waste
c) Minimising environmental degradation
d) All the above

4) The geothermal energy is the _____ from the earth.
a) Heat b) Light
c) Photons d) Protons

5) An Inspection survey and analysis of energy flows for energy conservation in a building is called as _____.
a) Energy Management b) Energy Audit
c) Energy Conservation d) None of above

6) Which of the following power plant have longest physical life?
a) Thermal power plant b) Nuclear power plant
c) Hydroelectric power plant d) Diesel power plant

7) What is the Acceptance Angle Pyrheliometer _____.
a) 5° b) 8°
c) 4° d) 10°

8) Economiser is used to heat _____.
a) Feed water b) Air
c) Flue gases d) All of the above

9) Load factor during a period is _____.
a) Average Load / Installed Capacity
b) Average Load / Maximum Load
c) Maximum Load / Average Load
d) Maximum Load / Installed Capacity

10) Kinetic energy that results from the oscillation of water is called _____.
a) Wave energy b) Tidal energy
c) Ocean thermal energy d) Hydro energy

11) Identify the non-renewable energy resource from the following: _____.
a) Wave power b) Fuel cells
c) Wind power d) Coal

12) Flat rate tariff is charged on what basis?
a) Connected load b) Units consumed
c) Maximum demand d) Both a) and b)

13) The Function of solar collectors to convert _____.
a) Solar energy into electricity
b) Solar energy into radiations
c) Solar energy into thermal energy
d) None of these

14) A load curve is a plot of _____.
a) Load versus generation capacity
b) Load versus current
c) Load versus cost of power
d) Load versus time

Seat No.	

Set **S**

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026
Power Plant and Energy Engineering (MECHPEC – 03C)

Day & Date: Monday, 25-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Solve any Two questions from each section.
2) Figure on fight indicates full marks.
3) Assume additional suitable data, if necessary and mention it required.
4) Use of a calculator is allowed.

Section – I

Q.2 Solve.

a) Explain in detail Selection of size and no. of generating units for Power Plants. **07**

b) What is Depreciation Cost? Explain Straight Line Method of Depreciation with figure. **07**

Q.3 Solve.

a) The load supplied by a power station is given below: **07**

Time (Hr.)	$0-6$	$6-12$	$12-14$	$14-18$	$18-24$
Load (MW)	40	95	75	105	65

Draw the load curve & load duration curve. Determine average load, load factor and plant capacity factor if plant capacity is 150 MW.

b) Define Load Curve. Explain Industrial and Street Light load curves with neat sketch. **07**

Q.4 a) Explain the Organization of Power Sector in India with a neat sketch. **05**

b) Write a short note on: **04**
i) NPCIL
ii) PGCIL

c) Write down the difference between Renewable & Non-Renewable Energy Sources **05**

Section – II

Q.5 Solve.

a) What is Wave Energy? Explain Dolphin type Wave Machine with a neat sketch. **07**

b) What is OTEC? Explain Closed OTEC Cycle Power Plant. **07**

Q.6 Solve.

a) What is Energy Conservation? Write a short note on Energy Conservation Act 2001. **07**

b) What is meant by Energy Audit? Explain any two Energy Audit methods in detail. **07**

Q.7 Solve.

a) Write a short note on Pyrheliometer. **04**

b) Explain construction and working of Liquid Flat Plate Collector with neat sketch. **05**

c) List down types of Solar Concentrators. Explain any two with neat sketch. **05**

SLR-QH-355

Seat No.	

Set P

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Railway Transportation (MECHPEC – 03D)

Day & Date: Monday, 25-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer: 14

1) Which of the following is not a component of the rail?
a) Head b) Web
c) Ballast d) Foot

2) Weight of the wheels is categorized in _____.
a) sprung mass b) unsprung mass
c) non-sprung mass d) dummy mass

3) Cant deficiency occurs when a vehicle travels around a curve at _____.
a) Equilibrium speed
b) Speeds higher than equilibrium speed
c) Speeds lower than equilibrium speed
d) Booked speed

4) The grip between wheel and the rail is known as _____.
a) Traction b) Adhesion
c) Braking d) Acceleration

5) The longitudinal movement of the rails in a track is technically known as _____.
a) Buckling b) Hogging
c) Creeping d) Creaking

6) Name the organization which is the research and development wing of Indian Railways?
a) CRIS b) RDSO
c) RSDO d) IRCTC

7) The Railways has a _____ degree of freedom for its movement.
a) Single b) Two
c) Three d) Four

8) Track modulus is defined as _____.
a) Load/unit length of sleeper
b) Load/unit length of sleeper to produce depression in rail
c) Load/unit length of rail to produce depression in sleeper
d) Load/unit length of rail to produce unit depression/deflection in track

9) Which of the following causes stresses in Sleepers?
a) Eccentric vertical loads
b) Contact shear stress of wheel and rail
c) Lateral deflection of sleepers
d) Track components

10) There are _____ types of rail sections.
a) 2 b) 3
c) 4 d) 5

11) What must be done to wooden sleepers before use?
a) Seasoning b) Washing
c) Painting d) Hydrating

12) According to wave motion theory what causes creep of rail?
a) Moving loads b) Stationary loads
c) Faulty rails d) Poor maintenance

13) How is creep caused because of Starting operation of locomotive?
a) Because of backward thrust b) Forward pushing of rail
c) Expansion of rail d) Contraction of rail

14) What causes wheel burns?
a) Slipping of wheel on rail surface
b) Falling of metal chunks
c) Manufacturing defects
d) High speed

Seat No.	

Set **P**

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Railway Transportation (MECHPEC – 03D)

Day & Date: Monday, 25-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Solve any Two questions from each section.
2) Figure on fight indicates full marks.
3) Assume suitable data, diagrams if required.

Section – I

Q.2 **a)** State and explain components of railway transportation systems. **07**

b) Describe the term derailment of vehicle through displacement of track. **07**

Q.3 **a)** Explain derailment criteria. **07**

b) With neat sketch explain bogies with self-steering wheel sets. **07**

Q.4 **a)** Explain bogies with creep-controlled wheel sets. **07**

b) Write short note on bogies with independently rotating wheels. **07**

Section – II

Q.5 **a)** Explain the term forces due to vehicle oscillations. **07**

b) Classify transversal loads acting on the track. Explain gravitational force in brief. **07**

Q.6 **a)** Define temperature force. Explain the effects of temperature forces on track. **07**

b) Explain residual centrifugal force and guidance forces acting on the track. **07**

Q.7 **a)** Write short note on design loads of bridges. **07**

b) Define traction forces and explain different types of it. **07**

SLR-QH-355

Seat No.	

Set Q

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Railway Transportation (MECHPEC – 03D)

Day & Date: Monday, 25-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer: 14

1) Track modulus is defined as _____.
a) Load/unit length of sleeper
b) Load/unit length of sleeper to produce depression in rail
c) Load/unit length of rail to produce depression in sleeper
d) Load/unit length of rail to produce unit depression/deflection in track

2) Which of the following causes stresses in Sleepers?
a) Eccentric vertical loads
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c) Lateral deflection of sleepers
d) Track components

3) There are _____ types of rail sections.
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c) 4 d) 5

4) What must be done to wooden sleepers before use?
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c) Painting d) Hydrating

5) According to wave motion theory what causes creep of rail?
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c) Faulty rails d) Poor maintenance

6) How is creep caused because of Starting operation of locomotive?
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7) What causes wheel burns?
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b) Falling of metal chunks
c) Manufacturing defects
d) High speed

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c) Ballast d) Foot

9) Weight of the wheels is categorized in _____.
a) sprung mass b) unsprung mass
c) non-sprung mass d) dummy mass

10) Cant deficiency occurs when a vehicle travels around a curve at _____.
a) Equilibrium speed
b) Speeds higher than equilibrium speed
c) Speeds lower than equilibrium speed
d) Booked speed

11) The grip between wheel and the rail is known as _____.
a) Traction b) Adhesion
c) Braking d) Acceleration

12) The longitudinal movement of the rails in a track is technically known as _____.
a) Buckling b) Hogging
c) Creeping d) Creaking

13) Name the organization which is the research and development wing of Indian Railways?
a) CRIS b) RDSO
c) RSDO d) IRCTC

14) The Railways has a _____ degree of freedom for its movement.
a) Single b) Two
c) Three d) Four

SLR-QH-355

Seat No.	

Set Q

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Railway Transportation (MECHPEC – 03D)

Day & Date: Monday, 25-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Solve any Two questions from each section.
2) Figure on fight indicates full marks.
3) Assume suitable data, diagrams if required.

Section – I

Q.2 **a)** State and explain components of railway transportation systems. **07**

b) Describe the term derailment of vehicle through displacement of track. **07**

Q.3 **a)** Explain derailment criteria. **07**

b) With neat sketch explain bogies with self-steering wheel sets. **07**

Q.4 **a)** Explain bogies with creep-controlled wheel sets. **07**

b) Write short note on bogies with independently rotating wheels. **07**

Section – II

Q.5 **a)** Explain the term forces due to vehicle oscillations. **07**

b) Classify transversal loads acting on the track. Explain gravitational force in brief. **07**

Q.6 **a)** Define temperature force. Explain the effects of temperature forces on track. **07**

b) Explain residual centrifugal force and guidance forces acting on the track. **07**

Q.7 **a)** Write short note on design loads of bridges. **07**

b) Define traction forces and explain different types of it. **07**

SLR-QH-355

Seat No.	

Set R

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Railway Transportation (MECHPEC – 03D)

Day & Date: Monday, 25-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer: **14**

1) What must be done to wooden sleepers before use?
a) Seasoning b) Washing
c) Painting d) Hydrating

2) According to wave motion theory what causes creep of rail?
a) Moving loads b) Stationary loads
c) Faulty rails d) Poor maintenance

3) How is creep caused because of Starting operation of locomotive?
a) Because of backward thrust b) Forward pushing of rail
c) Expansion of rail d) Contraction of rail

4) What causes wheel burns?
a) Slipping of wheel on rail surface
b) Falling of metal chunks
c) Manufacturing defects
d) High speed

5) Which of the following is not a component of the rail?
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b) Speeds higher than equilibrium speed
c) Speeds lower than equilibrium speed
d) Booked speed

8) The grip between wheel and the rail is known as _____.
a) Traction b) Adhesion
c) Braking d) Acceleration

9) The longitudinal movement of the rails in a track is technically known as _____.
a) Buckling b) Hogging
c) Creeping d) Creaking

10) Name the organization which is the research and development wing of Indian Railways?
a) CRIS b) RDSO
c) RSDO d) IRCTC

11) The Railways has a _____ degree of freedom for its movement.
a) Single b) Two
c) Three d) Four

12) Track modulus is defined as _____.
a) Load/unit length of sleeper
b) Load/unit length of sleeper to produce depression in rail
c) Load/unit length of rail to produce depression in sleeper
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13) Which of the following causes stresses in Sleepers?
a) Eccentric vertical loads
b) Contact shear stress of wheel and rail
c) Lateral deflection of sleepers
d) Track components

14) There are _____ types of rail sections.
a) 2 b) 3
c) 4 d) 5

Seat No.	

Set **R**

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Railway Transportation (MECHPEC – 03D)

Day & Date: Monday, 25-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Solve any Two questions from each section.
2) Figure on fight indicates full marks.
3) Assume suitable data, diagrams if required.

Section – I

Q.2 **a)** State and explain components of railway transportation systems. **07**

b) Describe the term derailment of vehicle through displacement of track. **07**

Q.3 **a)** Explain derailment criteria. **07**

b) With neat sketch explain bogies with self-steering wheel sets. **07**

Q.4 **a)** Explain bogies with creep-controlled wheel sets. **07**

b) Write short note on bogies with independently rotating wheels. **07**

Section – II

Q.5 **a)** Explain the term forces due to vehicle oscillations. **07**

b) Classify transversal loads acting on the track. Explain gravitational force in brief. **07**

Q.6 **a)** Define temperature force. Explain the effects of temperature forces on track. **07**

b) Explain residual centrifugal force and guidance forces acting on the track. **07**

Q.7 **a)** Write short note on design loads of bridges. **07**

b) Define traction forces and explain different types of it. **07**

Seat No.	

Set **S**

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Railway Transportation (MECHPEC – 03D)

Day & Date: Monday, 25-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer: **14**

1) Name the organization which is the research and development wing of Indian Railways?
a) CRIS b) RDSO
c) RSDO d) IRCTC

2) The Railways has a _____ degree of freedom for its movement.
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c) Lateral deflection of sleepers
d) Track components

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c) 4 d) 5

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c) Faulty rails d) Poor maintenance

8) How is creep caused because of Starting operation of locomotive?
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c) Manufacturing defects
d) High speed

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b) Speeds higher than equilibrium speed
c) Speeds lower than equilibrium speed
d) Booked speed

13) The grip between wheel and the rail is known as _____.
a) Traction b) Adhesion
c) Braking d) Acceleration

14) The longitudinal movement of the rails in a track is technically known as _____.
a) Buckling b) Hogging
c) Creeping d) Creaking

SLR-QH-355

Seat No.	

Set S

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Railway Transportation (MECHPEC – 03D)

Day & Date: Monday, 25-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Solve any Two questions from each section.
2) Figure on fight indicates full marks.
3) Assume suitable data, diagrams if required.

Section – I

Q.2 **a)** State and explain components of railway transportation systems. **07**

b) Describe the term derailment of vehicle through displacement of track. **07**

Q.3 **a)** Explain derailment criteria. **07**

b) With neat sketch explain bogies with self-steering wheel sets. **07**

Q.4 **a)** Explain bogies with creep-controlled wheel sets. **07**

b) Write short note on bogies with independently rotating wheels. **07**

Section – II

Q.5 **a)** Explain the term forces due to vehicle oscillations. **07**

b) Classify transversal loads acting on the track. Explain gravitational force in brief. **07**

Q.6 **a)** Define temperature force. Explain the effects of temperature forces on track. **07**

b) Explain residual centrifugal force and guidance forces acting on the track. **07**

Q.7 **a)** Write short note on design loads of bridges. **07**

b) Define traction forces and explain different types of it. **07**

SLR-QH-357

Seat No.	

Set P

T. Y. (B.Tech.) (Mechanical Engineering) (Sem - II) (New) (CBCS)
Examination: March/April – 2026
Honors in Electric Vehicle Engineering - Advanced topics in Electric Vehicles (Mech Hon - 04B)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) Which device is known for controlling power in electronic circuits?
a) Thyristor b) Capacitor
c) Resistor d) Photodiode

2) What is a common use for diodes in electronics?
a) Transforming electrical signals
b) Regulating voltage levels
c) Allowing current flow in one direction
d) Storing electrical energy

3) What safety measure is essential when working with high voltage equipment?
a) Using metal tools b) Wearing rubber gloves
c) Ignoring warnings d) Working alone

4) What type of vehicle uses autonomous sensors for navigation?
a) Traditional cars b) Bicycles
c) Self-driven cars d) Motorcycles

5) Which factor is crucial for the maintenance of EVs?
a) Bodywork repairs due to rust and corrosion
b) Tire rotations and brake fluid replacements only
c) Frequent oil changes and fuel system cleaning
d) Regular battery health checks and software updates

6) What is one advantage of electric vehicles (EVs)?
a) Higher emissions than combustion engines
b) Limited charging infrastructure availability
c) Lower operating costs compared to gasoline cars
d) Higher maintenance costs than traditional vehicles

7) What technology allows charging electric vehicles without plugs?
a) Hydraulic systems
b) Wireless charging
c) Wind turbines
d) Solar panels

8) What is the purpose of battery swapping in electric vehicles?
a) To improve fuel efficiency
b) To reduce carbon emissions
c) To increase vehicle weight
d) To replace depleted batteries quickly

9) What is the purpose of traction control in vehicles?
a) To enhance braking performance
b) To prevent wheel slippage during acceleration
c) To improve steering responsiveness
d) To increase fuel efficiency

10) Which system helps in maintaining a constant speed on highways?
a) Active Suspension Control
b) Electronic Stability Control
c) Adaptive Cruise Control
d) Traction Control

11) What is the benefit of electronic instrument clusters?
a) Improved fuel consumption
b) Enhanced driver information display
c) Reduced engine noise
d) Increased weight

12) What does active suspension control primarily improve?
a) Brake performance
b) Engine power
c) Fuel efficiency
d) Passenger comfort

13) Which layer of autonomy allows for full vehicle control by a computer?
a) Level 0 autonomy
b) Level 5 autonomy
c) Level 3 autonomy
d) Level 2 autonomy

14) What feature distinguishes Level 3 autonomy?
a) Basic driver assistance only
b) Full human control
c) Conditional automation with monitoring
d) No automation at all

SLR-QH-357

Seat No.	

Set P

T. Y. (B.Tech.) (Mechanical Engineering) (Sem - II) (New) (CBCS)
Examination: March/April – 2026
Honors in Electric Vehicle Engineering - Advanced topics in Electric Vehicles (Mech Hon - 04B)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Solve any Two questions from each section.
2) Figure to the right indicate full marks.
3) Assume suitable data if necessary.

Section – I

Q.2 Solve. **07**

a) Explain the basic working principle of a fuel cell used in electric vehicles with the help of a neat sketch of its operation.

b) Explain fuel oxidation and consumption. **07**

Q.3 Solve.

a) What is adaptive cruise control? How does it contribute to both safety and convenience for drivers? **07**

b) Explain the working principle of an Anti-lock Braking System (ABS). **07**

Q.4 Solve.

a) Explain the working of a Remote Keyless Entry (RKE) system in vehicles. **07**

b) What are the different sensors used in EVs? Explain their functions. **07**

Section – II

Q.5 Solve.

a) Explain the concept of layers of autonomy in autonomous vehicles. **07**

b) What is the purpose of Advanced Driver Assistance Systems (ADAS) in vehicles? Explain any one ADAS system. **07**

Q.6 Solve.

a) List and explain advantages and Disadvantages of electric vehicles (EVs) over traditional internal combustion engine vehicles. **07**

b) What are the safety risks associated with electric vehicles, and what precautions should be taken to prevent them? **07**

Q.7 Solve

a) Explain the concept of wireless charging for electric vehicles and its benefits compared to traditional plug-in charging. **07**

b) How can renewable energy sources support EV charging? Explain any one of Renewable energy systems for EV Charging. **07**

SLR-QH-357

Seat No.	

Set Q

T. Y. (B.Tech.) (Mechanical Engineering) (Sem - II) (New) (CBCS)
Examination: March/April – 2026
Honors in Electric Vehicle Engineering - Advanced topics in Electric Vehicles (Mech Hon - 04B)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. 14

1) What is the purpose of battery swapping in electric vehicles?
a) To improve fuel efficiency
b) To reduce carbon emissions
c) To increase vehicle weight
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2) What is the purpose of traction control in vehicles?
a) To enhance braking performance
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b) Level 5 autonomy
c) Level 3 autonomy
d) Level 2 autonomy

7) What feature distinguishes Level 3 autonomy?
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b) Full human control
c) Conditional automation with monitoring
d) No automation at all

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c) Allowing current flow in one direction
d) Storing electrical energy

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a) Bodywork repairs due to rust and corrosion
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d) Regular battery health checks and software updates

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a) Higher emissions than combustion engines
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d) Higher maintenance costs than traditional vehicles

14) What technology allows charging electric vehicles without plugs?
a) Hydraulic systems
b) Wireless charging
c) Wind turbines
d) Solar panels

SLR-QH-357

Seat No.	

Set Q

T. Y. (B.Tech.) (Mechanical Engineering) (Sem - II) (New) (CBCS)
Examination: March/April – 2026
Honors in Electric Vehicle Engineering - Advanced topics in Electric Vehicles (Mech Hon - 04B)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Solve any Two questions from each section.
2) Figure to the right indicate full marks.
3) Assume suitable data if necessary.

Section – I

Q.2 Solve. **07**

a) Explain the basic working principle of a fuel cell used in electric vehicles with the help of a neat sketch of its operation.

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Q.4 Solve.

a) Explain the working of a Remote Keyless Entry (RKE) system in vehicles. **07**

b) What are the different sensors used in EVs? Explain their functions. **07**

Section – II

Q.5 Solve.

a) Explain the concept of layers of autonomy in autonomous vehicles. **07**

b) What is the purpose of Advanced Driver Assistance Systems (ADAS) in vehicles? Explain any one ADAS system. **07**

Q.6 Solve.

a) List and explain advantages and Disadvantages of electric vehicles (EVs) over traditional internal combustion engine vehicles. **07**

b) What are the safety risks associated with electric vehicles, and what precautions should be taken to prevent them? **07**

Q.7 Solve

a) Explain the concept of wireless charging for electric vehicles and its benefits compared to traditional plug-in charging. **07**

b) How can renewable energy sources support EV charging? Explain any one of Renewable energy systems for EV Charging. **07**

SLR-QH-357

Seat No.	

Set R

T. Y. (B.Tech.) (Mechanical Engineering) (Sem - II) (New) (CBCS)
Examination: March/April – 2026
Honors in Electric Vehicle Engineering - Advanced topics in Electric Vehicles (Mech Hon - 04B)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. 14

1) What is the benefit of electronic instrument clusters?
a) Improved fuel consumption
b) Enhanced driver information display
c) Reduced engine noise
d) Increased weight

2) What does active suspension control primarily improve?
a) Brake performance b) Engine power
c) Fuel efficiency d) Passenger comfort

3) Which layer of autonomy allows for full vehicle control by a computer?
a) Level 0 autonomy b) Level 5 autonomy
c) Level 3 autonomy d) Level 2 autonomy

4) What feature distinguishes Level 3 autonomy?
a) Basic driver assistance only
b) Full human control
c) Conditional automation with monitoring
d) No automation at all

5) Which device is known for controlling power in electronic circuits?
a) Thyristor b) Capacitor
c) Resistor d) Photodiode

6) What is a common use for diodes in electronics?
a) Transforming electrical signals
b) Regulating voltage levels
c) Allowing current flow in one direction
d) Storing electrical energy

7) What safety measure is essential when working with high voltage equipment?
a) Using metal tools
b) Wearing rubber gloves
c) Ignoring warnings
d) Working alone

8) What type of vehicle uses autonomous sensors for navigation?
a) Traditional cars
b) Bicycles
c) Self-driven cars
d) Motorcycles

9) Which factor is crucial for the maintenance of EVs?
a) Bodywork repairs due to rust and corrosion
b) Tire rotations and brake fluid replacements only
c) Frequent oil changes and fuel system cleaning
d) Regular battery health checks and software updates

10) What is one advantage of electric vehicles (EVs)?
a) Higher emissions than combustion engines
b) Limited charging infrastructure availability
c) Lower operating costs compared to gasoline cars
d) Higher maintenance costs than traditional vehicles

11) What technology allows charging electric vehicles without plugs?
a) Hydraulic systems
b) Wireless charging
c) Wind turbines
d) Solar panels

12) What is the purpose of battery swapping in electric vehicles?
a) To improve fuel efficiency
b) To reduce carbon emissions
c) To increase vehicle weight
d) To replace depleted batteries quickly

13) What is the purpose of traction control in vehicles?
a) To enhance braking performance
b) To prevent wheel slippage during acceleration
c) To improve steering responsiveness
d) To increase fuel efficiency

14) Which system helps in maintaining a constant speed on highways?
a) Active Suspension Control
b) Electronic Stability Control
c) Adaptive Cruise Control
d) Traction Control

SLR-QH-357

Seat No.	

Set R

T. Y. (B.Tech.) (Mechanical Engineering) (Sem - II) (New) (CBCS)
Examination: March/April – 2026
Honors in Electric Vehicle Engineering - Advanced topics in Electric Vehicles (Mech Hon - 04B)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Solve any Two questions from each section.
2) Figure to the right indicate full marks.
3) Assume suitable data if necessary.

Section – I

Q.2 Solve. **07**

a) Explain the basic working principle of a fuel cell used in electric vehicles with the help of a neat sketch of its operation.

b) Explain fuel oxidation and consumption. **07**

Q.3 Solve.

a) What is adaptive cruise control? How does it contribute to both safety and convenience for drivers? **07**

b) Explain the working principle of an Anti-lock Braking System (ABS). **07**

Q.4 Solve.

a) Explain the working of a Remote Keyless Entry (RKE) system in vehicles. **07**

b) What are the different sensors used in EVs? Explain their functions. **07**

Section – II

Q.5 Solve.

a) Explain the concept of layers of autonomy in autonomous vehicles. **07**

b) What is the purpose of Advanced Driver Assistance Systems (ADAS) in vehicles? Explain any one ADAS system. **07**

Q.6 Solve.

a) List and explain advantages and Disadvantages of electric vehicles (EVs) over traditional internal combustion engine vehicles. **07**

b) What are the safety risks associated with electric vehicles, and what precautions should be taken to prevent them? **07**

Q.7 Solve

a) Explain the concept of wireless charging for electric vehicles and its benefits compared to traditional plug-in charging. **07**

b) How can renewable energy sources support EV charging? Explain any one of Renewable energy systems for EV Charging. **07**

SLR-QH-357

Seat No.	

Set S

T. Y. (B.Tech.) (Mechanical Engineering) (Sem - II) (New) (CBCS)
Examination: March/April – 2026
Honors in Electric Vehicle Engineering - Advanced topics in Electric Vehicles (Mech Hon - 04B)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) What is one advantage of electric vehicles (EVs)?
a) Higher emissions than combustion engines
b) Limited charging infrastructure availability
c) Lower operating costs compared to gasoline cars
d) Higher maintenance costs than traditional vehicles

2) What technology allows charging electric vehicles without plugs?
a) Hydraulic systems b) Wireless charging
c) Wind turbines d) Solar panels

3) What is the purpose of battery swapping in electric vehicles?
a) To improve fuel efficiency
b) To reduce carbon emissions
c) To increase vehicle weight
d) To replace depleted batteries quickly

4) What is the purpose of traction control in vehicles?
a) To enhance braking performance
b) To prevent wheel slippage during acceleration
c) To improve steering responsiveness
d) To increase fuel efficiency

5) Which system helps in maintaining a constant speed on highways?
a) Active Suspension Control b) Electronic Stability Control
c) Adaptive Cruise Control d) Traction Control

6) What is the benefit of electronic instrument clusters?
a) Improved fuel consumption
b) Enhanced driver information display
c) Reduced engine noise
d) Increased weight

7) What does active suspension control primarily improve?
a) Brake performance
b) Engine power
c) Fuel efficiency
d) Passenger comfort

8) Which layer of autonomy allows for full vehicle control by a computer?
a) Level 0 autonomy
b) Level 5 autonomy
c) Level 3 autonomy
d) Level 2 autonomy

9) What feature distinguishes Level 3 autonomy?
a) Basic driver assistance only
b) Full human control
c) Conditional automation with monitoring
d) No automation at all

10) Which device is known for controlling power in electronic circuits?
a) Thyristor
b) Capacitor
c) Resistor
d) Photodiode

11) What is a common use for diodes in electronics?
a) Transforming electrical signals
b) Regulating voltage levels
c) Allowing current flow in one direction
d) Storing electrical energy

12) What safety measure is essential when working with high voltage equipment?
a) Using metal tools
b) Wearing rubber gloves
c) Ignoring warnings
d) Working alone

13) What type of vehicle uses autonomous sensors for navigation?
a) Traditional cars
b) Bicycles
c) Self-driven cars
d) Motorcycles

14) Which factor is crucial for the maintenance of EVs?
a) Bodywork repairs due to rust and corrosion
b) Tire rotations and brake fluid replacements only
c) Frequent oil changes and fuel system cleaning
d) Regular battery health checks and software updates

SLR-QH-357

Seat No.	

Set S

T. Y. (B.Tech.) (Mechanical Engineering) (Sem - II) (New) (CBCS)
Examination: March/April – 2026
Honors in Electric Vehicle Engineering - Advanced topics in Electric Vehicles (Mech Hon - 04B)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Solve any Two questions from each section.
2) Figure to the right indicate full marks.
3) Assume suitable data if necessary.

Section – I

Q.2 Solve. **07**

a) Explain the basic working principle of a fuel cell used in electric vehicles with the help of a neat sketch of its operation.

b) Explain fuel oxidation and consumption. **07**

Q.3 Solve.

a) What is adaptive cruise control? How does it contribute to both safety and convenience for drivers? **07**

b) Explain the working principle of an Anti-lock Braking System (ABS). **07**

Q.4 Solve.

a) Explain the working of a Remote Keyless Entry (RKE) system in vehicles. **07**

b) What are the different sensors used in EVs? Explain their functions. **07**

Section – II

Q.5 Solve.

a) Explain the concept of layers of autonomy in autonomous vehicles. **07**

b) What is the purpose of Advanced Driver Assistance Systems (ADAS) in vehicles? Explain any one ADAS system. **07**

Q.6 Solve.

a) List and explain advantages and Disadvantages of electric vehicles (EVs) over traditional internal combustion engine vehicles. **07**

b) What are the safety risks associated with electric vehicles, and what precautions should be taken to prevent them? **07**

Q.7 Solve

a) Explain the concept of wireless charging for electric vehicles and its benefits compared to traditional plug-in charging. **07**

b) How can renewable energy sources support EV charging? Explain any one of Renewable energy systems for EV Charging. **07**

Seat No.	

Set **P**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Transmission System Design (BTN02601)

Day & Date: Friday, 15-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in first 30 minutes in Answer Book Page No. 3.
2) Answer MCQ/Objective type questions on Page No. 3 only. Don't forget to mention, Q.P. Set (P/Q/R/S) on Top of Page.
3) Make necessary assumptions, if required and mention it clearly.
4) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 A) Choose correct answer carrying two marks each. **06**

1) What is the primary factor considered when selecting gear materials?
   a) Cost-effectiveness b) Thermal conductivity
   c) Hardness d) Corrosion resistance

2) In the design of friction clutches, what factor is primarily considered in selecting the number of friction plates?
   a) Torque capacity b) Thermal conductivity
   c) Cost-effectiveness d) Material hardness

3) What is the primary consideration in selecting bearings for variable load and speed applications?
   a) Material hardness b) Lubrication type
   c) Bearing size d) Bearing life

B) Choose correct answer carrying one marks each. **08**

1) Which failure mode is characterized by excessive wear between gear teeth?
   a) Pitting b) Scoring
   c) Abrasion d) Fatigue

2) What equation is used to determine the minimum number of teeth in spur gears?
   a) Lewis equation b) Spott's equation
   c) Buckingham's equation d) Euler's equation

3) In helical gears, what is the purpose of considering the pressure angle in both the normal and transverse planes?
   a) To optimize gear efficiency
   b) To minimize gear noise
   c) To enhance gear strength
   d) To improve gear wear resistance

4) Which parameter primarily determines the load rating of worm drives?
   a) Gear material
   b) Applied torque
   c) Lubrication type
   d) Gear geometry

5) What type of load is primarily considered in the design of bevel gears based on beam strength?
   a) Tangential load
   b) Radial load
   c) Axial load
   d) Dynamic load

6) Which equation is used to calculate the equivalent bearing load in rolling contact bearings?
   a) Stribeck's equation
   b) Load life relationship
   c) Hertzian contact theory
   d) Buckingham's equation

7) What is the primary purpose of hydrodynamic lubrication in sliding contact bearings?
   a) To reduce friction and wear
   b) To minimize noise
   c) To improve gear alignment
   d) To increase load capacity

8) What type of brake provides uniform braking force distribution?
   a) Band brake
   b) Block brake
   c) External shoe brake
   d) Disc brake

Seat No.	

Set **P**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Transmission System Design (BTN02601)

Day & Date: Friday, 15-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Solve any two questions from each section I and II.
2) Make necessary assumptions, if required and mention it clearly.
3) Figures to the right indicate full marks.

Section – I

Q.2 **a)** Explain concept of hunting tooth in gear pair. **03**

b) Explain Design considerations of gears. **04**

c) A pair of spur gears with 20° full-depth involute teeth consists of a 20 teeth pinion meshing with a 41 teeth gear. The module is 3 mm while the face width is 40 mm. The material for pinion as well as gear is steel with an ultimate tensile strength of 600 N/mm2. The gears are heat-treated to a surface hardness of 400 BHN. The pinion rotates at 1450 rpm and the service factor for the application is 1.75. Assume that velocity factor accounts for the dynamic load and the factor of safety is 1.5. Determine the rated power that the gears can transmit. **07**

Q.3 **a)** Explain force analysis of helical gear with assumption in it. **07**

b) Pair of parallel helical gears consists of a 20 teeth pinion meshing with a 100 teeth gear. The pinion rotates at 720 rpm. The normal pressure angle is 20°, while the helix angle is 25°. The face width is 40 mm and the normal module is 4 mm. The pinion as well as the gear is made of steel 4OC8 (Sut = 600 N/mm2) and heat treated to a surface hardness of 300 BHN. The service factor and the factor of safety are 1.5 and 2 respectively. Assume that the velocity factor accounts for the dynamic load and calculate the power transmitting capacity of gears. **07**

Q.4 **a)** Explain thermal considerations in case of worm gears. **07**

b) 1 kW power at 720 rpm is supplied to the worm shaft. The number of starts for threads of the worm is four with a 50 mm pitch-circle diameter. The worm wheel has 30 teeth with 5 mm module. The normal pressure angle is 20°. Calculate the efficiency of the worm gear drive and the power lost in friction. **07**

Section – II

Q.5 **a)** Explain types of rolling contact bearings with applications. **07**

b) A pair of straight bevel gears consists of a 24-teeth pinion meshing with a 48 teeth gear. The module at the outside diameter is 6 mm, while the face width is 50 mm. The gears are made of grey cast iron FG 220 (Sut = 220 N/mm2). The pressure angle is 20°. The teeth are generated and assume that velocity factor accounts for the dynamic load. The pinion rotates at 300 rpm and the service factor is 1.5. Calculate: **07**

i) the beam strength of the tooth;
ii) the static load that the gears can transmit with a factor of safety of 2 for bending consideration;
iii) the rated power that the gears can transmit.

Q.6 **a)** Elaborate rolling contact bearing selection process from manufacture's catalogue. **07**

b) Single-row deep groove ball bearing is subjected to a radial force of 8 kN and a thrust force of 3kN. The values of X and Y factors are 0.56 and 1.5 respectively. The shaft rotates at 1200 rpm. The diameter of the shaft is 75 mm and Bearing No. 6315 (C =112 000 N) is selected for this application. **07**

i) Estimate the life of this bearing, with 90% reliability.
ii) Estimate the reliability for 20 000 h life.

Q.7 **a)** A multi-disk clutch consists of five steel plates and four bronze plates. The inner and outer diameters of the friction disks are 75 and 150 mm respectively. The coefficient of friction is 0.1 and the intensity of pressure on friction lining is limited to 0.3 N/mm2. Assuming uniform wear theory, Calculate: **07**

i) The required force to engage the clutch; and
ii) Power transmitting capacity at 750 rpm.

b) Explain uniform wear theory. **04**

c) Explain types of bevel gear with application. **03**

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Transmission System Design (BTN02601)

Day & Date: Friday, 15-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in first 30 minutes in Answer Book Page No. 3.
2) Answer MCQ/Objective type questions on Page No. 3 only. Don't forget to mention, Q.P. Set (P/Q/R/S) on Top of Page.
3) Make necessary assumptions, if required and mention it clearly.
4) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 A) Choose correct answer carrying two marks each. **06**

1) What is the primary factor considered when selecting gear materials?
   a) Cost-effectiveness b) Thermal conductivity
   c) Hardness d) Corrosion resistance

2) In the design of friction clutches, what factor is primarily considered in selecting the number of friction plates?
   a) Torque capacity b) Thermal conductivity
   c) Cost-effectiveness d) Material hardness

3) What is the primary consideration in selecting bearings for variable load and speed applications?
   a) Material hardness b) Lubrication type
   c) Bearing size d) Bearing life

B) Choose correct answer carrying one marks each. **08**

1) What type of load is primarily considered in the design of bevel gears based on beam strength?
   a) Tangential load b) Radial load
   c) Axial load d) Dynamic load

2) Which equation is used to calculate the equivalent bearing load in rolling contact bearings?
   a) Stribeck's equation b) Load life relationship
   c) Hertzian contact theory d) Buckingham's equation

3) What is the primary purpose of hydrodynamic lubrication in sliding contact bearings?
   a) To reduce friction and wear
   b) To minimize noise
   c) To improve gear alignment
   d) To increase load capacity

4) What type of brake provides uniform braking force distribution?
   a) Band brake
   b) Block brake
   c) External shoe brake
   d) Disc brake

5) Which failure mode is characterized by excessive wear between gear teeth?
   a) Pitting
   b) Scoring
   c) Abrasion
   d) Fatigue

6) What equation is used to determine the minimum number of teeth in spur gears?
   a) Lewis equation
   b) Spott’s equation
   c) Buckingham's equation
   d) Euler's equation

7) In helical gears, what is the purpose of considering the pressure angle in both the normal and transverse planes?
   a) To optimize gear efficiency
   b) To minimize gear noise
   c) To enhance gear strength
   d) To improve gear wear resistance

8) Which parameter primarily determines the load rating of worm drives?
   a) Gear material
   b) Applied torque
   c) Lubrication type
   d) Gear geometry

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Transmission System Design (BTN02601)

Day & Date: Friday, 15-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Solve any two questions from each section I and II.
2) Make necessary assumptions, if required and mention it clearly.
3) Figures to the right indicate full marks.

Section – I

Q.2 **a)** Explain concept of hunting tooth in gear pair. **03**

b) Explain Design considerations of gears. **04**

c) A pair of spur gears with 20° full-depth involute teeth consists of a 20 teeth pinion meshing with a 41 teeth gear. The module is 3 mm while the face width is 40 mm. The material for pinion as well as gear is steel with an ultimate tensile strength of 600 N/mm2. The gears are heat-treated to a surface hardness of 400 BHN. The pinion rotates at 1450 rpm and the service factor for the application is 1.75. Assume that velocity factor accounts for the dynamic load and the factor of safety is 1.5. Determine the rated power that the gears can transmit. **07**

Q.3 **a)** Explain force analysis of helical gear with assumption in it. **07**

b) Pair of parallel helical gears consists of a 20 teeth pinion meshing with a 100 teeth gear. The pinion rotates at 720 rpm. The normal pressure angle is 20°, while the helix angle is 25°. The face width is 40 mm and the normal module is 4 mm. The pinion as well as the gear is made of steel 4OC8 (Sut = 600 N/mm2) and heat treated to a surface hardness of 300 BHN. The service factor and the factor of safety are 1.5 and 2 respectively. Assume that the velocity factor accounts for the dynamic load and calculate the power transmitting capacity of gears. **07**

Q.4 **a)** Explain thermal considerations in case of worm gears. **07**

b) 1 kW power at 720 rpm is supplied to the worm shaft. The number of starts for threads of the worm is four with a 50 mm pitch-circle diameter. The worm wheel has 30 teeth with 5 mm module. The normal pressure angle is 20°. Calculate the efficiency of the worm gear drive and the power lost in friction. **07**

Section – II

Q.5 **a)** Explain types of rolling contact bearings with applications. **07**

b) A pair of straight bevel gears consists of a 24-teeth pinion meshing with a 48 teeth gear. The module at the outside diameter is 6 mm, while the face width is 50 mm. The gears are made of grey cast iron FG 220 (Sut = 220 N/mm2). The pressure angle is 20°. The teeth are generated and assume that velocity factor accounts for the dynamic load. The pinion rotates at 300 rpm and the service factor is 1.5. Calculate: **07**

i) the beam strength of the tooth;
ii) the static load that the gears can transmit with a factor of safety of 2 for bending consideration;
iii) the rated power that the gears can transmit.

Q.6 **a)** Elaborate rolling contact bearing selection process from manufacture's catalogue. **07**

b) Single-row deep groove ball bearing is subjected to a radial force of 8 kN and a thrust force of 3kN. The values of X and Y factors are 0.56 and 1.5 respectively. The shaft rotates at 1200 rpm. The diameter of the shaft is 75 mm and Bearing No. 6315 (C =112 000 N) is selected for this application. **07**

i) Estimate the life of this bearing, with 90% reliability.
ii) Estimate the reliability for 20 000 h life.

Q.7 **a)** A multi-disk clutch consists of five steel plates and four bronze plates. The inner and outer diameters of the friction disks are 75 and 150 mm respectively. The coefficient of friction is 0.1 and the intensity of pressure on friction lining is limited to 0.3 N/mm2. Assuming uniform wear theory, **07**
Calculate:

i) The required force to engage the clutch; and
ii) Power transmitting capacity at 750 rpm.

b) Explain uniform wear theory. **04**

c) Explain types of bevel gear with application. **03**

Seat No.	

Set **R**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Transmission System Design (BTN02601)

Day & Date: Friday, 15-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in first 30 minutes in Answer Book Page No. 3.
2) Answer MCQ/Objective type questions on Page No. 3 only. Don't forget to mention, Q.P. Set (P/Q/R/S) on Top of Page.
3) Make necessary assumptions, if required and mention it clearly.
4) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 A) Choose correct answer carrying two marks each. **06**

1) What is the primary factor considered when selecting gear materials?
   a) Cost-effectiveness b) Thermal conductivity
   c) Hardness d) Corrosion resistance

2) In the design of friction clutches, what factor is primarily considered in selecting the number of friction plates?
   a) Torque capacity b) Thermal conductivity
   c) Cost-effectiveness d) Material hardness

3) What is the primary consideration in selecting bearings for variable load and speed applications?
   a) Material hardness b) Lubrication type
   c) Bearing size d) Bearing life

B) Choose correct answer carrying one marks each. **08**

1) In helical gears, what is the purpose of considering the pressure angle in both the normal and transverse planes?
   a) To optimize gear efficiency
   b) To minimize gear noise
   c) To enhance gear strength
   d) To improve gear wear resistance

2) Which parameter primarily determines the load rating of worm drives?
   a) Gear material b) Applied torque
   c) Lubrication type d) Gear geometry

3) What type of load is primarily considered in the design of bevel gears based on beam strength?
   a) Tangential load
   b) Radial load
   c) Axial load
   d) Dynamic load

4) Which equation is used to calculate the equivalent bearing load in rolling contact bearings?
   a) Stribeck's equation
   b) Load life relationship
   c) Hertzian contact theory
   d) Buckingham's equation

5) What is the primary purpose of hydrodynamic lubrication in sliding contact bearings?
   a) To reduce friction and wear
   b) To minimize noise
   c) To improve gear alignment
   d) To increase load capacity

6) What type of brake provides uniform braking force distribution?
   a) Band brake
   b) Block brake
   c) External shoe brake
   d) Disc brake

7) Which failure mode is characterized by excessive wear between gear teeth?
   a) Pitting
   b) Scoring
   c) Abrasion
   d) Fatigue

8) What equation is used to determine the minimum number of teeth in spur gears?
   a) Lewis equation
   b) Spott's equation
   c) Buckingham's equation
   d) Euler's equation

Seat No.	

Set **R**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Transmission System Design (BTN02601)

Day & Date: Friday, 15-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Solve any two questions from each section I and II.
2) Make necessary assumptions, if required and mention it clearly.
3) Figures to the right indicate full marks.

Section – I

Q.2 **a)** Explain concept of hunting tooth in gear pair. **03**

b) Explain Design considerations of gears. **04**

c) A pair of spur gears with 20° full-depth involute teeth consists of a 20 teeth pinion meshing with a 41 teeth gear. The module is 3 mm while the face width is 40 mm. The material for pinion as well as gear is steel with an ultimate tensile strength of 600 N/mm2. The gears are heat-treated to a surface hardness of 400 BHN. The pinion rotates at 1450 rpm and the service factor for the application is 1.75. Assume that velocity factor accounts for the dynamic load and the factor of safety is 1.5. Determine the rated power that the gears can transmit. **07**

Q.3 **a)** Explain force analysis of helical gear with assumption in it. **07**

b) Pair of parallel helical gears consists of a 20 teeth pinion meshing with a 100 teeth gear. The pinion rotates at 720 rpm. The normal pressure angle is 20°, while the helix angle is 25°. The face width is 40 mm and the normal module is 4 mm. The pinion as well as the gear is made of steel 4OC8 (Sut = 600 N/mm2) and heat treated to a surface hardness of 300 BHN. The service factor and the factor of safety are 1.5 and 2 respectively. Assume that the velocity factor accounts for the dynamic load and calculate the power transmitting capacity of gears. **07**

Q.4 **a)** Explain thermal considerations in case of worm gears. **07**

b) 1 kW power at 720 rpm is supplied to the worm shaft. The number of starts for threads of the worm is four with a 50 mm pitch-circle diameter. The worm wheel has 30 teeth with 5 mm module. The normal pressure angle is 20°. Calculate the efficiency of the worm gear drive and the power lost in friction. **07**

Section – II

Q.5 **a)** Explain types of rolling contact bearings with applications. **07**

b) A pair of straight bevel gears consists of a 24-teeth pinion meshing with a 48 teeth gear. The module at the outside diameter is 6 mm, while the face width is 50 mm. The gears are made of grey cast iron FG 220 (Sut = 220 N/mm2). The pressure angle is 20°. The teeth are generated and assume that velocity factor accounts for the dynamic load. The pinion rotates at 300 rpm and the service factor is 1.5. Calculate: **07**

i) the beam strength of the tooth;
ii) the static load that the gears can transmit with a factor of safety of 2 for bending consideration;
iii) the rated power that the gears can transmit.

Q.6 **a)** Elaborate rolling contact bearing selection process from manufacture's catalogue. **07**

b) Single-row deep groove ball bearing is subjected to a radial force of 8 kN and a thrust force of 3kN. The values of X and Y factors are 0.56 and 1.5 respectively. The shaft rotates at 1200 rpm. The diameter of the shaft is 75 mm and Bearing No. 6315 (C =112 000 N) is selected for this application. **07**

i) Estimate the life of this bearing, with 90% reliability.
ii) Estimate the reliability for 20 000 h life.

Q.7 **a)** A multi-disk clutch consists of five steel plates and four bronze plates. The inner and outer diameters of the friction disks are 75 and 150 mm respectively. The coefficient of friction is 0.1 and the intensity of pressure on friction lining is limited to 0.3 N/mm2. Assuming uniform wear theory, Calculate: **07**

i) The required force to engage the clutch; and
ii) Power transmitting capacity at 750 rpm.

b) Explain uniform wear theory. **04**

c) Explain types of bevel gear with application. **03**

Seat No.	

Set **S**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Transmission System Design (BTN02601)

Day & Date: Friday, 15-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in first 30 minutes in Answer Book Page No. 3.
2) Answer MCQ/Objective type questions on Page No. 3 only. Don't forget to mention, Q.P. Set (P/Q/R/S) on Top of Page.
3) Make necessary assumptions, if required and mention it clearly.
4) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 A) Choose correct answer carrying two marks each. **06**

1) What is the primary factor considered when selecting gear materials?
   a) Cost-effectiveness b) Thermal conductivity
   c) Hardness d) Corrosion resistance

2) In the design of friction clutches, what factor is primarily considered in selecting the number of friction plates?
   a) Torque capacity b) Thermal conductivity
   c) Cost-effectiveness d) Material hardness

3) What is the primary consideration in selecting bearings for variable load and speed applications?
   a) Material hardness b) Lubrication type
   c) Bearing size d) Bearing life

B) Choose correct answer carrying one marks each. **08**

1) What is the primary purpose of hydrodynamic lubrication in sliding contact bearings?
   a) To reduce friction and wear
   b) To minimize noise
   c) To improve gear alignment
   d) To increase load capacity

2) What type of brake provides uniform braking force distribution?
   a) Band brake b) Block brake
   c) External shoe brake d) Disc brake

3) Which failure mode is characterized by excessive wear between gear teeth?
   a) Pitting
   b) Scoring
   c) Abrasion
   d) Fatigue

4) What equation is used to determine the minimum number of teeth in spur gears?
   a) Lewis equation
   b) Spott's equation
   c) Buckingham's equation
   d) Euler's equation

5) In helical gears, what is the purpose of considering the pressure angle in both the normal and transverse planes?
   a) To optimize gear efficiency
   b) To minimize gear noise
   c) To enhance gear strength
   d) To improve gear wear resistance

6) Which parameter primarily determines the load rating of worm drives?
   a) Gear material
   b) Applied torque
   c) Lubrication type
   d) Gear geometry

7) What type of load is primarily considered in the design of bevel gears based on beam strength?
   a) Tangential load
   b) Radial load
   c) Axial load
   d) Dynamic load

8) Which equation is used to calculate the equivalent bearing load in rolling contact bearings?
   a) Stribeck's equation
   b) Load life relationship
   c) Hertzian contact theory
   d) Buckingham's equation

Seat No.		Set	S

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Transmission System Design (BTN02601)

Day & Date: Friday, 15-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Solve any two questions from each section I and II.
2) Make necessary assumptions, if required and mention it clearly.
3) Figures to the right indicate full marks.

Section – I

Q.2 **a)** Explain concept of hunting tooth in gear pair. **03**

b) Explain Design considerations of gears. **04**

c) A pair of spur gears with 20° full-depth involute teeth consists of a 20 teeth pinion meshing with a 41 teeth gear. The module is 3 mm while the face width is 40 mm. The material for pinion as well as gear is steel with an ultimate tensile strength of 600 N/mm2. The gears are heat-treated to a surface hardness of 400 BHN. The pinion rotates at 1450 rpm and the service factor for the application is 1.75. Assume that velocity factor accounts for the dynamic load and the factor of safety is 1.5. Determine the rated power that the gears can transmit. **07**

Q.3 **a)** Explain force analysis of helical gear with assumption in it. **07**

b) Pair of parallel helical gears consists of a 20 teeth pinion meshing with a 100 teeth gear. The pinion rotates at 720 rpm. The normal pressure angle is 20°, while the helix angle is 25°. The face width is 40 mm and the normal module is 4 mm. The pinion as well as the gear is made of steel 4OC8 (Sut = 600 N/mm2) and heat treated to a surface hardness of 300 BHN. The service factor and the factor of safety are 1.5 and 2 respectively. Assume that the velocity factor accounts for the dynamic load and calculate the power transmitting capacity of gears. **07**

Q.4 **a)** Explain thermal considerations in case of worm gears. **07**

b) 1 kW power at 720 rpm is supplied to the worm shaft. The number of starts for threads of the worm is four with a 50 mm pitch-circle diameter. The worm wheel has 30 teeth with 5 mm module. The normal pressure angle is 20°. Calculate the efficiency of the worm gear drive and the power lost in friction. **07**

Section – II

Q.5 **a)** Explain types of rolling contact bearings with applications. **07**

b) A pair of straight bevel gears consists of a 24-teeth pinion meshing with a 48 teeth gear. The module at the outside diameter is 6 mm, while the face width is 50 mm. The gears are made of grey cast iron FG 220 (Sut = 220 N/mm2). The pressure angle is 20°. The teeth are generated and assume that velocity factor accounts for the dynamic load. The pinion rotates at 300 rpm and the service factor is 1.5. Calculate: **07**

i) the beam strength of the tooth;
ii) the static load that the gears can transmit with a factor of safety of 2 for bending consideration;
iii) the rated power that the gears can transmit.

Q.6 **a)** Elaborate rolling contact bearing selection process from manufacture's catalogue. **07**

b) Single-row deep groove ball bearing is subjected to a radial force of 8 kN and a thrust force of 3kN. The values of X and Y factors are 0.56 and 1.5 respectively. The shaft rotates at 1200 rpm. The diameter of the shaft is 75 mm and Bearing No. 6315 (C =112 000 N) is selected for this application. **07**

i) Estimate the life of this bearing, with 90% reliability.
ii) Estimate the reliability for 20 000 h life.

Q.7 **a)** A multi-disk clutch consists of five steel plates and four bronze plates. The inner and outer diameters of the friction disks are 75 and 150 mm respectively. The coefficient of friction is 0.1 and the intensity of pressure on friction lining is limited to 0.3 N/mm2. Assuming uniform wear theory, Calculate: **07**

i) The required force to engage the clutch; and
ii) Power transmitting capacity at 750 rpm.

b) Explain uniform wear theory. **04**

c) Explain types of bevel gear with application. **03**

SLR-QH-359

Seat No.	

Set P

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
Instrumentation and Control Engineering (BTN02602)

Day & Date: Monday, 18-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. 14

1) Output stage of a measurement system comprises of _____.
a) detector - transducer
b) transmission element
c) indicating or recording element
d) manipulating element

2) Closeness of output to the true value of measurand is called _____.
a) sensitivity b) accuracy
c) precision d) constancy

3) Unit of thermoelectric power is _____.
a) mV/°C b) °C / mV
c) mA /°C d) °C / m

4) A PV cell is used in _____ tachometer.
a) inductive pickup b) capacitive pickup
c) mechanical d) photoelectric pickup

5) In a rotameter, density of float must be _____ density of liquid.
a) less than b) equal to
c) half the d) more than

6) A Prony Brake dynamometer measures the _____.
a) crank shaft force b) crank shaft torque
c) engine brake power d) power input of Pump

7) The Whetstone's bridge circuit is used in _____ torsion meter.
a) strain gauge b) electrical
c) optical d) None of these

8) Feedback control system is _____.
a) open loop b) closed loop
c) semi-open d) None of these

9) Derivative Time is given by _____.
a) K_d / K_p b) K_p / K_d
c) K_d / K_i d) K_i / K_d

10) Offset Error is the drawback of _____.
a) I-Control b) D-Control
c) P-Control d) ON/OFF Control

11) A root locus is finite when _____.
a) P > Z b) P = Z
c) Z > P d) Z = 0

12) Angles of arrival are needed in a root locus if a system has _____.
a) real poles b) real zeros
c) complex conjugate poles d) complex conjugate zero

13) 'Gain Margin' is always calculated at _____.
a) gain cross-over frequency
b) resonant frequency
c) corner frequency
d) phase cross-over frequency

14) If a system has two zeros at the origin, then the phase angle contribution by them is _____.
a) 180° b) -180°
c) -90° d) 90°

Seat No.	

Set **P**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
Instrumentation and Control Engineering (BTN02602)

Day & Date: Monday, 18-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Solve any two questions from each section.
2) Figures to the right indicate full marks.
3) Assume additional suitable data if necessary and state it clearly.
4) Use of scientific calculator is allowed.
5) Use university graph paper & semi-long paper if required.

Section – I

Q.2 **a)** Explain following system characteristics. **04**
i) precision
ii) fidelity

b) Explain with a neat sketch dead weight pressure gauge testor. **06**

c) Explain the basic principle of working of a thermistor. **04**

Q.3 **a)** Describe with a neat sketch working of 'rotameter.' **06**

b) Explain with a neat sketch 'inductive pick up tachometer'. **04**

c) Explain with a neat sketch 'Prony brake dynamometer'. **04**

Q.4 **a)** Explain with a neat sketch working of 'Proving Ring' for force measurement. **06**

b) Explain with a neat sketch working of 'L.V.D.T.' **04**

c) Explain classification of strain gauges. **04**

Section – II

Q.5 **a)** Differentiate between manual and automatic control systems. **04**

b) Explain the rules for block diagram algebra. **06**

c) Explain the 'Angle Condition' in Root Locus and its importance. **04**

Q.6 **a)** For a control system represented by, **10**

$$G(S)H(S) = \frac{K}{S(S^2 + 2S + 2)}$$

Sketch the complete Root Locus and comment on the system stability.

b) Explain with a graph, $\mathrm{P} + \mathrm{I}$ controller. What do you mean by 'Integral Time'? **04**

Q.7 **a)** For a unity feedback control system given by, **08**

$$G(S) = \frac{80}{S(S+2)(S+20)}$$

Sketch the Bode Plots and comment on the system stability.

b) Explain the following term: **06**

i) corner frequency

ii) gain margin

iii) phase margin

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
Instrumentation and Control Engineering (BTN02602)

Day & Date: Monday, 18-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Feedback control system is _____.
a) open loop b) closed loop
c) semi-open d) None of these

2) Derivative Time is given by _____.
a) K_d / K_p b) K_p / K_d
c) K_d / K_i d) K_i / K_d

3) Offset Error is the drawback of _____.
a) I-Control b) D-Control
c) P-Control d) ON/OFF Control

4) A root locus is finite when _____.
a) P > Z b) P = Z
c) Z > P d) Z = 0

5) Angles of arrival are needed in a root locus if a system has _____.
a) real poles b) real zeros
c) complex conjugate poles d) complex conjugate zero

6) 'Gain Margin' is always calculated at _____.
a) gain cross-over frequency
b) resonant frequency
c) corner frequency
d) phase cross-over frequency

7) If a system has two zeros at the origin, then the phase angle contribution by them is _____.
a) 180° b) -180°
c) -90° d) 90°

8) Output stage of a measurement system comprises of _____.
a) detector - transducer
b) transmission element
c) indicating or recording element
d) manipulating element

9) Closeness of output to the true value of measurand is called _____.
a) sensitivity b) accuracy
c) precision d) constancy

10) Unit of thermoelectric power is _____.
a) mV/°C b) °C / mV
c) mA /°C d) °C / m

11) A PV cell is used in _____ tachometer.
a) inductive pickup b) capacitive pickup
c) mechanical d) photoelectric pickup

12) In a rotameter, density of float must be _____ density of liquid.
a) less than b) equal to
c) half the d) more than

13) A Prony Brake dynamometer measures the _____.
a) crank shaft force b) crank shaft torque
c) engine brake power d) power input of Pump

14) The Whetstone's bridge circuit is used in _____ torsion meter.
a) strain gauge b) electrical
c) optical d) None of these

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
Instrumentation and Control Engineering (BTN02602)

Day & Date: Monday, 18-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Solve any two questions from each section.
2) Figures to the right indicate full marks.
3) Assume additional suitable data if necessary and state it clearly.
4) Use of scientific calculator is allowed.
5) Use university graph paper & semi-long paper if required.

Section – I

Q.2 **a)** Explain following system characteristics. **04**
i) precision
ii) fidelity

b) Explain with a neat sketch dead weight pressure gauge testor. **06**

c) Explain the basic principle of working of a thermistor. **04**

Q.3 **a)** Describe with a neat sketch working of 'rotameter.' **06**

b) Explain with a neat sketch 'inductive pick up tachometer'. **04**

c) Explain with a neat sketch 'Prony brake dynamometer'. **04**

Q.4 **a)** Explain with a neat sketch working of 'Proving Ring' for force measurement. **06**

b) Explain with a neat sketch working of 'L.V.D.T.' **04**

c) Explain classification of strain gauges. **04**

Section – II

Q.5 **a)** Differentiate between manual and automatic control systems. **04**

b) Explain the rules for block diagram algebra. **06**

c) Explain the 'Angle Condition' in Root Locus and its importance. **04**

Q.6 **a)** For a control system represented by, **10**

$$G(S)H(S) = \frac{K}{S(S^2 + 2S + 2)}$$

Sketch the complete Root Locus and comment on the system stability.

b) Explain with a graph, $\mathrm{P} + \mathrm{I}$ controller. What do you mean by 'Integral Time'? **04**

Q.7 **a)** For a unity feedback control system given by, **08**

$$G(S) = \frac{80}{S(S+2)(S+20)}$$

Sketch the Bode Plots and comment on the system stability.

b) Explain the following term: **06**

i) corner frequency

ii) gain margin

iii) phase margin

SLR-QH-359

Seat No.	

Set R

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
Instrumentation and Control Engineering (BTN02602)

Day & Date: Monday, 18-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. 14

1) A root locus is finite when _____.
a) P > Z b) P = Z
c) Z > P d) Z = 0

2) Angles of arrival are needed in a root locus if a system has _____.
a) real poles b) real zeros
c) complex conjugate poles d) complex conjugate zero

3) 'Gain Margin' is always calculated at _____.
a) gain cross-over frequency
b) resonant frequency
c) corner frequency
d) phase cross-over frequency

4) If a system has two zeros at the origin, then the phase angle contribution by them is _____.
a) 180° b) -180°
c) -90° d) 90°

5) Output stage of a measurement system comprises of _____.
a) detector - transducer
b) transmission element
c) indicating or recording element
d) manipulating element

6) Closeness of output to the true value of measurand is called _____.
a) sensitivity b) accuracy
c) precision d) constancy

7) Unit of thermoelectric power is _____.
a) mV/°C b) °C / mV
c) mA /°C d) °C / m

8) A PV cell is used in _____ tachometer.
a) inductive pickup b) capacitive pickup
c) mechanical d) photoelectric pickup

9) In a rotameter, density of float must be _____ density of liquid.
a) less than b) equal to
c) half the d) more than

10) A Prony Brake dynamometer measures the _____.
a) crank shaft force b) crank shaft torque
c) engine brake power d) power input of Pump

11) The Whetstone's bridge circuit is used in _____ torsion meter.
a) strain gauge b) electrical
c) optical d) None of these

12) Feedback control system is _____.
a) open loop b) closed loop
c) semi-open d) None of these

13) Derivative Time is given by _____.
a) K_d / K_p b) K_p / K_d
c) K_d / K_i d) K_i / K_d

14) Offset Error is the drawback of _____.
a) I-Control b) D-Control
c) P-Control d) ON/OFF Control

Seat No.	

Set **R**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
Instrumentation and Control Engineering (BTN02602)

Day & Date: Monday, 18-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Solve any two questions from each section.
2) Figures to the right indicate full marks.
3) Assume additional suitable data if necessary and state it clearly.
4) Use of scientific calculator is allowed.
5) Use university graph paper & semi-long paper if required.

Section – I

Q.2 **a)** Explain following system characteristics. **04**
i) precision
ii) fidelity

b) Explain with a neat sketch dead weight pressure gauge testor. **06**

c) Explain the basic principle of working of a thermistor. **04**

Q.3 **a)** Describe with a neat sketch working of 'rotameter.' **06**

b) Explain with a neat sketch 'inductive pick up tachometer'. **04**

c) Explain with a neat sketch 'Prony brake dynamometer'. **04**

Q.4 **a)** Explain with a neat sketch working of 'Proving Ring' for force measurement. **06**

b) Explain with a neat sketch working of 'L.V.D.T.' **04**

c) Explain classification of strain gauges. **04**

Section – II

Q.5 **a)** Differentiate between manual and automatic control systems. **04**

b) Explain the rules for block diagram algebra. **06**

c) Explain the 'Angle Condition' in Root Locus and its importance. **04**

Q.6 **a)** For a control system represented by, **10**

$$G(S)H(S) = \frac{K}{S(S^2 + 2S + 2)}$$

Sketch the complete Root Locus and comment on the system stability.

b) Explain with a graph, $\mathrm{P} + \mathrm{I}$ controller. What do you mean by 'Integral Time'? **04**

Q.7 **a)** For a unity feedback control system given by, **08**

$$G(S) = \frac{80}{S(S+2)(S+20)}$$

Sketch the Bode Plots and comment on the system stability.

b) Explain the following term: **06**

i) corner frequency

ii) gain margin

iii) phase margin

Seat No.	

Set **S**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
Instrumentation and Control Engineering (BTN02602)

Day & Date: Monday, 18-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) A Prony Brake dynamometer measures the _____.
a) crank shaft force b) crank shaft torque
c) engine brake power d) power input of Pump

2) The Whetstone's bridge circuit is used in _____ torsion meter.
a) strain gauge b) electrical
c) optical d) None of these

3) Feedback control system is _____.
a) open loop b) closed loop
c) semi-open d) None of these

4) Derivative Time is given by _____.
a) K_d / K_p b) K_p / K_d
c) K_d / K_i d) K_i / K_d

5) Offset Error is the drawback of _____.
a) I-Control b) D-Control
c) P-Control d) ON/OFF Control

6) A root locus is finite when _____.
a) $P > Z$ b) $P = Z$
c) $Z > P$ d) $Z = 0$

7) Angles of arrival are needed in a root locus if a system has _____.
a) real poles b) real zeros
c) complex conjugate poles d) complex conjugate zero

8) 'Gain Margin' is always calculated at _____.
   a) gain cross-over frequency
   b) resonant frequency
   c) corner frequency
   d) phase cross-over frequency

9) If a system has two zeros at the origin, then the phase angle contribution by them is _____.
   a) 180° b) -180°
   c) -90° d) 90°

10) Output stage of a measurement system comprises of _____.
   a) detector - transducer
   b) transmission element
   c) indicating or recording element
   d) manipulating element

11) Closeness of output to the true value of measurand is called _____.
   a) sensitivity b) accuracy
   c) precision d) constancy

12) Unit of thermoelectric power is _____.
   a) mV/°C b) °C / mV
   c) mA /°C d) °C / m

13) A PV cell is used in _____ tachometer.
   a) inductive pickup b) capacitive pickup
   c) mechanical d) photoelectric pickup

14) In a rotameter, density of float must be _____ density of liquid.
   a) less than b) equal to
   c) half the d) more than

Seat No.	

Set **S**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
Instrumentation and Control Engineering (BTN02602)

Day & Date: Monday, 18-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Solve any two questions from each section.
2) Figures to the right indicate full marks.
3) Assume additional suitable data if necessary and state it clearly.
4) Use of scientific calculator is allowed.
5) Use university graph paper & semi-long paper if required.

Section – I

Q.2 **a)** Explain following system characteristics. **04**
i) precision
ii) fidelity

b) Explain with a neat sketch dead weight pressure gauge testor. **06**

c) Explain the basic principle of working of a thermistor. **04**

Q.3 **a)** Describe with a neat sketch working of 'rotameter.' **06**

b) Explain with a neat sketch 'inductive pick up tachometer'. **04**

c) Explain with a neat sketch 'Prony brake dynamometer'. **04**

Q.4 **a)** Explain with a neat sketch working of 'Proving Ring' for force measurement. **06**

b) Explain with a neat sketch working of 'L.V.D.T.' **04**

c) Explain classification of strain gauges. **04**

Section – II

Q.5 **a)** Differentiate between manual and automatic control systems. **04**

b) Explain the rules for block diagram algebra. **06**

c) Explain the 'Angle Condition' in Root Locus and its importance. **04**

Q.6 **a)** For a control system represented by, **10**

$$G(S)H(S) = \frac{K}{S(S^2 + 2S + 2)}$$

Sketch the complete Root Locus and comment on the system stability.

b) Explain with a graph, $\mathrm{P} + \mathrm{I}$ controller. What do you mean by 'Integral Time'? **04**

Q.7 **a)** For a unity feedback control system given by, **08**

$$G(S) = \frac{80}{S(S+2)(S+20)}$$

Sketch the Bode Plots and comment on the system stability.

b) Explain the following term: **06**

i) corner frequency

ii) gain margin

iii) phase margin

SLR-QH-360

Seat No.	

Set P

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Heat Transfer (BTN02603)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) Unit of thermal diffusivity _____.
a) m/s b) m^2/s
c) J/s d) None of the above

2) What is the relation between reflectivity (ρ), absorptivity (α) and Transmissivity (τ)?
a) $\rho - \alpha + \tau = 1$ b) $\rho + \alpha - \tau = 1$
c) $\rho + \alpha + \tau = 1$ d) $\rho - \alpha - \tau = 1$

3) Aluminum is used as a fin material because _____.
a) It has higher convection heat transfer coefficient
b) It has higher thermal conductivity
c) It has lower convection heat transfer coefficient
d) It has lower thermal conductivity

4) What is the purpose of using fins in a particular heat transfer system?
a) To decrease rate of heat transfer
b) To increase rate of heat transfer
c) To maintain rate of heat transfer at a constant rate
d) cannot say

5) In which of the following cases most unsteady heat flow occurs?
a) Through the walls of a furnace
b) Through lagged pipes carrying steam
c) Through the wall of a refrigerator
d) During annealing of castings

6) The critical radius of a hollow sphere having thermal conductivity k and h0 as convective heat transfer coefficient of outer fluid is given by _____.

a) h0/k
b) k/h0
c) 2k/h0
d) h0/2k

7) When a composite wall of three layers in series having thermal resistances R1, R2 and R3 respectively. The heat transfer takes place normal to the surface of the layers. How is the total thermal resistance of the composite system calculated?

a) 1/(R1 + R2 + R3)
b) ((1/R1) + (1/R2) + (1/R3))
c) (R1 + R2 + R3)
d) None of the above

8) In parallel flow heat exchangers, _____.

a) the exit temperature of hot fluid is always equal to the exit temperature of cold fluid
b) the exit temperature of hot fluid is always less than the exit temperature of cold fluid
c) the exit temperature of hot fluid is always more than the exit temperature of cold fluid
d) we cannot predict comparison between exit temperatures of hot fluid and cold fluid

9) For the same heat transfer Q and, same overall, heat transfer coefficient U0, surface area required for counter flow operation is always _____.

a) less than parallel flow
b) more than parallel flow
c) same as parallel flow
d) unpredictable

10) An automobile radiator is _____ type of heat exchanger.

a) cross-flow
b) regenerator
c) counter-flow
d) recuperator

11) The thickness of thermal boundary layer is equal to that of hydrodynamic Boundary layer when Prandtl number is _____.

a) 0
b) 0.1
c) 0.5
d) 1.0

12) _____ Number is generally associated with only natural convection heat transfer.

a) Prandtl
b) Weber
c) Nusselt
d) Grashoff

13) In a film condensation, the vertical plate temperature should be _____.

a) more than the saturation temperature of the vapour
b) less than the saturation temperature of the vapour
c) equal to the saturation temperature of the vapour
d) None of the above

14) A _____ body reflects entire radiation incident on it.

a) Transparent
b) Black
c) Gray
d) White

Seat No.	

Set | P

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Heat Transfer (BTN02603)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Attempt any two questions from each section.
2) Use of Scientific calculator is allowed.
3) Assume suitable data if required and state it clearly.

Section – I

Q.2 Attempt the following questions.

a) State Plank's law of radiation. Hence derive Wien's displacement law. **04**

b) Explain the following terms: **05**
i) Solid angle
ii) Radiosity
iii) Irradiation

c) Determine the rate of heat loss by radiation from a steel tube of outside diameter 70 mm and 3 m long at the temperature of 227°C. If the tube is located in a square brick conduit of 0.3 m side and 27°C. Take ε(Steel) = 0.79 & ε(brick) = 0.93 **05**

Q.3 Attempt the following questions.

a) Define thermal conductivity. Explain the effect of temperature on thermal conductivity for solid, liquid and gases. **04**

b) Derive the general heat conduction equation in three dimensions in Cartesian coordinates. **05**

c) A wall of a furnace is made up of inside layer of silica brick 120 mm thick covered with layer of magnetite brick 240 mm thick. The temperature at the inside surface of silica brick wall and outside surface of magnetite brick wall are 725°C and 1100°C respectively. The contact thermal resistance between the two walls at the interface is 0.0035°C /W per unit wall area. If thermal conductivities of silica and magnetite bricks are 1.7 w/m°C and 5.8 w/m°C. **05**
Calculate:
i) The rate of heat loss per unit area of walls, and
ii) The temperature drops at the interface

Q.4 Attempt the following questions.

a) Define thermal diffusivity. Explain its physical significance. **04**

b) Derive an expression for temperature distribution and heat flow rate for Infinitely long fin. **05**

c) Find out the amount of heat transferred through an iron fin of length 50 mm, width 100 mm & thickness 5 mm Assume k = 210 W/m °C & h = 42 W/M^{20} ^{o}C for the material of fin and the temperature and the base of fin 80 °C. Also determine the temperature at the tip of fin when atmosphere temperature 20 °C. **05**

Section – II

Q.5 Attempt the following questions.

a) Explain the concept of fouling factor in heat exchanger. **04**

b) Derive an expression for determining the LMTD of parallel flow heat Exchanger. **05**

c) A chemical having specific heat of 3.3 KJ/KgK flowing at the rate of 20000 Kg/hr. enters the parallel flow heat exchanger at 120°C. The flow rate of cooling water is 50000 Kg/hr having specific heat of 4.186 KJ/KgK with an inlet temperature 20°C. The heat transfer area is 10 m^2 and the overall heat transfer coefficient is 1050 W/m^{2}K. Find: **05**

i) The effectiveness of heat exchanger

ii) The outlet temperature of water and chemical

Q.6 Attempt the following questions.

a) Define condensation & explain its types. **04**

b) Explain the Heat Pipe working with neat sketch & its applications. **05**

c) Draw typical pool boiling curve and explain various regimes of pool boiling. **05**

Q.7 Attempt the following questions.

a) Explain with neat sketch velocity and thermal boundary layer. **04**

b) Define: Nusselt Number, Prandtl Number, Reynolds Number. Also give their significance. **05**

c) The Crankcase of an I.C. Engine measuring 80cm × 20 cm may be idealized as a flat plate. The engine runs at 90 Km/hr & the crankcase is cooled by the air flowing past it at the same speed. Calculate the heat loss from the crank surface maintained at 85°C to the ambient air at 15°C. Due to road induced vibration the boundary layer becomes turbulent from the Leading edge itself. **05**

The Properties of air at 50°C are:

K = 0.02824 w/m ^{o}C, $\gamma = 17.95 \times 10^{-6}$ m/s^2, Pr = 0.698

Use Nu = 0.036(Re)$^{0.8}$ (Pr)$^{0.333}$

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Heat Transfer (BTN02603)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) In parallel flow heat exchangers, _____.
a) the exit temperature of hot fluid is always equal to the exit temperature of cold fluid
b) the exit temperature of hot fluid is always less than the exit temperature of cold fluid
c) the exit temperature of hot fluid is always more than the exit temperature of cold fluid
d) we cannot predict comparison between exit temperatures of hot fluid and cold fluid

2) For the same heat transfer Q and, same overall, heat transfer coefficient U0, surface area required for counter flow operation is always _____.
a) less than parallel flow b) more than parallel flow
c) same as parallel flow d) unpredictable

3) An automobile radiator is _____ type of heat exchanger.
a) cross-flow b) regenerator
c) counter-flow d) recuperator

4) The thickness of thermal boundary layer is equal to that of hydrodynamic Boundary layer when Prandtl number is _____.
a) 0 b) 0.1
c) 0.5 d) 1.0

5) _____ Number is generally associated with only natural convection heat transfer.
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c) Nusselt d) Grashoff

6) In a film condensation, the vertical plate temperature should be _____.
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c) equal to the saturation temperature of the vapour
d) None of the above

7) A _____ body reflects entire radiation incident on it.
a) Transparent
b) Black
c) Gray
d) White

8) Unit of thermal diffusivity _____.
a) m/s
b) m^2/s
c) J/s
d) None of the above

9) What is the relation between reflectivity (ρ), absorptivity (α) and Transmissivity (τ)?
a) $\rho - \alpha + \tau = 1$
b) $\rho + \alpha - \tau = 1$
c) $\rho + \alpha + \tau = 1$
d) $\rho - \alpha - \tau = 1$

10) Aluminum is used as a fin material because _____.
a) It has higher convection heat transfer coefficient
b) It has higher thermal conductivity
c) It has lower convection heat transfer coefficient
d) It has lower thermal conductivity

11) What is the purpose of using fins in a particular heat transfer system?
a) To decrease rate of heat transfer
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12) In which of the following cases most unsteady heat flow occurs?
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13) The critical radius of a hollow sphere having thermal conductivity k and h0 as convective heat transfer coefficient of outer fluid is given by _____.
a) h0/k
b) k/h0
c) 2k/h0
d) h0/2k

14) When a composite wall of three layers in series having thermal resistances R1, R2 and R3 respectively. The heat transfer takes place normal to the surface of the layers. How is the total thermal resistance of the composite system calculated?
a) 1/(R1 + R2 + R3)
b) ((1/R1) + (1/R2) + (1/R3))
c) (R1 + R2 + R3)
d) None of the above

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Heat Transfer (BTN02603)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Attempt any two questions from each section.
2) Use of Scientific calculator is allowed.
3) Assume suitable data if required and state it clearly.

Section – I

Q.2 Attempt the following questions.

a) State Plank's law of radiation. Hence derive Wien's displacement law. **04**

b) Explain the following terms: **05**
i) Solid angle
ii) Radiosity
iii) Irradiation

c) Determine the rate of heat loss by radiation from a steel tube of outside diameter 70 mm and 3 m long at the temperature of 227°C. If the tube is located in a square brick conduit of 0.3 m side and 27°C. Take ε(Steel) = 0.79 & ε(brick) = 0.93 **05**

Q.3 Attempt the following questions.

a) Define thermal conductivity. Explain the effect of temperature on thermal conductivity for solid, liquid and gases. **04**

b) Derive the general heat conduction equation in three dimensions in Cartesian coordinates. **05**

c) A wall of a furnace is made up of inside layer of silica brick 120 mm thick covered with layer of magnetite brick 240 mm thick. The temperature at the inside surface of silica brick wall and outside surface of magnetite brick wall are 725°C and 1100°C respectively. The contact thermal resistance between the two walls at the interface is 0.0035°C /W per unit wall area. If thermal conductivities of silica and magnetite bricks are 1.7 w/m°C and 5.8 w/m°C. **05**
Calculate:
i) The rate of heat loss per unit area of walls, and
ii) The temperature drops at the interface

Q.4 Attempt the following questions.

a) Define thermal diffusivity. Explain its physical significance. **04**

b) Derive an expression for temperature distribution and heat flow rate for Infinitely long fin. **05**

c) Find out the amount of heat transferred through an iron fin of length 50 mm, width 100 mm & thickness 5 mm Assume k = 210 W/m °C & h = 42 W/M^{20} ^{o}C for the material of fin and the temperature and the base of fin 80 °C. Also determine the temperature at the tip of fin when atmosphere temperature 20 °C. **05**

Section – II

Q.5 Attempt the following questions.

a) Explain the concept of fouling factor in heat exchanger. **04**

b) Derive an expression for determining the LMTD of parallel flow heat Exchanger. **05**

c) A chemical having specific heat of 3.3 KJ/KgK flowing at the rate of 20000 Kg/hr. enters the parallel flow heat exchanger at 120°C. The flow rate of cooling water is 50000 Kg/hr having specific heat of 4.186 KJ/KgK with an inlet temperature 20°C. The heat transfer area is 10 m^2 and the overall heat transfer coefficient is 1050 W/m^{2}K. Find: **05**

i) The effectiveness of heat exchanger

ii) The outlet temperature of water and chemical

Q.6 Attempt the following questions.

a) Define condensation & explain its types. **04**

b) Explain the Heat Pipe working with neat sketch & its applications. **05**

c) Draw typical pool boiling curve and explain various regimes of pool boiling. **05**

Q.7 Attempt the following questions.

a) Explain with neat sketch velocity and thermal boundary layer. **04**

b) Define: Nusselt Number, Prandtl Number, Reynolds Number. Also give their significance. **05**

c) The Crankcase of an I.C. Engine measuring 80cm × 20 cm may be idealized as a flat plate. The engine runs at 90 Km/hr & the crankcase is cooled by the air flowing past it at the same speed. Calculate the heat loss from the crank surface maintained at 85°C to the ambient air at 15°C. Due to road induced vibration the boundary layer becomes turbulent from the Leading edge itself. **05**

The Properties of air at 50°C are:

K = 0.02824 w/m ^{o}C, $\gamma = 17.95 \times 10^{-6}$ m/s^2, Pr = 0.698

Use Nu = 0.036(Re)$^{0.8}$ (Pr)$^{0.333}$

Seat No.	

Set R

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Heat Transfer (BTN02603)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. 14

1) The thickness of thermal boundary layer is equal to that of hydrodynamic Boundary layer when Prandtl number is _____.
a) 0 b) 0.1
c) 0.5 d) 1.0

2) _____ Number is generally associated with only natural convection heat transfer.
a) Prandtl b) Weber
c) Nusselt d) Grashoff

3) In a film condensation, the vertical plate temperature should be _____.
a) more than the saturation temperature of the vapour
b) less than the saturation temperature of the vapour
c) equal to the saturation temperature of the vapour
d) None of the above

4) A _____ body reflects entire radiation incident on it.
a) Transparent b) Black
c) Gray d) White

5) Unit of thermal diffusivity _____.
a) m/s b) m^2/s
c) J/s d) None of the above

6) What is the relation between reflectivity (ρ), absorptivity (α) and Transmissivity (τ)?
a) $\rho - \alpha + \tau = 1$ b) $\rho + \alpha - \tau = 1$
c) $\rho + \alpha + \tau = 1$ d) $\rho - \alpha - \tau = 1$

7) Aluminum is used as a fin material because _____.
a) It has higher convection heat transfer coefficient
b) It has higher thermal conductivity
c) It has lower convection heat transfer coefficient
d) It has lower thermal conductivity

8) What is the purpose of using fins in a particular heat transfer system?
a) To decrease rate of heat transfer
b) To increase rate of heat transfer
c) To maintain rate of heat transfer at a constant rate
d) cannot say

9) In which of the following cases most unsteady heat flow occurs?
a) Through the walls of a furnace
b) Through lagged pipes carrying steam
c) Through the wall of a refrigerator
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10) The critical radius of a hollow sphere having thermal conductivity k and h0 as convective heat transfer coefficient of outer fluid is given by _____.
a) h0/k
b) k/h0
c) 2k/h0
d) h0/2k

11) When a composite wall of three layers in series having thermal resistances R1, R2 and R3 respectively. The heat transfer takes place normal to the surface of the layers. How is the total thermal resistance of the composite system calculated?
a) 1/(R1 + R2 + R3)
b) ((1/R1) + (1/R2) + (1/R3))
c) (R1 + R2 + R3)
d) None of the above

12) In parallel flow heat exchangers, _____.
a) the exit temperature of hot fluid is always equal to the exit temperature of cold fluid
b) the exit temperature of hot fluid is always less than the exit temperature of cold fluid
c) the exit temperature of hot fluid is always more than the exit temperature of cold fluid
d) we cannot predict comparison between exit temperatures of hot fluid and cold fluid

13) For the same heat transfer Q and, same overall, heat transfer coefficient U0, surface area required for counter flow operation is always _____.
a) less than parallel flow
b) more than parallel flow
c) same as parallel flow
d) unpredictable

14) An automobile radiator is _____ type of heat exchanger.
a) cross-flow
b) regenerator
c) counter-flow
d) recuperator

Seat No.	

Set **R**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Heat Transfer (BTN02603)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Attempt any two questions from each section.
2) Use of Scientific calculator is allowed.
3) Assume suitable data if required and state it clearly.

Section – I

Q.2 Attempt the following questions.

a) State Plank's law of radiation. Hence derive Wien's displacement law. **04**

b) Explain the following terms: **05**
i) Solid angle
ii) Radiosity
iii) Irradiation

c) Determine the rate of heat loss by radiation from a steel tube of outside diameter 70 mm and 3 m long at the temperature of 227°C. If the tube is located in a square brick conduit of 0.3 m side and 27°C. Take ε(Steel) = 0.79 & ε(brick) = 0.93 **05**

Q.3 Attempt the following questions.

a) Define thermal conductivity. Explain the effect of temperature on thermal conductivity for solid, liquid and gases. **04**

b) Derive the general heat conduction equation in three dimensions in Cartesian coordinates. **05**

c) A wall of a furnace is made up of inside layer of silica brick 120 mm thick covered with layer of magnetite brick 240 mm thick. The temperature at the inside surface of silica brick wall and outside surface of magnetite brick wall are 725°C and 1100°C respectively. The contact thermal resistance between the two walls at the interface is 0.0035°C /W per unit wall area. If thermal conductivities of silica and magnetite bricks are 1.7 w/m°C and 5.8 w/m°C. **05**
Calculate:
i) The rate of heat loss per unit area of walls, and
ii) The temperature drops at the interface

Q.4 Attempt the following questions.

a) Define thermal diffusivity. Explain its physical significance. **04**

b) Derive an expression for temperature distribution and heat flow rate for Infinitely long fin. **05**

c) Find out the amount of heat transferred through an iron fin of length 50 mm, width 100 mm & thickness 5 mm Assume k = 210 W/m °C & h = 42 W/M^{20} ^{o}C for the material of fin and the temperature and the base of fin 80 °C. Also determine the temperature at the tip of fin when atmosphere temperature 20 °C. **05**

Section – II

Q.5 Attempt the following questions.

a) Explain the concept of fouling factor in heat exchanger. **04**

b) Derive an expression for determining the LMTD of parallel flow heat Exchanger. **05**

c) A chemical having specific heat of 3.3 KJ/KgK flowing at the rate of 20000 Kg/hr. enters the parallel flow heat exchanger at 120°C. The flow rate of cooling water is 50000 Kg/hr having specific heat of 4.186 KJ/KgK with an inlet temperature 20°C. The heat transfer area is 10 m^2 and the overall heat transfer coefficient is 1050 W/m^{2}K. Find: **05**

i) The effectiveness of heat exchanger

ii) The outlet temperature of water and chemical

Q.6 Attempt the following questions.

a) Define condensation & explain its types. **04**

b) Explain the Heat Pipe working with neat sketch & its applications. **05**

c) Draw typical pool boiling curve and explain various regimes of pool boiling. **05**

Q.7 Attempt the following questions.

a) Explain with neat sketch velocity and thermal boundary layer. **04**

b) Define: Nusselt Number, Prandtl Number, Reynolds Number. Also give their significance. **05**

c) The Crankcase of an I.C. Engine measuring 80cm × 20 cm may be idealized as a flat plate. The engine runs at 90 Km/hr & the crankcase is cooled by the air flowing past it at the same speed. Calculate the heat loss from the crank surface maintained at 85°C to the ambient air at 15°C. Due to road induced vibration the boundary layer becomes turbulent from the Leading edge itself. **05**

The Properties of air at 50°C are:

K = 0.02824 w/m ^{o}C, $\gamma = 17.95 \times 10^{-6}$ m/s^2, Pr = 0.698

Use Nu = 0.036(Re)$^{0.8}$ (Pr)$^{0.333}$

Seat No.	

Set **S**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Heat Transfer (BTN02603)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) The critical radius of a hollow sphere having thermal conductivity k and h0 as convective heat transfer coefficient of outer fluid is given by _____.
a) h0/k b) k/h0
c) 2k/h0 d) h0/2k

2) When a composite wall of three layers in series having thermal resistances R1, R2 and R3 respectively. The heat transfer takes place normal to the surface of the layers. How is the total thermal resistance of the composite system calculated?
a) 1/(R1 + R2 + R3) b) ((1/R1) + (1/R2) + (1/R3))
c) (R1 + R2 + R3) d) None of the above

3) In parallel flow heat exchangers, _____.
a) the exit temperature of hot fluid is always equal to the exit temperature of cold fluid
b) the exit temperature of hot fluid is always less than the exit temperature of cold fluid
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4) For the same heat transfer Q and, same overall, heat transfer coefficient U0, surface area required for counter flow operation is always _____.
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b) To increase rate of heat transfer
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14) In which of the following cases most unsteady heat flow occurs?

a) Through the walls of a furnace
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Seat No.		Set	S

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Heat Transfer (BTN02603)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Attempt any two questions from each section.
2) Use of Scientific calculator is allowed.
3) Assume suitable data if required and state it clearly.

Section – I

Q.2 Attempt the following questions.

a) State Plank's law of radiation. Hence derive Wien's displacement law. **04**

b) Explain the following terms: **05**
i) Solid angle
ii) Radiosity
iii) Irradiation

c) Determine the rate of heat loss by radiation from a steel tube of outside diameter 70 mm and 3 m long at the temperature of 227°C. If the tube is located in a square brick conduit of 0.3 m side and 27°C. Take ε(Steel) = 0.79 & ε(brick) = 0.93 **05**

Q.3 Attempt the following questions.

a) Define thermal conductivity. Explain the effect of temperature on thermal conductivity for solid, liquid and gases. **04**

b) Derive the general heat conduction equation in three dimensions in Cartesian coordinates. **05**

c) A wall of a furnace is made up of inside layer of silica brick 120 mm thick covered with layer of magnetite brick 240 mm thick. The temperature at the inside surface of silica brick wall and outside surface of magnetite brick wall are 725°C and 1100°C respectively. The contact thermal resistance between the two walls at the interface is 0.0035°C /W per unit wall area. If thermal conductivities of silica and magnetite bricks are 1.7 w/m°C and 5.8 w/m°C. **05**
Calculate:
i) The rate of heat loss per unit area of walls, and
ii) The temperature drops at the interface

Q.4 Attempt the following questions.

a) Define thermal diffusivity. Explain its physical significance. **04**

b) Derive an expression for temperature distribution and heat flow rate for Infinitely long fin. **05**

c) Find out the amount of heat transferred through an iron fin of length 50 mm, width 100 mm & thickness 5 mm Assume k = 210 W/m °C & h = 42 W/M^{20} ^{o}C for the material of fin and the temperature and the base of fin 80 °C. Also determine the temperature at the tip of fin when atmosphere temperature 20 °C. **05**

Section – II

Q.5 Attempt the following questions.

a) Explain the concept of fouling factor in heat exchanger. **04**

b) Derive an expression for determining the LMTD of parallel flow heat Exchanger. **05**

c) A chemical having specific heat of 3.3 KJ/KgK flowing at the rate of 20000 Kg/hr. enters the parallel flow heat exchanger at 120°C. The flow rate of cooling water is 50000 Kg/hr having specific heat of 4.186 KJ/KgK with an inlet temperature 20°C. The heat transfer area is 10 m^2 and the overall heat transfer coefficient is 1050 W/m^{2}K. Find: **05**

i) The effectiveness of heat exchanger

ii) The outlet temperature of water and chemical

Q.6 Attempt the following questions.

a) Define condensation & explain its types. **04**

b) Explain the Heat Pipe working with neat sketch & its applications. **05**

c) Draw typical pool boiling curve and explain various regimes of pool boiling. **05**

Q.7 Attempt the following questions.

a) Explain with neat sketch velocity and thermal boundary layer. **04**

b) Define: Nusselt Number, Prandtl Number, Reynolds Number. Also give their significance. **05**

c) The Crankcase of an I.C. Engine measuring 80cm × 20 cm may be idealized as a flat plate. The engine runs at 90 Km/hr & the crankcase is cooled by the air flowing past it at the same speed. Calculate the heat loss from the crank surface maintained at 85°C to the ambient air at 15°C. Due to road induced vibration the boundary layer becomes turbulent from the Leading edge itself. **05**

The Properties of air at 50°C are:

K = 0.02824 w/m ^{o}C, $\gamma = 17.95 \times 10^{-6}$ m/s^2, Pr = 0.698

Use Nu = 0.036(Re)$^{0.8}$ (Pr)$^{0.333}$

SLR-QH-361

Seat No.	

Set P

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Industrial & Quality Management (BTN02604)

Day & Date: Friday, 22-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) _____ is defined as "the discipline dealing with what is good & bad & with moral duty & obligation".
a) Rule b) Organization culture
c) Protocol d) Ethics

2) _____ Managers are the real 'team manager' in grid type.
a) 1.9 b) 5.5
c) 9.1 d) 9.9

3) In _____ concept product enjoys the supreme importance.
a) Selling b) Marketing
c) Manufacturing d) Business

4) Close control, close supervision is advantage of _____.
a) Narrow span b) Wide span
c) Close span d) Open span

5) The responsibilities of the operations manager include _____.
a) Planning, organizing, staffing, procuring and reviewing
b) Forecasting, designing, planning, organizing, and controlling
c) Forecasting, designing, operating, procuring, and reviewing
d) Planning, organizing, staffing, leading, and controlling
e) Designing & operating

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SLR-QH-361

Seat No.	

Set P

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Industrial & Quality Management (BTN02604)

Day & Date: Friday, 22-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Attempt any Two Questions from each Section - I & Section - II.
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SECTION – I

Q.2	**a)**	What are managerial skills and managerial roles?	**07**
	b)	Explain the financial management role, nature & functions of each department.	**07**
Q.3	**a)**	What is planning? Explain steps in planning with advantages and disadvantages of planning.	**07**
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SECTION – II

Q.5	**a)**	What is meaning of quality of design and quality of conformance? Explain the factors affecting quality of design.	**07**
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Find C. Compute trial control limits, and plot control chart for C. What values of 'C' would you suggest for the subsequent period?

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SLR-QH-361

Seat No.	

Set Q

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Industrial & Quality Management (BTN02604)

Day & Date: Friday, 22-05-2026 Max. Marks: 70
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MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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SLR-QH-361

Seat No.	

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Industrial & Quality Management (BTN02604)

Day & Date: Friday, 22-05-2026 Max. Marks: 56
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SECTION – I

Q.2 **a)** What are managerial skills and managerial roles? **07**

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SECTION – II

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b) Name any three quality gurus and their contribution in quality. **07**

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Find C. Compute trial control limits, and plot control chart for C. What values of 'C' would you suggest for the subsequent period?

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Seat No.	

Set **R**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Industrial & Quality Management (BTN02604)

Day & Date: Friday, 22-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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2) The statistician who invented the control chart for use in industrial quality control was _____.
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3) The method of accepting or rejecting the lot is known as _____.
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SLR-QH-361

Seat No.	

Set R

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Industrial & Quality Management (BTN02604)

Day & Date: Friday, 22-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Attempt any Two Questions from each Section - I & Section - II.
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SECTION – I

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Seat No.	

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Industrial & Quality Management (BTN02604)

Day & Date: Friday, 22-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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SLR-QH-361

Seat No.	

Set S

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Industrial & Quality Management (BTN02604)

Day & Date: Friday, 22-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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SLR-QH-362

Seat No.	

Set P

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Project Management (BTN02608)

Day & Date: Monday, 25-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book).
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4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) What is the primary objective of project management?
a) Increase employee salaries
b) Reduce office workload
c) Eliminate all project risks
d) Meet project requirements within constraints

2) Net Present Value of a machine is _____.
a) PV of cash inflows less cost of investment
b) PV of cash inflows ÷ cost of investment
c) PV of net profit after tax less cost of investment
d) PV of cash inflows less average cost of investment

3) The critical path in a network diagram represents _____.
a) Shortest project duration b) Longest duration path
c) Path with maximum cost d) Highest risk activities

4) Which of the following is a characteristic of a project?
a) Continuous process b) Repetitive operation
c) Temporary endeavour d) Permanent activity

5) The payback period is the period _____.
a) a project takes to pay back the loan taken to purchase the capital assets
b) equal to the useful life of the machines
c) a project takes to recover its initial cash outflow
d) over which the project will be getting operating cash inflows

6) Which feasibility analysis method considers the time value of money?
   a) Payback Period
   b) Net Present Value
   c) Break-even Analysis
   d) Scoring Model

7) Which technique is used to reduce uncertainty in project estimation?
   a) WBS
   b) Gantt Chart
   c) Break-even Analysis
   d) Monte Carlo Simulation

8) Which estimating method uses historical data from similar projects?
   a) Bottom-Up Estimating
   b) Parametric Estimating
   c) Analogous Estimating
   d) Day Work Estimating

9) Feasibility study determines _____.
   a) Whether the project is possible with resources
   b) Comparing the project with world class manufacturing norms
   c) Calculate the cost crashing each unit
   d) Add duration to each unit

10) Which scheduling technique identifies the longest path in a project network?
   a) ROI
   b) CPM
   c) SWOT
   d) PEST

11) A communication management plan identifies the relevant information that should be communicated to _____.
   a) the project team
   b) the project stakeholders
   c) the project board
   d) the project sponsor

12) What is a milestone in Microsoft Project?
   a) A major event in the project
   b) A task that can be completed quickly
   c) A constraint that limits the start or end of a task
   d) A summary of the project's progress

13) In MS Project, Gantt Chart is mainly used for _____.
   a) Visual representation of schedule
   b) Risk Analysis
   c) Drawing machine parts
   d) Cost accounting

14) The probability of completing the project can be estimated based upon the _____.
   a) Uniform distribution curve
   b) Exponential distribution curve
   c) U-shaped distribution curve
   d) Normal distribution curve

SLR-QH-362

Seat No.	

Set P

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Project Management (BTN02608)

Day & Date: Monday, 25-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Solve any two questions from each Section.
2) Figures to the right indicate full marks.
3) Make suitable assumptions if necessary and state them clearly.

Section – I

Q.2 **a)** Explain different classifications of projects with suitable examples. **07**

b) Describe the Project Life Cycle with neat diagram and explain each phase in detail. **07**

Q.3 **a)** Explain risk identification and risk analysis techniques used in project management. **07**

b) Explain break even analysis with its importance in project management. **07**

Q.4 **a)** State the various project cost-estimating methods. Explain bottom-up Estimating with examples. **07**

b) Discuss various feasibility study techniques used in project management. **07**

Section – II

Q.5 **a)** Explain the need and importance of Project Planning in engineering projects. **07**

b) Explain the process of project execution and control in detail. **07**

Q.6 **a)** What is Work Breakdown Structure (WBS)? Explain the procedure for developing WBS with suitable example. **07**

b) Explain Project Management Information System (PMIS) and discuss its planning and design. **07**

Q.7 Write a short note on.

a) Project Performance measurement **07**

b) Gantt chart **07**

SLR-QH-362

Seat No.	

Set Q

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Project Management (BTN02608)

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Q.1 Choose the correct Answer. 14

1) Which estimating method uses historical data from similar projects?
a) Bottom-Up Estimating b) Parametric Estimating
c) Analogous Estimating d) Day Work Estimating

2) Feasibility study determines _____.
a) Whether the project is possible with resources
b) Comparing the project with world class manufacturing norms
c) Calculate the cost crashing each unit
d) Add duration to each unit

3) Which scheduling technique identifies the longest path in a project network?
a) ROI b) CPM
c) SWOT d) PEST

4) A communication management plan identifies the relevant information that should be communicated to _____.
a) the project team b) the project stakeholders
c) the project board d) the project sponsor

5) What is a milestone in Microsoft Project?
a) A major event in the project
b) A task that can be completed quickly
c) A constraint that limits the start or end of a task
d) A summary of the project's progress

6) In MS Project, Gantt Chart is mainly used for _____.
   a) Visual representation of schedule
   b) Risk Analysis
   c) Drawing machine parts
   d) Cost accounting

7) The probability of completing the project can be estimated based upon the _____.
   a) Uniform distribution curve
   b) Exponential distribution curve
   c) U-shaped distribution curve
   d) Normal distribution curve

8) What is the primary objective of project management?
   a) Increase employee salaries
   b) Reduce office workload
   c) Eliminate all project risks
   d) Meet project requirements within constraints

9) Net Present Value of a machine is _____.
   a) PV of cash inflows less cost of investment
   b) PV of cash inflows ÷ cost of investment
   c) PV of net profit after tax less cost of investment
   d) PV of cash inflows less average cost of investment

10) The critical path in a network diagram represents _____.
   a) Shortest project duration b) Longest duration path
   c) Path with maximum cost d) Highest risk activities

11) Which of the following is a characteristic of a project?
   a) Continuous process b) Repetitive operation
   c) Temporary endeavour d) Permanent activity

12) The payback period is the period _____.
   a) a project takes to pay back the loan taken to purchase the capital assets
   b) equal to the useful life of the machines
   c) a project takes to recover its initial cash outflow
   d) over which the project will be getting operating cash inflows

13) Which feasibility analysis method considers the time value of money?
   a) Payback Period b) Net Present Value
   c) Break-even Analysis d) Scoring Model

14) Which technique is used to reduce uncertainty in project estimation?
   a) WBS b) Gantt Chart
   c) Break-even Analysis d) Monte Carlo Simulation

SLR-QH-362

Seat No.	

Set Q

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Project Management (BTN02608)

Day & Date: Monday, 25-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Solve any two questions from each Section.
2) Figures to the right indicate full marks.
3) Make suitable assumptions if necessary and state them clearly.

Section – I

Q.2	**a)**	Explain different classifications of projects with suitable examples.	**07**
	b)	Describe the Project Life Cycle with neat diagram and explain each phase in detail.	**07**
Q.3	**a)**	Explain risk identification and risk analysis techniques used in project management.	**07**
	b)	Explain break even analysis with its importance in project management.	**07**
Q.4	**a)**	State the various project cost-estimating methods. Explain bottom-up Estimating with examples.	**07**
	b)	Discuss various feasibility study techniques used in project management.	**07**

Section – II

Q.5	**a)**	Explain the need and importance of Project Planning in engineering projects.	**07**
	b)	Explain the process of project execution and control in detail.	**07**
Q.6	**a)**	What is Work Breakdown Structure (WBS)? Explain the procedure for developing WBS with suitable example.	**07**
	b)	Explain Project Management Information System (PMIS) and discuss its planning and design.	**07**
Q.7	**Write a short note on.**		
	a)	Project Performance measurement	**07**
	b)	Gantt chart	**07**

SLR-QH-362

Seat No.	

Set R

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Project Management (BTN02608)

Day & Date: Monday, 25-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book).
Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) A communication management plan identifies the relevant information that should be communicated to _____.
a) the project team b) the project stakeholders
c) the project board d) the project sponsor

2) What is a milestone in Microsoft Project?
a) A major event in the project
b) A task that can be completed quickly
c) A constraint that limits the start or end of a task
d) A summary of the project's progress

3) In MS Project, Gantt Chart is mainly used for _____.
a) Visual representation of schedule
b) Risk Analysis
c) Drawing machine parts
d) Cost accounting

4) The probability of completing the project can be estimated based upon the _____.
a) Uniform distribution curve
b) Exponential distribution curve
c) U-shaped distribution curve
d) Normal distribution curve

5) What is the primary objective of project management?
   a) Increase employee salaries
   b) Reduce office workload
   c) Eliminate all project risks
   d) Meet project requirements within constraints

6) Net Present Value of a machine is _____.
   a) PV of cash inflows less cost of investment
   b) PV of cash inflows ÷ cost of investment
   c) PV of net profit after tax less cost of investment
   d) PV of cash inflows less average cost of investment

7) The critical path in a network diagram represents _____.
   a) Shortest project duration b) Longest duration path
   c) Path with maximum cost d) Highest risk activities

8) Which of the following is a characteristic of a project?
   a) Continuous process b) Repetitive operation
   c) Temporary endeavour d) Permanent activity

9) The payback period is the period _____.
   a) a project takes to pay back the loan taken to purchase the capital assets
   b) equal to the useful life of the machines
   c) a project takes to recover its initial cash outflow
   d) over which the project will be getting operating cash inflows

10) Which feasibility analysis method considers the time value of money?
   a) Payback Period b) Net Present Value
   c) Break-even Analysis d) Scoring Model

11) Which technique is used to reduce uncertainty in project estimation?
   a) WBS b) Gantt Chart
   c) Break-even Analysis d) Monte Carlo Simulation

12) Which estimating method uses historical data from similar projects?
   a) Bottom-Up Estimating b) Parametric Estimating
   c) Analogous Estimating d) Day Work Estimating

13) Feasibility study determines _____.
   a) Whether the project is possible with resources
   b) Comparing the project with world class manufacturing norms
   c) Calculate the cost crashing each unit
   d) Add duration to each unit

14) Which scheduling technique identifies the longest path in a project network?

a) ROI
b) CPM
c) SWOT
d) PEST

SLR-QH-362

Seat No.		Set	R

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Project Management (BTN02608)

Day & Date: Monday, 25-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Solve any two questions from each Section.
2) Figures to the right indicate full marks.
3) Make suitable assumptions if necessary and state them clearly.

Section – I

Q.2 **a)** Explain different classifications of projects with suitable examples. **07**

b) Describe the Project Life Cycle with neat diagram and explain each phase in detail. **07**

Q.3 **a)** Explain risk identification and risk analysis techniques used in project management. **07**

b) Explain break even analysis with its importance in project management. **07**

Q.4 **a)** State the various project cost-estimating methods. Explain bottom-up Estimating with examples. **07**

b) Discuss various feasibility study techniques used in project management. **07**

Section – II

Q.5 **a)** Explain the need and importance of Project Planning in engineering projects. **07**

b) Explain the process of project execution and control in detail. **07**

Q.6 **a)** What is Work Breakdown Structure (WBS)? Explain the procedure for developing WBS with suitable example. **07**

b) Explain Project Management Information System (PMIS) and discuss its planning and design. **07**

Q.7 **Write a short note on.**

a) Project Performance measurement **07**

b) Gantt chart **07**

SLR-QH-362

Seat No.		Set	S

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Project Management (BTN02608)

Day & Date: Monday, 25-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book).
Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which feasibility analysis method considers the time value of money?
a) Payback Period b) Net Present Value
c) Break-even Analysis d) Scoring Model

2) Which technique is used to reduce uncertainty in project estimation?
a) WBS b) Gantt Chart
c) Break-even Analysis d) Monte Carlo Simulation

3) Which estimating method uses historical data from similar projects?
a) Bottom-Up Estimating b) Parametric Estimating
c) Analogous Estimating d) Day Work Estimating

4) Feasibility study determines _____.
a) Whether the project is possible with resources
b) Comparing the project with world class manufacturing norms
c) Calculate the cost crashing each unit
d) Add duration to each unit

5) Which scheduling technique identifies the longest path in a project network?
a) ROI b) CPM
c) SWOT d) PEST

6) A communication management plan identifies the relevant information that should be communicated to _____.
   a) the project team
   b) the project stakeholders
   c) the project board
   d) the project sponsor

7) What is a milestone in Microsoft Project?
   a) A major event in the project
   b) A task that can be completed quickly
   c) A constraint that limits the start or end of a task
   d) A summary of the project's progress

8) In MS Project, Gantt Chart is mainly used for _____.
   a) Visual representation of schedule
   b) Risk Analysis
   c) Drawing machine parts
   d) Cost accounting

9) The probability of completing the project can be estimated based upon the _____.
   a) Uniform distribution curve
   b) Exponential distribution curve
   c) U-shaped distribution curve
   d) Normal distribution curve

10) What is the primary objective of project management?
   a) Increase employee salaries
   b) Reduce office workload
   c) Eliminate all project risks
   d) Meet project requirements within constraints

11) Net Present Value of a machine is _____.
   a) PV of cash inflows less cost of investment
   b) PV of cash inflows ÷ cost of investment
   c) PV of net profit after tax less cost of investment
   d) PV of cash inflows less average cost of investment

12) The critical path in a network diagram represents _____.
   a) Shortest project duration
   b) Longest duration path
   c) Path with maximum cost
   d) Highest risk activities

13) Which of the following is a characteristic of a project?
   a) Continuous process
   b) Repetitive operation
   c) Temporary endeavour
   d) Permanent activity

14) The payback period is the period _____.

a) a project takes to pay back the loan taken to purchase the capital assets
b) equal to the useful life of the machines
c) a project takes to recover its initial cash outflow
d) over which the project will be getting operating cash inflows

SLR-QH-362

Seat No.		Set	S

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Project Management (BTN02608)

Day & Date: Monday, 25-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Solve any two questions from each Section.
2) Figures to the right indicate full marks.
3) Make suitable assumptions if necessary and state them clearly.

Section – I

Q.2 **a)** Explain different classifications of projects with suitable examples. **07**

b) Describe the Project Life Cycle with neat diagram and explain each phase in detail. **07**

Q.3 **a)** Explain risk identification and risk analysis techniques used in project management. **07**

b) Explain break even analysis with its importance in project management. **07**

Q.4 **a)** State the various project cost-estimating methods. Explain bottom-up Estimating with examples. **07**

b) Discuss various feasibility study techniques used in project management. **07**

Section – II

Q.5 **a)** Explain the need and importance of Project Planning in engineering projects. **07**

b) Explain the process of project execution and control in detail. **07**

Q.6 **a)** What is Work Breakdown Structure (WBS)? Explain the procedure for developing WBS with suitable example. **07**

b) Explain Project Management Information System (PMIS) and discuss its planning and design. **07**

Q.7 **Write a short note on.**

a) Project Performance measurement **07**

b) Gantt chart **07**

SLR-QH-363

Seat No.	

Set P

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Industrial Product Design (BTN02609)

Day & Date: Monday, 25-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) The following subject(s) is (are) related to Ergonomics.
a) Anthropology b) Physiology
c) Psychology d) All of the above

2) The following aspect of product is concerned with the ease and efficiency of the product performance _____.
a) Functional aspect b) Operational aspect
c) Durability aspect d) Aesthetic aspect

3) 'Comfort' term closely relates to _____ requirement of a consumer product.
a) Aesthetic b) Ergonomic
c) Technical d) Economics

4) What is the primary purpose of utilizing anthropometric data in industrial product design?
a) Ensuring ergonomic fit and user comfort
b) Enhancing product aesthetics
c) Maximizing production efficiency
d) Minimizing production costs

5) Ergonomic principle suggests that _____.
a) Monitoring displays should be placed outside peripheral limitations
b) Glow-in-the dark dials made of reflective substances are good for viewing in the nights
c) Visual systems should be preferred over auditory systems in noisy locations
d) All of the above

6) What is the primary consideration when choosing the color for heavy machinery and construction equipment?
   a) Aesthetics
   b) Manufacturing costs
   c) Visibility and safety
   d) User preference

7) How does the psychology of scene relate to user satisfaction in product design?
   a) It has no impact on user satisfaction.
   b) It only affects the product's functionality.
   c) It primarily focuses on marketing strategies.
   d) It plays a significant role in shaping user perceptions and emotions, ultimately influencing satisfaction.

8) What is the term for the quality that makes something visually appealing or beautiful?
   a) Symmetry
   b) Proportion
   c) Aesthetic
   d) Harmony

9) What is the primary purpose of QFD in product development?
   a) To create prototypes quickly
   b) To translate customer needs into technical requirements
   c) To perform cost analysis
   d) To design marketing strategies

10) QFD is a quality management technique that translates the needs of customers to?
   a) Technical requirement
   b) Modelling requirement
   c) Analysis requirement
   d) None

11) Consumer needs and requirements are known as _____ in QFD methodology.
   a) Voice of the customer
   b) Consumer preferences
   c) Expectations
   d) Variety of needs

12) The design for the environment is essentially due to _____.
   a) Customer Demand
   b) Government Laws
   c) ISO Requirement
   d) All of the above

13) _____ is more detailed and physical.
   a) Vertical thinking
   b) Lateral thinking
   c) Creative thinking
   d) None of the above

14) How does Rapid Prototyping contribute to sustainability in product development?
   a) By producing large quantities of prototypes
   b) By reducing the need for skilled labor
   c) By minimizing material waste and energy consumption
   d) By focusing on mass production

SLR-QH-363

Seat No.	

Set P

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Industrial Product Design (BTN02609)

Day & Date: Monday, 25-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Answer any two questions from each section.
2) Figures to the right indicate full marks.
3) Assume suitable data if required and mention it clearly.

Section – I

Q.2 **a)** Explain in detail the process of concept development. **07**

b) Identify and differentiate the visual effects of line and form in a family car and a sports car. **07**

Q.3 **a)** What are the different types of control devices? Explain ergonomic and technical considerations in the design of control devices. **07**

b) Describe prototype and test stage in the design thinking process. **07**

Q.4 **Write short note on the following. (Any Two)** **14**

a) Impact of marketing on product design

b) Role of colour in industrial products

c) Aesthetics of Design

Section – II

Q.5 **a)** Explain benchmarking with competitors **07**

b) Discuss the various phases of new product development in detail. **07**

Q.6 **a)** Explain Product Life Cycle. **07**

b) Explain importance of modelling technique and prototype design in industrial product design with examples. **07**

Q.7 **Write short note on the following. (Any Two)** **14**

a) Effective DFM principles

b) Rapid prototyping

c) Additive Manufacturing

Seat No.	

Set **Q**

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Industrial Product Design (BTN02609)

Day & Date: Monday, 25-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) What is the term for the quality that makes something visually appealing or beautiful?
a) Symmetry b) Proportion
c) Aesthetic d) Harmony

2) What is the primary purpose of QFD in product development?
a) To create prototypes quickly
b) To translate customer needs into technical requirements
c) To perform cost analysis
d) To design marketing strategies

3) QFD is a quality management technique that translates the needs of customers to?
a) Technical requirement b) Modelling requirement
c) Analysis requirement d) None

4) Consumer needs and requirements are known as _____ in QFD methodology.
a) Voice of the customer b) Consumer preferences
c) Expectations d) Variety of needs

5) The design for the environment is essentially due to _____.
a) Customer Demand b) Government Laws
c) ISO Requirement d) All of the above

6) _____ is more detailed and physical.
a) Vertical thinking b) Lateral thinking
c) Creative thinking d) None of the above

7) How does Rapid Prototyping contribute to sustainability in product development?
   a) By producing large quantities of prototypes
   b) By reducing the need for skilled labor
   c) By minimizing material waste and energy consumption
   d) By focusing on mass production

8) The following subject(s) is (are) related to Ergonomics.
   a) Anthropology
   b) Physiology
   c) Psychology
   d) All of the above

9) The following aspect of product is concerned with the ease and efficiency of the product performance _____.
   a) Functional aspect
   b) Operational aspect
   c) Durability aspect
   d) Aesthetic aspect

10) 'Comfort' term closely relates to _____ requirement of a consumer product.
   a) Aesthetic
   b) Ergonomic
   c) Technical
   d) Economics

11) What is the primary purpose of utilizing anthropometric data in industrial product design?
   a) Ensuring ergonomic fit and user comfort
   b) Enhancing product aesthetics
   c) Maximizing production efficiency
   d) Minimizing production costs

12) Ergonomic principle suggests that _____.
   a) Monitoring displays should be placed outside peripheral limitations
   b) Glow-in-the dark dials made of reflective substances are good for viewing in the nights
   c) Visual systems should be preferred over auditory systems in noisy locations
   d) All of the above

13) What is the primary consideration when choosing the color for heavy machinery and construction equipment?
   a) Aesthetics
   b) Manufacturing costs
   c) Visibility and safety
   d) User preference

14) How does the psychology of scene relate to user satisfaction in product design?
   a) It has no impact on user satisfaction.
   b) It only affects the product's functionality.
   c) It primarily focuses on marketing strategies.
   d) It plays a significant role in shaping user perceptions and emotions, ultimately influencing satisfaction.

SLR-QH-363

Seat No.	

Set Q

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Industrial Product Design (BTN02609)

Day & Date: Monday, 25-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Answer any two questions from each section.
2) Figures to the right indicate full marks.
3) Assume suitable data if required and mention it clearly.

Section – I

Q.2 **a)** Explain in detail the process of concept development. **07**

b) Identify and differentiate the visual effects of line and form in a family car and a sports car. **07**

Q.3 **a)** What are the different types of control devices? Explain ergonomic and technical considerations in the design of control devices. **07**

b) Describe prototype and test stage in the design thinking process. **07**

Q.4 **Write short note on the following. (Any Two)** **14**

a) Impact of marketing on product design

b) Role of colour in industrial products

c) Aesthetics of Design

Section – II

Q.5 **a)** Explain benchmarking with competitors **07**

b) Discuss the various phases of new product development in detail. **07**

Q.6 **a)** Explain Product Life Cycle. **07**

b) Explain importance of modelling technique and prototype design in industrial product design with examples. **07**

Q.7 **Write short note on the following. (Any Two)** **14**

a) Effective DFM principles

b) Rapid prototyping

c) Additive Manufacturing

Seat No.	

Set **R**

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Industrial Product Design (BTN02609)

Day & Date: Monday, 25-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) Consumer needs and requirements are known as _____ in QFD methodology.
a) Voice of the customer b) Consumer preferences
c) Expectations d) Variety of needs

2) The design for the environment is essentially due to _____.
a) Customer Demand b) Government Laws
c) ISO Requirement d) All of the above

3) _____ is more detailed and physical.
a) Vertical thinking b) Lateral thinking
c) Creative thinking d) None of the above

4) How does Rapid Prototyping contribute to sustainability in product development?
a) By producing large quantities of prototypes
b) By reducing the need for skilled labor
c) By minimizing material waste and energy consumption
d) By focusing on mass production

5) The following subject(s) is (are) related to Ergonomics.
a) Anthropology b) Physiology
c) Psychology d) All of the above

6) The following aspect of product is concerned with the ease and efficiency of the product performance _____.
a) Functional aspect b) Operational aspect
c) Durability aspect d) Aesthetic aspect

7) 'Comfort' term closely relates to _____ requirement of a consumer product.
   a) Aesthetic
   b) Ergonomic
   c) Technical
   d) Economics

8) What is the primary purpose of utilizing anthropometric data in industrial product design?
   a) Ensuring ergonomic fit and user comfort
   b) Enhancing product aesthetics
   c) Maximizing production efficiency
   d) Minimizing production costs

9) Ergonomic principle suggests that _____.
   a) Monitoring displays should be placed outside peripheral limitations
   b) Glow-in-the dark dials made of reflective substances are good for viewing in the nights
   c) Visual systems should be preferred over auditory systems in noisy locations
   d) All of the above

10) What is the primary consideration when choosing the color for heavy machinery and construction equipment?
   a) Aesthetics
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   c) Visibility and safety
   d) User preference

11) How does the psychology of scene relate to user satisfaction in product design?
   a) It has no impact on user satisfaction.
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12) What is the term for the quality that makes something visually appealing or beautiful?
   a) Symmetry
   b) Proportion
   c) Aesthetic
   d) Harmony

13) What is the primary purpose of QFD in product development?
   a) To create prototypes quickly
   b) To translate customer needs into technical requirements
   c) To perform cost analysis
   d) To design marketing strategies

14) QFD is a quality management technique that translates the needs of customers to?
   a) Technical requirement
   b) Modelling requirement
   c) Analysis requirement
   d) None

SLR-QH-363

Seat No.	

Set R

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Industrial Product Design (BTN02609)

Day & Date: Monday, 25-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Answer any two questions from each section.
2) Figures to the right indicate full marks.
3) Assume suitable data if required and mention it clearly.

Section – I

Q.2 **a)** Explain in detail the process of concept development. **07**

b) Identify and differentiate the visual effects of line and form in a family car and a sports car. **07**

Q.3 **a)** What are the different types of control devices? Explain ergonomic and technical considerations in the design of control devices. **07**

b) Describe prototype and test stage in the design thinking process. **07**

Q.4 Write short note on the following. (Any Two) **14**

a) Impact of marketing on product design

b) Role of colour in industrial products

c) Aesthetics of Design

Section – II

Q.5 **a)** Explain benchmarking with competitors **07**

b) Discuss the various phases of new product development in detail. **07**

Q.6 **a)** Explain Product Life Cycle. **07**

b) Explain importance of modelling technique and prototype design in industrial product design with examples. **07**

Q.7 Write short note on the following. (Any Two) **14**

a) Effective DFM principles

b) Rapid prototyping

c) Additive Manufacturing

SLR-QH-363

Seat No.	

Set S

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Industrial Product Design (BTN02609)

Day & Date: Monday, 25-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) What is the primary consideration when choosing the color for heavy machinery and construction equipment?
a) Aesthetics b) Manufacturing costs
c) Visibility and safety d) User preference

2) How does the psychology of scene relate to user satisfaction in product design?
a) It has no impact on user satisfaction.
b) It only affects the product's functionality.
c) It primarily focuses on marketing strategies.
d) It plays a significant role in shaping user perceptions and emotions, ultimately influencing satisfaction.

3) What is the term for the quality that makes something visually appealing or beautiful?
a) Symmetry b) Proportion
c) Aesthetic d) Harmony

4) What is the primary purpose of QFD in product development?
a) To create prototypes quickly
b) To translate customer needs into technical requirements
c) To perform cost analysis
d) To design marketing strategies

5) QFD is a quality management technique that translates the needs of customers to?
a) Technical requirement b) Modelling requirement
c) Analysis requirement d) None

6) Consumer needs and requirements are known as _____ in QFD methodology.
   a) Voice of the customer
   b) Consumer preferences
   c) Expectations
   d) Variety of needs

7) The design for the environment is essentially due to _____.
   a) Customer Demand
   b) Government Laws
   c) ISO Requirement
   d) All of the above

8) _____ is more detailed and physical.
   a) Vertical thinking
   b) Lateral thinking
   c) Creative thinking
   d) None of the above

9) How does Rapid Prototyping contribute to sustainability in product development?
   a) By producing large quantities of prototypes
   b) By reducing the need for skilled labor
   c) By minimizing material waste and energy consumption
   d) By focusing on mass production

10) The following subject(s) is (are) related to Ergonomics.
   a) Anthropology
   b) Physiology
   c) Psychology
   d) All of the above

11) The following aspect of product is concerned with the ease and efficiency of the product performance _____.
   a) Functional aspect
   b) Operational aspect
   c) Durability aspect
   d) Aesthetic aspect

12) 'Comfort' term closely relates to _____ requirement of a consumer product.
   a) Aesthetic
   b) Ergonomic
   c) Technical
   d) Economics

13) What is the primary purpose of utilizing anthropometric data in industrial product design?
   a) Ensuring ergonomic fit and user comfort
   b) Enhancing product aesthetics
   c) Maximizing production efficiency
   d) Minimizing production costs

13) Ergonomic principle suggests that _____.
   a) Monitoring displays should be placed outside peripheral limitations
   b) Glow-in-the dark dials made of reflective substances are good for viewing in the nights
   c) Visual systems should be preferred over auditory systems in noisy locations
   d) All of the above

SLR-QH-363

Seat No.	

Set S

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Industrial Product Design (BTN02609)

Day & Date: Monday, 25-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Answer any two questions from each section.
2) Figures to the right indicate full marks.
3) Assume suitable data if required and mention it clearly.

Section – I

Q.2 **a)** Explain in detail the process of concept development. **07**

b) Identify and differentiate the visual effects of line and form in a family car and a sports car. **07**

Q.3 **a)** What are the different types of control devices? Explain ergonomic and technical considerations in the design of control devices. **07**

b) Describe prototype and test stage in the design thinking process. **07**

Q.4 Write short note on the following. (Any Two) **14**

a) Impact of marketing on product design

b) Role of colour in industrial products

c) Aesthetics of Design

Section – II

Q.5 **a)** Explain benchmarking with competitors **07**

b) Discuss the various phases of new product development in detail. **07**

Q.6 **a)** Explain Product Life Cycle. **07**

b) Explain importance of modelling technique and prototype design in industrial product design with examples. **07**

Q.7 Write short note on the following. (Any Two) **14**

a) Effective DFM principles

b) Rapid prototyping

c) Additive Manufacturing

Seat No.	

Set **P**

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Plastic Engineering (BTN02610)

Day & Date: Monday, 25-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) _____ welding occurs when some form of energy other than thermal is applied to the joint.
a) Infra-red b) Hot gas
c) Hot Tool d) All of the above

2) _____ is the most of commonly used manufacturing process for the plastic components.
a) Injection molding b) Transfer Molding
c) Blow Molding d) Rotational Molding

3) The complicated joints are produced by _____.
a) High frequency Ind. Welding
b) Hot gas Welding
c) Hot tool Welding
d) Both b) and c)

4) Generally, polymers are very _____ in weight with significant degrees of strength.
a) Heavy b) Light
c) Both a) & b) d) None of the above

5) The Rotational Molding is _____ plastic forming process.
a) High Temperature
b) Low Pressure
c) Low Temperature, High Pressure
d) High Temperature, Low Pressure

6) Polymers are large chain molecules having a high molecular weight in the range of _____.
a) 104 to 107 b) 13 to 17
c) 150 to 180 d) 25 to 50

7) Materials having a _____ shrinkage allowance can be molded with close tolerance.
a) Low b) High
c) Medium d) None of the above

8) In compression molding, for phenolic materials suitable pressure range is _____ kg/cm^2.
a) 100 to 158 b) 158 to 211
c) 211 to 258 d) 250 to 300

9) Mold vents are found _____.
a) around the whole cavity set
b) on the parting line
c) near the gates
d) within the 'B' half of the mold

10) For normal sized molding land should be _____.
a) 15mm to 25mm b) 4mm to 9mm
c) 1mm to 5mm d) 9mm to 16mm

11) What should be the draft for Nylon material?
a) 0-1/4° b) 0-1/8°
c) 0-1/2° d) 0-1°

12) The mold design known as 'runner-less' is the: _____.
a) the hot-runner mold b) the two-plate cold-runner mold
c) the insulated-runner mold d) none of the above

13) The properties of the polymer will also depend on the _____ available for cooling.
a) Time b) speed
c) area d) momentum

14) It is the _____ operation that sets the shape of thermoplastics.
a) heating b) cutting
c) grinding d) cooling

Seat No.	

Set **P**

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Plastic Engineering (BTN02610)

Day & Date: Monday, 25-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Answer any two questions from Section I and Section II.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary and state it clearly.

Section – I

Q.2	**a)**	What are plastics? Classify along with its respective practical applications.	**04**
	b)	Write a note on additives in plastics.	**06**
	c)	What are the different tests carried out on plastic parts? Explain any two in detail.	**04**
Q.3	**a)**	Explain with a neat sketch a Blow Moulding Process for plastics.	**05**
	b)	Write a short note on “ultrasonic and friction welding”.	**05**
	c)	With a neat sketch, Explain the calendaring moulding process.	**04**
Q.4	**a)**	Explain in brief Tolerances and Allowances of molded plastic parts.	**04**
	b)	Write design aspects of plastic molded component.	**06**
	c)	Explain in brief information about mould materials.	**04**

Section – II

Q.5	**a)**	With neat sketch explain in brief difference between compression mould and transfer mould	**07**
	b)	What are the design criteria for design of compression mould. Explain with suitable example	**07**
Q.6	**a)**	Explain in brief difference between two plates and three plate injection mould	**06**
	b)	Explain in brief temperature control system and injector system in injection moulding.	**04**
	c)	Explain with neat sketch feed system in injection mould.	**04**

Q.7	**a)**	Explain in brief at least three different cooling system used in injection mould.	**05**
	b)	Explain in brief amount of water required for cooling injection mould.	**04**
	c)	Write a short note on time required for cooling system with suitable example.	**05**

Seat No.	

Set **Q**

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Plastic Engineering (BTN02610)

Day & Date: Monday, 25-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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3) Figures to the right indicates full marks.
4) Make suitable assumptions (if necessary and state them clearly).
5) Assume suitable data if necessary and state it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) In compression molding, for phenolic materials suitable pressure range is _____ kg/cm^2.
a) 100 to 158 b) 158 to 211
c) 211 to 258 d) 250 to 300

2) Mold vents are found _____.
a) around the whole cavity set
b) on the parting line
c) near the gates
d) within the 'B' half of the mold

3) For normal sized molding land should be _____.
a) 15mm to 25mm b) 4mm to 9mm
c) 1mm to 5mm d) 9mm to 16mm

4) What should be the draft for Nylon material?
a) 0-1/4° b) 0-1/8°
c) 0-1/2° d) 0-1°

5) The mold design known as 'runner-less' is the: _____.
a) the hot-runner mold b) the two-plate cold-runner mold
c) the insulated-runner mold d) none of the above

6) The properties of the polymer will also depend on the _____ available for cooling.
a) Time b) speed
c) area d) momentum

7) It is the _____ operation that sets the shape of thermoplastics.
a) heating b) cutting
c) grinding d) cooling

8) _____ welding occurs when some form of energy other than thermal is applied to the joint.
a) Infra-red b) Hot gas
c) Hot Tool d) All of the above

9) _____ is the most of commonly used manufacturing process for the plastic components.
a) Injection molding b) Transfer Molding
c) Blow Molding d) Rotational Molding

10) The complicated joints are produced by _____.
a) High frequency Ind. Welding
b) Hot gas Welding
c) Hot tool Welding
d) Both b) and c)

11) Generally, polymers are very _____ in weight with significant degrees of strength.
a) Heavy b) Light
c) Both a) & b) d) None of the above

12) The Rotational Molding is _____ plastic forming process.
a) High Temperature
b) Low Pressure
c) Low Temperature, High Pressure
d) High Temperature, Low Pressure

13) Polymers are large chain molecules having a high molecular weight in the range of _____.
a) 104 to 107 b) 13 to 17
c) 150 to 180 d) 25 to 50

14) Materials having a _____ shrinkage allowance can be molded with close tolerance.
a) Low b) High
c) Medium d) None of the above

Seat No.	

Set **Q**

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Plastic Engineering (BTN02610)

Day & Date: Monday, 25-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Answer any two questions from Section I and Section II.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary and state it clearly.

Section – I

Q.2	**a)**	What are plastics? Classify along with its respective practical applications.	**04**
	b)	Write a note on additives in plastics.	**06**
	c)	What are the different tests carried out on plastic parts? Explain any two in detail.	**04**
Q.3	**a)**	Explain with a neat sketch a Blow Moulding Process for plastics.	**05**
	b)	Write a short note on “ultrasonic and friction welding”.	**05**
	c)	With a neat sketch, Explain the calendaring moulding process.	**04**
Q.4	**a)**	Explain in brief Tolerances and Allowances of molded plastic parts.	**04**
	b)	Write design aspects of plastic molded component.	**06**
	c)	Explain in brief information about mould materials.	**04**

Section – II

Q.5	**a)**	With neat sketch explain in brief difference between compression mould and transfer mould	**07**
	b)	What are the design criteria for design of compression mould. Explain with suitable example	**07**
Q.6	**a)**	Explain in brief difference between two plates and three plate injection mould	**06**
	b)	Explain in brief temperature control system and injector system in injection moulding.	**04**
	c)	Explain with neat sketch feed system in injection mould.	**04**

Q.7	**a)**	Explain in brief at least three different cooling system used in injection mould.	**05**
	b)	Explain in brief amount of water required for cooling injection mould.	**04**
	c)	Write a short note on time required for cooling system with suitable example.	**05**

Seat No.	

Set **R**

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Plastic Engineering (BTN02610)

Day & Date: Monday, 25-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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4) Make suitable assumptions (if necessary and state them clearly).
5) Assume suitable data if necessary and state it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) What should be the draft for Nylon material?
a) 0-1/4° b) 0-1/8°
c) 0-1/2° d) 0-1°

2) The mold design known as 'runner-less' is the: _____.
a) the hot-runner mold b) the two-plate cold-runner mold
c) the insulated-runner mold d) none of the above

3) The properties of the polymer will also depend on the _____ available for cooling.
a) Time b) speed
c) area d) momentum

4) It is the _____ operation that sets the shape of thermoplastics.
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c) grinding d) cooling

5) _____ welding occurs when some form of energy other than thermal is applied to the joint.
a) Infra-red b) Hot gas
c) Hot Tool d) All of the above

6) _____ is the most of commonly used manufacturing process for the plastic components.
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7) The complicated joints are produced by _____.
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d) Both b) and c)

8) Generally, polymers are very _____ in weight with significant degrees of strength.
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c) Both a) & b)
d) None of the above

9) The Rotational Molding is _____ plastic forming process.
a) High Temperature
b) Low Pressure
c) Low Temperature, High Pressure
d) High Temperature, Low Pressure

10) Polymers are large chain molecules having a high molecular weight in the range of _____.
a) 104 to 107
b) 13 to 17
c) 150 to 180
d) 25 to 50

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13) Mold vents are found _____.
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c) near the gates
d) within the 'B' half of the mold

14) For normal sized molding land should be _____.
a) 15mm to 25mm
b) 4mm to 9mm
c) 1mm to 5mm
d) 9mm to 16mm

Seat No.	

Set **R**

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Plastic Engineering (BTN02610)

Day & Date: Monday, 25-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Answer any two questions from Section I and Section II.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary and state it clearly.

Section – I

Q.2	**a)**	What are plastics? Classify along with its respective practical applications.	**04**
	b)	Write a note on additives in plastics.	**06**
	c)	What are the different tests carried out on plastic parts? Explain any two in detail.	**04**
Q.3	**a)**	Explain with a neat sketch a Blow Moulding Process for plastics.	**05**
	b)	Write a short note on “ultrasonic and friction welding”.	**05**
	c)	With a neat sketch, Explain the calendaring moulding process.	**04**
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	b)	Write design aspects of plastic molded component.	**06**
	c)	Explain in brief information about mould materials.	**04**

Section – II

Q.5	**a)**	With neat sketch explain in brief difference between compression mould and transfer mould	**07**
	b)	What are the design criteria for design of compression mould. Explain with suitable example	**07**
Q.6	**a)**	Explain in brief difference between two plates and three plate injection mould	**06**
	b)	Explain in brief temperature control system and injector system in injection moulding.	**04**
	c)	Explain with neat sketch feed system in injection mould.	**04**

Q.7	**a)**	Explain in brief at least three different cooling system used in injection mould.	**05**
	b)	Explain in brief amount of water required for cooling injection mould.	**04**
	c)	Write a short note on time required for cooling system with suitable example.	**05**

Seat No.		Set	S

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Plastic Engineering (BTN02610)

Day & Date: Monday, 25-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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4) Make suitable assumptions (if necessary and state them clearly).
5) Assume suitable data if necessary and state it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) Polymers are large chain molecules having a high molecular weight in the range of _____.
a) 104 to 107 b) 13 to 17
c) 150 to 180 d) 25 to 50

2) Materials having a _____ shrinkage allowance can be molded with close tolerance.
a) Low b) High
c) Medium d) None of the above

3) In compression molding, for phenolic materials suitable pressure range is _____ kg/cm^2.
a) 100 to 158 b) 158 to 211
c) 211 to 258 d) 250 to 300

4) Mold vents are found _____.
a) around the whole cavity set
b) on the parting line
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d) within the 'B' half of the mold

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6) What should be the draft for Nylon material?
a) 0-1/4° b) 0-1/8°
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7) The mold design known as 'runner-less' is the: _____.
a) the hot-runner mold
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8) The properties of the polymer will also depend on the _____ available for cooling.
a) Time
b) speed
c) area
d) momentum

9) It is the _____ operation that sets the shape of thermoplastics.
a) heating
b) cutting
c) grinding
d) cooling

10) _____ welding occurs when some form of energy other than thermal is applied to the joint.
a) Infra-red
b) Hot gas
c) Hot Tool
d) All of the above

11) _____ is the most of commonly used manufacturing process for the plastic components.
a) Injection molding
b) Transfer Molding
c) Blow Molding
d) Rotational Molding

12) The complicated joints are produced by _____.
a) High frequency Ind. Welding
b) Hot gas Welding
c) Hot tool Welding
d) Both b) and c)

13) Generally, polymers are very _____ in weight with significant degrees of strength.
a) Heavy
b) Light
c) Both a) & b)
d) None of the above

14) The Rotational Molding is _____ plastic forming process.
a) High Temperature
b) Low Pressure
c) Low Temperature, High Pressure
d) High Temperature, Low Pressure

SLR-QH-364

Seat No.	

Set S

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Plastic Engineering (BTN02610)

Day & Date: Monday, 25-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Answer any two questions from Section I and Section II.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary and state it clearly.

Section – I

Q.2	**a)**	What are plastics? Classify along with its respective practical applications.	**04**
	b)	Write a note on additives in plastics.	**06**
	c)	What are the different tests carried out on plastic parts? Explain any two in detail.	**04**
Q.3	**a)**	Explain with a neat sketch a Blow Moulding Process for plastics.	**05**
	b)	Write a short note on “ultrasonic and friction welding”.	**05**
	c)	With a neat sketch, Explain the calendaring moulding process.	**04**
Q.4	**a)**	Explain in brief Tolerances and Allowances of molded plastic parts.	**04**
	b)	Write design aspects of plastic molded component.	**06**
	c)	Explain in brief information about mould materials.	**04**

Section – II

Q.5	**a)**	With neat sketch explain in brief difference between compression mould and transfer mould	**07**
	b)	What are the design criteria for design of compression mould. Explain with suitable example	**07**
Q.6	**a)**	Explain in brief difference between two plates and three plate injection mould	**06**
	b)	Explain in brief temperature control system and injector system in injection moulding.	**04**
	c)	Explain with neat sketch feed system in injection mould.	**04**

Q.7	**a)**	Explain in brief at least three different cooling system used in injection mould.	**05**
	b)	Explain in brief amount of water required for cooling injection mould.	**04**
	c)	Write a short note on time required for cooling system with suitable example.	**05**

SLR-QH-365

Seat No.	

Set P

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Railway Transportation System (BTN02611)

Day & Date: Monday, 25-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) Which of the following is a component of railway rolling stock?
a) Bridges b) Tracks
c) Locomotives d) Signalling systems

2) What is the primary function of railway infrastructure?
a) To manufacture rolling stock
b) To provide a stable platform for rolling stock
c) To design transportation policies
d) To manage train schedules

3) In vehicles with independently rotating wheels, what happens to the wheels during movement?
a) The wheels rotate together as one unit
b) Each wheel can rotate independently of the others
c) The wheels are fixed and do not rotate
d) The wheels only rotate in reverse direction

4) What is the primary purpose of creep-controlled wheel sets in bogies?
a) To increase the speed of the train
b) To prevent wheel slip and ensure stable movement on curves
c) To improve fuel efficiency
d) To decrease the overall weight of the train

5) Which of the following is a characteristic of conventional bogies?
a) Wheels rotate independently of each other
b) The wheels are steered by a mechanism that adjusts to curves
c) The wheels are fixed, and the bogie pivots to follow the track
d) The bogie has self-aligning mechanisms for each wheel

6) What is a key factor in derailment with wheel climb?
   a) The track is too narrow for the vehicle
   b) The track is not properly aligned with the curve
   c) The train is traveling at low speeds
   d) The wheels of the vehicle lose grip and climb over the track rail

7) What is the primary cause of derailment through displacement of track?
   a) Overloading of the train
   b) Uneven track surface or track misalignment
   c) High-speed operation on curves
   d) Poor maintenance of the wheels

8) Which of the following is an example of a static vertical load on a railway track?
   a) Axle load
   b) Vertical wheel load due to crosswinds
   c) Dynamic wheel load during acceleration
   d) Residual centrifugal force

9) What does quasi-static vertical load refer to?
   a) Loads caused by the train's speed and momentum
   b) Loads that occur as a result of environmental factors like rain
   c) Loads from vertical wheel load due to crosswinds and residual centrifugal force
   d) Loads caused by the braking system

10) What type of force is primarily responsible for the lateral displacement of a train on straight tracks?
   a) Gravitational forces b) Creep forces
   c) Crosswind forces d) Guidance forces

11) Which of the following forces is caused by wind acting on the train as it moves?
   a) Gravitational forces b) Crosswind forces
   c) Residual centrifugal forces d) Guidance forces

12) Which of the following is a type of transverse load on a railway track?
   a) Gravitational force b) Longitudinal force
   c) Thermal expansion d) Frictional force

13) The force responsible for moving the train forward by overcoming resistance is known as _____.
   a) Adhesion forces b) Traction forces
   c) Fishplate forces d) Temperature forces

14) Fishplate forces are generated due to: _____.

a) The friction between the wheel and rail
b) The expansion and contraction of the rails due to temperature changes
c) The forces acting at the joint between two rail sections
d) The vehicle's braking action on the track

SLR-QH-365

Seat No.	

Set P

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Railway Transportation System (BTN02611)

Day & Date: Monday, 25-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Answer any two questions from each Section.
2) Figures to the right indicate full marks.
3) Assume suitable data if required.

Section – I

Q.2 **a)** Explain with neat sketch fundamental functional principles of vehicle running on a straight curve. **07**

b) Describe the term derailment of vehicle through displacement of track. **07**

Q.3 **a)** Write short note on comparison of the characteristics of railway systems. **07**

b) With neat sketch explain bogies with self-steering wheel sets. **07**

Q.4 **a)** Explain bogies with creep-controlled wheel sets. **07**

b) State advantages and disadvantages of railway systems. **07**

Section – II

Q.5 **a)** Explain the term forces due to vehicle oscillations. **07**

b) Explain the with neat sketch transversal cross wind forces acting on track. Also state how to avoid it. **07**

Q.6 **a)** Explain vertical wheel load acting on the track. **07**

b) Explain residual centrifugal force and guidance forces acting on the track. **07**

Q.7 **a)** With neat sketch explain the concept of longitudinal rail creep forces. **07**

b) Define traction forces and explain different types of it. **07**

Seat No.	

Set **Q**

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Railway Transportation System (BTN02611)

Day & Date: Monday, 25-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) Which of the following is an example of a static vertical load on a railway track?
a) Axle load
b) Vertical wheel load due to crosswinds
c) Dynamic wheel load during acceleration
d) Residual centrifugal force

2) What does quasi-static vertical load refer to?
a) Loads caused by the train's speed and momentum
b) Loads that occur as a result of environmental factors like rain
c) Loads from vertical wheel load due to crosswinds and residual centrifugal force
d) Loads caused by the braking system

3) What type of force is primarily responsible for the lateral displacement of a train on straight tracks?
a) Gravitational forces b) Creep forces
c) Crosswind forces d) Guidance forces

4) Which of the following forces is caused by wind acting on the train as it moves?
a) Gravitational forces b) Crosswind forces
c) Residual centrifugal forces d) Guidance forces

5) Which of the following is a type of transverse load on a railway track?
a) Gravitational force b) Longitudinal force
c) Thermal expansion d) Frictional force

6) The force responsible for moving the train forward by overcoming resistance is known as _____.

a) Adhesion forces
b) Traction forces
c) Fishplate forces
d) Temperature forces

7) Fishplate forces are generated due to: _____.

a) The friction between the wheel and rail
b) The expansion and contraction of the rails due to temperature changes
c) The forces acting at the joint between two rail sections
d) The vehicle's braking action on the track

8) Which of the following is a component of railway rolling stock?

a) Bridges
b) Tracks
c) Locomotives
d) Signalling systems

9) What is the primary function of railway infrastructure?

a) To manufacture rolling stock
b) To provide a stable platform for rolling stock
c) To design transportation policies
d) To manage train schedules

10) In vehicles with independently rotating wheels, what happens to the wheels during movement?

a) The wheels rotate together as one unit
b) Each wheel can rotate independently of the others
c) The wheels are fixed and do not rotate
d) The wheels only rotate in reverse direction

11) What is the primary purpose of creep-controlled wheel sets in bogies?

a) To increase the speed of the train
b) To prevent wheel slip and ensure stable movement on curves
c) To improve fuel efficiency
d) To decrease the overall weight of the train

12) Which of the following is a characteristic of conventional bogies?

a) Wheels rotate independently of each other
b) The wheels are steered by a mechanism that adjusts to curves
c) The wheels are fixed, and the bogie pivots to follow the track
d) The bogie has self-aligning mechanisms for each wheel

13) What is a key factor in derailment with wheel climb?

a) The track is too narrow for the vehicle
b) The track is not properly aligned with the curve
c) The train is traveling at low speeds
d) The wheels of the vehicle lose grip and climb over the track rail

14) What is the primary cause of derailment through displacement of track?

a) Overloading of the train
b) Uneven track surface or track misalignment
c) High-speed operation on curves
d) Poor maintenance of the wheels

Seat No.	

Set **Q**

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Railway Transportation System (BTN02611)

Day & Date: Monday, 25-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Answer any two questions from each Section.
2) Figures to the right indicate full marks.
3) Assume suitable data if required.

Section – I

Q.2	**a)**	Explain with neat sketch fundamental functional principles of vehicle running on a straight curve.	**07**
	b)	Describe the term derailment of vehicle through displacement of track.	**07**
Q.3	**a)**	Write short note on comparison of the characteristics of railway systems.	**07**
	b)	With neat sketch explain bogies with self-steering wheel sets.	**07**
Q.4	**a)**	Explain bogies with creep-controlled wheel sets.	**07**
	b)	State advantages and disadvantages of railway systems.	**07**

Section – II

Q.5	**a)**	Explain the term forces due to vehicle oscillations.	**07**
	b)	Explain the with neat sketch transversal cross wind forces acting on track. Also state how to avoid it.	**07**
Q.6	**a)**	Explain vertical wheel load acting on the track.	**07**
	b)	Explain residual centrifugal force and guidance forces acting on the track.	**07**
Q.7	**a)**	With neat sketch explain the concept of longitudinal rail creep forces.	**07**
	b)	Define traction forces and explain different types of it.	**07**

Seat No.	

Set **R**

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Railway Transportation System (BTN02611)

Day & Date: Monday, 25-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) Which of the following forces is caused by wind acting on the train as it moves?
a) Gravitational forces b) Crosswind forces
c) Residual centrifugal forces d) Guidance forces

2) Which of the following is a type of transverse load on a railway track?
a) Gravitational force b) Longitudinal force
c) Thermal expansion d) Frictional force

3) The force responsible for moving the train forward by overcoming resistance is known as _____.
a) Adhesion forces b) Traction forces
c) Fishplate forces d) Temperature forces

4) Fishplate forces are generated due to: _____.
a) The friction between the wheel and rail
b) The expansion and contraction of the rails due to temperature changes
c) The forces acting at the joint between two rail sections
d) The vehicle's braking action on the track

5) Which of the following is a component of railway rolling stock?
a) Bridges b) Tracks
c) Locomotives d) Signalling systems

6) What is the primary function of railway infrastructure?
   a) To manufacture rolling stock
   b) To provide a stable platform for rolling stock
   c) To design transportation policies
   d) To manage train schedules

7) In vehicles with independently rotating wheels, what happens to the wheels during movement?
   a) The wheels rotate together as one unit
   b) Each wheel can rotate independently of the others
   c) The wheels are fixed and do not rotate
   d) The wheels only rotate in reverse direction

8) What is the primary purpose of creep-controlled wheel sets in bogies?
   a) To increase the speed of the train
   b) To prevent wheel slip and ensure stable movement on curves
   c) To improve fuel efficiency
   d) To decrease the overall weight of the train

9) Which of the following is a characteristic of conventional bogies?
   a) Wheels rotate independently of each other
   b) The wheels are steered by a mechanism that adjusts to curves
   c) The wheels are fixed, and the bogie pivots to follow the track
   d) The bogie has self-aligning mechanisms for each wheel

10) What is a key factor in derailment with wheel climb?
   a) The track is too narrow for the vehicle
   b) The track is not properly aligned with the curve
   c) The train is traveling at low speeds
   d) The wheels of the vehicle lose grip and climb over the track rail

11) What is the primary cause of derailment through displacement of track?
   a) Overloading of the train
   b) Uneven track surface or track misalignment
   c) High-speed operation on curves
   d) Poor maintenance of the wheels

12) Which of the following is an example of a static vertical load on a railway track?
   a) Axle load
   b) Vertical wheel load due to crosswinds
   c) Dynamic wheel load during acceleration
   d) Residual centrifugal force

13) What does quasi-static vertical load refer to?

a) Loads caused by the train's speed and momentum
b) Loads that occur as a result of environmental factors like rain
c) Loads from vertical wheel load due to crosswinds and residual centrifugal force
d) Loads caused by the braking system

14) What type of force is primarily responsible for the lateral displacement of a train on straight tracks?

a) Gravitational forces
b) Creep forces
c) Crosswind forces
d) Guidance forces

Seat No.	

Set **R**

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Railway Transportation System (BTN02611)

Day & Date: Monday, 25-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Answer any two questions from each Section.
2) Figures to the right indicate full marks.
3) Assume suitable data if required.

Section – I

Q.2	**a)**	Explain with neat sketch fundamental functional principles of vehicle running on a straight curve.	**07**
	b)	Describe the term derailment of vehicle through displacement of track.	**07**
Q.3	**a)**	Write short note on comparison of the characteristics of railway systems.	**07**
	b)	With neat sketch explain bogies with self-steering wheel sets.	**07**
Q.4	**a)**	Explain bogies with creep-controlled wheel sets.	**07**
	b)	State advantages and disadvantages of railway systems.	**07**

Section – II

Q.5	**a)**	Explain the term forces due to vehicle oscillations.	**07**
	b)	Explain the with neat sketch transversal cross wind forces acting on track. Also state how to avoid it.	**07**
Q.6	**a)**	Explain vertical wheel load acting on the track.	**07**
	b)	Explain residual centrifugal force and guidance forces acting on the track.	**07**
Q.7	**a)**	With neat sketch explain the concept of longitudinal rail creep forces.	**07**
	b)	Define traction forces and explain different types of it.	**07**

Seat No.	

Set **S**

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Railway Transportation System (BTN02611)

Day & Date: Monday, 25-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) What is a key factor in derailment with wheel climb?
a) The track is too narrow for the vehicle
b) The track is not properly aligned with the curve
c) The train is traveling at low speeds
d) The wheels of the vehicle lose grip and climb over the track rail

2) What is the primary cause of derailment through displacement of track?
a) Overloading of the train
b) Uneven track surface or track misalignment
c) High-speed operation on curves
d) Poor maintenance of the wheels

3) Which of the following is an example of a static vertical load on a railway track?
a) Axle load
b) Vertical wheel load due to crosswinds
c) Dynamic wheel load during acceleration
d) Residual centrifugal force

4) What does quasi-static vertical load refer to?
a) Loads caused by the train's speed and momentum
b) Loads that occur as a result of environmental factors like rain
c) Loads from vertical wheel load due to crosswinds and residual centrifugal force
d) Loads caused by the braking system

5) What type of force is primarily responsible for the lateral displacement of a train on straight tracks?
a) Gravitational forces b) Creep forces
c) Crosswind forces d) Guidance forces

6) Which of the following forces is caused by wind acting on the train as it moves?
a) Gravitational forces b) Crosswind forces
c) Residual centrifugal forces d) Guidance forces

7) Which of the following is a type of transverse load on a railway track?
a) Gravitational force b) Longitudinal force
c) Thermal expansion d) Frictional force

8) The force responsible for moving the train forward by overcoming resistance is known as _____.
a) Adhesion forces b) Traction forces
c) Fishplate forces d) Temperature forces

9) Fishplate forces are generated due to: _____.
a) The friction between the wheel and rail
b) The expansion and contraction of the rails due to temperature changes
c) The forces acting at the joint between two rail sections
d) The vehicle's braking action on the track

10) Which of the following is a component of railway rolling stock?
a) Bridges b) Tracks
c) Locomotives d) Signalling systems

11) What is the primary function of railway infrastructure?
a) To manufacture rolling stock
b) To provide a stable platform for rolling stock
c) To design transportation policies
d) To manage train schedules

12) In vehicles with independently rotating wheels, what happens to the wheels during movement?
a) The wheels rotate together as one unit
b) Each wheel can rotate independently of the others
c) The wheels are fixed and do not rotate
d) The wheels only rotate in reverse direction

13) What is the primary purpose of creep-controlled wheel sets in bogies?
a) To increase the speed of the train
b) To prevent wheel slip and ensure stable movement on curves
c) To improve fuel efficiency
d) To decrease the overall weight of the train

14) Which of the following is a characteristic of conventional bogies?

a) Wheels rotate independently of each other
b) The wheels are steered by a mechanism that adjusts to curves
c) The wheels are fixed, and the bogie pivots to follow the track
d) The bogie has self-aligning mechanisms for each wheel ____

SLR-QH-365

Seat No.	

Set S

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Railway Transportation System (BTN02611)

Day & Date: Monday, 25-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Answer any two questions from each Section.
2) Figures to the right indicate full marks.
3) Assume suitable data if required.

Section – I

Q.2	**a)**	Explain with neat sketch fundamental functional principles of vehicle running on a straight curve.	**07**
	b)	Describe the term derailment of vehicle through displacement of track.	**07**
Q.3	**a)**	Write short note on comparison of the characteristics of railway systems.	**07**
	b)	With neat sketch explain bogies with self-steering wheel sets.	**07**
Q.4	**a)**	Explain bogies with creep-controlled wheel sets.	**07**
	b)	State advantages and disadvantages of railway systems.	**07**

Section – II

Q.5	**a)**	Explain the term forces due to vehicle oscillations.	**07**
	b)	Explain the with neat sketch transversal cross wind forces acting on track. Also state how to avoid it.	**07**
Q.6	**a)**	Explain vertical wheel load acting on the track.	**07**
	b)	Explain residual centrifugal force and guidance forces acting on the track.	**07**
Q.7	**a)**	With neat sketch explain the concept of longitudinal rail creep forces.	**07**
	b)	Define traction forces and explain different types of it.	**07**

SLR-QH-367

Seat No.	

Set P

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
3D Printing Hardware and Software (BTN02613)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer bookPage no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Assume suitable data if required and mention it clearly.
4) Use of scientific calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) How are 3D printing processes classified?
a) By the type of material used
b) By the size of the object being printed
c) By the number of colors in the design
d) By the speed of the printing process

2) What is the purpose of software in 3D printing?
a) To create a physical object from a digital design
b) To choose the color and texture of the final product
c) To determine the size and shape of the final product
d) To program the printer's hardware

3) What is an STL file?
a) A file format used in 2D printing
b) A file format used in 3D printing
c) A file format used in video editing
d) A file format used in music production

4) Which additive manufacturing technology uses a UV laser to cure photopolymer resin layer by layer?
a) Stereolithography (SLA)
b) Digital Light Processing (DLP)
c) Fused Deposition Modeling (FDM)
d) Selective Laser Sintering (SLS)

5) Which type of software is used for creating the 3D models that will be printed?
   a) Slicing/CAM software
   b) Printer Control/Client software
   c) 3D Modeling/CAD software
   d) Rendering software

6) What is the purpose of slicing software in 3D printing?
   a) Creating 3D models
   b) Controlling the 3D printer
   c) Transforming 3D models into printable instructions
   d) Visualizing the final printed object

7) Which software is responsible for controlling the 3D printer during the printing process?
   a) Slicing/CAM software
   b) Printer Control/Client software
   c) 3D Modeling/CAD software
   d) Simulation software

8) What is the purpose of 3D scanning?
   a) Creating 3D models for virtual reality
   b) Capturing real-world objects and converting them into digital 3D models
   c) Controlling the 3D printer during the printing process
   d) Transforming 2D images into 3D representations

9) Which additive manufacturing technology uses a digital light projector to cure liquid resin layer by layer?
   a) Stereolithography (SLA)
   b) Digital Light Processing (DLP)
   c) Fused Deposition Modeling (FDM)
   d) Selective Laser Sintering (SLS)

10) Which additive manufacturing technology extrudes thermoplastic filament layer by layer to build a 3D object?
   a) Stereolithography (SLA)
   b) Digital Light Processing (DLP)
   c) Fused Deposition Modeling (FDM)
   d) Selective Laser Sintering (SLS)

11) Which design approach focuses on optimizing the design for efficient manufacturing and assembly?
   a) Design for 3D Printing
   b) Design for Manufacturing and Assembly
   c) Core DFM for 3D Printing
   d) Design Tools for 3D Printing

12) What is one of the objectives of Design for 3D Printing?
a) Maximizing production planning and control
b) Minimizing the use of additive manufacturing technologies
c) Optimizing design for efficient manufacturing and assembly
d) Implementing traditional manufacturing techniques in 3D printing

13) Which technology is used to create digital models for 3D printing?
a) Computer-Aided Design (CAD)
b) Virtual Reality (VR)
c) Augmented Reality (AR)
d) Artificial Intelligence (Al)

14) What is the main advantage of using layers in 3D printing?
a) It makes the printing process faster
b) It allows for more precise and complex designs
c) It reduces the cost of materials
d) It allows for a smoother surface finish

Seat No.	

Set **P**

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
3D Printing Hardware and Software (BTN02613)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) In Section – I, Q. 2 is compulsory and solve any two from Q. No. 3 to Q. No. 5.
2) In Section – II, Q. 6 is compulsory and solve any two from Q. No. 7 to Q. No. 9.
3) Figures to the right indicate full marks.
4) Assume suitable data if required and mention it clearly.
5) Use of scientific calculator is allowed.

SECTION – I

Q.2 Discuss CAD and Associated technology used in 3D printer. **10**

Q.3 Illustrate classification of 3D printing processes. **09**

Q.4 Enlist different 3D Printing Technologies and describe any 01 with application. **09**

Q.5 Explain the concept of Design for Manufacturing and Assembly (DFMA) and explain its significance in the context of 3D printing. **09**

SECTION – II

Q.6 Discuss the significance of 3D modeling/CAD software in the 3D printing workflow. **10**

Q.7 Explain the key steps involved in preparing a 3D model for printing using slicing/CAM software. **09**

Q.8 Describe the basic principles behind 3D scanning technology and the process involved in creating digital 3D models. **09**

Q.9 Illustrate the importance of cleaning and repairing 3D scans before 3D printing. **09**

Seat No.	

Set **Q**

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
3D Printing Hardware and Software (BTN02613)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer bookPage no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Assume suitable data if required and mention it clearly.
4) Use of scientific calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) What is the purpose of 3D scanning?
a) Creating 3D models for virtual reality
b) Capturing real-world objects and converting them into digital 3D models
c) Controlling the 3D printer during the printing process
d) Transforming 2D images into 3D representations

2) Which additive manufacturing technology uses a digital light projector to cure liquid resin layer by layer?
a) Stereolithography (SLA)
b) Digital Light Processing (DLP)
c) Fused Deposition Modeling (FDM)
d) Selective Laser Sintering (SLS)

3) Which additive manufacturing technology extrudes thermoplastic filament layer by layer to build a 3D object?
a) Stereolithography (SLA)
b) Digital Light Processing (DLP)
c) Fused Deposition Modeling (FDM)
d) Selective Laser Sintering (SLS)

4) Which design approach focuses on optimizing the design for efficient manufacturing and assembly?
a) Design for 3D Printing
b) Design for Manufacturing and Assembly
c) Core DFM for 3D Printing
d) Design Tools for 3D Printing

5) What is one of the objectives of Design for 3D Printing?
   a) Maximizing production planning and control
   b) Minimizing the use of additive manufacturing technologies
   c) Optimizing design for efficient manufacturing and assembly
   d) Implementing traditional manufacturing techniques in 3D printing

6) Which technology is used to create digital models for 3D printing?
   a) Computer-Aided Design (CAD)
   b) Virtual Reality (VR)
   c) Augmented Reality (AR)
   d) Artificial Intelligence (Al)

7) What is the main advantage of using layers in 3D printing?
   a) It makes the printing process faster
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   c) It reduces the cost of materials
   d) It allows for a smoother surface finish

8) How are 3D printing processes classified?
   a) By the type of material used
   b) By the size of the object being printed
   c) By the number of colors in the design
   d) By the speed of the printing process

9) What is the purpose of software in 3D printing?
   a) To create a physical object from a digital design
   b) To choose the color and texture of the final product
   c) To determine the size and shape of the final product
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   a) A file format used in 2D printing
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11) Which additive manufacturing technology uses a UV laser to cure photopolymer resin layer by layer?
   a) Stereolithography (SLA)
   b) Digital Light Processing (DLP)
   c) Fused Deposition Modeling (FDM)
   d) Selective Laser Sintering (SLS)

12) Which type of software is used for creating the 3D models that will be printed?
   a) Slicing/CAM software
   b) Printer Control/Client software
   c) 3D Modeling/CAD software
   d) Rendering software

13) What is the purpose of slicing software in 3D printing?
   a) Creating 3D models
   b) Controlling the 3D printer
   c) Transforming 3D models into printable instructions
   d) Visualizing the final printed object

14) Which software is responsible for controlling the 3D printer during the printing process?
   a) Slicing/CAM software
   b) Printer Control/Client software
   c) 3D Modeling/CAD software
   d) Simulation software

Seat No.	

Set **Q**

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
3D Printing Hardware and Software (BTN02613)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) In Section – I, Q. 2 is compulsory and solve any two from Q. No. 3 to Q. No. 5.
2) In Section – II, Q. 6 is compulsory and solve any two from Q. No. 7 to Q. No. 9.
3) Figures to the right indicate full marks.
4) Assume suitable data if required and mention it clearly.
5) Use of scientific calculator is allowed.

SECTION – I

Q.2 Discuss CAD and Associated technology used in 3D printer. **10**

Q.3 Illustrate classification of 3D printing processes. **09**

Q.4 Enlist different 3D Printing Technologies and describe any 01 with application. **09**

Q.5 Explain the concept of Design for Manufacturing and Assembly (DFMA) and explain its significance in the context of 3D printing. **09**

SECTION – II

Q.6 Discuss the significance of 3D modeling/CAD software in the 3D printing workflow. **10**

Q.7 Explain the key steps involved in preparing a 3D model for printing using slicing/CAM software. **09**

Q.8 Describe the basic principles behind 3D scanning technology and the process involved in creating digital 3D models. **09**

Q.9 Illustrate the importance of cleaning and repairing 3D scans before 3D printing. **09**

SLR-QH-367

Seat No.	

Set R

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
3D Printing Hardware and Software (BTN02613)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer bookPage no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Assume suitable data if required and mention it clearly.
4) Use of scientific calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. 14

1) Which design approach focuses on optimizing the design for efficient manufacturing and assembly?
a) Design for 3D Printing
b) Design for Manufacturing and Assembly
c) Core DFM for 3D Printing
d) Design Tools for 3D Printing

2) What is one of the objectives of Design for 3D Printing?
a) Maximizing production planning and control
b) Minimizing the use of additive manufacturing technologies
c) Optimizing design for efficient manufacturing and assembly
d) Implementing traditional manufacturing techniques in 3D printing

3) Which technology is used to create digital models for 3D printing?
a) Computer-Aided Design (CAD)
b) Virtual Reality (VR)
c) Augmented Reality (AR)
d) Artificial Intelligence (Al)

4) What is the main advantage of using layers in 3D printing?
a) It makes the printing process faster
b) It allows for more precise and complex designs
c) It reduces the cost of materials
d) It allows for a smoother surface finish

5) How are 3D printing processes classified?
   a) By the type of material used
   b) By the size of the object being printed
   c) By the number of colors in the design
   d) By the speed of the printing process

6) What is the purpose of software in 3D printing?
   a) To create a physical object from a digital design
   b) To choose the color and texture of the final product
   c) To determine the size and shape of the final product
   d) To program the printer's hardware

7) What is an STL file?
   a) A file format used in 2D printing
   b) A file format used in 3D printing
   c) A file format used in video editing
   d) A file format used in music production

8) Which additive manufacturing technology uses a UV laser to cure photopolymer resin layer by layer?
   a) Stereolithography (SLA)
   b) Digital Light Processing (DLP)
   c) Fused Deposition Modeling (FDM)
   d) Selective Laser Sintering (SLS)

9) Which type of software is used for creating the 3D models that will be printed?
   a) Slicing/CAM software
   b) Printer Control/Client software
   c) 3D Modeling/CAD software
   d) Rendering software

10) What is the purpose of slicing software in 3D printing?
   a) Creating 3D models
   b) Controlling the 3D printer
   c) Transforming 3D models into printable instructions
   d) Visualizing the final printed object

11) Which software is responsible for controlling the 3D printer during the printing process?
   a) Slicing/CAM software
   b) Printer Control/Client software
   c) 3D Modeling/CAD software
   d) Simulation software

12) What is the purpose of 3D scanning?
   a) Creating 3D models for virtual reality
   b) Capturing real-world objects and converting them into digital 3D models
   c) Controlling the 3D printer during the printing process
   d) Transforming 2D images into 3D representations

13) Which additive manufacturing technology uses a digital light projector to cure liquid resin layer by layer?
   a) Stereolithography (SLA)
   b) Digital Light Processing (DLP)
   c) Fused Deposition Modeling (FDM)
   d) Selective Laser Sintering (SLS)

14) Which additive manufacturing technology extrudes thermoplastic filament layer by layer to build a 3D object?
   a) Stereolithography (SLA)
   b) Digital Light Processing (DLP)
   c) Fused Deposition Modeling (FDM)
   d) Selective Laser Sintering (SLS)

Seat No.	

Set **R**

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
3D Printing Hardware and Software (BTN02613)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) In Section – I, Q. 2 is compulsory and solve any two from Q. No. 3 to Q. No. 5.
2) In Section – II, Q. 6 is compulsory and solve any two from Q. No. 7 to Q. No. 9.
3) Figures to the right indicate full marks.
4) Assume suitable data if required and mention it clearly.
5) Use of scientific calculator is allowed.

SECTION – I

Q.2 Discuss CAD and Associated technology used in 3D printer. **10**

Q.3 Illustrate classification of 3D printing processes. **09**

Q.4 Enlist different 3D Printing Technologies and describe any 01 with application. **09**

Q.5 Explain the concept of Design for Manufacturing and Assembly (DFMA) and explain its significance in the context of 3D printing. **09**

SECTION – II

Q.6 Discuss the significance of 3D modeling/CAD software in the 3D printing workflow. **10**

Q.7 Explain the key steps involved in preparing a 3D model for printing using slicing/CAM software. **09**

Q.8 Describe the basic principles behind 3D scanning technology and the process involved in creating digital 3D models. **09**

Q.9 Illustrate the importance of cleaning and repairing 3D scans before 3D printing. **09**

Seat No.	

Set **S**

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
3D Printing Hardware and Software (BTN02613)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer bookPage no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Assume suitable data if required and mention it clearly.
4) Use of scientific calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) What is the purpose of slicing software in 3D printing?
a) Creating 3D models
b) Controlling the 3D printer
c) Transforming 3D models into printable instructions
d) Visualizing the final printed object

2) Which software is responsible for controlling the 3D printer during the printing process?
a) Slicing/CAM software
b) Printer Control/Client software
c) 3D Modeling/CAD software
d) Simulation software

3) What is the purpose of 3D scanning?
a) Creating 3D models for virtual reality
b) Capturing real-world objects and converting them into digital 3D models
c) Controlling the 3D printer during the printing process
d) Transforming 2D images into 3D representations

4) Which additive manufacturing technology uses a digital light projector to cure liquid resin layer by layer?
a) Stereolithography (SLA)
b) Digital Light Processing (DLP)
c) Fused Deposition Modeling (FDM)
d) Selective Laser Sintering (SLS)

5) Which additive manufacturing technology extrudes thermoplastic filament layer by layer to build a 3D object?
   a) Stereolithography (SLA)
   b) Digital Light Processing (DLP)
   c) Fused Deposition Modeling (FDM)
   d) Selective Laser Sintering (SLS)

6) Which design approach focuses on optimizing the design for efficient manufacturing and assembly?
   a) Design for 3D Printing
   b) Design for Manufacturing and Assembly
   c) Core DFM for 3D Printing
   d) Design Tools for 3D Printing

7) What is one of the objectives of Design for 3D Printing?
   a) Maximizing production planning and control
   b) Minimizing the use of additive manufacturing technologies
   c) Optimizing design for efficient manufacturing and assembly
   d) Implementing traditional manufacturing techniques in 3D printing

8) Which technology is used to create digital models for 3D printing?
   a) Computer-Aided Design (CAD)
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   c) Augmented Reality (AR)
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   b) It allows for more precise and complex designs
   c) It reduces the cost of materials
   d) It allows for a smoother surface finish

10) How are 3D printing processes classified?
   a) By the type of material used
   b) By the size of the object being printed
   c) By the number of colors in the design
   d) By the speed of the printing process

11) What is the purpose of software in 3D printing?
   a) To create a physical object from a digital design
   b) To choose the color and texture of the final product
   c) To determine the size and shape of the final product
   d) To program the printer's hardware

12) What is an STL file?
   a) A file format used in 2D printing
   b) A file format used in 3D printing
   c) A file format used in video editing
   d) A file format used in music production

13) Which additive manufacturing technology uses a UV laser to cure photopolymer resin layer by layer?

a) Stereolithography (SLA)
b) Digital Light Processing (DLP)
c) Fused Deposition Modeling (FDM)
d) Selective Laser Sintering (SLS)

14) Which type of software is used for creating the 3D models that will be printed?

a) Slicing/CAM software
b) Printer Control/Client software
c) 3D Modeling/CAD software
d) Rendering software

SLR-QH-367

Seat No.	

Set S

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
3D Printing Hardware and Software (BTN02613)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) In Section – I, Q. 2 is compulsory and solve any two from Q. No. 3 to Q. No. 5.
2) In Section – II, Q. 6 is compulsory and solve any two from Q. No. 7 to Q. No. 9.
3) Figures to the right indicate full marks.
4) Assume suitable data if required and mention it clearly.
5) Use of scientific calculator is allowed.

SECTION – I

Q.2 Discuss CAD and Associated technology used in 3D printer. **10**

Q.3 Illustrate classification of 3D printing processes. **09**

Q.4 Enlist different 3D Printing Technologies and describe any 01 with application. **09**

Q.5 Explain the concept of Design for Manufacturing and Assembly (DFMA) and explain its significance in the context of 3D printing. **09**

SECTION – II

Q.6 Discuss the significance of 3D modeling/CAD software in the 3D printing workflow. **10**

Q.7 Explain the key steps involved in preparing a 3D model for printing using slicing/CAM software. **09**

Q.8 Describe the basic principles behind 3D scanning technology and the process involved in creating digital 3D models. **09**

Q.9 Illustrate the importance of cleaning and repairing 3D scans before 3D printing. **09**

SLR-QH-369

Seat No.	

Set P

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
Battery Technology and Charging Infrastructure (BTN02615)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) Number of cells connected in series provide a _____.
a) High current carrying capacity
b) Higher Voltage
c) Higher Power
d) None of the above

2) Specific Gravity of a electrolyte in a single cell or a battery is always _____.
a) Equal to 1.0
b) Greater than 1.0
c) Less than 1.0
d) None of the above

3) A floating battery is one _____.
a) Which gets charged and discharged simultaneously
b) Which supplies current intermittently and also during off cycle gets charged
c) In which battery voltage is equal charger voltage
d) In which the current in the circuit is fully supplied by the battery

4) If the battery is wrongly connected on charge following will happen _____.
a) Current delivered by the battery will be high
b) Current drawing will be Nil
c) Current drawing will be very small
d) Currently drawing will be very high

5) Capacity of dry cell is _____.
a) More when it is supplying current for intermittent periods
b) More when it is supplying current for continuous period
c) Unaffected by the type of discharge
d) None of the above

6) Secondary cells are also called _____.
a) Lead acid battery
b) Dry cell battery
c) Edison cell
d) None of the above

7) Which of the following material is used as separator material in Lithium-ion battery?
a) Brass
b) Metal sheet
c) Paper
d) Plastic

8) _____ is one which supplies current intermittently and also during off cycle gets charged.
a) Charing of a battery
b) Discharging of a battery
c) Floating battery
d) All of the above

9) Which of the following battery is used for aircraft?
a) Lead acid battery
b) Nickel-iron battery
c) Dry cell battery
d) Silver oxide battery

10) Trickle charge is required for _____.
a) Primary cells
b) Lead acid batteries
c) Nickel iron cells
d) All of the above

11) Batteries are charged by _____.
a) Rectifiers
b) Engine generator sets
c) Motor generator sets
d) Any of the above

12) On over charging a battery _____.
a) It will bring about chemical change in active materials
b) It will increase the capacity of the battery
c) It will raise the specific gravity of the electrolyte
d) None of the above

13) Charging methods of batteries are _____.
a) Constant voltage method
b) Constant current method
c) Both a) and b)
d) None of the above

14) The terminal voltage when the battery is being charged decreases with _____.
a) Increasing temperature
b) Increasing charging rate
c) Increasing stage of charge
d) All of the above

SLR-QH-369

Seat No.	

Set P

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April- 2026
Battery Technology and Charging Infrastructure (BTN02615)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Solve any two questions from Section - I and Section - II.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculator is allowed.
4) Assume suitable data wherever needed and mention it clearly.

Section – I

Q.2	**a)**	Explain in detail with example Charging & Discharging at C Rate of Battery.	**07**
	b)	Discuss in detail Li-ion Battery construction in detail with neat sketch.	**07**
Q.3	**a)**	Write a note on Battery management system (BMS).	**07**
	b)	What is Solid State Lithium? Discuss its challenges in detail.	**07**
Q.4	**a)**	What is Depth of Discharge? Discuss in detail with suitable Example.	**07**
	b)	What is the operating principle of sodium ion battery? Elaborate its advantages over other types of batteries.	**07**

Section – II

Q.5	**a)**	What is the need of battery pack? Explain in detail process of battery pack development.	**07**
	b)	Explain requirements of thermal design of battery pack.	**07**
Q.6	**a)**	Explain the active & passive thermal management of battery.	**07**
	b)	What is Indian battery swapping policy?	**07**
Q.7	**a)**	Discuss in detail Mechanical Design of Battery Pack.	**07**
	b)	Explain types of charging standards and connectors.	**07**

Seat No.	

Set **Q**

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April- 2026
Battery Technology and Charging Infrastructure (BTN02615)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) _____ is one which supplies current intermittently and also during off cycle gets charged.
a) Charing of a battery b) Discharging of a battery
c) Floating battery d) All of the above

2) Which of the following battery is used for aircraft?
a) Lead acid battery b) Nickel-iron battery
c) Dry cell battery d) Silver oxide battery

3) Trickle charge is required for _____.
a) Primary cells b) Lead acid batteries
c) Nickel iron cells d) All of the above

4) Batteries are charged by _____.
a) Rectifiers b) Engine generator sets
c) Motor generator sets d) Any of the above

5) On over charging a battery _____.
a) It will bring about chemical change in active materials
b) It will increase the capacity of the battery
c) It will raise the specific gravity of the electrolyte
d) None of the above

6) Charging methods of batteries are _____.
a) Constant voltage method b) Constant current method
c) Both a) and b) d) None of the above

7) The terminal voltage when the battery is being charged decreases with _____.
   a) Increasing temperature
   b) Increasing charging rate
   c) Increasing stage of charge
   d) All of the above

8) Number of cells connected in series provide a _____.
   a) High current carrying capacity
   b) Higher Voltage
   c) Higher Power
   d) None of the above

9) Specific Gravity of a electrolyte in a single cell or a battery is always _____.
   a) Equal to 1.0
   b) Greater than 1.0
   c) Less than 1.0
   d) None of the above

10) A floating battery is one _____.
   a) Which gets charged and discharged simultaneously
   b) Which supplies current intermittently and also during off cycle gets charged
   c) In which battery voltage is equal charger voltage
   d) In which the current in the circuit is fully supplied by the battery

11) If the battery is wrongly connected on charge following will happen _____.
   a) Current delivered by the battery will be high
   b) Current drawing will be Nil
   c) Current drawing will be very small
   d) Currently drawing will be very high

12) Capacity of dry cell is _____.
   a) More when it is supplying current for intermittent periods
   b) More when it is supplying current for continuous period
   c) Unaffected by the type of discharge
   d) None of the above

13) Secondary cells are also called _____.
   a) Lead acid battery
   b) Dry cell battery
   c) Edison cell
   d) None of the above

14) Which of the following material is used as separator material in Lithium-ion battery?
   a) Brass
   b) Metal sheet
   c) Paper
   d) Plastic

SLR-QH-369

Seat No.	

Set Q

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April- 2026
Battery Technology and Charging Infrastructure (BTN02615)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Solve any two questions from Section - I and Section - II.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculator is allowed.
4) Assume suitable data wherever needed and mention it clearly.

Section – I

Q.2	**a)**	Explain in detail with example Charging & Discharging at C Rate of Battery.	**07**
	b)	Discuss in detail Li-ion Battery construction in detail with neat sketch.	**07**
Q.3	**a)**	Write a note on Battery management system (BMS).	**07**
	b)	What is Solid State Lithium? Discuss its challenges in detail.	**07**
Q.4	**a)**	What is Depth of Discharge? Discuss in detail with suitable Example.	**07**
	b)	What is the operating principle of sodium ion battery? Elaborate its advantages over other types of batteries.	**07**

Section – II

Q.5	**a)**	What is the need of battery pack? Explain in detail process of battery pack development.	**07**
	b)	Explain requirements of thermal design of battery pack.	**07**
Q.6	**a)**	Explain the active & passive thermal management of battery.	**07**
	b)	What is Indian battery swapping policy?	**07**
Q.7	**a)**	Discuss in detail Mechanical Design of Battery Pack.	**07**
	b)	Explain types of charging standards and connectors.	**07**

Seat No.	

Set **R**

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April- 2026
Battery Technology and Charging Infrastructure (BTN02615)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) Batteries are charged by _____.
a) Rectifiers b) Engine generator sets
c) Motor generator sets d) Any of the above

2) On over charging a battery _____.
a) It will bring about chemical change in active materials
b) It will increase the capacity of the battery
c) It will raise the specific gravity of the electrolyte
d) None of the above

3) Charging methods of batteries are _____.
a) Constant voltage method b) Constant current method
c) Both a) and b) d) None of the above

4) The terminal voltage when the battery is being charged decreases with _____.
a) Increasing temperature b) Increasing charging rate
c) Increasing stage of charge d) All of the above

5) Number of cells connected in series provide a _____.
a) High current carrying capacity
b) Higher Voltage
c) Higher Power
d) None of the above

6) Specific Gravity of a electrolyte in a single cell or a battery is always _____.
a) Equal to 1.0 b) Greater than 1.0
c) Less than 1.0 d) None of the above

7) A floating battery is one _____.
   a) Which gets charged and discharged simultaneously
   b) Which supplies current intermittently and also during off cycle gets charged
   c) In which battery voltage is equal charger voltage
   d) In which the current in the circuit is fully supplied by the battery

8) If the battery is wrongly connected on charge following will happen _____.
   a) Current delivered by the battery will be high
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   c) Current drawing will be very small
   d) Currently drawing will be very high

9) Capacity of dry cell is _____.
   a) More when it is supplying current for intermittent periods
   b) More when it is supplying current for continuous period
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10) Secondary cells are also called _____.
   a) Lead acid battery
   b) Dry cell battery
   c) Edison cell
   d) None of the above

11) Which of the following material is used as separator material in Lithium-ion battery?
   a) Brass
   b) Metal sheet
   c) Paper
   d) Plastic

12) _____ is one which supplies current intermittently and also during off cycle gets charged.
   a) Charing of a battery
   b) Discharging of a battery
   c) Floating battery
   d) All of the above

13) Which of the following battery is used for aircraft?
   a) Lead acid battery
   b) Nickel-iron battery
   c) Dry cell battery
   d) Silver oxide battery

14) Trickle charge is required for _____.
   a) Primary cells
   b) Lead acid batteries
   c) Nickel iron cells
   d) All of the above

SLR-QH-369

Seat No.	

Set R

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April- 2026
Battery Technology and Charging Infrastructure (BTN02615)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Solve any two questions from Section - I and Section - II.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculator is allowed.
4) Assume suitable data wherever needed and mention it clearly.

Section – I

Q.2	**a)**	Explain in detail with example Charging & Discharging at C Rate of Battery.	**07**
	b)	Discuss in detail Li-ion Battery construction in detail with neat sketch.	**07**
Q.3	**a)**	Write a note on Battery management system (BMS).	**07**
	b)	What is Solid State Lithium? Discuss its challenges in detail.	**07**
Q.4	**a)**	What is Depth of Discharge? Discuss in detail with suitable Example.	**07**
	b)	What is the operating principle of sodium ion battery? Elaborate its advantages over other types of batteries.	**07**

Section – II

Q.5	**a)**	What is the need of battery pack? Explain in detail process of battery pack development.	**07**
	b)	Explain requirements of thermal design of battery pack.	**07**
Q.6	**a)**	Explain the active & passive thermal management of battery.	**07**
	b)	What is Indian battery swapping policy?	**07**
Q.7	**a)**	Discuss in detail Mechanical Design of Battery Pack.	**07**
	b)	Explain types of charging standards and connectors.	**07**

Seat No.	

Set **S**

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April- 2026
Battery Technology and Charging Infrastructure (BTN02615)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) Secondary cells are also called _____.
a) Lead acid battery b) Dry cell battery
c) Edison cell d) None of the above

2) Which of the following material is used as separator material in Lithium-ion battery?
a) Brass b) Metal sheet
c) Paper d) Plastic

3) _____ is one which supplies current intermittently and also during off cycle gets charged.
a) Charing of a battery b) Discharging of a battery
c) Floating battery d) All of the above

4) Which of the following battery is used for aircraft?
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5) Trickle charge is required for _____.
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6) Batteries are charged by _____.
a) Rectifiers b) Engine generator sets
c) Motor generator sets d) Any of the above

7) On over charging a battery _____.
   a) It will bring about chemical change in active materials
   b) It will increase the capacity of the battery
   c) It will raise the specific gravity of the electrolyte
   d) None of the above

8) Charging methods of batteries are _____.
   a) Constant voltage method b) Constant current method
   c) Both a) and b) d) None of the above

9) The terminal voltage when the battery is being charged decreases with _____.
   a) Increasing temperature b) Increasing charging rate
   c) Increasing stage of charge d) All of the above

10) Number of cells connected in series provide a _____.
   a) High current carrying capacity
   b) Higher Voltage
   c) Higher Power
   d) None of the above

11) Specific Gravity of a electrolyte in a single cell or a battery is always _____.
   a) Equal to 1.0 b) Greater than 1.0
   c) Less than 1.0 d) None of the above

12) A floating battery is one _____.
   a) Which gets charged and discharged simultaneously
   b) Which supplies current intermittently and also during off cycle gets charged
   c) In which battery voltage is equal charger voltage
   d) In which the current in the circuit is fully supplied by the battery

13) If the battery is wrongly connected on charge following will happen _____.
   a) Current delivered by the battery will be high
   b) Current drawing will be Nil
   c) Current drawing will be very small
   d) Currently drawing will be very high

14) Capacity of dry cell is _____.
   a) More when it is supplying current for intermittent periods
   b) More when it is supplying current for continuous period
   c) Unaffected by the type of discharge
   d) None of the above

SLR-QH-369

Seat No.	

Set S

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April- 2026
Battery Technology and Charging Infrastructure (BTN02615)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Solve any two questions from Section - I and Section - II.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculator is allowed.
4) Assume suitable data wherever needed and mention it clearly.

Section – I

Q.2	**a)**	Explain in detail with example Charging & Discharging at C Rate of Battery.	**07**
	b)	Discuss in detail Li-ion Battery construction in detail with neat sketch.	**07**
Q.3	**a)**	Write a note on Battery management system (BMS).	**07**
	b)	What is Solid State Lithium? Discuss its challenges in detail.	**07**
Q.4	**a)**	What is Depth of Discharge? Discuss in detail with suitable Example.	**07**
	b)	What is the operating principle of sodium ion battery? Elaborate its advantages over other types of batteries.	**07**

Section – II

Q.5	**a)**	What is the need of battery pack? Explain in detail process of battery pack development.	**07**
	b)	Explain requirements of thermal design of battery pack.	**07**
Q.6	**a)**	Explain the active & passive thermal management of battery.	**07**
	b)	What is Indian battery swapping policy?	**07**
Q.7	**a)**	Discuss in detail Mechanical Design of Battery Pack.	**07**
	b)	Explain types of charging standards and connectors.	**07**

SLR-QH-370

Seat No.	

Set P

Fourth. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Refrigeration and Air Conditioning (BTN02701)

Day & Date: Saturday, 02-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct option from the following. 14

1) Which cycle is considered the ideal standard for refrigeration?
a) Brayton cycle b) Carnot cycle
c) Rankine cycle d) Otto cycle

2) ASHRAE Standard 34 classifies refrigerants based on _____.
a) Pressure and temperature b) Safety and toxicity
c) COP and efficiency d) Environmental impact only

3) Which refrigerant has the highest ozone depletion potential (ODP)?
a) R-22 b) R-134a
c) R-11 d) Ammonia

4) In a vapour compression cycle, subcooling improves COP because _____.
a) It reduces compressor work
b) It increases refrigeration effect
c) It reduces condenser pressure
d) Both a and b

5) Flash gas removal is used to _____.
a) Increase condenser efficiency
b) Improve evaporator performance
c) Reduce throttling losses
d) Increase compressor work

6) Compound compression with intercooling is mainly used to _____.
   a) Reduce discharge temperature
   b) Increase COP
   c) Reduce compressor size
   d) All of the above

7) Electrolux refrigeration system is also called _____.
   a) Two-fluid system b) Three-fluid system
   c) Cascade system d) Cryogenic system

8) The enthalpy of moist air depends on _____.
   a) Dry bulb temperature only
   b) Humidity ratio only
   c) Both dry bulb temperature and humidity ratio
   d) Wet bulb temperature only

9) The Sensible Heat Factor (SHF) is defined as _____.
   a) Ratio of sensible heat to total heat
   b) Ratio of latent heat to total heat
   c) Ratio of sensible heat to latent heat
   d) Ratio of latent heat to sensible heat

10) ASHRAE Standard 62.1 deals with _____.
   a) Refrigerant safety classification
   b) Ventilation requirements
   c) Cooling load calculations
   d) Comfort chart

11) U-value of a building material represents _____.
   a) Thermal conductivity
   b) Thermal resistance
   c) Overall heat transfer coefficient
   d) Specific heat

12) DX system stands for _____.
   a) Direct expansion system b) Dual exchange system
   c) Dynamic expansion system d) Direct exhaust system

13) In duct design, the equal friction method ensures _____.
   a) Constant velocity throughout duct
   b) Constant pressure drop per unit length
   c) Minimum fan power
   d) Maximum air distribution efficiency

14) The Linde system is used for _____.
   a) Liquefaction of air b) Absorption refrigeration
   c) Vapour compression d) Psychrometric analysis

Seat No.	

Set **P**

Fourth. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Refrigeration and Air Conditioning (BTN02701)

Day & Date: Saturday, 02-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Attempt any two questions from each Section.
2) Figures to the right indicates full marks.
3) Assume suitable data if necessary and mention state it clearly.
4) Use of non-programmable calculators is allowed.

Section – I

Q.2 Attempt the following questions.

a) Discuss the desirable properties of an ideal refrigerant. **05**

b) Write a short note on the environmental impact of refrigerants (ODP, GWP, TEWI) **04**

c) The capacity of a refrigerator is 200 TR when working between - 6°C and 25°C. Determine the mass of ice produced per day from water at 25°C. Also find the power required to drive the unit. Assume that the cycle operates on the reversed Carnot cycle. Latent heat of ice = 335 kJ/kg. The specific heat of water = 4.187 kJ/kgK. **05**

Q.3 Attempt the following questions.

a) Explain the effect of subcooling and superheating on the performance of a vapour compression cycle. **04**

b) Explain the need of multi-staging in compression. Describe the working of VCRS with Compound compression with Flash Intercooler. **05**

c) 28 tonnes of ice from and at 0°C is produced per day in an ammonia refrigerator. The temperature range in the compressor is from 25°C to -15°C. The vapour is dry and saturated at the end of compression and an expansion valve is used. There is no liquid subcooling. Assuming actual COP of 62% of the theoretical, calculate the power required to drive the compressor. Latent heat of ice = 335 kJ/kg **05**

Temperature	Enthalpy (kJ/kg)		Entropy (kJ/kg.k)	
	Liquid	Vapour	Liquid	Vapour
25°C	298.9	1465.84	1.1242	5.0391
-15°C	112.34	1426.54	0.4572	5.5490

Q.4 Attempting the following questions.

a) State the limitations of VCRS and Compare VCRS and VARS. **04**

b) Explain the working of a simple vapour absorption system with aqua-ammonia as the working pair. **05**

c) Describe the Linde system for liquefaction of air. **05**

Section – II

Q.5 Attempt the following questions.

a) Discuss the concept of human comfort and factors affecting it. **04**

b) Write short notes on SHF, BPF, and ADP coil condition line. **05**

c) The atmospheric air has 35°C dry bulb temperature and 50% relative humidity. Using a psychrometric chart, find **05**

i) wet bulb temperature
ii) humidity ratio
iii) dew point temperature
iv) enthalpy of air per kg of dry air

Q.6 Attempt the following questions.

a) What is Ventilation? Write a note on ventilation requirements as per ASHRAE Standard 62.1 **04**

b) Explain the factors contributing to cooling load in air conditioning systems. **05**

c) The following data are given for the space to be air conditioned: **05**

- Outside air conditions = 43°C DBT and 27°C WBT
- Inside design conditions = 25°C DBT and 50% RH
- Room sensible heat load = 40 kW
- Room latent heat load = 10 kW
- By-pass factor of the cooling coil = 0.2

The return air from the room is mixed with the outside air before entry to the cooling coil in the ratio of 3:1 by mass. Determine:

i) Supply air flow rate
ii) Outside air sensible heat
iii) Outside air latent heat
iv) Grand total heat
v) Effective room sensible heat factor

Q.7 Attempt the following questions.

a) Compare chilled water systems and DX systems. **05**

b) Explain the equal friction method of duct design. **04**

c) Write short notes on AHU, and desert coolers. **05**

Seat No.	

Set **Q**

Fourth. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Refrigeration and Air Conditioning (BTN02701)

Day & Date: Saturday, 02-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct option from the following. **14**

1) The enthalpy of moist air depends on _____.
a) Dry bulb temperature only
b) Humidity ratio only
c) Both dry bulb temperature and humidity ratio
d) Wet bulb temperature only

2) The Sensible Heat Factor (SHF) is defined as _____.
a) Ratio of sensible heat to total heat
b) Ratio of latent heat to total heat
c) Ratio of sensible heat to latent heat
d) Ratio of latent heat to sensible heat

3) ASHRAE Standard 62.1 deals with _____.
a) Refrigerant safety classification
b) Ventilation requirements
c) Cooling load calculations
d) Comfort chart

4) U-value of a building material represents _____.
a) Thermal conductivity
b) Thermal resistance
c) Overall heat transfer coefficient
d) Specific heat

5) DX system stands for _____.
a) Direct expansion system b) Dual exchange system
c) Dynamic expansion system d) Direct exhaust system

6) In duct design, the equal friction method ensures _____.
   a) Constant velocity throughout duct
   b) Constant pressure drop per unit length
   c) Minimum fan power
   d) Maximum air distribution efficiency

7) The Linde system is used for _____.
   a) Liquefaction of air
   b) Absorption refrigeration
   c) Vapour compression
   d) Psychrometric analysis

8) Which cycle is considered the ideal standard for refrigeration?
   a) Brayton cycle
   b) Carnot cycle
   c) Rankine cycle
   d) Otto cycle

9) ASHRAE Standard 34 classifies refrigerants based on _____.
   a) Pressure and temperature
   b) Safety and toxicity
   c) COP and efficiency
   d) Environmental impact only

10) Which refrigerant has the highest ozone depletion potential (ODP)?
   a) R-22
   b) R-134a
   c) R-11
   d) Ammonia

11) In a vapour compression cycle, subcooling improves COP because _____.
   a) It reduces compressor work
   b) It increases refrigeration effect
   c) It reduces condenser pressure
   d) Both a and b

12) Flash gas removal is used to _____.
   a) Increase condenser efficiency
   b) Improve evaporator performance
   c) Reduce throttling losses
   d) Increase compressor work

13) Compound compression with intercooling is mainly used to _____.
   a) Reduce discharge temperature
   b) Increase COP
   c) Reduce compressor size
   d) All of the above

14) Electrolux refrigeration system is also called _____.
   a) Two-fluid system
   b) Three-fluid system
   c) Cascade system
   d) Cryogenic system

Seat No.	

Set **Q**

Fourth. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Refrigeration and Air Conditioning (BTN02701)

Day & Date: Saturday, 02-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Attempt any two questions from each Section.
2) Figures to the right indicates full marks.
3) Assume suitable data if necessary and mention state it clearly.
4) Use of non-programmable calculators is allowed.

Section – I

Q.2 Attempt the following questions.

a) Discuss the desirable properties of an ideal refrigerant. **05**

b) Write a short note on the environmental impact of refrigerants (ODP, GWP, TEWI) **04**

c) The capacity of a refrigerator is 200 TR when working between - 6°C and 25°C. Determine the mass of ice produced per day from water at 25°C. Also find the power required to drive the unit. Assume that the cycle operates on the reversed Carnot cycle. Latent heat of ice = 335 kJ/kg. The specific heat of water = 4.187 kJ/kgK. **05**

Q.3 Attempt the following questions.

a) Explain the effect of subcooling and superheating on the performance of a vapour compression cycle. **04**

b) Explain the need of multi-staging in compression. Describe the working of VCRS with Compound compression with Flash Intercooler. **05**

c) 28 tonnes of ice from and at 0°C is produced per day in an ammonia refrigerator. The temperature range in the compressor is from 25°C to -15°C. The vapour is dry and saturated at the end of compression and an expansion valve is used. There is no liquid subcooling. Assuming actual COP of 62% of the theoretical, calculate the power required to drive the compressor. Latent heat of ice = 335 kJ/kg **05**

Temperature	Enthalpy (kJ/kg)		Entropy (kJ/kg.k)	
	Liquid	Vapour	Liquid	Vapour
25°C	298.9	1465.84	1.1242	5.0391
-15°C	112.34	1426.54	0.4572	5.5490

Q.4 Attempting the following questions.

a) State the limitations of VCRS and Compare VCRS and VARS. **04**

b) Explain the working of a simple vapour absorption system with aqua-ammonia as the working pair. **05**

c) Describe the Linde system for liquefaction of air. **05**

Section – II

Q.5 Attempt the following questions.

a) Discuss the concept of human comfort and factors affecting it. **04**

b) Write short notes on SHF, BPF, and ADP coil condition line. **05**

c) The atmospheric air has 35°C dry bulb temperature and 50% relative humidity. Using a psychrometric chart, find **05**

i) wet bulb temperature
ii) humidity ratio
iii) dew point temperature
iv) enthalpy of air per kg of dry air

Q.6 Attempt the following questions.

a) What is Ventilation? Write a note on ventilation requirements as per ASHRAE Standard 62.1 **04**

b) Explain the factors contributing to cooling load in air conditioning systems. **05**

c) The following data are given for the space to be air conditioned: **05**

- Outside air conditions = 43°C DBT and 27°C WBT
- Inside design conditions = 25°C DBT and 50% RH
- Room sensible heat load = 40 kW
- Room latent heat load = 10 kW
- By-pass factor of the cooling coil = 0.2

The return air from the room is mixed with the outside air before entry to the cooling coil in the ratio of 3:1 by mass. Determine:

i) Supply air flow rate
ii) Outside air sensible heat
iii) Outside air latent heat
iv) Grand total heat
v) Effective room sensible heat factor

Q.7 Attempt the following questions.

a) Compare chilled water systems and DX systems. **05**

b) Explain the equal friction method of duct design. **04**

c) Write short notes on AHU, and desert coolers. **05**

Seat No.	

Set **R**

Fourth. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Refrigeration and Air Conditioning (BTN02701)

Day & Date: Saturday, 02-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct option from the following. **14**

1) U-value of a building material represents _____.
a) Thermal conductivity
b) Thermal resistance
c) Overall heat transfer coefficient
d) Specific heat

2) DX system stands for _____.
a) Direct expansion system b) Dual exchange system
c) Dynamic expansion system d) Direct exhaust system

3) In duct design, the equal friction method ensures _____.
a) Constant velocity throughout duct
b) Constant pressure drop per unit length
c) Minimum fan power
d) Maximum air distribution efficiency

4) The Linde system is used for _____.
a) Liquefaction of air b) Absorption refrigeration
c) Vapour compression d) Psychrometric analysis

5) Which cycle is considered the ideal standard for refrigeration?
a) Brayton cycle b) Carnot cycle
c) Rankine cycle d) Otto cycle

6) ASHRAE Standard 34 classifies refrigerants based on _____.
a) Pressure and temperature b) Safety and toxicity
c) COP and efficiency d) Environmental impact only

7) Which refrigerant has the highest ozone depletion potential (ODP)?
a) R-22 b) R-134a
c) R-11 d) Ammonia

8) In a vapour compression cycle, subcooling improves COP because _____.
a) It reduces compressor work
b) It increases refrigeration effect
c) It reduces condenser pressure
d) Both a and b

9) Flash gas removal is used to _____.
a) Increase condenser efficiency
b) Improve evaporator performance
c) Reduce throttling losses
d) Increase compressor work

10) Compound compression with intercooling is mainly used to _____.
a) Reduce discharge temperature
b) Increase COP
c) Reduce compressor size
d) All of the above

11) Electrolux refrigeration system is also called _____.
a) Two-fluid system b) Three-fluid system
c) Cascade system d) Cryogenic system

12) The enthalpy of moist air depends on _____.
a) Dry bulb temperature only
b) Humidity ratio only
c) Both dry bulb temperature and humidity ratio
d) Wet bulb temperature only

13) The Sensible Heat Factor (SHF) is defined as _____.
a) Ratio of sensible heat to total heat
b) Ratio of latent heat to total heat
c) Ratio of sensible heat to latent heat
d) Ratio of latent heat to sensible heat

14) ASHRAE Standard 62.1 deals with _____.
a) Refrigerant safety classification
b) Ventilation requirements
c) Cooling load calculations
d) Comfort chart

Seat No.	

Set **R**

Fourth. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Refrigeration and Air Conditioning (BTN02701)

Day & Date: Saturday, 02-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Attempt any two questions from each Section.
2) Figures to the right indicates full marks.
3) Assume suitable data if necessary and mention state it clearly.
4) Use of non-programmable calculators is allowed.

Section – I

Q.2 Attempt the following questions.

a) Discuss the desirable properties of an ideal refrigerant. **05**

b) Write a short note on the environmental impact of refrigerants (ODP, GWP, TEWI) **04**

c) The capacity of a refrigerator is 200 TR when working between - 6°C and 25°C. Determine the mass of ice produced per day from water at 25°C. Also find the power required to drive the unit. Assume that the cycle operates on the reversed Carnot cycle. Latent heat of ice = 335 kJ/kg. The specific heat of water = 4.187 kJ/kgK. **05**

Q.3 Attempt the following questions.

a) Explain the effect of subcooling and superheating on the performance of a vapour compression cycle. **04**

b) Explain the need of multi-staging in compression. Describe the working of VCRS with Compound compression with Flash Intercooler. **05**

c) 28 tonnes of ice from and at 0°C is produced per day in an ammonia refrigerator. The temperature range in the compressor is from 25°C to -15°C. The vapour is dry and saturated at the end of compression and an expansion valve is used. There is no liquid subcooling. Assuming actual COP of 62% of the theoretical, calculate the power required to drive the compressor. Latent heat of ice = 335 kJ/kg **05**

Temperature	Enthalpy (kJ/kg)		Entropy (kJ/kg.k)	
	Liquid	Vapour	Liquid	Vapour
25°C	298.9	1465.84	1.1242	5.0391
-15°C	112.34	1426.54	0.4572	5.5490

Q.4 Attempting the following questions.

a) State the limitations of VCRS and Compare VCRS and VARS. **04**

b) Explain the working of a simple vapour absorption system with aqua-ammonia as the working pair. **05**

c) Describe the Linde system for liquefaction of air. **05**

Section – II

Q.5 Attempt the following questions.

a) Discuss the concept of human comfort and factors affecting it. **04**

b) Write short notes on SHF, BPF, and ADP coil condition line. **05**

c) The atmospheric air has 35°C dry bulb temperature and 50% relative humidity. Using a psychrometric chart, find **05**

i) wet bulb temperature
ii) humidity ratio
iii) dew point temperature
iv) enthalpy of air per kg of dry air

Q.6 Attempt the following questions.

a) What is Ventilation? Write a note on ventilation requirements as per ASHRAE Standard 62.1 **04**

b) Explain the factors contributing to cooling load in air conditioning systems. **05**

c) The following data are given for the space to be air conditioned: **05**

- Outside air conditions = 43°C DBT and 27°C WBT
- Inside design conditions = 25°C DBT and 50% RH
- Room sensible heat load = 40 kW
- Room latent heat load = 10 kW
- By-pass factor of the cooling coil = 0.2

The return air from the room is mixed with the outside air before entry to the cooling coil in the ratio of 3:1 by mass. Determine:

i) Supply air flow rate
ii) Outside air sensible heat
iii) Outside air latent heat
iv) Grand total heat
v) Effective room sensible heat factor

Q.7 Attempt the following questions.

a) Compare chilled water systems and DX systems. **05**

b) Explain the equal friction method of duct design. **04**

c) Write short notes on AHU, and desert coolers. **05**

SLR-QH-370

Seat No.	

Set S

Fourth. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Refrigeration and Air Conditioning (BTN02701)

Day & Date: Saturday, 02-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct option from the following. 14

1) Compound compression with intercooling is mainly used to _____.
a) Reduce discharge temperature
b) Increase COP
c) Reduce compressor size
d) All of the above

2) Electrolux refrigeration system is also called _____.
a) Two-fluid system b) Three-fluid system
c) Cascade system d) Cryogenic system

3) The enthalpy of moist air depends on _____.
a) Dry bulb temperature only
b) Humidity ratio only
c) Both dry bulb temperature and humidity ratio
d) Wet bulb temperature only

4) The Sensible Heat Factor (SHF) is defined as _____.
a) Ratio of sensible heat to total heat
b) Ratio of latent heat to total heat
c) Ratio of sensible heat to latent heat
d) Ratio of latent heat to sensible heat

5) ASHRAE Standard 62.1 deals with _____.
a) Refrigerant safety classification
b) Ventilation requirements
c) Cooling load calculations
d) Comfort chart

6) U-value of a building material represents _____.
   a) Thermal conductivity
   b) Thermal resistance
   c) Overall heat transfer coefficient
   d) Specific heat

7) DX system stands for _____.
   a) Direct expansion system b) Dual exchange system
   c) Dynamic expansion system d) Direct exhaust system

8) In duct design, the equal friction method ensures _____.
   a) Constant velocity throughout duct
   b) Constant pressure drop per unit length
   c) Minimum fan power
   d) Maximum air distribution efficiency

9) The Linde system is used for _____.
   a) Liquefaction of air b) Absorption refrigeration
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10) Which cycle is considered the ideal standard for refrigeration?
   a) Brayton cycle b) Carnot cycle
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12) Which refrigerant has the highest ozone depletion potential (ODP)?
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   c) R-11 d) Ammonia

13) In a vapour compression cycle, subcooling improves COP because _____.
   a) It reduces compressor work
   b) It increases refrigeration effect
   c) It reduces condenser pressure
   d) Both a and b

14) Flash gas removal is used to _____.
   a) Increase condenser efficiency
   b) Improve evaporator performance
   c) Reduce throttling losses
   d) Increase compressor work

Seat No.	

Set **S**

Fourth. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Refrigeration and Air Conditioning (BTN02701)

Day & Date: Saturday, 02-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Attempt any two questions from each Section.
2) Figures to the right indicates full marks.
3) Assume suitable data if necessary and mention state it clearly.
4) Use of non-programmable calculators is allowed.

Section – I

Q.2 Attempt the following questions.

a) Discuss the desirable properties of an ideal refrigerant. **05**

b) Write a short note on the environmental impact of refrigerants (ODP, GWP, TEWI) **04**

c) The capacity of a refrigerator is 200 TR when working between - 6°C and 25°C. Determine the mass of ice produced per day from water at 25°C. Also find the power required to drive the unit. Assume that the cycle operates on the reversed Carnot cycle. Latent heat of ice = 335 kJ/kg. The specific heat of water = 4.187 kJ/kgK. **05**

Q.3 Attempt the following questions.

a) Explain the effect of subcooling and superheating on the performance of a vapour compression cycle. **04**

b) Explain the need of multi-staging in compression. Describe the working of VCRS with Compound compression with Flash Intercooler. **05**

c) 28 tonnes of ice from and at 0°C is produced per day in an ammonia refrigerator. The temperature range in the compressor is from 25°C to -15°C. The vapour is dry and saturated at the end of compression and an expansion valve is used. There is no liquid subcooling. Assuming actual COP of 62% of the theoretical, calculate the power required to drive the compressor. Latent heat of ice = 335 kJ/kg **05**

Temperature	Enthalpy (kJ/kg)		Entropy (kJ/kg.k)	
	Liquid	Vapour	Liquid	Vapour
25°C	298.9	1465.84	1.1242	5.0391
-15°C	112.34	1426.54	0.4572	5.5490

Q.4 Attempting the following questions.

a) State the limitations of VCRS and Compare VCRS and VARS. **04**

b) Explain the working of a simple vapour absorption system with aqua-ammonia as the working pair. **05**

c) Describe the Linde system for liquefaction of air. **05**

Section – II

Q.5 Attempt the following questions.

a) Discuss the concept of human comfort and factors affecting it. **04**

b) Write short notes on SHF, BPF, and ADP coil condition line. **05**

c) The atmospheric air has 35°C dry bulb temperature and 50% relative humidity. Using a psychrometric chart, find **05**

i) wet bulb temperature
ii) humidity ratio
iii) dew point temperature
iv) enthalpy of air per kg of dry air

Q.6 Attempt the following questions.

a) What is Ventilation? Write a note on ventilation requirements as per ASHRAE Standard 62.1 **04**

b) Explain the factors contributing to cooling load in air conditioning systems. **05**

c) The following data are given for the space to be air conditioned: **05**

- Outside air conditions = 43°C DBT and 27°C WBT
- Inside design conditions = 25°C DBT and 50% RH
- Room sensible heat load = 40 kW
- Room latent heat load = 10 kW
- By-pass factor of the cooling coil = 0.2

The return air from the room is mixed with the outside air before entry to the cooling coil in the ratio of 3:1 by mass. Determine:

i) Supply air flow rate
ii) Outside air sensible heat
iii) Outside air latent heat
iv) Grand total heat
v) Effective room sensible heat factor

Q.7 Attempt the following questions.

a) Compare chilled water systems and DX systems. **05**

b) Explain the equal friction method of duct design. **04**

c) Write short notes on AHU, and desert coolers. **05**

SLR-QH-371

Seat No.	

Set P

Fourth. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Automobile Engineering (BTN02702)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Multiple choice question: **14**

1) Which of these falls under LMV (Light Motor Vehicle) category based on capacity?
a) Motorbikes b) Buses
c) Cars d) Trains

2) A 4*2 drive vehicle implies that _____.
a) It has 4*2=8 wheels
b) It has 2 auxiliary wheels and 4 drive wheels
c) It has 4 wheels out of which 2 are drive wheels
d) None of the mentioned

3) Where is the clutch located?
a) Between transmission and engine
b) Between transmission and rear axle
c) Between transmission and propeller shaft
d) Between transmission and differential

4) Which of the following is the need of the gearbox?
a) To vary the speed of the vehicle
b) To vary the torque of the vehicle
c) To vary the power of the vehicle
d) To vary the acceleration of the vehicle

5) Transfer case is located next to the gearbox in _____.
a) Front wheel drive b) Rear wheel drive
c) Four wheel drive d) All of the above

6) Two advantages of using helical gears rather than spur gears in a transmission are _____.
a) High strength and low cost
b) High strength and less end thrust
c) Low noise level and high strength
d) Low noise level and economy

7) By using synchronizing device, the two involved adjacent gears have their speeds _____
a) increased b) equalized
c) reduced d) unequalized

8) The central gear of an epicyclic gear set is called a _____.
a) ring gear b) sun gear
c) planet gear d) internal gear

9) The vehicle ride will be comfortable if _____.
a) unsprung weight is kept minimum
b) sprung weight is kept minimum
c) vehicle weight is kept minimum
d) All of the above

10) The function of a shackle with a leaf spring is to _____.
a) allow pivoting of spring end
b) allow spring length to change
c) control sides way
d) control rear torque

11) Another name for a damper is ____.
a) shock absorber b) torsion bar
c) spring d) independent suspension

12) In Maruti car the brakes used are _____.
a) disc brakes only
b) drum brakes only
c) disc on front and drum on rear
d) drum on front and disc on rear

13) Air resistance varies with _____.
a) Speed b) Square of speed
c) Cube of speed d) Inversely with speed

14) Rolling resistance depends on _____
a) Road condition b) Tyre pressure
c) Load d) All of the above

Seat No.	

Set **P**

Fourth. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Automobile Engineering (BTN02702)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Solve any two questions from each section.
2) Figures to the right indicates full marks.
3) Assume suitable data if necessary and mention it clearly.

SECTION – I

Q.2 Attempt Following Questions.

a) Describe the major components of an automobile and explain the functions of each. **06**

b) Draw neat sketch of Front engine rear wheel drive and state its advantages and disadvantages. **08**

Q.3 Attempt Following Questions.

a) Explain with neat sketch working of single plate clutch. **06**

b) Explain working of differential with a neat sketch. **08**

Q.4 Attempt Following Questions.

a) Explain various resistances to vehicle motion. **06**

b) Explain traction, tractive effort and power required for vehicle propulsion. **08**

SECTION – II

Q.5 a) State the functions of steering and explain with neat sketch steering System Layout. **08**

b) State types of steering gear boxes. Explain any one. **06**

Q.6 a) State types of brakes and explain the function of braking system. **06**

b) Explain construction and working of hydraulic braking system with neat sketch. **08**

Q.7 a) Explain Hotch Kiss drive & torque tube drive with neat sketch. **06**

b) Explain with neat sketch construction and working of MacPherson strut type of suspension system. **08**

SLR-QH-371

Seat No.		Set	Q

Fourth. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Automobile Engineering (BTN02702)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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3) Figures to the right indicates full marks.
4) Assume suitable data if necessary and mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Multiple choice question: **14**

1) The central gear of an epicyclic gear set is called a _____.
a) ring gear b) sun gear
c) planet gear d) internal gear

2) The vehicle ride will be comfortable if _____.
a) unsprung weight is kept minimum
b) sprung weight is kept minimum
c) vehicle weight is kept minimum
d) All of the above

3) The function of a shackle with a leaf spring is to _____.
a) allow pivoting of spring end
b) allow spring length to change
c) control sides way
d) control rear torque

4) Another name for a damper is ____.
a) shock absorber b) torsion bar
c) spring d) independent suspension

5) In Maruti car the brakes used are _____.
a) disc brakes only
b) drum brakes only
c) disc on front and drum on rear
d) drum on front and disc on rear

6) Air resistance varies with _____.
a) Speed
b) Square of speed
c) Cube of speed
d) Inversely with speed

7) Rolling resistance depends on _____
a) Road condition
b) Tyre pressure
c) Load
d) All of the above

8) Which of these falls under LMV (Light Motor Vehicle) category based on capacity?
a) Motorbikes
b) Buses
c) Cars
d) Trains

9) A 4*2 drive vehicle implies that _____.
a) It has 4*2=8 wheels
b) It has 2 auxiliary wheels and 4 drive wheels
c) It has 4 wheels out of which 2 are drive wheels
d) None of the mentioned

10) Where is the clutch located?
a) Between transmission and engine
b) Between transmission and rear axle
c) Between transmission and propeller shaft
d) Between transmission and differential

11) Which of the following is the need of the gearbox?
a) To vary the speed of the vehicle
b) To vary the torque of the vehicle
c) To vary the power of the vehicle
d) To vary the acceleration of the vehicle

12) Transfer case is located next to the gearbox in _____.
a) Front wheel drive
b) Rear wheel drive
c) Four wheel drive
d) All of the above

13) Two advantages of using helical gears rather than spur gears in a transmission are _____.
a) High strength and low cost
b) High strength and less end thrust
c) Low noise level and high strength
d) Low noise level and economy

14) By using synchronizing device, the two involved adjacent gears have their speeds _____
a) increased
b) equalized
c) reduced
d) unequalized

SLR-QH-371

Seat No.		Set	Q

Fourth. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Automobile Engineering (BTN02702)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Solve any two questions from each section.
2) Figures to the right indicates full marks.
3) Assume suitable data if necessary and mention it clearly.

SECTION – I

Q.2 Attempt Following Questions.

a) Describe the major components of an automobile and explain the functions of each. **06**

b) Draw neat sketch of Front engine rear wheel drive and state its advantages and disadvantages. **08**

Q.3 Attempt Following Questions.

a) Explain with neat sketch working of single plate clutch. **06**

b) Explain working of differential with a neat sketch. **08**

Q.4 Attempt Following Questions.

a) Explain various resistances to vehicle motion. **06**

b) Explain traction, tractive effort and power required for vehicle propulsion. **08**

SECTION – II

Q.5 a) State the functions of steering and explain with neat sketch steering System Layout. **08**

b) State types of steering gear boxes. Explain any one. **06**

Q.6 a) State types of brakes and explain the function of braking system. **06**

b) Explain construction and working of hydraulic braking system with neat sketch. **08**

Q.7 a) Explain Hotch Kiss drive & torque tube drive with neat sketch. **06**

b) Explain with neat sketch construction and working of MacPherson strut type of suspension system. **08**

SLR-QH-371

Seat No.	

Set R

Fourth. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Automobile Engineering (BTN02702)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Multiple choice question: **14**

1) Another name for a damper is ____.
a) shock absorber b) torsion bar
c) spring d) independent suspension

2) In Maruti car the brakes used are _____.
a) disc brakes only
b) drum brakes only
c) disc on front and drum on rear
d) drum on front and disc on rear

3) Air resistance varies with _____.
a) Speed b) Square of speed
c) Cube of speed d) Inversely with speed

4) Rolling resistance depends on _____
a) Road condition b) Tyre pressure
c) Load d) All of the above

5) Which of these falls under LMV (Light Motor Vehicle) category based on capacity?
a) Motorbikes b) Buses
c) Cars d) Trains

6) A 4*2 drive vehicle implies that _____.
a) It has 4*2=8 wheels
b) It has 2 auxiliary wheels and 4 drive wheels
c) It has 4 wheels out of which 2 are drive wheels
d) None of the mentioned

7) Where is the clutch located?
a) Between transmission and engine
b) Between transmission and rear axle
c) Between transmission and propeller shaft
d) Between transmission and differential

8) Which of the following is the need of the gearbox?
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b) To vary the torque of the vehicle
c) To vary the power of the vehicle
d) To vary the acceleration of the vehicle

9) Transfer case is located next to the gearbox in _____.
a) Front wheel drive
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c) Four wheel drive
d) All of the above

10) Two advantages of using helical gears rather than spur gears in a transmission are _____.
a) High strength and low cost
b) High strength and less end thrust
c) Low noise level and high strength
d) Low noise level and economy

11) By using synchronizing device, the two involved adjacent gears have their speeds _____
a) increased
b) equalized
c) reduced
d) unequalized

12) The central gear of an epicyclic gear set is called a _____.
a) ring gear
b) sun gear
c) planet gear
d) internal gear

13) The vehicle ride will be comfortable if _____.
a) unsprung weight is kept minimum
b) sprung weight is kept minimum
c) vehicle weight is kept minimum
d) All of the above

14) The function of a shackle with a leaf spring is to _____.
a) allow pivoting of spring end
b) allow spring length to change
c) control sides way
d) control rear torque

Seat No.	

Set **R**

Fourth. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Automobile Engineering (BTN02702)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Solve any two questions from each section.
2) Figures to the right indicates full marks.
3) Assume suitable data if necessary and mention it clearly.

SECTION – I

Q.2 Attempt Following Questions.

a) Describe the major components of an automobile and explain the functions of each. **06**

b) Draw neat sketch of Front engine rear wheel drive and state its advantages and disadvantages. **08**

Q.3 Attempt Following Questions.

a) Explain with neat sketch working of single plate clutch. **06**

b) Explain working of differential with a neat sketch. **08**

Q.4 Attempt Following Questions.

a) Explain various resistances to vehicle motion. **06**

b) Explain traction, tractive effort and power required for vehicle propulsion. **08**

SECTION – II

Q.5 a) State the functions of steering and explain with neat sketch steering System Layout. **08**

b) State types of steering gear boxes. Explain any one. **06**

Q.6 a) State types of brakes and explain the function of braking system. **06**

b) Explain construction and working of hydraulic braking system with neat sketch. **08**

Q.7 a) Explain Hotch Kiss drive & torque tube drive with neat sketch. **06**

b) Explain with neat sketch construction and working of MacPherson strut type of suspension system. **08**

SLR-QH-371

Seat No.		Set	S

Fourth. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Automobile Engineering (BTN02702)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Multiple choice question: **14**

1) Two advantages of using helical gears rather than spur gears in a transmission are _____.
a) High strength and low cost
b) High strength and less end thrust
c) Low noise level and high strength
d) Low noise level and economy

2) By using synchronizing device, the two involved adjacent gears have their speeds _____
a) increased b) equalized
c) reduced d) unequalized

3) The central gear of an epicyclic gear set is called a _____.
a) ring gear b) sun gear
c) planet gear d) internal gear

4) The vehicle ride will be comfortable if _____.
a) unsprung weight is kept minimum
b) sprung weight is kept minimum
c) vehicle weight is kept minimum
d) All of the above

5) The function of a shackle with a leaf spring is to _____.
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b) allow spring length to change
c) control sides way
d) control rear torque

6) Another name for a damper is ____.
a) shock absorber b) torsion bar
c) spring d) independent suspension

7) In Maruti car the brakes used are _____.
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b) drum brakes only
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d) drum on front and disc on rear

8) Air resistance varies with _____.
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c) Cube of speed d) Inversely with speed

9) Rolling resistance depends on _____
a) Road condition b) Tyre pressure
c) Load d) All of the above

10) Which of these falls under LMV (Light Motor Vehicle) category based on capacity?
a) Motorbikes b) Buses
c) Cars d) Trains

11) A 4*2 drive vehicle implies that _____.
a) It has 4*2=8 wheels
b) It has 2 auxiliary wheels and 4 drive wheels
c) It has 4 wheels out of which 2 are drive wheels
d) None of the mentioned

12) Where is the clutch located?
a) Between transmission and engine
b) Between transmission and rear axle
c) Between transmission and propeller shaft
d) Between transmission and differential

13) Which of the following is the need of the gearbox?
a) To vary the speed of the vehicle
b) To vary the torque of the vehicle
c) To vary the power of the vehicle
d) To vary the acceleration of the vehicle

14) Transfer case is located next to the gearbox in _____.
a) Front wheel drive b) Rear wheel drive
c) Four wheel drive d) All of the above

SLR-QH-371

Seat No.		Set	S

Fourth. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Automobile Engineering (BTN02702)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Solve any two questions from each section.
2) Figures to the right indicates full marks.
3) Assume suitable data if necessary and mention it clearly.

SECTION – I

Q.2 Attempt Following Questions.

a) Describe the major components of an automobile and explain the functions of each. **06**

b) Draw neat sketch of Front engine rear wheel drive and state its advantages and disadvantages. **08**

Q.3 Attempt Following Questions.

a) Explain with neat sketch working of single plate clutch. **06**

b) Explain working of differential with a neat sketch. **08**

Q.4 Attempt Following Questions.

a) Explain various resistances to vehicle motion. **06**

b) Explain traction, tractive effort and power required for vehicle propulsion. **08**

SECTION – II

Q.5 a) State the functions of steering and explain with neat sketch steering System Layout. **08**

b) State types of steering gear boxes. Explain any one. **06**

Q.6 a) State types of brakes and explain the function of braking system. **06**

b) Explain construction and working of hydraulic braking system with neat sketch. **08**

Q.7 a) Explain Hotch Kiss drive & torque tube drive with neat sketch. **06**

b) Explain with neat sketch construction and working of MacPherson strut type of suspension system. **08**

SLR-QH-372

Seat No.	

Set P

Fourth. Y. (B. Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Automation and Robotics (BTN02703)

Day & Date: Thursday, 07-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answers from the given options. 14

1) The workspace formed by a Cartesian robot resembles a _____.
a) Triangular prism b) Rectangular box
c) Cylindrical shell d) Spherical dome

2) For high-speed assembly operations, the most suitable robot configuration is _____.
a) Cylindrical b) SCARA
c) Polar d) Jointed arm

3) Sensing the presence or absence of an object through physical contact is typically done using a _____.
a) encoder b) accelerometer
c) limit-switch d) tachometer

4) The imaging sensor technology in which pixels transfer their charge through shift-registers is _____.
a) ultrasonic b) CCD
c) LIDAR d) CMOS

5) AS/RS improves industrial productivity primarily by enabling _____.
a) random stacking
b) low-density storage
c) high-speed automatic retrieval
d) manual bin picking

6) LVDT is a type of _____ transducer.
a) Capacitive b) Resistive
c) Inductive d) Piezoelectric

7) A motor providing discrete angular increments is a _____ motor.
a) Servo b) Shunt
c) Stepper d) Universal

8) Forward kinematics computes _____.
a) joint values
b) end-effector pose from joint variables
c) torque values
d) actuator currents

9) Edge detection identifies _____.
a) brightness peaks b) object boundaries
c) noise d) centroids

10) Camera Calibration defines relation between _____.
a) pixels & actual dimensions
b) weight & force
c) torque & current
d) luminance & contrast

11) In-line robot cells suit _____ production.
a) batch b) continuous flow
c) single piece d) prototyping

12) The sector with highest robot usage in India is _____.
a) Education b) IT
c) Automotive d) Textile

13) Payload capacity represents _____.
a) robot weight b) maximum load robot can carry
c) torque d) inertia

14) A revolute joint provides _____ DOF.
a) 1 b) 2
c) 3 d) 0

SLR-QH-372

Seat No.		Set	P

Fourth. Y. (B. Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Automation and Robotics (BTN02703)

Day & Date: Thursday, 07-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Solve any two questions from each section.
2) Figures to the right indicates full marks.

Section – I

Q.2	**a)**	What are AGVs? Explain various navigation techniques used in AGVs.	**07**
	b)	Explain with neat diagram the sub-systems of an Industrial Robot.	**07**
Q.3	**a)**	Explain any two position sensors used in industrial robots.	**07**
	b)	What is an end-effector? Explain 'Types of end effectors'.	**07**
Q.4	**a)**	What do you mean by forward kinematics and inverse kinematics? Derive forward kinematics equation for 2 DOF planar system.	**07**
	b)	Explain PID Control used in robots. Support your explanation with relevant practical cases.	**07**

Section – II

Q.5	**a)**	Explain CCD and CMOS sensors used in Industrial Cameras with neat diagrams.	**07**
	b)	Explain various steps in Image Processing with respect to Machine Vision.	**07**
Q.6	**a)**	Explain considerations to be made in work-cell layout design.	**07**
	b)	Explain Robot centred Work Cell Layout with neat diagram.	**07**
Q.7	**a)**	Explain considerations while selecting robot for welding application.	**07**
	b)	Explain considerations while selecting robot for electronic assembly.	**07**

Seat No.	

Set **Q**

Fourth. Y. (B. Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Automation and Robotics (BTN02703)

Day & Date: Thursday, 07-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) Forward kinematics computes _____.
a) joint values
b) end-effector pose from joint variables
c) torque values
d) actuator currents

2) Edge detection identifies _____.
a) brightness peaks b) object boundaries
c) noise d) centroids

3) Camera Calibration defines relation between _____.
a) pixels & actual dimensions
b) weight & force
c) torque & current
d) luminance & contrast

4) In-line robot cells suit _____ production.
a) batch b) continuous flow
c) single piece d) prototyping

5) The sector with highest robot usage in India is _____.
a) Education b) IT
c) Automotive d) Textile

6) Payload capacity represents _____.
a) robot weight b) maximum load robot can carry
c) torque d) inertia

7) A revolute joint provides _____ DOF.
a) 1 b) 2
c) 3 d) 0

8) The workspace formed by a Cartesian robot resembles a _____.
a) Triangular prism b) Rectangular box
c) Cylindrical shell d) Spherical dome

9) For high-speed assembly operations, the most suitable robot configuration is _____.
a) Cylindrical b) SCARA
c) Polar d) Jointed arm

10) Sensing the presence or absence of an object through physical contact is typically done using a _____.
a) encoder b) accelerometer
c) limit-switch d) tachometer

11) The imaging sensor technology in which pixels transfer their charge through shift-registers is _____.
a) ultrasonic b) CCD
c) LIDAR d) CMOS

12) AS/RS improves industrial productivity primarily by enabling _____.
a) random stacking
b) low-density storage
c) high-speed automatic retrieval
d) manual bin picking

13) LVDT is a type of _____ transducer.
a) Capacitive b) Resistive
c) Inductive d) Piezoelectric

14) A motor providing discrete angular increments is a _____ motor.
a) Servo b) Shunt
c) Stepper d) Universal

SLR-QH-372

Seat No.	

Set Q

Fourth. Y. (B. Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Automation and Robotics (BTN02703)

Day & Date: Thursday, 07-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Solve any two questions from each section.
2) Figures to the right indicates full marks.

Section – I

Q.2	**a)**	What are AGVs? Explain various navigation techniques used in AGVs.	**07**
	b)	Explain with neat diagram the sub-systems of an Industrial Robot.	**07**
Q.3	**a)**	Explain any two position sensors used in industrial robots.	**07**
	b)	What is an end-effector? Explain 'Types of end effectors'.	**07**
Q.4	**a)**	What do you mean by forward kinematics and inverse kinematics? Derive forward kinematics equation for 2 DOF planar system.	**07**
	b)	Explain PID Control used in robots. Support your explanation with relevant practical cases.	**07**

Section – II

Q.5	**a)**	Explain CCD and CMOS sensors used in Industrial Cameras with neat diagrams.	**07**
	b)	Explain various steps in Image Processing with respect to Machine Vision.	**07**
Q.6	**a)**	Explain considerations to be made in work-cell layout design.	**07**
	b)	Explain Robot centred Work Cell Layout with neat diagram.	**07**
Q.7	**a)**	Explain considerations while selecting robot for welding application.	**07**
	b)	Explain considerations while selecting robot for electronic assembly.	**07**

Seat No.	

Set **R**

Fourth. Y. (B. Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Automation and Robotics (BTN02703)

Day & Date: Thursday, 07-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) In-line robot cells suit _____ production.
a) batch b) continuous flow
c) single piece d) prototyping

2) The sector with highest robot usage in India is _____.
a) Education b) IT
c) Automotive d) Textile

3) Payload capacity represents _____.
a) robot weight b) maximum load robot can carry
c) torque d) inertia

4) A revolute joint provides _____ DOF.
a) 1 b) 2
c) 3 d) 0

5) The workspace formed by a Cartesian robot resembles a _____.
a) Triangular prism b) Rectangular box
c) Cylindrical shell d) Spherical dome

6) For high-speed assembly operations, the most suitable robot configuration is _____.
a) Cylindrical b) SCARA
c) Polar d) Jointed arm

7) Sensing the presence or absence of an object through physical contact is typically done using a _____.
a) encoder b) accelerometer
c) limit-switch d) tachometer

8) The imaging sensor technology in which pixels transfer their charge through shift-registers is _____.

a) ultrasonic b) CCD
c) LIDAR d) CMOS

9) AS/RS improves industrial productivity primarily by enabling _____.

a) random stacking
b) low-density storage
c) high-speed automatic retrieval
d) manual bin picking

10) LVDT is a type of _____ transducer.

a) Capacitive b) Resistive
c) Inductive d) Piezoelectric

11) A motor providing discrete angular increments is a _____ motor.

a) Servo b) Shunt
c) Stepper d) Universal

12) Forward kinematics computes _____.

a) joint values
b) end-effector pose from joint variables
c) torque values
d) actuator currents

13) Edge detection identifies _____.

a) brightness peaks b) object boundaries
c) noise d) centroids

14) Camera Calibration defines relation between _____.

a) pixels & actual dimensions
b) weight & force
c) torque & current
d) luminance & contrast

Seat No.	

Set **R**

Fourth. Y. (B. Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Automation and Robotics (BTN02703)

Day & Date: Thursday, 07-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Solve any two questions from each section.
2) Figures to the right indicates full marks.

Section – I

Q.2	**a)**	What are AGVs? Explain various navigation techniques used in AGVs.	**07**
	b)	Explain with neat diagram the sub-systems of an Industrial Robot.	**07**
Q.3	**a)**	Explain any two position sensors used in industrial robots.	**07**
	b)	What is an end-effector? Explain 'Types of end effectors'.	**07**
Q.4	**a)**	What do you mean by forward kinematics and inverse kinematics? Derive forward kinematics equation for 2 DOF planar system.	**07**
	b)	Explain PID Control used in robots. Support your explanation with relevant practical cases.	**07**

Section – II

Q.5	**a)**	Explain CCD and CMOS sensors used in Industrial Cameras with neat diagrams.	**07**
	b)	Explain various steps in Image Processing with respect to Machine Vision.	**07**
Q.6	**a)**	Explain considerations to be made in work-cell layout design.	**07**
	b)	Explain Robot centred Work Cell Layout with neat diagram.	**07**
Q.7	**a)**	Explain considerations while selecting robot for welding application.	**07**
	b)	Explain considerations while selecting robot for electronic assembly.	**07**

SLR-QH-372

Seat No.	

Set S

Fourth. Y. (B. Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Automation and Robotics (BTN02703)

Day & Date: Thursday, 07-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answers from the given options. 14

1) LVDT is a type of _____ transducer.
a) Capacitive b) Resistive
c) Inductive d) Piezoelectric

2) A motor providing discrete angular increments is a _____ motor.
a) Servo b) Shunt
c) Stepper d) Universal

3) Forward kinematics computes _____.
a) joint values
b) end-effector pose from joint variables
c) torque values
d) actuator currents

4) Edge detection identifies _____.
a) brightness peaks b) object boundaries
c) noise d) centroids

5) Camera Calibration defines relation between _____.
a) pixels & actual dimensions
b) weight & force
c) torque & current
d) luminance & contrast

6) In-line robot cells suit _____ production.
a) batch b) continuous flow
c) single piece d) prototyping

7) The sector with highest robot usage in India is _____.
a) Education b) IT
c) Automotive d) Textile

8) Payload capacity represents _____.
a) robot weight b) maximum load robot can carry
c) torque d) inertia

9) A revolute joint provides _____ DOF.
a) 1 b) 2
c) 3 d) 0

10) The workspace formed by a Cartesian robot resembles a _____.
a) Triangular prism b) Rectangular box
c) Cylindrical shell d) Spherical dome

11) For high-speed assembly operations, the most suitable robot configuration is _____.
a) Cylindrical b) SCARA
c) Polar d) Jointed arm

12) Sensing the presence or absence of an object through physical contact is typically done using a _____.
a) encoder b) accelerometer
c) limit-switch d) tachometer

13) The imaging sensor technology in which pixels transfer their charge through shift-registers is _____.
a) ultrasonic b) CCD
c) LIDAR d) CMOS

14) AS/RS improves industrial productivity primarily by enabling _____.
a) random stacking
b) low-density storage
c) high-speed automatic retrieval
d) manual bin picking

SLR-QH-372

Seat No.		Set	S

Fourth. Y. (B. Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Automation and Robotics (BTN02703)

Day & Date: Thursday, 07-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Solve any two questions from each section.
2) Figures to the right indicates full marks.

Section – I

Q.2	**a)**	What are AGVs? Explain various navigation techniques used in AGVs.	**07**
	b)	Explain with neat diagram the sub-systems of an Industrial Robot.	**07**
Q.3	**a)**	Explain any two position sensors used in industrial robots.	**07**
	b)	What is an end-effector? Explain 'Types of end effectors'.	**07**
Q.4	**a)**	What do you mean by forward kinematics and inverse kinematics? Derive forward kinematics equation for 2 DOF planar system.	**07**
	b)	Explain PID Control used in robots. Support your explanation with relevant practical cases.	**07**

Section – II

Q.5	**a)**	Explain CCD and CMOS sensors used in Industrial Cameras with neat diagrams.	**07**
	b)	Explain various steps in Image Processing with respect to Machine Vision.	**07**
Q.6	**a)**	Explain considerations to be made in work-cell layout design.	**07**
	b)	Explain Robot centred Work Cell Layout with neat diagram.	**07**
Q.7	**a)**	Explain considerations while selecting robot for welding application.	**07**
	b)	Explain considerations while selecting robot for electronic assembly.	**07**

SLR-QH-373

Seat No.	

Set P

Fourth. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Production and Operations Management (BTN02706)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) Which of the following best defines Production Management?
a) The management of resources and processes to produce goods
b) The management of marketing strategies
c) The management of financial investments
d) The management of human resources

2) Quantitative forecasting methods rely on _____.
a) Subjective judgment
b) Historical data and statistical techniques
c) Focus groups and surveys
d) Expert consensus

3) The moving average method is used to _____.
a) Analyze long-term trends
b) Smooth out short-term fluctuations in data
c) Determine seasonal patterns
d) Identify cyclical variations

4) The objective of Economic Order Quantity (EOQ.) is to _____.
a) Maximize inventory levels
b) Minimize the total cost of inventory
c) Increase the number of orders placed
d) Maximize labor costs

5) The Economic Batch Quantity (EBQ.) model is useful for _____.
a) Continuous production
b) JIT production
c) Batch production with setup costs
d) Minimizing labor costs

6) In Value Engineering, a product's "value" is defined as the ratio of ____.
a) cost to quality
b) function to cost
c) efficiency to complexity
d) weight to durability

7) The main objective of aggregate planning is to _____.
a) Minimize production costs
b) Optimize the use of resources and meet demand
c) Maximize inventory levels
d) Increase market share

8) Which of the following is a key objective of PPC?
a) Maximizing waste
b) Increasing the cost of materials
c) Reducing production time
d) Reducing customer satisfaction

9) Line balancing helps to minimize _____.
a) Raw material costs
b) Finished product quality
c) Idle time at workstations
d) Delivery lead times

10) In Supply Chain Management, what is the primary goal?
a) To maximize inventory holding costs
b) To streamline the flow of goods, information, and resources to deliver products efficiently to customers
c) To disconnect suppliers from production
d) To extend delivery times

11) Which of the following is a key benefit of TPM?
a) Higher operator absenteeism
b) Improved equipment efficiency and performance
c) More frequent machine breakdowns
d) Higher maintenance costs

12) Which diagram is commonly used to identify the causes of equipment breakdown?
a) Pareto chart
b) Fishbone diagram
c) Flowchart
d) Gantt chart

13) Lead time in inventory management refers to _____.
a) The time taken for an employee to complete a task
b) The transportation time of finished goods
c) The production time of a product
d) The time from ordering materials to their delivery

14) What is the key use of Value Analysis in an organization?
a) Reducing marketing costs
b) Designing products with no consideration for function
c) Increasing product cost to maximize profit
d) Reducing production waste while maintaining product function

Seat No.	

Set **P**

Fourth. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Production and Operations Management (BTN02706)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Attempt any two questions from each section.
2) Figures to the right indicates full marks.
3) Assume suitable assumptions if necessary and mention it clearly.
4) Draw neat diagram wherever necessary.

Section – I

Q.2 **a)** Define Production Management. Explain the types of manufacturing system. **07**

b) The sales (in '000 units) of a product for seven consecutive years are given below. Using the least squares trend method, project sales for the next two years. **07**

Year	2010	2011	2012	2013	2014	2015	2016
Sales	61	64	67	70	73	76	79

Q.3 **a)** Explain in detail the procedure for capacity planning. **07**

b) Explain moving average method of forecasting. **07**

Q.4 Write notes on. (Any Two) **14**

a) Discuss Need for demand forecasting.

b) Production Planning and Control.

c) Coordination of PPC with other department.

Section – II

Q.5 **a)** Explain the different costs associated with inventory. **07**

b) A manufacturer has to supply his customers 3600 units of his product per year. Shortages are not permitted. Inventory carrying cost amounts Rs. 1.2 per unit per annum. The set-up cost per run is Rs. 80. **07**

Find:

i) Economic order quantity
ii) Optimum number of orders per annum
iii) Average annual inventory cost (minimum)
iv) Optimum period of supply per optimum order

Q.6	**a)**	Outline the different types of maintenance practiced in industries. Explain any two types with suitable examples.	**07**
	b)	'Maintenance of Machines in an industry is not a waste of time and money only'. Justify.	**07**
Q.7	**a)**	What is Value Analysis and Value Engineering. Discuss the benefits of Value Engineering.	**07**
	b)	Define Kaizen and explain its philosophy of continuous improvement.	**07**

Seat No.	

Set **Q**

Fourth. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Production and Operations Management (BTN02706)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) Which of the following is a key objective of PPC?
a) Maximizing waste b) Increasing the cost of materials
c) Reducing production time d) Reducing customer satisfaction

2) Line balancing helps to minimize _____.
a) Raw material costs b) Finished product quality
c) Idle time at workstations d) Delivery lead times

3) In Supply Chain Management, what is the primary goal?
a) To maximize inventory holding costs
b) To streamline the flow of goods, information, and resources to deliver products efficiently to customers
c) To disconnect suppliers from production
d) To extend delivery times

4) Which of the following is a key benefit of TPM?
a) Higher operator absenteeism
b) Improved equipment efficiency and performance
c) More frequent machine breakdowns
d) Higher maintenance costs

5) Which diagram is commonly used to identify the causes of equipment breakdown?
a) Pareto chart b) Fishbone diagram
c) Flowchart d) Gantt chart

6) Lead time in inventory management refers to _____.
   a) The time taken for an employee to complete a task
   b) The transportation time of finished goods
   c) The production time of a product
   d) The time from ordering materials to their delivery

7) What is the key use of Value Analysis in an organization?
   a) Reducing marketing costs
   b) Designing products with no consideration for function
   c) Increasing product cost to maximize profit
   d) Reducing production waste while maintaining product function

8) Which of the following best defines Production Management?
   a) The management of resources and processes to produce goods
   b) The management of marketing strategies
   c) The management of financial investments
   d) The management of human resources

9) Quantitative forecasting methods rely on _____.
   a) Subjective judgment
   b) Historical data and statistical techniques
   c) Focus groups and surveys
   d) Expert consensus

10) The moving average method is used to _____.
   a) Analyze long-term trends
   b) Smooth out short-term fluctuations in data
   c) Determine seasonal patterns
   d) Identify cyclical variations

11) The objective of Economic Order Quantity (EOQ.) is to _____.
   a) Maximize inventory levels
   b) Minimize the total cost of inventory
   c) Increase the number of orders placed
   d) Maximize labor costs

12) The Economic Batch Quantity (EBQ.) model is useful for _____.
   a) Continuous production
   b) JIT production
   c) Batch production with setup costs
   d) Minimizing labor costs

13) In Value Engineering, a product's "value" is defined as the ratio of ____.
   a) cost to quality
   b) function to cost
   c) efficiency to complexity
   d) weight to durability

14) The main objective of aggregate planning is to _____.

a) Minimize production costs
b) Optimize the use of resources and meet demand
c) Maximize inventory levels
d) Increase market share

Seat No.	

Set **Q**

Fourth. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Production and Operations Management (BTN02706)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Attempt any two questions from each section.
2) Figures to the right indicates full marks.
3) Assume suitable assumptions if necessary and mention it clearly.
4) Draw neat diagram wherever necessary.

Section – I

Q.2 **a)** Define Production Management. Explain the types of manufacturing system. **07**

b) The sales (in '000 units) of a product for seven consecutive years are given below. Using the least squares trend method, project sales for the next two years. **07**

Year	2010	2011	2012	2013	2014	2015	2016
Sales	61	64	67	70	73	76	79

Q.3 **a)** Explain in detail the procedure for capacity planning. **07**

b) Explain moving average method of forecasting. **07**

Q.4 Write notes on. (Any Two) **14**

a) Discuss Need for demand forecasting.

b) Production Planning and Control.

c) Coordination of PPC with other department.

Section – II

Q.5 **a)** Explain the different costs associated with inventory. **07**

b) A manufacturer has to supply his customers 3600 units of his product per year. Shortages are not permitted. Inventory carrying cost amounts Rs. 1.2 per unit per annum. The set-up cost per run is Rs. 80. **07**

Find:

i) Economic order quantity
ii) Optimum number of orders per annum
iii) Average annual inventory cost (minimum)
iv) Optimum period of supply per optimum order

Q.6	**a)**	Outline the different types of maintenance practiced in industries. Explain any two types with suitable examples.	**07**
	b)	'Maintenance of Machines in an industry is not a waste of time and money only'. Justify.	**07**
Q.7	**a)**	What is Value Analysis and Value Engineering. Discuss the benefits of Value Engineering.	**07**
	b)	Define Kaizen and explain its philosophy of continuous improvement.	**07**

SLR-QH-373

Seat No.	

Set R

Fourth. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Production and Operations Management (BTN02706)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) Which of the following is a key benefit of TPM?
a) Higher operator absenteeism
b) Improved equipment efficiency and performance
c) More frequent machine breakdowns
d) Higher maintenance costs

2) Which diagram is commonly used to identify the causes of equipment breakdown?
a) Pareto chart b) Fishbone diagram
c) Flowchart d) Gantt chart

3) Lead time in inventory management refers to _____.
a) The time taken for an employee to complete a task
b) The transportation time of finished goods
c) The production time of a product
d) The time from ordering materials to their delivery

4) What is the key use of Value Analysis in an organization?
a) Reducing marketing costs
b) Designing products with no consideration for function
c) Increasing product cost to maximize profit
d) Reducing production waste while maintaining product function

5) Which of the following best defines Production Management?
a) The management of resources and processes to produce goods
b) The management of marketing strategies
c) The management of financial investments
d) The management of human resources

6) Quantitative forecasting methods rely on _____.
a) Subjective judgment
b) Historical data and statistical techniques
c) Focus groups and surveys
d) Expert consensus

7) The moving average method is used to _____.
a) Analyze long-term trends
b) Smooth out short-term fluctuations in data
c) Determine seasonal patterns
d) Identify cyclical variations

8) The objective of Economic Order Quantity (EOQ.) is to _____.
a) Maximize inventory levels
b) Minimize the total cost of inventory
c) Increase the number of orders placed
d) Maximize labor costs

9) The Economic Batch Quantity (EBQ.) model is useful for _____.
a) Continuous production
b) JIT production
c) Batch production with setup costs
d) Minimizing labor costs

10) In Value Engineering, a product's "value" is defined as the ratio of ____.
a) cost to quality
b) function to cost
c) efficiency to complexity
d) weight to durability

11) The main objective of aggregate planning is to _____.
a) Minimize production costs
b) Optimize the use of resources and meet demand
c) Maximize inventory levels
d) Increase market share

12) Which of the following is a key objective of PPC?
a) Maximizing waste
b) Increasing the cost of materials
c) Reducing production time
d) Reducing customer satisfaction

13) Line balancing helps to minimize _____.
a) Raw material costs
b) Finished product quality
c) Idle time at workstations
d) Delivery lead times

14) In Supply Chain Management, what is the primary goal?
a) To maximize inventory holding costs
b) To streamline the flow of goods, information, and resources to deliver products efficiently to customers
c) To disconnect suppliers from production
d) To extend delivery times

Seat No.	

Set **R**

Fourth. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Production and Operations Management (BTN02706)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Attempt any two questions from each section.
2) Figures to the right indicates full marks.
3) Assume suitable assumptions if necessary and mention it clearly.
4) Draw neat diagram wherever necessary.

Section – I

Q.2 **a)** Define Production Management. Explain the types of manufacturing system. **07**

b) The sales (in '000 units) of a product for seven consecutive years are given below. Using the least squares trend method, project sales for the next two years. **07**

Year	2010	2011	2012	2013	2014	2015	2016
Sales	61	64	67	70	73	76	79

Q.3 **a)** Explain in detail the procedure for capacity planning. **07**

b) Explain moving average method of forecasting. **07**

Q.4 Write notes on. (Any Two) **14**

a) Discuss Need for demand forecasting.

b) Production Planning and Control.

c) Coordination of PPC with other department.

Section – II

Q.5 **a)** Explain the different costs associated with inventory. **07**

b) A manufacturer has to supply his customers 3600 units of his product per year. Shortages are not permitted. Inventory carrying cost amounts Rs. 1.2 per unit per annum. The set-up cost per run is Rs. 80. **07**
Find:

i) Economic order quantity
ii) Optimum number of orders per annum
iii) Average annual inventory cost (minimum)
iv) Optimum period of supply per optimum order

Q.6	**a)**	Outline the different types of maintenance practiced in industries. Explain any two types with suitable examples.	**07**
	b)	'Maintenance of Machines in an industry is not a waste of time and money only'. Justify.	**07**
Q.7	**a)**	What is Value Analysis and Value Engineering. Discuss the benefits of Value Engineering.	**07**
	b)	Define Kaizen and explain its philosophy of continuous improvement.	**07**

Seat No.	

Set **S**

Fourth. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Production and Operations Management (BTN02706)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) In Value Engineering, a product's "value" is defined as the ratio of ____.
a) cost to quality b) function to cost
c) efficiency to complexity d) weight to durability

2) The main objective of aggregate planning is to _____.
a) Minimize production costs
b) Optimize the use of resources and meet demand
c) Maximize inventory levels
d) Increase market share

3) Which of the following is a key objective of PPC?
a) Maximizing waste b) Increasing the cost of materials
c) Reducing production time d) Reducing customer satisfaction

4) Line balancing helps to minimize _____.
a) Raw material costs b) Finished product quality
c) Idle time at workstations d) Delivery lead times

5) In Supply Chain Management, what is the primary goal?
a) To maximize inventory holding costs
b) To streamline the flow of goods, information, and resources to deliver products efficiently to customers
c) To disconnect suppliers from production
d) To extend delivery times

6) Which of the following is a key benefit of TPM?
a) Higher operator absenteeism
b) Improved equipment efficiency and performance
c) More frequent machine breakdowns
d) Higher maintenance costs

7) Which diagram is commonly used to identify the causes of equipment breakdown?
a) Pareto chart
b) Fishbone diagram
c) Flowchart
d) Gantt chart

8) Lead time in inventory management refers to _____.
a) The time taken for an employee to complete a task
b) The transportation time of finished goods
c) The production time of a product
d) The time from ordering materials to their delivery

9) What is the key use of Value Analysis in an organization?
a) Reducing marketing costs
b) Designing products with no consideration for function
c) Increasing product cost to maximize profit
d) Reducing production waste while maintaining product function

10) Which of the following best defines Production Management?
a) The management of resources and processes to produce goods
b) The management of marketing strategies
c) The management of financial investments
d) The management of human resources

11) Quantitative forecasting methods rely on _____.
a) Subjective judgment
b) Historical data and statistical techniques
c) Focus groups and surveys
d) Expert consensus

12) The moving average method is used to _____.
a) Analyze long-term trends
b) Smooth out short-term fluctuations in data
c) Determine seasonal patterns
d) Identify cyclical variations

13) The objective of Economic Order Quantity (EOQ.) is to _____.
a) Maximize inventory levels
b) Minimize the total cost of inventory
c) Increase the number of orders placed
d) Maximize labor costs

14) The Economic Batch Quantity (EBQ.) model is useful for _____.

a) Continuous production
b) JIT production
c) Batch production with setup costs
d) Minimizing labor costs

Seat No.	

Set **S**

Fourth. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Production and Operations Management (BTN02706)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Attempt any two questions from each section.
2) Figures to the right indicates full marks.
3) Assume suitable assumptions if necessary and mention it clearly.
4) Draw neat diagram wherever necessary.

Section – I

Q.2 **a)** Define Production Management. Explain the types of manufacturing system. **07**

b) The sales (in '000 units) of a product for seven consecutive years are given below. Using the least squares trend method, project sales for the next two years. **07**

Year	2010	2011	2012	2013	2014	2015	2016
Sales	61	64	67	70	73	76	79

Q.3 **a)** Explain in detail the procedure for capacity planning. **07**

b) Explain moving average method of forecasting. **07**

Q.4 Write notes on. (Any Two) **14**

a) Discuss Need for demand forecasting.

b) Production Planning and Control.

c) Coordination of PPC with other department.

Section – II

Q.5 **a)** Explain the different costs associated with inventory. **07**

b) A manufacturer has to supply his customers 3600 units of his product per year. Shortages are not permitted. Inventory carrying cost amounts Rs. 1.2 per unit per annum. The set-up cost per run is Rs. 80. **07**

Find:

i) Economic order quantity
ii) Optimum number of orders per annum
iii) Average annual inventory cost (minimum)
iv) Optimum period of supply per optimum order

Q.6	**a)**	Outline the different types of maintenance practiced in industries. Explain any two types with suitable examples.	**07**
	b)	'Maintenance of Machines in an industry is not a waste of time and money only'. Justify.	**07**
Q.7	**a)**	What is Value Analysis and Value Engineering. Discuss the benefits of Value Engineering.	**07**
	b)	Define Kaizen and explain its philosophy of continuous improvement.	**07**

SLR-QH-375

Seat No.	

Set P

Fourth. Y. (B.Tech.) (Mechanical Engineering) (Sem - I) (New) (CBCS) Examination: March/April - 2026
Railway Systems Management (BTN02708)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no. 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if required.
5) Use of scientific calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. 14

1) Which signals are used in shunting operations for low-speed movement?
a) Semaphore Signal b) Warner Signal
c) Starter signal d) Disc signal

2) Weight of the passenger is categorized in _____.
a) sprung mass b) unsprang mass
c) non-sprung mass d) dummy mass

3) _____ is not a coupling used in Railway Coaches.
a) Screw Coupling b) Side buffer coupling
c) Central buffer coupling d) Tie coupling

4) Which of the following is an advantage of electric traction over other methods of traction?
a) Faster acceleration b) No pollution problems
c) Better braking action d) All of the above

5) _____ is not a part of VCC used in A/C.
a) Evaporator b) Condenser
c) Compressor d) Deflector

6) In railway the green light indicates _____.
a) Stop b) Proceed
c) Proceed cautiously d) None

7) For Fiat Bogie Break disc diameter is _____ mm.
a) 750 b) 650
c) 635 d) 640

8) Which of the following can be used in case of Bridge joints?
a) Metal flat or Bridge plate b) Extra sleepers
c) Metal flat d) Bridge plate

9) _____ is not a maintenance report that is recorded in Loco shade.
a) loco master defect report b) component defect report
c) analysis defect report d) component inspection report

10) _____ is not a cause of accident in Indian Railway.
a) Negligence
b) Human error
c) Reckless pedestrians and drivers
d) Electrification

11) _____ works as primary energy absorber during accidental shock.
a) Honeycomb absorber b) Pads
c) Spring d) None of these

12) _____ is not strategy of fire accidents.
a) Prevention b) Detection
c) Suppression d) Speed

13) In DFC track inspection is done by _____.
a) TRC b) BFC
c) NFC d) LFC

14) FOIS Means _____.
a) Freight Operations Information Society
b) Freight Operations Internet System
c) Freight Operations Information System
d) none of these

SLR-QH-375

Seat No.	

Set P

Fourth. Y. (B.Tech.) (Mechanical Engineering) (Sem - I) (New) (CBCS) Examination: March/April - 2026
Railway Systems Management (BTN02708)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Attempt any two questions from each section.
2) Figures to the right indicates full marks.
3) Assume suitable data if required.
4) Use of scientific calculator is allowed.

Section – I

Q.2 Solve the following questions.

a) What are the components of air suspension in the Indian Railway? Elaborate in details. **04**

b) Draw typical passenger Vehicle showing the layout of air conditioning & heating equipment. **05**

c) Explain in details the different parts of C.B.C coupler. **05**

Q.3 Solve the following questions.

a) Write the steps of heating load calculation in 2. A. C coach. **04**

b) Explain with neat Sketches the Electronic power and Auxiliary Services. **05**

c) Write the constructional details of Traction Motors used in Indian Railway. **05**

Q.4 Solve the following questions.

a) Describe all Parts of LHB Bogies in Railway. **04**

b) Write a short note R.M.P.U in LHB coaches. **05**

c) Explain in details of HOG. **05**

Section – II

Q.5 Solve the following questions.

a) What are different components of Bio-Vacuum toilet system explain in detail. **04**

b) Write Short note on types of pollution in Indian railway. **05**

c) What is role of production engineers in rolling stock maintenance? Describe in details. **05**

Q.6 Solve the following questions.

a)	Which digital technologies used in traffic control. Explain RFID in details.	**05**
b)	What is mean byoverhauling? Explain in details overhauling & periodic overhauling in diesel Locomotives.	**05**
c)	Describe in details the Green Initiatives in Indian railway sectors.	**04**

Q.7 Solve the following questions.

a)	Write in details the Ticket reservation system in Indian Railway.	**04**
b)	What is mean by rolling stock management? which types of rolling stock management used in Indian railway?	**05**
c)	Explain in details Human waste management used in Indian railway.	**05**

SLR-QH-375

Seat No.	

Set Q

Fourth. Y. (B.Tech.) (Mechanical Engineering) (Sem - I) (New) (CBCS) Examination: March/April - 2026
Railway Systems Management (BTN02708)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no. 03 (Starting page of the Answer Book). Each question carries one mark.
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3) Figures to the right indicates full marks.
4) Assume suitable data if required.
5) Use of scientific calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. 14

1) Which of the following can be used in case of Bridge joints?
a) Metal flat or Bridge plate b) Extra sleepers
c) Metal flat d) Bridge plate

2) _____ is not a maintenance report that is recorded in Loco shade.
a) loco master defect report b) component defect report
c) analysis defect report d) component inspection report

3) _____ is not a cause of accident in Indian Railway.
a) Negligence
b) Human error
c) Reckless pedestrians and drivers
d) Electrification

4) _____ works as primary energy absorber during accidental shock.
a) Honeycomb absorber b) Pads
c) Spring d) None of these

5) _____ is not strategy of fire accidents.
a) Prevention b) Detection
c) Suppression d) Speed

6) In DFC track inspection is done by _____.
a) TRC b) BFC
c) NFC d) LFC

7) FOIS Means _____.
a) Freight Operations Information Society
b) Freight Operations Internet System
c) Freight Operations Information System
d) none of these

8) Which signals are used in shunting operations for low-speed movement?
a) Semaphore Signal
b) Warner Signal
c) Starter signal
d) Disc signal

9) Weight of the passenger is categorized in _____.
a) sprung mass
b) unsprang mass
c) non-sprung mass
d) dummy mass

10) _____ is not a coupling used in Railway Coaches.
a) Screw Coupling
b) Side buffer coupling
c) Central buffer coupling
d) Tie coupling

11) Which of the following is an advantage of electric traction over other methods of traction?
a) Faster acceleration
b) No pollution problems
c) Better braking action
d) All of the above

12) _____ is not a part of VCC used in A/C.
a) Evaporator
b) Condenser
c) Compressor
d) Deflector

13) In railway the green light indicates _____.
a) Stop
b) Proceed
c) Proceed cautiously
d) None

14) For Fiat Bogie Break disc diameter is _____ mm.
a) 750
b) 650
c) 635
d) 640

SLR-QH-375

Seat No.	

Set Q

Fourth. Y. (B.Tech.) (Mechanical Engineering) (Sem - I) (New) (CBCS) Examination: March/April - 2026
Railway Systems Management (BTN02708)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Attempt any two questions from each section.
2) Figures to the right indicates full marks.
3) Assume suitable data if required.
4) Use of scientific calculator is allowed.

Section – I

Q.2 Solve the following questions.

a) What are the components of air suspension in the Indian Railway? Elaborate in details. **04**

b) Draw typical passenger Vehicle showing the layout of air conditioning & heating equipment. **05**

c) Explain in details the different parts of C.B.C coupler. **05**

Q.3 Solve the following questions.

a) Write the steps of heating load calculation in 2. A. C coach. **04**

b) Explain with neat Sketches the Electronic power and Auxiliary Services. **05**

c) Write the constructional details of Traction Motors used in Indian Railway. **05**

Q.4 Solve the following questions.

a) Describe all Parts of LHB Bogies in Railway. **04**

b) Write a short note R.M.P.U in LHB coaches. **05**

c) Explain in details of HOG. **05**

Section – II

Q.5 Solve the following questions.

a) What are different components of Bio-Vacuum toilet system explain in detail. **04**

b) Write Short note on types of pollution in Indian railway. **05**

c) What is role of production engineers in rolling stock maintenance? Describe in details. **05**

Q.6 Solve the following questions.

a) Which digital technologies used in traffic control. Explain RFID in details. **05**

b) What is mean byoverhauling? Explain in details overhauling & periodic overhauling in diesel Locomotives. **05**

c) Describe in details the Green Initiatives in Indian railway sectors. **04**

Q.7 Solve the following questions.

a) Write in details the Ticket reservation system in Indian Railway. **04**

b) What is mean by rolling stock management? which types of rolling stock management used in Indian railway? **05**

c) Explain in details Human waste management used in Indian railway. **05**

Seat No.	

Set **R**

Fourth. Y. (B.Tech.) (Mechanical Engineering) (Sem - I) (New) (CBCS) Examination: March/April - 2026
Railway Systems Management (BTN02708)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no. 03 (Starting page of the Answer Book). Each question carries one mark.
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3) Figures to the right indicates full marks.
4) Assume suitable data if required.
5) Use of scientific calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) _____ works as primary energy absorber during accidental shock.
a) Honeycomb absorber b) Pads
c) Spring d) None of these

2) _____ is not strategy of fire accidents.
a) Prevention b) Detection
c) Suppression d) Speed

3) In DFC track inspection is done by _____.
a) TRC b) BFC
c) NFC d) LFC

4) FOIS Means _____.
a) Freight Operations Information Society
b) Freight Operations Internet System
c) Freight Operations Information System
d) none of these

5) Which signals are used in shunting operations for low-speed movement?
a) Semaphore Signal b) Warner Signal
c) Starter signal d) Disc signal

6) Weight of the passenger is categorized in _____.
a) sprung mass b) unsprang mass
c) non-sprung mass d) dummy mass

7) _____ is not a coupling used in Railway Coaches.
a) Screw Coupling b) Side buffer coupling
c) Central buffer coupling d) Tie coupling

8) Which of the following is an advantage of electric traction over other methods of traction?
a) Faster acceleration b) No pollution problems
c) Better braking action d) All of the above

9) _____ is not a part of VCC used in A/C.
a) Evaporator b) Condenser
c) Compressor d) Deflector

10) In railway the green light indicates _____.
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12) Which of the following can be used in case of Bridge joints?
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c) Metal flat d) Bridge plate

13) _____ is not a maintenance report that is recorded in Loco shade.
a) loco master defect report b) component defect report
c) analysis defect report d) component inspection report

14) _____ is not a cause of accident in Indian Railway.
a) Negligence
b) Human error
c) Reckless pedestrians and drivers
d) Electrification

SLR-QH-375

Seat No.	

Set R

Fourth. Y. (B.Tech.) (Mechanical Engineering) (Sem - I) (New) (CBCS) Examination: March/April - 2026
Railway Systems Management (BTN02708)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Attempt any two questions from each section.
2) Figures to the right indicates full marks.
3) Assume suitable data if required.
4) Use of scientific calculator is allowed.

Section – I

Q.2 Solve the following questions.

a) What are the components of air suspension in the Indian Railway? Elaborate in details. **04**

b) Draw typical passenger Vehicle showing the layout of air conditioning & heating equipment. **05**

c) Explain in details the different parts of C.B.C coupler. **05**

Q.3 Solve the following questions.

a) Write the steps of heating load calculation in 2. A. C coach. **04**

b) Explain with neat Sketches the Electronic power and Auxiliary Services. **05**

c) Write the constructional details of Traction Motors used in Indian Railway. **05**

Q.4 Solve the following questions.

a) Describe all Parts of LHB Bogies in Railway. **04**

b) Write a short note R.M.P.U in LHB coaches. **05**

c) Explain in details of HOG. **05**

Section – II

Q.5 Solve the following questions.

a) What are different components of Bio-Vacuum toilet system explain in detail. **04**

b) Write Short note on types of pollution in Indian railway. **05**

c) What is role of production engineers in rolling stock maintenance? Describe in details. **05**

Q.6 Solve the following questions.

a) Which digital technologies used in traffic control. Explain RFID in details. **05**

b) What is mean byoverhauling? Explain in details overhauling & periodic overhauling in diesel Locomotives. **05**

c) Describe in details the Green Initiatives in Indian railway sectors. **04**

Q.7 Solve the following questions.

a) Write in details the Ticket reservation system in Indian Railway. **04**

b) What is mean by rolling stock management? which types of rolling stock management used in Indian railway? **05**

c) Explain in details Human waste management used in Indian railway. **05**

Seat No.	

Set **S**

Fourth. Y. (B.Tech.) (Mechanical Engineering) (Sem - I) (New) (CBCS) Examination: March/April - 2026
Railway Systems Management (BTN02708)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no. 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if required.
5) Use of scientific calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) In railway the green light indicates _____.
a) Stop b) Proceed
c) Proceed cautiously d) None

2) For Fiat Bogie Break disc diameter is _____ mm.
a) 750 b) 650
c) 635 d) 640

3) Which of the following can be used in case of Bridge joints?
a) Metal flat or Bridge plate b) Extra sleepers
c) Metal flat d) Bridge plate

4) _____ is not a maintenance report that is recorded in Loco shade.
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c) analysis defect report d) component inspection report

5) _____ is not a cause of accident in Indian Railway.
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c) Reckless pedestrians and drivers
d) Electrification

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c) Spring d) None of these

7) _____ is not strategy of fire accidents.
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c) Suppression d) Speed

8) In DFC track inspection is done by _____.
a) TRC b) BFC
c) NFC d) LFC

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b) Freight Operations Internet System
c) Freight Operations Information System
d) none of these

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c) Starter signal d) Disc signal

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c) non-sprung mass d) dummy mass

12) _____ is not a coupling used in Railway Coaches.
a) Screw Coupling b) Side buffer coupling
c) Central buffer coupling d) Tie coupling

13) Which of the following is an advantage of electric traction over other methods of traction?
a) Faster acceleration b) No pollution problems
c) Better braking action d) All of the above

14) _____ is not a part of VCC used in A/C.
a) Evaporator b) Condenser
c) Compressor d) Deflector

SLR-QH-375

Seat No.	

Set S

Fourth. Y. (B.Tech.) (Mechanical Engineering) (Sem - I) (New) (CBCS) Examination: March/April - 2026
Railway Systems Management (BTN02708)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Attempt any two questions from each section.
2) Figures to the right indicates full marks.
3) Assume suitable data if required.
4) Use of scientific calculator is allowed.

Section – I

Q.2 Solve the following questions.

a) What are the components of air suspension in the Indian Railway? Elaborate in details. **04**

b) Draw typical passenger Vehicle showing the layout of air conditioning & heating equipment. **05**

c) Explain in details the different parts of C.B.C coupler. **05**

Q.3 Solve the following questions.

a) Write the steps of heating load calculation in 2. A. C coach. **04**

b) Explain with neat Sketches the Electronic power and Auxiliary Services. **05**

c) Write the constructional details of Traction Motors used in Indian Railway. **05**

Q.4 Solve the following questions.

a) Describe all Parts of LHB Bogies in Railway. **04**

b) Write a short note R.M.P.U in LHB coaches. **05**

c) Explain in details of HOG. **05**

Section – II

Q.5 Solve the following questions.

a) What are different components of Bio-Vacuum toilet system explain in detail. **04**

b) Write Short note on types of pollution in Indian railway. **05**

c) What is role of production engineers in rolling stock maintenance? Describe in details. **05**

Q.6 Solve the following questions.

a) Which digital technologies used in traffic control. Explain RFID in details. **05**

b) What is mean byoverhauling? Explain in details overhauling & periodic overhauling in diesel Locomotives. **05**

c) Describe in details the Green Initiatives in Indian railway sectors. **04**

Q.7 Solve the following questions.

a) Write in details the Ticket reservation system in Indian Railway. **04**

b) What is mean by rolling stock management? which types of rolling stock management used in Indian railway? **05**

c) Explain in details Human waste management used in Indian railway. **05**

SLR-QH-377

Seat No.	

Set P

Fourth.Y. (B.Tech.) (Mechanical Engineering) (Sem - I) (New) (CBCS) Examination: March/April - 2026
Business Economics (BTN02710)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page No. 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper Set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume additional suitable data if necessary and state it clearly.
5) Use of scientific calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) If demand for a product is elastic, _____.
a) PED=1 b) PED<1
c) PED>1 d) PED=0

2) If two products are complements, their CPED will be _____.
a) positive b) negative
c) zero d) infinity

3) Minimum ceiling price must be _____.
a) above the equilibrium price
b) same as the equilibrium price
c) below the equilibrium price
d) same as production cost

4) Explicit cost is also known as _____.
a) economist's cost b) factory cost
c) prime cost d) accountant's cost

5) Which of the following is an example of indirect material cost for a fabrication shop?
a) cost of steel b) cost of building
c) cost of welding rods d) cost of transportation

6) Additional cost incurred to increase production by one unit is known as _____.
a) sunk cost b) marginal cost
c) incremental cost d) managerial cost

7) Finding the future value from the principal amount is known as _____.
a) annual equivalent method b) present worth method
c) rate of return method d) future worth method

8) Replacing copper by aluminium is an example of _____.
a) raw material substitution b) product modification
c) process modification d) design modification

9) _____ favours 'make' decision.
a) Higher fixed cost b) Protection of own patent
c) Availability of vendors d) Less production volume

10) Carrying out repairs on the day of weekly off is an example of _____.
a) predictive maintenance b) routine maintenance
c) breakdown maintenance d) opportunistic maintenance

11) C.B.M. stands for _____.
a) Condition Based Monitoring
b) Cost of Breakdown Maintenance
c) Cost Benefit Management
d) Cost Based Maintenance

12) Usually, which of the following is the least for an asset?
a) useful life b) physical life
c) economic life d) ownership life

13) Color of a refrigerator adds to its _____.
a) functional value b) exchange value
c) scrap value d) esteem value

14) Raising funds for a project is covered in _____ appraisal.
a) technical b) economic
c) financial d) market

Seat No.	

Set | P

Fourth.Y. (B.Tech.) (Mechanical Engineering) (Sem - I) (New) (CBCS)
Examination: March/April - 2026
Business Economics (BTN02710)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Solve any two questions from each section.
2) Figures to right indicate full marks.
3) Assume additional suitable data if necessary and state it clearly.
4) Use of scientific calculator is allowed.

SECTION – I

Q.2 **a)** Explain law of demand and determinants of demand. **08**

b) Suresh is currently investing money in a bank account having a nominal 6% interest compounded annually. If he invests Rs. 100000 today, how many years will it take for his account to grow to Rs. 500000? **06**

Q.3 **a)** A company purchases an article at Rs. 12/unit. The rent for the space is Rs. 40000. Articles are sold at Rs. 16/unit. Calculate the number of articles that must be sold, **08**

i) to break even
ii) to earn a profit of Rs. 10000
iii) to incur a loss of Rs. 4000
iv) if company sells 15000 articles, calculate percentage safety margin.

b) Rachana wants her savings to yield Rs. 600000 at the end of five years. How much should she deposit today if interest rate is fixed at 7% compounded annually. **06**

Q.4 **a)** Explain SRAC & LRAC graphically using ATC curve. **08**

b) Explain graphically, 'Consumer's Surplus' and 'Producer's Surplus'. **06**

SECTION – II

Q.5 **a)** Explain various functional aspects of make or buy decision. **08**

b) Explain the stepwise procedure of value engineering. **06**

Q.6 **a)** Describe various types of maintenance practices with suitable examples. **08**

b) Define 'project' and explain various types of project appraisals. **06**

Q.7 **a)** What do you mean by design modification and why is it needed? **08**

b) Explain the following terms for an asset. **06**

i) challenger
ii) defender
iii) economic life

Seat No.	

Set **Q**

Fourth.Y. (B.Tech.) (Mechanical Engineering) (Sem - I) (New) (CBCS) Examination: March/April - 2026
Business Economics (BTN02710)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page No. 03 (Starting page of the Answer Book). Each question carries one mark.
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4) Assume additional suitable data if necessary and state it clearly.
5) Use of scientific calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) Replacing copper by aluminium is an example of _____.
a) raw material substitution b) product modification
c) process modification d) design modification

2) _____ favours 'make' decision.
a) Higher fixed cost b) Protection of own patent
c) Availability of vendors d) Less production volume

3) Carrying out repairs on the day of weekly off is an example of _____.
a) predictive maintenance b) routine maintenance
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a) Condition Based Monitoring
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5) Usually, which of the following is the least for an asset?
a) useful life b) physical life
c) economic life d) ownership life

6) Color of a refrigerator adds to its _____.
a) functional value b) exchange value
c) scrap value d) esteem value

7) Raising funds for a project is covered in _____ appraisal.
a) technical b) economic
c) financial d) market

8) If demand for a product is elastic, _____.
a) PED=1 b) PED<1
c) PED>1 d) PED=0

9) If two products are complements, their CPED will be _____.
a) positive b) negative
c) zero d) infinity

10) Minimum ceiling price must be _____.
a) above the equilibrium price
b) same as the equilibrium price
c) below the equilibrium price
d) same as production cost

11) Explicit cost is also known as _____.
a) economist's cost b) factory cost
c) prime cost d) accountant's cost

12) Which of the following is an example of indirect material cost for a fabrication shop?
a) cost of steel b) cost of building
c) cost of welding rods d) cost of transportation

13) Additional cost incurred to increase production by one unit is known as _____.
a) sunk cost b) marginal cost
c) incremental cost d) managerial cost

14) Finding the future value from the principal amount is known as _____.
a) annual equivalent method b) present worth method
c) rate of return method d) future worth method

Seat No.	

Set **Q**

Fourth.Y. (B.Tech.) (Mechanical Engineering) (Sem - I) (New) (CBCS)
Examination: March/April - 2026
Business Economics (BTN02710)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Solve any two questions from each section.
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4) Use of scientific calculator is allowed.

SECTION – I

Q.2 **a)** Explain law of demand and determinants of demand. **08**

b) Suresh is currently investing money in a bank account having a nominal 6% interest compounded annually. If he invests Rs. 100000 today, how many years will it take for his account to grow to Rs. 500000? **06**

Q.3 **a)** A company purchases an article at Rs. 12/unit. The rent for the space is Rs. 40000. Articles are sold at Rs. 16/unit. Calculate the number of articles that must be sold, **08**

i) to break even
ii) to earn a profit of Rs. 10000
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iv) if company sells 15000 articles, calculate percentage safety margin.

b) Rachana wants her savings to yield Rs. 600000 at the end of five years. How much should she deposit today if interest rate is fixed at 7% compounded annually. **06**

Q.4 **a)** Explain SRAC & LRAC graphically using ATC curve. **08**

b) Explain graphically, 'Consumer's Surplus' and 'Producer's Surplus'. **06**

SECTION – II

Q.5 **a)** Explain various functional aspects of make or buy decision. **08**

b) Explain the stepwise procedure of value engineering. **06**

Q.6 **a)** Describe various types of maintenance practices with suitable examples. **08**

b) Define 'project' and explain various types of project appraisals. **06**

Q.7 **a)** What do you mean by design modification and why is it needed? **08**

b) Explain the following terms for an asset. **06**

i) challenger
ii) defender
iii) economic life

Seat No.	

Set **R**

Fourth.Y. (B.Tech.) (Mechanical Engineering) (Sem - I) (New) (CBCS) Examination: March/April - 2026
Business Economics (BTN02710)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page No. 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper Set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume additional suitable data if necessary and state it clearly.
5) Use of scientific calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) C.B.M. stands for _____.
a) Condition Based Monitoring
b) Cost of Breakdown Maintenance
c) Cost Benefit Management
d) Cost Based Maintenance

2) Usually, which of the following is the least for an asset?
a) useful life b) physical life
c) economic life d) ownership life

3) Color of a refrigerator adds to its _____.
a) functional value b) exchange value
c) scrap value d) esteem value

4) Raising funds for a project is covered in _____ appraisal.
a) technical b) economic
c) financial d) market

5) If demand for a product is elastic, _____.
a) PED=1 b) PED<1
c) PED>1 d) PED=0

6) If two products are complements, their CPED will be _____.
a) positive b) negative
c) zero d) infinity

7) Minimum ceiling price must be _____.
a) above the equilibrium price
b) same as the equilibrium price
c) below the equilibrium price
d) same as production cost

8) Explicit cost is also known as _____.
a) economist's cost
b) factory cost
c) prime cost
d) accountant's cost

9) Which of the following is an example of indirect material cost for a fabrication shop?
a) cost of steel
b) cost of building
c) cost of welding rods
d) cost of transportation

10) Additional cost incurred to increase production by one unit is known as _____.
a) sunk cost
b) marginal cost
c) incremental cost
d) managerial cost

11) Finding the future value from the principal amount is known as _____.
a) annual equivalent method
b) present worth method
c) rate of return method
d) future worth method

12) Replacing copper by aluminium is an example of _____.
a) raw material substitution
b) product modification
c) process modification
d) design modification

13) _____ favours 'make' decision.
a) Higher fixed cost
b) Protection of own patent
c) Availability of vendors
d) Less production volume

14) Carrying out repairs on the day of weekly off is an example of _____.
a) predictive maintenance
b) routine maintenance
c) breakdown maintenance
d) opportunistic maintenance

Seat No.	

Set **R**

Fourth.Y. (B.Tech.) (Mechanical Engineering) (Sem - I) (New) (CBCS)
Examination: March/April - 2026
Business Economics (BTN02710)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Solve any two questions from each section.
2) Figures to right indicate full marks.
3) Assume additional suitable data if necessary and state it clearly.
4) Use of scientific calculator is allowed.

SECTION – I

Q.2 **a)** Explain law of demand and determinants of demand. **08**

b) Suresh is currently investing money in a bank account having a nominal 6% interest compounded annually. If he invests Rs. 100000 today, how many years will it take for his account to grow to Rs. 500000? **06**

Q.3 **a)** A company purchases an article at Rs. 12/unit. The rent for the space is Rs. 40000. Articles are sold at Rs. 16/unit. Calculate the number of articles that must be sold, **08**

i) to break even
ii) to earn a profit of Rs. 10000
iii) to incur a loss of Rs. 4000
iv) if company sells 15000 articles, calculate percentage safety margin.

b) Rachana wants her savings to yield Rs. 600000 at the end of five years. How much should she deposit today if interest rate is fixed at 7% compounded annually. **06**

Q.4 **a)** Explain SRAC & LRAC graphically using ATC curve. **08**

b) Explain graphically, 'Consumer's Surplus' and 'Producer's Surplus'. **06**

SECTION – II

Q.5 **a)** Explain various functional aspects of make or buy decision. **08**

b) Explain the stepwise procedure of value engineering. **06**

Q.6 **a)** Describe various types of maintenance practices with suitable examples. **08**

b) Define 'project' and explain various types of project appraisals. **06**

Q.7 **a)** What do you mean by design modification and why is it needed? **08**

b) Explain the following terms for an asset. **06**

i) challenger
ii) defender
iii) economic life

SLR-QH-377

Seat No.		Set	S

Fourth.Y. (B.Tech.) (Mechanical Engineering) (Sem - I) (New) (CBCS) Examination: March/April - 2026
Business Economics (BTN02710)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page No. 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper Set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume additional suitable data if necessary and state it clearly.
5) Use of scientific calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. 14

1) Additional cost incurred to increase production by one unit is known as _____.
a) sunk cost b) marginal cost
c) incremental cost d) managerial cost

2) Finding the future value from the principal amount is known as _____.
a) annual equivalent method b) present worth method
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4) _____ favours 'make' decision.
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5) Carrying out repairs on the day of weekly off is an example of _____.
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c) PED>1 d) PED=0

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12) Minimum ceiling price must be _____.
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b) same as the equilibrium price
c) below the equilibrium price
d) same as production cost

13) Explicit cost is also known as _____.
a) economist's cost b) factory cost
c) prime cost d) accountant's cost

14) Which of the following is an example of indirect material cost for a fabrication shop?
a) cost of steel b) cost of building
c) cost of welding rods d) cost of transportation

Seat No.	

Set | S

Fourth.Y. (B.Tech.) (Mechanical Engineering) (Sem - I) (New) (CBCS)
Examination: March/April - 2026
Business Economics (BTN02710)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Solve any two questions from each section.
2) Figures to right indicate full marks.
3) Assume additional suitable data if necessary and state it clearly.
4) Use of scientific calculator is allowed.

SECTION – I

Q.2 **a)** Explain law of demand and determinants of demand. **08**

b) Suresh is currently investing money in a bank account having a nominal 6% interest compounded annually. If he invests Rs. 100000 today, how many years will it take for his account to grow to Rs. 500000? **06**

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i) to break even
ii) to earn a profit of Rs. 10000
iii) to incur a loss of Rs. 4000
iv) if company sells 15000 articles, calculate percentage safety margin.

b) Rachana wants her savings to yield Rs. 600000 at the end of five years. How much should she deposit today if interest rate is fixed at 7% compounded annually. **06**

Q.4 **a)** Explain SRAC & LRAC graphically using ATC curve. **08**

b) Explain graphically, 'Consumer's Surplus' and 'Producer's Surplus'. **06**

SECTION – II

Q.5 **a)** Explain various functional aspects of make or buy decision. **08**

b) Explain the stepwise procedure of value engineering. **06**

Q.6 **a)** Describe various types of maintenance practices with suitable examples. **08**

b) Define 'project' and explain various types of project appraisals. **06**

Q.7 **a)** What do you mean by design modification and why is it needed? **08**

b) Explain the following terms for an asset. **06**

i) challenger
ii) defender
iii) economic life

SLR-QH-378

Seat No.	

Set P

Fourth.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Advanced Topics in Robotics (BTN02718)

Day & Date: Monday, 11-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Select the correct alternative: **14**

1) In which industries are collaborative robots (cobots) expected to play a pivotal role in the future?
a) Agriculture and farming b) Construction and mining
c) Entertainment and Gaming d) Manufacturing and healthcare

2) The service industry is a promising area for robots in tasks like _____.
a) By providing personalized human interaction
b) By replacing human workers
c) By operating exclusively in back-end operation
d) By avoiding customer interaction

3) Which of the following is NOT a consideration in work cell design?
a) Work flow efficiency b) Safety features
c) Robot color d) Accessibility for maintenance

4) Unmanned Ground Vehicles (UGV) are primarily designed for _____.
a) Aerial surveillance
b) Underwater exploration
c) Ground-based tasks without human intervention
d) Space exploration

5) What does HMI stand for in the context of robotics?
a) Human Machine Integration b) Human Machine Interface
c) Human Machine Inhibitor d) Human Machine Insulator

6) The HMI in a robot cell serves as _____.
a) A complex interface requiring extensive coding knowledge
b) An operator interface for controlling and monitoring the cell
c) A separate system for robot programming only
d) A visual representation of the robot's internal code

7) Slip in the context of WMR refers to _____.
a) Smoot motion on flat surfaces
b) The loss of traction and wheel slippage
c) Precise positioning on uneven terrain
d) Reducing the wheel diameter

8) For arc welding operation, _____ control is preferred.
a) Pont-to-point b) Continuous
c) Real-time d) Offline

9) A suitable robot for material handling tasks should have ____.
a) High precision and dexterity
b) High reach and payload capacity
c) Advanced vision system
d) All of the above

10) In ROI method of economic analysis, the rate of return is compared with _____.
a) Bank interest on FD b) Bank Interest on Loan
c) MARR d) EUAC

11) MARR stands for _____ in economic analysis.
a) Mean Annual Rate of Return
b) Minimum Annual Rate of Return
c) Minimum Attractive Rate of Return
d) Maximum Annual Rate of Return

12) What should organizations consider when planning and engineering the installation of robotics systems?
a) Ignoring the need for ongoing maintenance
b) Ensuring the system's compatibility with existing infrastructure
c) Reducing investment in training and skill development
d) Maximizing complexity without regard for system reliability

13) _____ maintenance of robot is the case when the maintenance is done at periodic intervals.
a) Preventive b) Predictive
c) Remedial d) All of the above

14) If the EUAC sum is less than zero, then _____
a) The project is likely to be funded
b) Project is unattractive for funding
c) No relation between funding and EUAC
d) None of these

Seat No.	

Set **P**

Fourth.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April-2026
Advanced Topics in Robotics (BTN02718)

Day & Date: Monday, 11-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Answer any Two questions from each section.
2) Figures to the right indicates full marks.
3) Use of a non-programmable scientific calculator is allowed.
4) Assume suitable data if necessary.

SECTION – I

Q.2 Attempt Following Questions.

a) Elaborate more on the characteristics of “Future Robot” tasks assessing the feasibility of deploying them. **07**

b) Explore the concept of collaborative robotics (cobots) and its role in enabling robots to work alongside humans in shared workspaces. Discuss the benefits and challenges of human-robot collaboration in different industries. **07**

Q.3 Attempt Following Questions.

a) Compare and contrast lead-through programming, walk-through programming, and offline programming techniques for teaching robots new tasks and trajectories. Discuss the advantages and limitations of each programming method in terms of ease of use, programming time, and flexibility. Provide examples of real-world applications where each programming approach is commonly employed. **07**

b) Compare and contrast the different types of robot cell layouts. **07**

Q.4 Attempt Following Questions.

a) Define Mobile robots and enlist the types of land-based mobile robots. Explain the key issues for the locomotion of mobile robots. **07**

b) What is slip in the context of WMR? Model the WMR for rolling without slip on flat terrain. **07**

SECTION – II

Q.5 Attempt Following Questions.

a) Elaborate on the features of the arc welding robot. **07**

b) Enlist the potential hazards faced by human operator during spray coating. Explain how a robot can solve this problem stating the advantages of robot for spray coating. **07**

Q.6 Attempt Following Questions.

a) Prepare a checklist for workforce acceptance to assess the potential for successfully implementing robotics in plant. **06**

b) A robot installation project has an initial cost of $1,00,000 and expected annual costs for operation and maintenance are estimated to be $24,000. The project is expected to generate revenues of $60,000 annually for four years, at which time the project will be retired. The estimated salvage value of the robot at the end of 4 years is $ 30,000 **08**

i) Determine the payback period for the project.
ii) Determine the Equivalent uniform annual cost for the project using a 25% MARR.
iii) Determine the expected Return on investment to be derived from the investment.

Evaluate by all the methods separately, whether the robot project is economically feasible.

Given: Capital recovery factor and Sinking fund factor for 4 years are given below for various interest rates.

Interest Rates (%)	Capital Recovery factor	Sinking Fund factor
20	0.3863	0.1863
25	0.4234	0.1734
30	0.4616	0.1616
35	0.5008	0.1508

Q.7 Attempt Following Questions.

a) What are the general characteristics during plant survey that would make a potential robot application technically practical and economically feasible? **06**

b) The cost of the robot is $60,000 and the user company wants to establish an optimum level of spare parts inventory. The company knows which components of robot are likely to fail and it wants to build its spare parts to a stock level at which total cost of inventory plus lost total production time is minimized. When a breakdown occurs, the repair time will average 3 hours if the required spare part is available. If it is not available, it will lose an average of 15 hours of production while the part is being ordered and delivered. In addition, rush delivery of the part will cost $50 per order. The company estimates that the cost of downtime is $150 per hour. The robot operates one shift per day of 8 hours for 250 days per year. The mean time between failure is 250 hours. The cost of inventory is 15% per year of the value of spare parts in stock. The following level indicates various alternative spare parts level and the corresponding probability that the robot can be repaired using parts available in stock. **08**

Spare Parts level ($)	Pr (Coverage)	Pr (No coverage)
0	0	1
5000	0.25	0.75
10000	0.4	0.6
20000	0.65	0.35
30000	0.8	0.2
40000	0.9	0.1
60000	1	0

i) Based on the data provided, determine the optimum level of spare parts inventory to maintain.

ii) At the level of inventory determined in part (a), determine the 'availability' of the robot.

Seat No.	

Set **Q**

Fourth.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April-2026
Advanced Topics in Robotics (BTN02718)

Day & Date: Monday, 11-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Select the correct alternative: **14**

1) For arc welding operation, _____ control is preferred.
a) Pont-to-point b) Continuous
c) Real-time d) Offline

2) A suitable robot for material handling tasks should have ____.
a) High precision and dexterity
b) High reach and payload capacity
c) Advanced vision system
d) All of the above

3) In ROI method of economic analysis, the rate of return is compared with _____.
a) Bank interest on FD b) Bank Interest on Loan
c) MARR d) EUAC

4) MARR stands for _____ in economic analysis.
a) Mean Annual Rate of Return
b) Minimum Annual Rate of Return
c) Minimum Attractive Rate of Return
d) Maximum Annual Rate of Return

5) What should organizations consider when planning and engineering the installation of robotics systems?
a) Ignoring the need for ongoing maintenance
b) Ensuring the system's compatibility with existing infrastructure
c) Reducing investment in training and skill development
d) Maximizing complexity without regard for system reliability

6) _____ maintenance of robot is the case when the maintenance is done at periodic intervals.
a) Preventive
b) Predictive
c) Remedial
d) All of the above

7) If the EUAC sum is less than zero, then _____
a) The project is likely to be funded
b) Project is unattractive for funding
c) No relation between funding and EUAC
d) None of these

8) In which industries are collaborative robots (cobots) expected to play a pivotal role in the future?
a) Agriculture and farming
b) Construction and mining
c) Entertainment and Gaming
d) Manufacturing and healthcare

9) The service industry is a promising area for robots in tasks like _____.
a) By providing personalized human interaction
b) By replacing human workers
c) By operating exclusively in back-end operation
d) By avoiding customer interaction

10) Which of the following is NOT a consideration in work cell design?
a) Work flow efficiency
b) Safety features
c) Robot color
d) Accessibility for maintenance

11) Unmanned Ground Vehicles (UGV) are primarily designed for _____.
a) Aerial surveillance
b) Underwater exploration
c) Ground-based tasks without human intervention
d) Space exploration

12) What does HMI stand for in the context of robotics?
a) Human Machine Integration
b) Human Machine Interface
c) Human Machine Inhibitor
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13) The HMI in a robot cell serves as _____.
a) A complex interface requiring extensive coding knowledge
b) An operator interface for controlling and monitoring the cell
c) A separate system for robot programming only
d) A visual representation of the robot's internal code

14) Slip in the context of WMR refers to _____.
a) Smoot motion on flat surfaces
b) The loss of traction and wheel slippage
c) Precise positioning on uneven terrain
d) Reducing the wheel diameter

Seat No.	

Set **Q**

Fourth.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April-2026
Advanced Topics in Robotics (BTN02718)

Day & Date: Monday, 11-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Answer any Two questions from each section.
2) Figures to the right indicates full marks.
3) Use of a non-programmable scientific calculator is allowed.
4) Assume suitable data if necessary.

SECTION – I

Q.2 Attempt Following Questions.

a) Elaborate more on the characteristics of “Future Robot” tasks assessing the feasibility of deploying them. **07**

b) Explore the concept of collaborative robotics (cobots) and its role in enabling robots to work alongside humans in shared workspaces. Discuss the benefits and challenges of human-robot collaboration in different industries. **07**

Q.3 Attempt Following Questions.

a) Compare and contrast lead-through programming, walk-through programming, and offline programming techniques for teaching robots new tasks and trajectories. Discuss the advantages and limitations of each programming method in terms of ease of use, programming time, and flexibility. Provide examples of real-world applications where each programming approach is commonly employed. **07**

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b) What is slip in the context of WMR? Model the WMR for rolling without slip on flat terrain. **07**

SECTION – II

Q.5 Attempt Following Questions.

a) Elaborate on the features of the arc welding robot. **07**

b) Enlist the potential hazards faced by human operator during spray coating. Explain how a robot can solve this problem stating the advantages of robot for spray coating. **07**

Q.6 Attempt Following Questions.

a) Prepare a checklist for workforce acceptance to assess the potential for successfully implementing robotics in plant. **06**

b) A robot installation project has an initial cost of $1,00,000 and expected annual costs for operation and maintenance are estimated to be $24,000. The project is expected to generate revenues of $60,000 annually for four years, at which time the project will be retired. The estimated salvage value of the robot at the end of 4 years is $ 30,000 **08**

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Evaluate by all the methods separately, whether the robot project is economically feasible.

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20000	0.65	0.35
30000	0.8	0.2
40000	0.9	0.1
60000	1	0

i) Based on the data provided, determine the optimum level of spare parts inventory to maintain.

ii) At the level of inventory determined in part (a), determine the 'availability' of the robot.

Seat No.	

Set **R**

Fourth.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April-2026
Advanced Topics in Robotics (BTN02718)

Day & Date: Monday, 11-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Select the correct alternative: **14**

1) MARR stands for _____ in economic analysis.
a) Mean Annual Rate of Return
b) Minimum Annual Rate of Return
c) Minimum Attractive Rate of Return
d) Maximum Annual Rate of Return

2) What should organizations consider when planning and engineering the installation of robotics systems?
a) Ignoring the need for ongoing maintenance
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a) Preventive b) Predictive
c) Remedial d) All of the above

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b) Project is unattractive for funding
c) No relation between funding and EUAC
d) None of these

5) In which industries are collaborative robots (cobots) expected to play a pivotal role in the future?
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d) Accessibility for maintenance

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12) For arc welding operation, _____ control is preferred.
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b) Continuous
c) Real-time
d) Offline

13) A suitable robot for material handling tasks should have ____.
a) High precision and dexterity
b) High reach and payload capacity
c) Advanced vision system
d) All of the above

14) In ROI method of economic analysis, the rate of return is compared with _____.
a) Bank interest on FD
b) Bank Interest on Loan
c) MARR
d) EUAC

Seat No.	

Set **R**

Fourth.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April-2026
Advanced Topics in Robotics (BTN02718)

Day & Date: Monday, 11-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Answer any Two questions from each section.
2) Figures to the right indicates full marks.
3) Use of a non-programmable scientific calculator is allowed.
4) Assume suitable data if necessary.

SECTION – I

Q.2 Attempt Following Questions.

a) Elaborate more on the characteristics of “Future Robot” tasks assessing the feasibility of deploying them. **07**

b) Explore the concept of collaborative robotics (cobots) and its role in enabling robots to work alongside humans in shared workspaces. Discuss the benefits and challenges of human-robot collaboration in different industries. **07**

Q.3 Attempt Following Questions.

a) Compare and contrast lead-through programming, walk-through programming, and offline programming techniques for teaching robots new tasks and trajectories. Discuss the advantages and limitations of each programming method in terms of ease of use, programming time, and flexibility. Provide examples of real-world applications where each programming approach is commonly employed. **07**

b) Compare and contrast the different types of robot cell layouts. **07**

Q.4 Attempt Following Questions.

a) Define Mobile robots and enlist the types of land-based mobile robots. Explain the key issues for the locomotion of mobile robots. **07**

b) What is slip in the context of WMR? Model the WMR for rolling without slip on flat terrain. **07**

SECTION – II

Q.5 Attempt Following Questions.

a) Elaborate on the features of the arc welding robot. **07**

b) Enlist the potential hazards faced by human operator during spray coating. Explain how a robot can solve this problem stating the advantages of robot for spray coating. **07**

Q.6 Attempt Following Questions.

a) Prepare a checklist for workforce acceptance to assess the potential for successfully implementing robotics in plant. **06**

b) A robot installation project has an initial cost of $1,00,000 and expected annual costs for operation and maintenance are estimated to be $24,000. The project is expected to generate revenues of $60,000 annually for four years, at which time the project will be retired. The estimated salvage value of the robot at the end of 4 years is $ 30,000 **08**

i) Determine the payback period for the project.
ii) Determine the Equivalent uniform annual cost for the project using a 25% MARR.
iii) Determine the expected Return on investment to be derived from the investment.

Evaluate by all the methods separately, whether the robot project is economically feasible.

Given: Capital recovery factor and Sinking fund factor for 4 years are given below for various interest rates.

Interest Rates (%)	Capital Recovery factor	Sinking Fund factor
20	0.3863	0.1863
25	0.4234	0.1734
30	0.4616	0.1616
35	0.5008	0.1508

Q.7 Attempt Following Questions.

a) What are the general characteristics during plant survey that would make a potential robot application technically practical and economically feasible? **06**

b) The cost of the robot is $60,000 and the user company wants to establish an optimum level of spare parts inventory. The company knows which components of robot are likely to fail and it wants to build its spare parts to a stock level at which total cost of inventory plus lost total production time is minimized. When a breakdown occurs, the repair time will average 3 hours if the required spare part is available. If it is not available, it will lose an average of 15 hours of production while the part is being ordered and delivered. In addition, rush delivery of the part will cost $50 per order. The company estimates that the cost of downtime is $150 per hour. The robot operates one shift per day of 8 hours for 250 days per year. The mean time between failure is 250 hours. The cost of inventory is 15% per year of the value of spare parts in stock. The following level indicates various alternative spare parts level and the corresponding probability that the robot can be repaired using parts available in stock. **08**

Spare Parts level ($)	Pr (Coverage)	Pr (No coverage)
0	0	1
5000	0.25	0.75
10000	0.4	0.6
20000	0.65	0.35
30000	0.8	0.2
40000	0.9	0.1
60000	1	0

i) Based on the data provided, determine the optimum level of spare parts inventory to maintain.

ii) At the level of inventory determined in part (a), determine the 'availability' of the robot.

SLR-QH-378

Seat No.	

Set S

Fourth.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April-2026
Advanced Topics in Robotics (BTN02718)

Day & Date: Monday, 11-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Select the correct alternative: **14**

1) The HMI in a robot cell serves as _____.
a) A complex interface requiring extensive coding knowledge
b) An operator interface for controlling and monitoring the cell
c) A separate system for robot programming only
d) A visual representation of the robot's internal code

2) Slip in the context of WMR refers to _____.
a) Smoot motion on flat surfaces
b) The loss of traction and wheel slippage
c) Precise positioning on uneven terrain
d) Reducing the wheel diameter

3) For arc welding operation, _____ control is preferred.
a) Pont-to-point b) Continuous
c) Real-time d) Offline

4) A suitable robot for material handling tasks should have ____.
a) High precision and dexterity
b) High reach and payload capacity
c) Advanced vision system
d) All of the above

5) In ROI method of economic analysis, the rate of return is compared with _____.
a) Bank interest on FD b) Bank Interest on Loan
c) MARR d) EUAC

6) MARR stands for _____ in economic analysis.
a) Mean Annual Rate of Return
b) Minimum Annual Rate of Return
c) Minimum Attractive Rate of Return
d) Maximum Annual Rate of Return

7) What should organizations consider when planning and engineering the installation of robotics systems?
a) Ignoring the need for ongoing maintenance
b) Ensuring the system's compatibility with existing infrastructure
c) Reducing investment in training and skill development
d) Maximizing complexity without regard for system reliability

8) _____ maintenance of robot is the case when the maintenance is done at periodic intervals.
a) Preventive
b) Predictive
c) Remedial
d) All of the above

9) If the EUAC sum is less than zero, then _____
a) The project is likely to be funded
b) Project is unattractive for funding
c) No relation between funding and EUAC
d) None of these

10) In which industries are collaborative robots (cobots) expected to play a pivotal role in the future?
a) Agriculture and farming
b) Construction and mining
c) Entertainment and Gaming
d) Manufacturing and healthcare

11) The service industry is a promising area for robots in tasks like _____.
a) By providing personalized human interaction
b) By replacing human workers
c) By operating exclusively in back-end operation
d) By avoiding customer interaction

12) Which of the following is NOT a consideration in work cell design?
a) Work flow efficiency
b) Safety features
c) Robot color
d) Accessibility for maintenance

13) Unmanned Ground Vehicles (UGV) are primarily designed for _____.
a) Aerial surveillance
b) Underwater exploration
c) Ground-based tasks without human intervention
d) Space exploration

14) What does HMI stand for in the context of robotics?
a) Human Machine Integration
b) Human Machine Interface
c) Human Machine Inhibitor
d) Human Machine Insulator

Seat No.	

Set **S**

Fourth.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April-2026
Advanced Topics in Robotics (BTN02718)

Day & Date: Monday, 11-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Answer any Two questions from each section.
2) Figures to the right indicates full marks.
3) Use of a non-programmable scientific calculator is allowed.
4) Assume suitable data if necessary.

SECTION – I

Q.2 Attempt Following Questions.

a) Elaborate more on the characteristics of “Future Robot” tasks assessing the feasibility of deploying them. **07**

b) Explore the concept of collaborative robotics (cobots) and its role in enabling robots to work alongside humans in shared workspaces. Discuss the benefits and challenges of human-robot collaboration in different industries. **07**

Q.3 Attempt Following Questions.

a) Compare and contrast lead-through programming, walk-through programming, and offline programming techniques for teaching robots new tasks and trajectories. Discuss the advantages and limitations of each programming method in terms of ease of use, programming time, and flexibility. Provide examples of real-world applications where each programming approach is commonly employed. **07**

b) Compare and contrast the different types of robot cell layouts. **07**

Q.4 Attempt Following Questions.

a) Define Mobile robots and enlist the types of land-based mobile robots. Explain the key issues for the locomotion of mobile robots. **07**

b) What is slip in the context of WMR? Model the WMR for rolling without slip on flat terrain. **07**

SECTION – II

Q.5 Attempt Following Questions.

a) Elaborate on the features of the arc welding robot. **07**

b) Enlist the potential hazards faced by human operator during spray coating. Explain how a robot can solve this problem stating the advantages of robot for spray coating. **07**

Q.6 Attempt Following Questions.

a) Prepare a checklist for workforce acceptance to assess the potential for successfully implementing robotics in plant. **06**

b) A robot installation project has an initial cost of $1,00,000 and expected annual costs for operation and maintenance are estimated to be $24,000. The project is expected to generate revenues of $60,000 annually for four years, at which time the project will be retired. The estimated salvage value of the robot at the end of 4 years is $ 30,000 **08**

i) Determine the payback period for the project.
ii) Determine the Equivalent uniform annual cost for the project using a 25% MARR.
iii) Determine the expected Return on investment to be derived from the investment.

Evaluate by all the methods separately, whether the robot project is economically feasible.

Given: Capital recovery factor and Sinking fund factor for 4 years are given below for various interest rates.

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Q.7 Attempt Following Questions.

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b) The cost of the robot is $60,000 and the user company wants to establish an optimum level of spare parts inventory. The company knows which components of robot are likely to fail and it wants to build its spare parts to a stock level at which total cost of inventory plus lost total production time is minimized. When a breakdown occurs, the repair time will average 3 hours if the required spare part is available. If it is not available, it will lose an average of 15 hours of production while the part is being ordered and delivered. In addition, rush delivery of the part will cost $50 per order. The company estimates that the cost of downtime is $150 per hour. The robot operates one shift per day of 8 hours for 250 days per year. The mean time between failure is 250 hours. The cost of inventory is 15% per year of the value of spare parts in stock. The following level indicates various alternative spare parts level and the corresponding probability that the robot can be repaired using parts available in stock. **08**

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10000	0.4	0.6
20000	0.65	0.35
30000	0.8	0.2
40000	0.9	0.1
60000	1	0

i) Based on the data provided, determine the optimum level of spare parts inventory to maintain.

ii) At the level of inventory determined in part (a), determine the 'availability' of the robot.

SLR-QH-379

Seat No.	

Set P

Fourth. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Advanced Topics on 3D Printing (BTN02719)

Day & Date: Monday, 11-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top on page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.
5) Use of scientific calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answers. 14

1) What does CAD stand for?
a) Computer-Aided Design
b) Computer-Aided Development
c) Computer-Activated Drawing
d) Computer-Appointed Diagram

2) In feature-based 3D CAD modeling, what are "features"?
a) Specific design elements with no parametric relations
b) Geometric shapes that cannot be edited
c) Parametric design elements like holes, fillets, and extrusions
d) 3D scans of physical objects

3) What is the primary goal of Rapid Tooling?
a) To produce high-quality, long-lasting molds
b) To create functional prototypes quickly
c) To handcraft tools for manufacturing
d) To minimize the use of technology in tooling

4) Rapid Tooling is often used in which phase of product development?
a) Conceptual design b) Mass production
c) Market research d) Distribution

5) Which of the following is NOT a key advantage of Rapid Tooling?
a) Cost-effectiveness b) High tool durability
c) Short lead times d) Increased design flexibility

6) What does “STL” stand for in the context of 3D printing?
a) Stereolithography
b) Standard Triangle Language
c) Structured Text Language
d) Solid Transition Layer

7) What is the primary purpose of an STL file in 3D printing?
a) Storing color information for 3D models
b) Defining the dimensions of a 3D printer
c) Describing the geometry of a 3D object
d) Managing printer firmware

8) What is post-processing in the context of 3D printing?
a) The initial setup of a 3D printer
b) The process of designing 3D models
c) Additional treatments or finishing steps after 3D printing
d) The method of slicing 3D models for printing

9) Which phase of 3D printing involves post-processing?
a) Modeling
b) Printing
c) Design
d) Finishing

10) What is the primary goal of automation in manufacturing?
a) Reduce workforce
b) Increase production speed and efficiency
c) Decrease product quality
d) Increase manual labour

11) Which of the following is an example of a basic automated process?
a) Handcrafting
b) 3D printing
c) Wood carving
d) Sewing by hand

12) What is the purpose of 3D CAD modeling in the manufacturing process?
a) Creating physical prototypes
b) Designing user interfaces
c) Modeling 2D graphics
d) Drafting blueprints

13) Which 3D printing technology is associated with the acronym “SLA”?
a) Solid Ground Curing (SGC) System
b) Solid Creation System
c) 3D Systems SLA
d) EOS’ Stereos System

14) What does “SGC” stand for in 3D printing technology?
a) Solid Ground Curing
b) Solid Creation System
c) Stereolithography
d) Selective Laser Sintering

SLR-QH-379

Seat No.	

Set P

Fourth. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Advanced Topics on 3D Printing (BTN02719)

Day & Date: Monday, 11-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No.2 and Q. No.6 are compulsory.
2) Solve any two from Q. No. 3 to Q. No. 5 and Q. No. 7 to Q. No. 9 questions from each section.
3) Assume suitable data if required.
4) Use of scientific calculator is allowed.
5) Figure to the right indicates full marks.

SECTION – I

Q.2 Enlist the types of 3D printing technologies and illustrate any 01 with neat sketch. **10**

Q.3 Compare Automated processes in w.r.t. 3D printing. **09**

Q.4 Elaborate the Stratasys's Fused Deposition Modeling process with applications. **09**

Q.5 Discuss Feature based 3D CAD modeling. **09**

SECTION – II

Q.6 Enlist different types of Indirect tooling. Explain any 01 with neat sketch. **10**

Q.7 What is meant by Rapid Tooling? Discuss Architecture of Rapid Tooling Integrated Manufacturing system. **09**

Q.8 Discuss common errors in CAD to STL conversion. **09**

Q.9 Describe techniques for improvement in surface finish and geometry in 3D Printing. **09**

SLR-QH-379

Seat No.	

Set Q

Fourth. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Advanced Topics on 3D Printing (BTN02719)

Day & Date: Monday, 11-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top on page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.
5) Use of scientific calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answers. 14

1) What is post-processing in the context of 3D printing?
a) The initial setup of a 3D printer
b) The process of designing 3D models
c) Additional treatments or finishing steps after 3D printing
d) The method of slicing 3D models for printing

2) Which phase of 3D printing involves post-processing?
a) Modeling b) Printing
c) Design d) Finishing

3) What is the primary goal of automation in manufacturing?
a) Reduce workforce
b) Increase production speed and efficiency
c) Decrease product quality
d) Increase manual labour

4) Which of the following is an example of a basic automated process?
a) Handcrafting b) 3D printing
c) Wood carving d) Sewing by hand

5) What is the purpose of 3D CAD modeling in the manufacturing process?
a) Creating physical prototypes b) Designing user interfaces
c) Modeling 2D graphics d) Drafting blueprints

6) Which 3D printing technology is associated with the acronym “SLA”?
   a) Solid Ground Curing (SGC) System
   b) Solid Creation System
   c) 3D Systems SLA
   d) EOS’ Stereos System

7) What does “SGC” stand for in 3D printing technology?
   a) Solid Ground Curing
   b) Solid Creation System
   c) Stereolithography
   d) Selective Laser Sintering

8) What does CAD stand for?
   a) Computer-Aided Design
   b) Computer-Aided Development
   c) Computer-Activated Drawing
   d) Computer-Appointed Diagram

9) In feature-based 3D CAD modeling, what are “features”?
   a) Specific design elements with no parametric relations
   b) Geometric shapes that cannot be edited
   c) Parametric design elements like holes, fillets, and extrusions
   d) 3D scans of physical objects

10) What is the primary goal of Rapid Tooling?
   a) To produce high-quality, long-lasting molds
   b) To create functional prototypes quickly
   c) To handcraft tools for manufacturing
   d) To minimize the use of technology in tooling

11) Rapid Tooling is often used in which phase of product development?
   a) Conceptual design
   b) Mass production
   c) Market research
   d) Distribution

12) Which of the following is NOT a key advantage of Rapid Tooling?
   a) Cost-effectiveness
   b) High tool durability
   c) Short lead times
   d) Increased design flexibility

13) What does “STL” stand for in the context of 3D printing?
   a) Stereolithography
   b) Standard Triangle Language
   c) Structured Text Language
   d) Solid Transition Layer

14) What is the primary purpose of an STL file in 3D printing?
   a) Storing color information for 3D models
   b) Defining the dimensions of a 3D printer
   c) Describing the geometry of a 3D object
   d) Managing printer firmware

Seat No.	

Set **Q**

Fourth. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Advanced Topics on 3D Printing (BTN02719)

Day & Date: Monday, 11-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No.2 and Q. No.6 are compulsory.
2) Solve any two from Q. No. 3 to Q. No. 5 and Q. No. 7 to Q. No. 9 questions from each section.
3) Assume suitable data if required.
4) Use of scientific calculator is allowed.
5) Figure to the right indicates full marks.

SECTION – I

Q.2 Enlist the types of 3D printing technologies and illustrate any 01 with neat sketch. **10**

Q.3 Compare Automated processes in w.r.t. 3D printing. **09**

Q.4 Elaborate the Stratasys's Fused Deposition Modeling process with applications. **09**

Q.5 Discuss Feature based 3D CAD modeling. **09**

SECTION – II

Q.6 Enlist different types of Indirect tooling. Explain any 01 with neat sketch. **10**

Q.7 What is meant by Rapid Tooling? Discuss Architecture of Rapid Tooling Integrated Manufacturing system. **09**

Q.8 Discuss common errors in CAD to STL conversion. **09**

Q.9 Describe techniques for improvement in surface finish and geometry in 3D Printing. **09**

Seat No.	

Set **R**

Fourth. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Advanced Topics on 3D Printing (BTN02719)

Day & Date: Monday, 11-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top on page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.
5) Use of scientific calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answers. **14**

1) Which of the following is an example of a basic automated process?
a) Handcrafting b) 3D printing
c) Wood carving d) Sewing by hand

2) What is the purpose of 3D CAD modeling in the manufacturing process?
a) Creating physical prototypes b) Designing user interfaces
c) Modeling 2D graphics d) Drafting blueprints

3) Which 3D printing technology is associated with the acronym "SLA"?
a) Solid Ground Curing (SGC) System
b) Solid Creation System
c) 3D Systems SLA
d) EOS' Stereos System

4) What does "SGC" stand for in 3D printing technology?
a) Solid Ground Curing b) Solid Creation System
c) Stereolithography d) Selective Laser Sintering

5) What does CAD stand for?
a) Computer-Aided Design
b) Computer-Aided Development
c) Computer-Activated Drawing
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6) In feature-based 3D CAD modeling, what are “features”?
   a) Specific design elements with no parametric relations
   b) Geometric shapes that cannot be edited
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7) What is the primary goal of Rapid Tooling?
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8) Rapid Tooling is often used in which phase of product development?
   a) Conceptual design
   b) Mass production
   c) Market research
   d) Distribution

9) Which of the following is NOT a key advantage of Rapid Tooling?
   a) Cost-effectiveness
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10) What does “STL” stand for in the context of 3D printing?
   a) Stereolithography
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11) What is the primary purpose of an STL file in 3D printing?
   a) Storing color information for 3D models
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   c) Describing the geometry of a 3D object
   d) Managing printer firmware

12) What is post-processing in the context of 3D printing?
   a) The initial setup of a 3D printer
   b) The process of designing 3D models
   c) Additional treatments or finishing steps after 3D printing
   d) The method of slicing 3D models for printing

13) Which phase of 3D printing involves post-processing?
   a) Modeling
   b) Printing
   c) Design
   d) Finishing

14) What is the primary goal of automation in manufacturing?
   a) Reduce workforce
   b) Increase production speed and efficiency
   c) Decrease product quality
   d) Increase manual labour

Seat No.	

Set **R**

Fourth. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Advanced Topics on 3D Printing (BTN02719)

Day & Date: Monday, 11-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No.2 and Q. No.6 are compulsory.
2) Solve any two from Q. No. 3 to Q. No. 5 and Q. No. 7 to Q. No. 9 questions from each section.
3) Assume suitable data if required.
4) Use of scientific calculator is allowed.
5) Figure to the right indicates full marks.

SECTION – I

Q.2 Enlist the types of 3D printing technologies and illustrate any 01 with neat sketch. **10**

Q.3 Compare Automated processes in w.r.t. 3D printing. **09**

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Q.5 Discuss Feature based 3D CAD modeling. **09**

SECTION – II

Q.6 Enlist different types of Indirect tooling. Explain any 01 with neat sketch. **10**

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Q.8 Discuss common errors in CAD to STL conversion. **09**

Q.9 Describe techniques for improvement in surface finish and geometry in 3D Printing. **09**

Seat No.	

Set **S**

Fourth. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Advanced Topics on 3D Printing (BTN02719)

Day & Date: Monday, 11-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answers. **14**

1) What does "STL" stand for in the context of 3D printing?
a) Stereolithography b) Standard Triangle Language
c) Structured Text Language d) Solid Transition Layer

2) What is the primary purpose of an STL file in 3D printing?
a) Storing color information for 3D models
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a) Modeling b) Printing
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a) Conceptual design
b) Mass production
c) Market research
d) Distribution

14) Which of the following is NOT a key advantage of Rapid Tooling?
a) Cost-effectiveness
b) High tool durability
c) Short lead times
d) Increased design flexibility

SLR-QH-379

Seat No.	

Set S

Fourth. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Advanced Topics on 3D Printing (BTN02719)

Day & Date: Monday, 11-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No.2 and Q. No.6 are compulsory.
2) Solve any two from Q. No. 3 to Q. No. 5 and Q. No. 7 to Q. No. 9 questions from each section.
3) Assume suitable data if required.
4) Use of scientific calculator is allowed.
5) Figure to the right indicates full marks.

SECTION – I

Q.2 Enlist the types of 3D printing technologies and illustrate any 01 with neat sketch. **10**

Q.3 Compare Automated processes in w.r.t. 3D printing. **09**

Q.4 Elaborate the Stratasys's Fused Deposition Modeling process with applications. **09**

Q.5 Discuss Feature based 3D CAD modeling. **09**

SECTION – II

Q.6 Enlist different types of Indirect tooling. Explain any 01 with neat sketch. **10**

Q.7 What is meant by Rapid Tooling? Discuss Architecture of Rapid Tooling Integrated Manufacturing system. **09**

Q.8 Discuss common errors in CAD to STL conversion. **09**

Q.9 Describe techniques for improvement in surface finish and geometry in 3D Printing. **09**

SLR-QH-380

Seat No.	

Set P

Fourth. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Energy Resources, Economics and Environment (BTN02716)

Day & Date: Monday, 11-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) Green House gases are _____.
a) Absorbers of long-wave radiations from earth
b) Transparent to both solar radiations and long-wave radiations from earth
c) Absorbers of solar radiations for warming the atmosphere of earth
d) Transparent to emissions from earth for passage into outer space

2) A coal deposit that is not economical to mine today would be considered part of ours?
a) coal reserves b) coal resources
c) coal reservoirs d) None of these

3) Which is not a source of fresh water?
a) Glaciers and ice sheets b) Groundwater
c) Surface run off d) Oceans

4) National Solar Mission launched in _____.
a) Jan 2011 b) Jan 2023
c) Jan 2022 d) Jan 2010

5) Purpose of "Energy Audit" is to access the nature and extent risk of harm to Human health & Environment?
a) True b) False

6) NPV stands for _____.
a) Net Protect Value b) Net Present value
c) a) & b) d) None of the Above

7) One carbon credit permit emission of One Ton of _____.
a) Petrol b) Coal
c) Diesel d) Co2 or GHG

8) Most of the energy used on earth today originally came from which of these sources _____.
a) The sun b) The Moon
c) Oceans d) Soil

9) Which is the First Solar thermal power plant?
a) Tarapur b) Palodi-Rajasthan
c) Manipur d) Delhi

10) Which is the Following is Environmental impact?
a) Soil damage b) Gas leakage
c) Air pollution d) Temperature

11) Energy Resources which are being used for many decades are known as _____.
a) Conventional energy sources
b) Non-conventional energy sources
c) Primary energy sources
d) Fuel cells

12) World Energy Needs are rising due to _____.
a) Deforestation
b) Increasing population and Industrialization
c) Inflation
d) Natural calamities

13) Kyoto Protocol launched in _____.
a) India b) Japan
c) China d) U.S.

14) Which of these is the major contributor to world pollution?
a) Commercial resources b) Non-Commercial Resources
c) Renewable Resources d) Nuclear Energy

Seat No.	

Set **P**

Fourth. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Energy Resources, Economics and Environment (BTN02716)

Day & Date: Monday, 11-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Attempt any two questions from each section.
2) Assume suitable data, diagrams if required.
3) Use of scientific calculator is allowed.
4) Figures to the right indicates full marks.

SECTION – I

Q.2 Solve:

a) Define energy resources and explain any one type of energy resources. **04**

b) Define Kaya identity & Emission factor of Energy resources. **05**

c) Explain the concept of “Energy Security” in detailed. **05**

Q.3 Solve:

a) Explain in detailed Time value of money discount rate in energy Economics. **04**

b) Explain the Linkage between “Energy & Development. **05**

c) Write a short note on “Global Energy Use in India. **05**

Q.4 Solve:

a) Write a short note on Commercial resources of energy. **04**

b) What is the Net present value? Explain positive & Negative NPV of energy Economics. **05**

c) What is the criteria for assessing Energy Projects? Explain. **05**

SECTION – II

Q.5 Solve:

a) Explain the term “Future Energy demand & Supply. **04**

b) Explain the term “Global Warming.” **05**

c) What is Hoteling rule? Explain the terms “Bioenergy”. **05**

Q.6 Solve:

a) Define Pollution and Explain Types of Pollution in detailed. **04**

b) Write a short note On “Kyoto Protocol” of Energy & Environment. **05**

c) Write a short note on “Climate Change due to greenhouse gas Co2. **05**

Q.7 Solve:

a) Define the term “Energy resource management” and how it will perform for Energy & environment. **04**

b) Explain “Preferences & Utility” of energy. **05**

c) Write a Short note on “Betting on Planet Simons change. **05**

SLR-QH-380

Seat No.	

Set Q

Fourth. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Energy Resources, Economics and Environment (BTN02716)

Day & Date: Monday, 11-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) Most of the energy used on earth today originally came from which of these sources _____.
a) The sun b) The Moon
c) Oceans d) Soil

2) Which is the First Solar thermal power plant?
a) Tarapur b) Palodi-Rajasthan
c) Manipur d) Delhi

3) Which is the Following is Environmental impact?
a) Soil damage b) Gas leakage
c) Air pollution d) Temperature

4) Energy Resources which are being used for many decades are known as _____.
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b) Non-conventional energy sources
c) Primary energy sources
d) Fuel cells

5) World Energy Needs are rising due to _____.
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c) Inflation
d) Natural calamities

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a) India b) Japan
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7) Which of these is the major contributor to world pollution?
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c) Renewable Resources
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9) A coal deposit that is not economical to mine today would be considered part of ours?
a) coal reserves
b) coal resources
c) coal reservoirs
d) None of these

10) Which is not a source of fresh water?
a) Glaciers and ice sheets
b) Groundwater
c) Surface run off
d) Oceans

11) National Solar Mission launched in _____.
a) Jan 2011
b) Jan 2023
c) Jan 2022
d) Jan 2010

12) Purpose of “Energy Audit" is to access the nature and extent risk of harm to Human health & Environment?
a) True
b) False

13) NPV stands for _____.
a) Net Protect Value
b) Net Present value
c) a) & b)
d) None of the Above

14) One carbon credit permit emission of One Ton of _____.
a) Petrol
b) Coal
c) Diesel
d) Co2 or GHG

Seat No.	

Set **Q**

Fourth. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Energy Resources, Economics and Environment (BTN02716)

Day & Date: Monday, 11-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Attempt any two questions from each section.
2) Assume suitable data, diagrams if required.
3) Use of scientific calculator is allowed.
4) Figures to the right indicates full marks.

SECTION – I

Q.2 Solve:

a) Define energy resources and explain any one type of energy resources. **04**

b) Define Kaya identity & Emission factor of Energy resources. **05**

c) Explain the concept of “Energy Security” in detailed. **05**

Q.3 Solve:

a) Explain in detailed Time value of money discount rate in energy Economics. **04**

b) Explain the Linkage between “Energy & Development. **05**

c) Write a short note on “Global Energy Use in India. **05**

Q.4 Solve:

a) Write a short note on Commercial resources of energy. **04**

b) What is the Net present value? Explain positive & Negative NPV of energy Economics. **05**

c) What is the criteria for assessing Energy Projects? Explain. **05**

SECTION – II

Q.5 Solve:

a) Explain the term “Future Energy demand & Supply. **04**

b) Explain the term “Global Warming.” **05**

c) What is Hoteling rule? Explain the terms “Bioenergy”. **05**

Q.6 Solve:

a) Define Pollution and Explain Types of Pollution in detailed. **04**

b) Write a short note On “Kyoto Protocol” of Energy & Environment. **05**

c) Write a short note on “Climate Change due to greenhouse gas Co2. **05**

Q.7 Solve:

a) Define the term “Energy resource management” and how it will perform for Energy & environment. **04**

b) Explain “Preferences & Utility” of energy. **05**

c) Write a Short note on “Betting on Planet Simons change. **05**

SLR-QH-380

Seat No.	

Set R

Fourth. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Energy Resources, Economics and Environment (BTN02716)

Day & Date: Monday, 11-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) Energy Resources which are being used for many decades are known as _____.
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b) Non-conventional energy sources
c) Primary energy sources
d) Fuel cells

2) World Energy Needs are rising due to _____.
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c) Inflation
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a) India b) Japan
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c) Manipur d) Delhi

14) Which is the Following is Environmental impact?
a) Soil damage b) Gas leakage
c) Air pollution d) Temperature

SLR-QH-380

Seat No.	

Set R

Fourth. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Energy Resources, Economics and Environment (BTN02716)

Day & Date: Monday, 11-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Attempt any two questions from each section.
2) Assume suitable data, diagrams if required.
3) Use of scientific calculator is allowed.
4) Figures to the right indicates full marks.

SECTION – I

Q.2 Solve:

a) Define energy resources and explain any one type of energy resources. **04**

b) Define Kaya identity & Emission factor of Energy resources. **05**

c) Explain the concept of “Energy Security” in detailed. **05**

Q.3 Solve:

a) Explain in detailed Time value of money discount rate in energy Economics. **04**

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c) What is the criteria for assessing Energy Projects? Explain. **05**

SECTION – II

Q.5 Solve:

a) Explain the term “Future Energy demand & Supply. **04**

b) Explain the term “Global Warming.” **05**

c) What is Hoteling rule? Explain the terms “Bioenergy”. **05**

Q.6 Solve:

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SLR-QH-380

Seat No.		Set	S

Fourth. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Energy Resources, Economics and Environment (BTN02716)

Day & Date: Monday, 11-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) NPV stands for _____.
a) Net Protect Value b) Net Present value
c) a) & b) d) None of the Above

2) One carbon credit permit emission of One Ton of _____.
a) Petrol b) Coal
c) Diesel d) Co2 or GHG

3) Most of the energy used on earth today originally came from which of these sources _____.
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c) Primary energy sources
d) Fuel cells

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   b) Increasing population and Industrialization
   c) Inflation
   d) Natural calamities

8) Kyoto Protocol launched in _____.
   a) India
   b) Japan
   c) China
   d) U.S.

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   c) Renewable Resources
   d) Nuclear Energy

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11) A coal deposit that is not economical to mine today would be considered part of ours?
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   a) Glaciers and ice sheets
   b) Groundwater
   c) Surface run off
   d) Oceans

13) National Solar Mission launched in _____.
   a) Jan 2011
   b) Jan 2023
   c) Jan 2022
   d) Jan 2010

14) Purpose of “Energy Audit" is to access the nature and extent risk of harm to Human health & Environment?
   a) True
   b) False

Seat No.	

Set **S**

Fourth. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Energy Resources, Economics and Environment (BTN02716)

Day & Date: Monday, 11-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Attempt any two questions from each section.
2) Assume suitable data, diagrams if required.
3) Use of scientific calculator is allowed.
4) Figures to the right indicates full marks.

SECTION – I

Q.2 Solve:

a) Define energy resources and explain any one type of energy resources. **04**

b) Define Kaya identity & Emission factor of Energy resources. **05**

c) Explain the concept of “Energy Security” in detailed. **05**

Q.3 Solve:

a) Explain in detailed Time value of money discount rate in energy Economics. **04**

b) Explain the Linkage between “Energy & Development. **05**

c) Write a short note on “Global Energy Use in India. **05**

Q.4 Solve:

a) Write a short note on Commercial resources of energy. **04**

b) What is the Net present value? Explain positive & Negative NPV of energy Economics. **05**

c) What is the criteria for assessing Energy Projects? Explain. **05**

SECTION – II

Q.5 Solve:

a) Explain the term “Future Energy demand & Supply. **04**

b) Explain the term “Global Warming.” **05**

c) What is Hoteling rule? Explain the terms “Bioenergy”. **05**

Q.6 Solve:

a) Define Pollution and Explain Types of Pollution in detailed. **04**

b) Write a short note On “Kyoto Protocol” of Energy & Environment. **05**

c) Write a short note on “Climate Change due to greenhouse gas Co2. **05**

Q.7 Solve:

a) Define the term “Energy resource management” and how it will perform for Energy & environment. **04**

b) Explain “Preferences & Utility” of energy. **05**

c) Write a Short note on “Betting on Planet Simons change. **05**

SLR-QH-381

Seat No.	

Set P

Fourth. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April-2026
Advanced Topics in Electric Vehicles (BTN02717)

Day & Date: Monday, 11-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Multiple choice questions: **14**

1) What is the role of the catalyst in a fuel cell?
a) It conducts electrons from the cathode to the anode
b) It facilitates the reaction between hydrogen and oxygen
c) It blocks the flow of protons through the membrane
d) It stores energy for later use

2) What is the primary function of a fuel cell?
a) To store energy
b) To convert fuel into heat
c) To convert chemical potential energy into electrical energy
d) To generate mechanical power

3) Which component in an electric vehicle's traction control system is responsible for processing data from various sensors and making real-time control decisions?
a) Battery pack b) Electric motor
c) Traction control module d) Headlights

4) Which of the following is NOT a potential benefit of traction control in electric vehicles?
a) Improved safety b) Enhanced efficiency
c) Extended battery life d) Better handling and control

5) What is the minimum voltage required to trigger a thyristor into the conducting state?
a) 0V b) Half the supply voltage
c) Equal to the supply voltage d) Double the supply voltage

6) IGBTs combine the advantages of which two types of transistors?
   a) Diode and BJT
   b) BJT and MOSFET
   c) Diode and MOSFET
   d) Thyristor and BJT

7) What is path control in the context of robotics and automation?
   a) Managing road traffic signals
   b) Navigating through GPS coordinates
   c) Manipulating objects along a predefined trajectory
   d) Controlling the speed of a vehicle

8) What is one advantage of using machine learning algorithms for path control in autonomous systems?
   a) Limited adaptability to changing environments
   b) Dependence on human intervention
   c) Improved adaptability and learning from experience
   d) Slower decision-making compared to traditional algorithms

9) In robotics, what is the main goal of path planning?
   a) Maximizing fuel efficiency
   b) Finding the shortest path between two points
   c) Avoiding obstacles while reaching a target destination
   d) Minimizing manufacturing costs

10) Which of the following is an advantage of regenerative braking in electric vehicles?
   a) Increased brake pad wear
   b) Improved energy efficiency and extended range
   c) Reduced battery capacity
   d) Higher energy consumption

11) What is one of the main maintenance tasks specific to electric vehicles?
   a) Changing the engine oil
   b) Replacing the transmission fluid
   c) Periodic battery maintenance and monitoring
   d) Adjusting the exhaust system

12) What is the primary focus of intra-vehicle security measures?
   a) Protecting the vehicle from external threats
   b) Protecting the vehicle’s occupants and systems from internal threats
   c) Ensuring vehicle performance
   d) Enhancing fuel efficiency

13) What advantage does battery swap offer in terms of charging time compared to traditional plug-in charging?
   a) Battery swap takes longer to complete
   b) Battery swap is faster and typically takes just a few minutes
   c) Battery swap requires the EV to be stationary for hours
   d) Battery swap reduces the vehicle's driving range

14) How does wireless charging technology for EVs work?

a) It uses high-pressure hoses to transfer electricity
b) It relies on physical connections through cables
c) It uses electromagnetic fields to transfer power between a charging pad and the vehicle
d) It requires the EV to be stationary for hours during charging

SLR-QH-381

Seat No.	

Set P

Fourth. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April-2026
Advanced Topics in Electric Vehicles (BTN02717)

Day & Date: Monday, 11-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Answer any two questions from Section I and Section II.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

SECTION – I

Q.2	**a)**	What is a fuel cell, and how does it differ from traditional combustion-based power generation methods?	**05**
	b)	Explain the basic operation principle of a fuel cell, highlighting the roles of the anode and cathode.	**04**
	c)	List and explain at least three factors that can significantly affect the performance and efficiency of a fuel cell.	**05**
Q.3	**a)**	What is adaptive cruise control, and how does it differ from traditional cruise control systems? How does it contribute to both safety and convenience for drivers?	**05**
	b)	Explain how immobilizers contribute to vehicle security. What technology is typically used in these systems?	**05**
	c)	How does active suspension control improve ride comfort and handling?	**04**
Q.4	**a)**	How do converters and inverters play a crucial role in power management and conversion in various electronic systems?	**05**
	b)	Differentiate between a BJT (Bipolar Junction Transistor) and a MOSFET (Metal-Oxide-Semiconductor Field-Effect Transistor) in terms of their operating principles and characteristics.	**04**
	c)	What types of sensors are commonly used in autonomous electric vehicles (EVs) to perceive their surroundings?	**05**

SECTION – II

Q.5	**a)**	Explain the concept of layers of autonomy in autonomous vehicles. What are the typical levels or layers, and how do they progress from minimal to full automation?	**05**
	b)	What is the purpose of Advanced Driver Assistance Systems (ADAS) in vehicles? Provide examples of ADAS features that enhance safety and convenience for drivers	**05**
	c)	Define an Unmanned Ground Vehicle (UGV) and its primary applications. How does a UGV differ from a conventional human-operated vehicle in terms of control and functionality?	**04**
Q.6	**a)**	What is Auto crypt V2G (Vehicle-to-Grid) technology? How does it enable bidirectional energy flow between EVs and the power grid?	**05**
	b)	Describe potential safety considerations unique to electric vehicles in the event of an accident. What measures are taken to ensure emergency responders safety during EV accidents?	**05**
	c)	List and explain three advantages of electric vehicles (EVs) over traditional internal combustion engine vehicles.	**04**
Q.7	**a)**	Discuss the feasibility of implementing battery swap stations on a large scale and their compatibility with different EV models.	**05**
	b)	Explain the concept of wireless charging for electric vehicles and its benefits compared to traditional plug-in charging	**05**
	c)	How can renewable energy sources such as solar and wind power contribute to sustainable electric vehicle charging infrastructure?	**04**

SLR-QH-381

Seat No.	

Set Q

Fourth. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April-2026
Advanced Topics in Electric Vehicles (BTN02717)

Day & Date: Monday, 11-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

Duration: 30 Minutes Marks:14

Q.1 Multiple choice questions: **14**

1) What is one advantage of using machine learning algorithms for path control in autonomous systems?
a) Limited adaptability to changing environments
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3) Which of the following is an advantage of regenerative braking in electric vehicles?
a) Increased brake pad wear
b) Improved energy efficiency and extended range
c) Reduced battery capacity
d) Higher energy consumption

4) What is one of the main maintenance tasks specific to electric vehicles?
a) Changing the engine oil
b) Replacing the transmission fluid
c) Periodic battery maintenance and monitoring
d) Adjusting the exhaust system

5) What is the primary focus of intra-vehicle security measures?
   a) Protecting the vehicle from external threats
   b) Protecting the vehicle's occupants and systems from internal threats
   c) Ensuring vehicle performance
   d) Enhancing fuel efficiency

6) What advantage does battery swap offer in terms of charging time compared to traditional plug-in charging?
   a) Battery swap takes longer to complete
   b) Battery swap is faster and typically takes just a few minutes
   c) Battery swap requires the EV to be stationary for hours
   d) Battery swap reduces the vehicle's driving range

7) How does wireless charging technology for EVs work?
   a) It uses high-pressure hoses to transfer electricity
   b) It relies on physical connections through cables
   c) It uses electromagnetic fields to transfer power between a charging pad and the vehicle
   d) It requires the EV to be stationary for hours during charging

8) What is the role of the catalyst in a fuel cell?
   a) It conducts electrons from the cathode to the anode
   b) It facilitates the reaction between hydrogen and oxygen
   c) It blocks the flow of protons through the membrane
   d) It stores energy for later use

9) What is the primary function of a fuel cell?
   a) To store energy
   b) To convert fuel into heat
   c) To convert chemical potential energy into electrical energy
   d) To generate mechanical power

10) Which component in an electric vehicle's traction control system is responsible for processing data from various sensors and making real-time control decisions?
   a) Battery pack
   b) Electric motor
   c) Traction control module
   d) Headlights

11) Which of the following is NOT a potential benefit of traction control in electric vehicles?
   a) Improved safety
   b) Enhanced efficiency
   c) Extended battery life
   d) Better handling and control

12) What is the minimum voltage required to trigger a thyristor into the conducting state?
   a) 0V
   b) Half the supply voltage
   c) Equal to the supply voltage
   d) Double the supply voltage

13) IGBTs combine the advantages of which two types of transistors?

a) Diode and BJT
b) BJT and MOSFET
c) Diode and MOSFET
d) Thyristor and BJT

14) What is path control in the context of robotics and automation?

a) Managing road traffic signals
b) Navigating through GPS coordinates
c) Manipulating objects along a predefined trajectory
d) Controlling the speed of a vehicle

Seat No.	

Set **Q**

Fourth. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April-2026
Advanced Topics in Electric Vehicles (BTN02717)

Day & Date: Monday, 11-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Answer any two questions from Section I and Section II.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

SECTION – I

Q.2	**a)**	What is a fuel cell, and how does it differ from traditional combustion-based power generation methods?	**05**
	b)	Explain the basic operation principle of a fuel cell, highlighting the roles of the anode and cathode.	**04**
	c)	List and explain at least three factors that can significantly affect the performance and efficiency of a fuel cell.	**05**
Q.3	**a)**	What is adaptive cruise control, and how does it differ from traditional cruise control systems? How does it contribute to both safety and convenience for drivers?	**05**
	b)	Explain how immobilizers contribute to vehicle security. What technology is typically used in these systems?	**05**
	c)	How does active suspension control improve ride comfort and handling?	**04**
Q.4	**a)**	How do converters and inverters play a crucial role in power management and conversion in various electronic systems?	**05**
	b)	Differentiate between a BJT (Bipolar Junction Transistor) and a MOSFET (Metal-Oxide-Semiconductor Field-Effect Transistor) in terms of their operating principles and characteristics.	**04**
	c)	What types of sensors are commonly used in autonomous electric vehicles (EVs) to perceive their surroundings?	**05**

SECTION – II

Q.5	**a)**	Explain the concept of layers of autonomy in autonomous vehicles. What are the typical levels or layers, and how do they progress from minimal to full automation?	**05**
	b)	What is the purpose of Advanced Driver Assistance Systems (ADAS) in vehicles? Provide examples of ADAS features that enhance safety and convenience for drivers	**05**
	c)	Define an Unmanned Ground Vehicle (UGV) and its primary applications. How does a UGV differ from a conventional human-operated vehicle in terms of control and functionality?	**04**
Q.6	**a)**	What is Auto crypt V2G (Vehicle-to-Grid) technology? How does it enable bidirectional energy flow between EVs and the power grid?	**05**
	b)	Describe potential safety considerations unique to electric vehicles in the event of an accident. What measures are taken to ensure emergency responders safety during EV accidents?	**05**
	c)	List and explain three advantages of electric vehicles (EVs) over traditional internal combustion engine vehicles.	**04**
Q.7	**a)**	Discuss the feasibility of implementing battery swap stations on a large scale and their compatibility with different EV models.	**05**
	b)	Explain the concept of wireless charging for electric vehicles and its benefits compared to traditional plug-in charging	**05**
	c)	How can renewable energy sources such as solar and wind power contribute to sustainable electric vehicle charging infrastructure?	**04**

SLR-QH-381

Seat No.	

Set R

Fourth. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April-2026
Advanced Topics in Electric Vehicles (BTN02717)

Day & Date: Monday, 11-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Multiple choice questions: **14**

1) What is one of the main maintenance tasks specific to electric vehicles?
a) Changing the engine oil
b) Replacing the transmission fluid
c) Periodic battery maintenance and monitoring
d) Adjusting the exhaust system

2) What is the primary focus of intra-vehicle security measures?
a) Protecting the vehicle from external threats
b) Protecting the vehicle's occupants and systems from internal threats
c) Ensuring vehicle performance
d) Enhancing fuel efficiency

3) What advantage does battery swap offer in terms of charging time compared to traditional plug-in charging?
a) Battery swap takes longer to complete
b) Battery swap is faster and typically takes just a few minutes
c) Battery swap requires the EV to be stationary for hours
d) Battery swap reduces the vehicle's driving range

4) How does wireless charging technology for EVs work?
a) It uses high-pressure hoses to transfer electricity
b) It relies on physical connections through cables
c) It uses electromagnetic fields to transfer power between a charging pad and the vehicle
d) It requires the EV to be stationary for hours during charging

5) What is the role of the catalyst in a fuel cell?
   a) It conducts electrons from the cathode to the anode
   b) It facilitates the reaction between hydrogen and oxygen
   c) It blocks the flow of protons through the membrane
   d) It stores energy for later use

6) What is the primary function of a fuel cell?
   a) To store energy
   b) To convert fuel into heat
   c) To convert chemical potential energy into electrical energy
   d) To generate mechanical power

7) Which component in an electric vehicle's traction control system is responsible for processing data from various sensors and making real-time control decisions?
   a) Battery pack
   b) Electric motor
   c) Traction control module
   d) Headlights

8) Which of the following is NOT a potential benefit of traction control in electric vehicles?
   a) Improved safety
   b) Enhanced efficiency
   c) Extended battery life
   d) Better handling and control

9) What is the minimum voltage required to trigger a thyristor into the conducting state?
   a) 0V
   b) Half the supply voltage
   c) Equal to the supply voltage
   d) Double the supply voltage

10) IGBTs combine the advantages of which two types of transistors?
   a) Diode and BJT
   b) BJT and MOSFET
   c) Diode and MOSFET
   d) Thyristor and BJT

11) What is path control in the context of robotics and automation?
   a) Managing road traffic signals
   b) Navigating through GPS coordinates
   c) Manipulating objects along a predefined trajectory
   d) Controlling the speed of a vehicle

12) What is one advantage of using machine learning algorithms for path control in autonomous systems?
   a) Limited adaptability to changing environments
   b) Dependence on human intervention
   c) Improved adaptability and learning from experience
   d) Slower decision-making compared to traditional algorithms

13) In robotics, what is the main goal of path planning?
   a) Maximizing fuel efficiency
   b) Finding the shortest path between two points
   c) Avoiding obstacles while reaching a target destination
   d) Minimizing manufacturing costs

14) Which of the following is an advantage of regenerative braking in electric vehicles?

a) Increased brake pad wear
b) Improved energy efficiency and extended range
c) Reduced battery capacity
d) Higher energy consumption

SLR-QH-381

Seat No.	

Set R

Fourth. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April-2026
Advanced Topics in Electric Vehicles (BTN02717)

Day & Date: Monday, 11-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Answer any two questions from Section I and Section II.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

SECTION – I

Q.2	**a)**	What is a fuel cell, and how does it differ from traditional combustion-based power generation methods?	**05**
	b)	Explain the basic operation principle of a fuel cell, highlighting the roles of the anode and cathode.	**04**
	c)	List and explain at least three factors that can significantly affect the performance and efficiency of a fuel cell.	**05**
Q.3	**a)**	What is adaptive cruise control, and how does it differ from traditional cruise control systems? How does it contribute to both safety and convenience for drivers?	**05**
	b)	Explain how immobilizers contribute to vehicle security. What technology is typically used in these systems?	**05**
	c)	How does active suspension control improve ride comfort and handling?	**04**
Q.4	**a)**	How do converters and inverters play a crucial role in power management and conversion in various electronic systems?	**05**
	b)	Differentiate between a BJT (Bipolar Junction Transistor) and a MOSFET (Metal-Oxide-Semiconductor Field-Effect Transistor) in terms of their operating principles and characteristics.	**04**
	c)	What types of sensors are commonly used in autonomous electric vehicles (EVs) to perceive their surroundings?	**05**

SECTION – II

Q.5	**a)**	Explain the concept of layers of autonomy in autonomous vehicles. What are the typical levels or layers, and how do they progress from minimal to full automation?	**05**
	b)	What is the purpose of Advanced Driver Assistance Systems (ADAS) in vehicles? Provide examples of ADAS features that enhance safety and convenience for drivers	**05**
	c)	Define an Unmanned Ground Vehicle (UGV) and its primary applications. How does a UGV differ from a conventional human-operated vehicle in terms of control and functionality?	**04**
Q.6	**a)**	What is Auto crypt V2G (Vehicle-to-Grid) technology? How does it enable bidirectional energy flow between EVs and the power grid?	**05**
	b)	Describe potential safety considerations unique to electric vehicles in the event of an accident. What measures are taken to ensure emergency responders safety during EV accidents?	**05**
	c)	List and explain three advantages of electric vehicles (EVs) over traditional internal combustion engine vehicles.	**04**
Q.7	**a)**	Discuss the feasibility of implementing battery swap stations on a large scale and their compatibility with different EV models.	**05**
	b)	Explain the concept of wireless charging for electric vehicles and its benefits compared to traditional plug-in charging	**05**
	c)	How can renewable energy sources such as solar and wind power contribute to sustainable electric vehicle charging infrastructure?	**04**

Seat No.	

Set **S**

Fourth. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April-2026
Advanced Topics in Electric Vehicles (BTN02717)

Day & Date: Monday, 11-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Multiple choice questions: **14**

1) IGBTs combine the advantages of which two types of transistors?
a) Diode and BJT
b) BJT and MOSFET
c) Diode and MOSFET
d) Thyristor and BJT

2) What is path control in the context of robotics and automation?
a) Managing road traffic signals
b) Navigating through GPS coordinates
c) Manipulating objects along a predefined trajectory
d) Controlling the speed of a vehicle

3) What is one advantage of using machine learning algorithms for path control in autonomous systems?
a) Limited adaptability to changing environments
b) Dependence on human intervention
c) Improved adaptability and learning from experience
d) Slower decision-making compared to traditional algorithms

4) In robotics, what is the main goal of path planning?
a) Maximizing fuel efficiency
b) Finding the shortest path between two points
c) Avoiding obstacles while reaching a target destination
d) Minimizing manufacturing costs

5) Which of the following is an advantage of regenerative braking in electric vehicles?
a) Increased brake pad wear
b) Improved energy efficiency and extended range
c) Reduced battery capacity
d) Higher energy consumption

6) What is one of the main maintenance tasks specific to electric vehicles?
   a) Changing the engine oil
   b) Replacing the transmission fluid
   c) Periodic battery maintenance and monitoring
   d) Adjusting the exhaust system

7) What is the primary focus of intra-vehicle security measures?
   a) Protecting the vehicle from external threats
   b) Protecting the vehicle's occupants and systems from internal threats
   c) Ensuring vehicle performance
   d) Enhancing fuel efficiency

8) What advantage does battery swap offer in terms of charging time compared to traditional plug-in charging?
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   a) It uses high-pressure hoses to transfer electricity
   b) It relies on physical connections through cables
   c) It uses electromagnetic fields to transfer power between a charging pad and the vehicle
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10) What is the role of the catalyst in a fuel cell?
   a) It conducts electrons from the cathode to the anode
   b) It facilitates the reaction between hydrogen and oxygen
   c) It blocks the flow of protons through the membrane
   d) It stores energy for later use

11) What is the primary function of a fuel cell?
   a) To store energy
   b) To convert fuel into heat
   c) To convert chemical potential energy into electrical energy
   d) To generate mechanical power

12) Which component in an electric vehicle's traction control system is responsible for processing data from various sensors and making real-time control decisions?
   a) Battery pack
   b) Electric motor
   c) Traction control module
   d) Headlights

13) Which of the following is NOT a potential benefit of traction control in electric vehicles?
   a) Improved safety
   b) Enhanced efficiency
   c) Extended battery life
   d) Better handling and control

14) What is the minimum voltage required to trigger a thyristor into the conducting state?

a) 0V
b) Half the supply voltage
c) Equal to the supply voltage
d) Double the supply voltage

SLR-QH-381

Seat No.	

Set S

Fourth. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April-2026
Advanced Topics in Electric Vehicles (BTN02717)

Day & Date: Monday, 11-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Answer any two questions from Section I and Section II.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

SECTION – I

Q.2	**a)**	What is a fuel cell, and how does it differ from traditional combustion-based power generation methods?	**05**
	b)	Explain the basic operation principle of a fuel cell, highlighting the roles of the anode and cathode.	**04**
	c)	List and explain at least three factors that can significantly affect the performance and efficiency of a fuel cell.	**05**
Q.3	**a)**	What is adaptive cruise control, and how does it differ from traditional cruise control systems? How does it contribute to both safety and convenience for drivers?	**05**
	b)	Explain how immobilizers contribute to vehicle security. What technology is typically used in these systems?	**05**
	c)	How does active suspension control improve ride comfort and handling?	**04**
Q.4	**a)**	How do converters and inverters play a crucial role in power management and conversion in various electronic systems?	**05**
	b)	Differentiate between a BJT (Bipolar Junction Transistor) and a MOSFET (Metal-Oxide-Semiconductor Field-Effect Transistor) in terms of their operating principles and characteristics.	**04**
	c)	What types of sensors are commonly used in autonomous electric vehicles (EVs) to perceive their surroundings?	**05**

SECTION – II

Q.5	**a)**	Explain the concept of layers of autonomy in autonomous vehicles. What are the typical levels or layers, and how do they progress from minimal to full automation?	**05**
	b)	What is the purpose of Advanced Driver Assistance Systems (ADAS) in vehicles? Provide examples of ADAS features that enhance safety and convenience for drivers	**05**
	c)	Define an Unmanned Ground Vehicle (UGV) and its primary applications. How does a UGV differ from a conventional human-operated vehicle in terms of control and functionality?	**04**
Q.6	**a)**	What is Auto crypt V2G (Vehicle-to-Grid) technology? How does it enable bidirectional energy flow between EVs and the power grid?	**05**
	b)	Describe potential safety considerations unique to electric vehicles in the event of an accident. What measures are taken to ensure emergency responders safety during EV accidents?	**05**
	c)	List and explain three advantages of electric vehicles (EVs) over traditional internal combustion engine vehicles.	**04**
Q.7	**a)**	Discuss the feasibility of implementing battery swap stations on a large scale and their compatibility with different EV models.	**05**
	b)	Explain the concept of wireless charging for electric vehicles and its benefits compared to traditional plug-in charging	**05**
	c)	How can renewable energy sources such as solar and wind power contribute to sustainable electric vehicle charging infrastructure?	**04**

SLR-QH-382

Seat No.	

Set P

Fourth. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Entrepreneurship Development (BTN02711)

Day & Date: Wednesday, 13-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) Which of the following best defines entrepreneurship?
a) A process of managing existing resources
b) A process of identifying and seizing opportunities
c) A process of achieving government subsidies
d) A process of producing only innovative products.

2) What does intrapreneurship focus on?
a) Developing external business opportunities
b) Entrepreneurial activities within an organization
c) Social welfare through entrepreneurship
d) Creating non-profit organizations

3) Which of the following is a characteristic of a successful entrepreneur?
a) Risk aversion
b) Avoidance of market changes
c) Dependence on external guidance
d) Strong networking skills

4) What is a primary factor influencing entrepreneurial development?
a) Education level b) Technological stagnation
c) Cultural values d) Lack of communication

5) What is the main objective of Entrepreneurial Development Programmes (EDPs)?
a) To develop entrepreneurial skills and motivation
b) To provide subsidies to entrepreneurs
c) To regulate small businesses
d) To create government-controlled enterprises

6) Which phase of EDP focuses on training participants?
a) Pre-training phase b) Post-training phase
c) Training phase d) None of the above

7) Which of the following is NOT a problem faced by new entrepreneurs?
a) Managerial issues
b) Marketing challenges
c) Abundant financial resources
d) Technological limitations

8) What is Ancillarisation?
a) Developing small-scale industries to support large-scale units
b) Acquiring existing businesses
c) Expanding franchises overseas
d) Licensing technology from competitors

9) Which tool is commonly used for exploring change in a business environment?
a) Gantt Chart b) SWOT Analysis
c) Break-Even Chart d) Product Lifecycle

10) A business arrangement where one party allows another party to use a business name and sell its products or services is known as _____.
a) A franchise b) An owner-manager business
c) A cooperative d) A limited company

11) What is the key advantage of setting up a sole proprietorship?
a) Easy to start and manage b) High financial security
c) Large-scale resource pooling d) Limited liability protection

12) What is the significance of a project appraisal?
a) It guarantees project success
b) It assesses feasibility across multiple aspects
c) It replaces business planning
d) It predicts future competition

13) Which of these is NOT part of a business plan?
a) Market plan b) Operational plan
c) Financial plan d) Cultural analysis

14) What does the Lean Canvas model focus on?
a) Preparing a detailed business report
b) Simplifying a business model on a single page
c) Defining only financial goals
d) Only technological solutions

SLR-QH-382

Seat No.	

Set P

Fourth. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Entrepreneurship Development (BTN02711)

Day & Date: Wednesday, 13-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Answer any two full questions from each Section.
2) Figures to the right indicates full marks.
3) Make suitable assumptions, if necessary and state them clearly.

SECTION – I

Q.2	**a)**	Describe entrepreneur and entrepreneurship. Explain concept of it.	**07**
	b)	Explain classification of entrepreneurs.	**07**
Q.3	**a)**	Explain problems faced by new entrepreneurs giving their probable solutions.	**07**
	b)	Explain corporate entrepreneurship with few examples.	**07**
Q.4	**a)**	Explain franchising with its advantages and disadvantages.	**07**
	b)	Explain characteristics and qualities of entrepreneurs.	**07**

SECTION – II

Q.5	**a)**	Discuss the various aspects of project appraisal. How can economic, financial, market, technological, and managerial competency evaluations contribute to the feasibility study of a project?	**07**
	b)	What are the critical components of a business plan, and how do the financial, operational, market, and HR plans interrelate in ensuring project viability?	**07**
Q.6	**a)**	Explain the key differences in ownership patterns such as sole proprietorship, partnership, and private limited companies?	**07**
	b)	List various support agencies available for SMEs. Explain any two support agencies.	**07**
Q.7	**a)**	Explain the funding options available for SMEs giving examples.	**07**
	b)	Discuss the taxation benefits available to SMEs and their significance in promoting the sector.	**07**

Seat No.	

Set **Q**

Fourth. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Entrepreneurship Development (BTN02711)

Day & Date: Wednesday, 13-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
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4) Make suitable assumptions if necessary and state it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) What is Ancillarisation?
a) Developing small-scale industries to support large-scale units
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d) Licensing technology from competitors

2) Which tool is commonly used for exploring change in a business environment?
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b) It assesses feasibility across multiple aspects
c) It replaces business planning
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6) Which of these is NOT part of a business plan?
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d) Cultural analysis

7) What does the Lean Canvas model focus on?
a) Preparing a detailed business report
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8) Which of the following best defines entrepreneurship?
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a) Developing external business opportunities
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a) Risk aversion
b) Avoidance of market changes
c) Dependence on external guidance
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11) What is a primary factor influencing entrepreneurial development?
a) Education level
b) Technological stagnation
c) Cultural values
d) Lack of communication

12) What is the main objective of Entrepreneurial Development Programmes (EDPs)?
a) To develop entrepreneurial skills and motivation
b) To provide subsidies to entrepreneurs
c) To regulate small businesses
d) To create government-controlled enterprises

13) Which phase of EDP focuses on training participants?
a) Pre-training phase
b) Post-training phase
c) Training phase
d) None of the above

14) Which of the following is NOT a problem faced by new entrepreneurs?
a) Managerial issues
b) Marketing challenges
c) Abundant financial resources
d) Technological limitations

SLR-QH-382

Seat No.	

Set Q

Fourth. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Entrepreneurship Development (BTN02711)

Day & Date: Wednesday, 13-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Answer any two full questions from each Section.
2) Figures to the right indicates full marks.
3) Make suitable assumptions, if necessary and state them clearly.

SECTION – I

Q.2	**a)**	Describe entrepreneur and entrepreneurship. Explain concept of it.	**07**
	b)	Explain classification of entrepreneurs.	**07**
Q.3	**a)**	Explain problems faced by new entrepreneurs giving their probable solutions.	**07**
	b)	Explain corporate entrepreneurship with few examples.	**07**
Q.4	**a)**	Explain franchising with its advantages and disadvantages.	**07**
	b)	Explain characteristics and qualities of entrepreneurs.	**07**

SECTION – II

Q.5	**a)**	Discuss the various aspects of project appraisal. How can economic, financial, market, technological, and managerial competency evaluations contribute to the feasibility study of a project?	**07**
	b)	What are the critical components of a business plan, and how do the financial, operational, market, and HR plans interrelate in ensuring project viability?	**07**
Q.6	**a)**	Explain the key differences in ownership patterns such as sole proprietorship, partnership, and private limited companies?	**07**
	b)	List various support agencies available for SMEs. Explain any two support agencies.	**07**
Q.7	**a)**	Explain the funding options available for SMEs giving examples.	**07**
	b)	Discuss the taxation benefits available to SMEs and their significance in promoting the sector.	**07**

Seat No.	

Set **R**

Fourth. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Entrepreneurship Development (BTN02711)

Day & Date: Wednesday, 13-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) What is the key advantage of setting up a sole proprietorship?
a) Easy to start and manage b) High financial security
c) Large-scale resource pooling d) Limited liability protection

2) What is the significance of a project appraisal?
a) It guarantees project success
b) It assesses feasibility across multiple aspects
c) It replaces business planning
d) It predicts future competition

3) Which of these is NOT part of a business plan?
a) Market plan b) Operational plan
c) Financial plan d) Cultural analysis

4) What does the Lean Canvas model focus on?
a) Preparing a detailed business report
b) Simplifying a business model on a single page
c) Defining only financial goals
d) Only technological solutions

5) Which of the following best defines entrepreneurship?
a) A process of managing existing resources
b) A process of identifying and seizing opportunities
c) A process of achieving government subsidies
d) A process of producing only innovative products.

6) What does intrapreneurship focus on?
a) Developing external business opportunities
b) Entrepreneurial activities within an organization
c) Social welfare through entrepreneurship
d) Creating non-profit organizations

7) Which of the following is a characteristic of a successful entrepreneur?
a) Risk aversion
b) Avoidance of market changes
c) Dependence on external guidance
d) Strong networking skills

8) What is a primary factor influencing entrepreneurial development?
a) Education level
b) Technological stagnation
c) Cultural values
d) Lack of communication

9) What is the main objective of Entrepreneurial Development Programmes (EDPs)?
a) To develop entrepreneurial skills and motivation
b) To provide subsidies to entrepreneurs
c) To regulate small businesses
d) To create government-controlled enterprises

10) Which phase of EDP focuses on training participants?
a) Pre-training phase
b) Post-training phase
c) Training phase
d) None of the above

11) Which of the following is NOT a problem faced by new entrepreneurs?
a) Managerial issues
b) Marketing challenges
c) Abundant financial resources
d) Technological limitations

12) What is Ancillarisation?
a) Developing small-scale industries to support large-scale units
b) Acquiring existing businesses
c) Expanding franchises overseas
d) Licensing technology from competitors

13) Which tool is commonly used for exploring change in a business environment?
a) Gantt Chart
b) SWOT Analysis
c) Break-Even Chart
d) Product Lifecycle

14) A business arrangement where one party allows another party to use a business name and sell its products or services is known as _____.
a) A franchise
b) An owner-manager business
c) A cooperative
d) A limited company

SLR-QH-382

Seat No.	

Set R

Fourth. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Entrepreneurship Development (BTN02711)

Day & Date: Wednesday, 13-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Answer any two full questions from each Section.
2) Figures to the right indicates full marks.
3) Make suitable assumptions, if necessary and state them clearly.

SECTION – I

Q.2	**a)**	Describe entrepreneur and entrepreneurship. Explain concept of it.	**07**
	b)	Explain classification of entrepreneurs.	**07**
Q.3	**a)**	Explain problems faced by new entrepreneurs giving their probable solutions.	**07**
	b)	Explain corporate entrepreneurship with few examples.	**07**
Q.4	**a)**	Explain franchising with its advantages and disadvantages.	**07**
	b)	Explain characteristics and qualities of entrepreneurs.	**07**

SECTION – II

Q.5	**a)**	Discuss the various aspects of project appraisal. How can economic, financial, market, technological, and managerial competency evaluations contribute to the feasibility study of a project?	**07**
	b)	What are the critical components of a business plan, and how do the financial, operational, market, and HR plans interrelate in ensuring project viability?	**07**
Q.6	**a)**	Explain the key differences in ownership patterns such as sole proprietorship, partnership, and private limited companies?	**07**
	b)	List various support agencies available for SMEs. Explain any two support agencies.	**07**
Q.7	**a)**	Explain the funding options available for SMEs giving examples.	**07**
	b)	Discuss the taxation benefits available to SMEs and their significance in promoting the sector.	**07**

Seat No.	

Set **S**

Fourth. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Entrepreneurship Development (BTN02711)

Day & Date: Wednesday, 13-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) Which phase of EDP focuses on training participants?
a) Pre-training phase b) Post-training phase
c) Training phase d) None of the above

2) Which of the following is NOT a problem faced by new entrepreneurs?
a) Managerial issues
b) Marketing challenges
c) Abundant financial resources
d) Technological limitations

3) What is Ancillarisation?
a) Developing small-scale industries to support large-scale units
b) Acquiring existing businesses
c) Expanding franchises overseas
d) Licensing technology from competitors

4) Which tool is commonly used for exploring change in a business environment?
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c) Break-Even Chart d) Product Lifecycle

5) A business arrangement where one party allows another party to use a business name and sell its products or services is known as _____.
a) A franchise b) An owner-manager business
c) A cooperative d) A limited company

6) What is the key advantage of setting up a sole proprietorship?
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c) Large-scale resource pooling d) Limited liability protection

7) What is the significance of a project appraisal?
a) It guarantees project success
b) It assesses feasibility across multiple aspects
c) It replaces business planning
d) It predicts future competition

8) Which of these is NOT part of a business plan?
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10) Which of the following best defines entrepreneurship?
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b) A process of identifying and seizing opportunities
c) A process of achieving government subsidies
d) A process of producing only innovative products.

11) What does intrapreneurship focus on?
a) Developing external business opportunities
b) Entrepreneurial activities within an organization
c) Social welfare through entrepreneurship
d) Creating non-profit organizations

12) Which of the following is a characteristic of a successful entrepreneur?
a) Risk aversion
b) Avoidance of market changes
c) Dependence on external guidance
d) Strong networking skills

13) What is a primary factor influencing entrepreneurial development?
a) Education level b) Technological stagnation
c) Cultural values d) Lack of communication

14) What is the main objective of Entrepreneurial Development Programmes (EDPs)?
a) To develop entrepreneurial skills and motivation
b) To provide subsidies to entrepreneurs
c) To regulate small businesses
d) To create government-controlled enterprises

SLR-QH-382

Seat No.		Set	S

Fourth. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Entrepreneurship Development (BTN02711)

Day & Date: Wednesday, 13-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Answer any two full questions from each Section.
2) Figures to the right indicates full marks.
3) Make suitable assumptions, if necessary and state them clearly.

SECTION – I

Q.2	**a)**	Describe entrepreneur and entrepreneurship. Explain concept of it.	**07**
	b)	Explain classification of entrepreneurs.	**07**
Q.3	**a)**	Explain problems faced by new entrepreneurs giving their probable solutions.	**07**
	b)	Explain corporate entrepreneurship with few examples.	**07**
Q.4	**a)**	Explain franchising with its advantages and disadvantages.	**07**
	b)	Explain characteristics and qualities of entrepreneurs.	**07**

SECTION – II

Q.5	**a)**	Discuss the various aspects of project appraisal. How can economic, financial, market, technological, and managerial competency evaluations contribute to the feasibility study of a project?	**07**
	b)	What are the critical components of a business plan, and how do the financial, operational, market, and HR plans interrelate in ensuring project viability?	**07**
Q.6	**a)**	Explain the key differences in ownership patterns such as sole proprietorship, partnership, and private limited companies?	**07**
	b)	List various support agencies available for SMEs. Explain any two support agencies.	**07**
Q.7	**a)**	Explain the funding options available for SMEs giving examples.	**07**
	b)	Discuss the taxation benefits available to SMEs and their significance in promoting the sector.	**07**

SLR-QH-383

Seat No.	

Set P

Fourth. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Operations Research (BTN02712)

Day & Date: Wednesday, 13-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) What is the full form of PERT?
a) Project Evaluation and Review Technique
b) Program Evaluation and Resource Technique
c) Program Estimation and Review Technique
d) Project Estimation and Resource Technique

2) In a balanced assignment problem, the total supply is _____.
a) Less than total demand b) Equal to total demand
c) More than total demand d) Not related to total demand

3) Johnson's Rule is used for _____.
a) Queuing problems
b) Project scheduling
c) Sequencing jobs on machines
d) Linear programming

4) Which method is used to calculate the earliest and latest times in CPM?
a) Backward pass and forward pass
b) Simplex method
c) Johnson's Rule
d) Probability analysis

5) The critical path in a network represents _____.
a) The longest path and minimum time for completion
b) The shortest path and maximum time for completion
c) The longest path and cost minimization
d) None of the above

6) The graphical method of LPP is applicable for how many variables?
a) Two or more
b) Two only
c) One only
d) Three only

7) For a queuing system, if arrival rate λ\lambda λ = 5 customers/hour and service rate μ\mu μ = 10 customers/hour, the traffic intensity (ρ\rho ρ) is _____.
a) 0.2
b) 0.5
c) 0.8
d) 2.0

8) In the North-West Corner Rule, allocations start from _____.
a) The cell with the least cost
b) The top-left corner
c) The bottom-right corner
d) Any random cell

9) What does duality in LPP provide?
a) An alternative optimal solution
b) An infeasible solution
c) A solution to the primal problem
d) Insight into the shadow prices

10) A cash flow diagram is used in _____.
a) PERT analysis
b) Linear programming problems
c) Engineering economics
d) Transportation problems

11) Which cost is an example of an intangible cost?
a) Labor cost
b) Material cost
c) Lost customer goodwill
d) Equipment cost

12) What is the purpose of calculating floats in CPM?
a) To reduce the project duration
b) To determine slack in non-critical activities
c) To identify the critical path
d) To calculate the expected completion time

13) What is the objective of linear programming?
a) Maximization or minimization of a linear function
b) Solving non-linear equations
c) Estimating probabilities
d) Scheduling projects

14) The term “waiting line” is associated with_____.
a) Assignment problems
b) Queuing theory
c) Sequencing rules
d) Transportation models

Seat No.	

Set P

Fourth. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Operations Research (BTN02712)

Day & Date: Wednesday, 13-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Solve any two questions from each section.
2) Use of a calculator is allowed.
3) Figures to the right indicate full marks.
4) Assume additional suitable data, if necessary and mention it clearly

SECTION – I

Q.2 a) Maximize by Graphical Method. **07**

Maximize $Z = 3x_1 + 4x_2$,
Subject to, $5x_1 + 4x_2 \leq 200$,
$3x_1 + 5x_2 \leq 150$,
$5x_1 + 4x_2 \geq 100$,
$8x_1 + 4x_2 \geq 80$,
$x_1, x_2 \geq 0$.

b) Solve the minimal assignment problem whose effectiveness matrix is: **07**

	1	**2**	**3**	**4**
I	2	3	4	5
II	4	5	6	7
III	7	8	9	8
IV	3	5	8	4

Q.3 a) A firm marketing a product has four salesmen S_1, S_2, S_3 and S_4. There are three customers C_1, C_2 and C_3. The probability of making a sale to a customer depends upon the salesman-customer support. The table below represents the probability with which each of the salesmen can sell to each of the customers: **07**

	S_1	**S_2**	**S_3**	**S_4**
C_1	0.7	0.4	0.5	0.8
C_2	0.5	0.8	0.6	0.7
C_3	0.3	0.9	0.6	0.2

b) Solve the following unbalanced transportation problem: **07**

	1	**2**	**3**	**Supply**
1	5	1	7	10
2	6	4	6	80
3	3	2	5	15
Demand	75	20	50	

Q.4 **a)** Explain the methodology of Operations Research (OR) and its applications in mechanical engineering. **07**

b) A company manufacturing air coolers has two plants located at Mumbai and Kolkata with a capacity of 200 units and 100 units per week respectively. The company supplies the air coolers to its four show rooms situated at Ranchi, Delhi, Lucknow and Kanpur which have a maximum demand of 75, 100, 100 and 30 units respectively. Due to the differences in raw material cost and transportation cost, the profit per unit in rupees differs which is shown in the table below. **07**

	Ranchi	*Delhi*	*Lucknow*	*Kanpur*
Mumbai	90	90	100	110
Kolkata	50	70	130	85

SECTION – II

Q.5 **a)** Explain the concept of idle time and its impact on production scheduling. **05**

Estimated times for the jobs of a project are given below:

Job	A	B	C	D	E	F	G	H	I	J	K	L
Time (Weeks)	13	5	8	10	9	7	7	12	8	9	4	17

b) The constraints governing the jobs are as follows: **09**

A and B are start jobs; A controls C, D and E; B controls F and J; G depends upon C; H depends on D; E and F control I and L; K follows J; L is also controlled by K; G, H, I and L are the last jobs. Draw the network; determine project duration and the critical path.

Q.6 **a)** Explain the procedure for constructing a PERT network and how time estimates are used to calculate the probability of completing a project within a scheduled time. **07**

b) A company plans to invest ₹1,00,000 in a project for 5 years at an annual interest rate of 10%. Calculate the compound interest earned at the end of 5 years. **07**

Q.7 **a)** There are seven jobs, each of which has to go through the machines A and B in the order AB. Processing times in hours are given as **07**

Job	1	2	3	4	5	6	7
Machine A	3	12	15	6	10	11	9
Machine B	8	10	10	6	12	1	3

Determine a sequence of these jobs that will minimize the total elapsed time T. Also find T and idle time for machines A and B.

b) Discuss the significance of inflation and its impact on cash flow analysis in engineering projects. **07**

SLR-QH-383

Seat No.	

Set Q

Fourth. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Operations Research (BTN02712)

Day & Date: Wednesday, 13-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) In the North-West Corner Rule, allocations start from _____.
a) The cell with the least cost b) The top-left corner
c) The bottom-right corner d) Any random cell

2) What does duality in LPP provide?
a) An alternative optimal solution
b) An infeasible solution
c) A solution to the primal problem
d) Insight into the shadow prices

3) A cash flow diagram is used in _____.
a) PERT analysis
b) Linear programming problems
c) Engineering economics
d) Transportation problems

4) Which cost is an example of an intangible cost?
a) Labor cost b) Material cost
c) Lost customer goodwill d) Equipment cost

5) What is the purpose of calculating floats in CPM?
a) To reduce the project duration
b) To determine slack in non-critical activities
c) To identify the critical path
d) To calculate the expected completion time

6) What is the objective of linear programming?
   a) Maximization or minimization of a linear function
   b) Solving non-linear equations
   c) Estimating probabilities
   d) Scheduling projects

7) The term “waiting line” is associated with_____.
   a) Assignment problems
   b) Queuing theory
   c) Sequencing rules
   d) Transportation models

8) What is the full form of PERT?
   a) Project Evaluation and Review Technique
   b) Program Evaluation and Resource Technique
   c) Program Estimation and Review Technique
   d) Project Estimation and Resource Technique

9) In a balanced assignment problem, the total supply is _____.
   a) Less than total demand
   b) Equal to total demand
   c) More than total demand
   d) Not related to total demand

10) Johnson’s Rule is used for _____.
   a) Queuing problems
   b) Project scheduling
   c) Sequencing jobs on machines
   d) Linear programming

11) Which method is used to calculate the earliest and latest times in CPM?
   a) Backward pass and forward pass
   b) Simplex method
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12) The critical path in a network represents _____.
   a) The longest path and minimum time for completion
   b) The shortest path and maximum time for completion
   c) The longest path and cost minimization
   d) None of the above

13) The graphical method of LPP is applicable for how many variables?
   a) Two or more
   b) Two only
   c) One only
   d) Three only

14) For a queuing system, if arrival rate λ\lambda λ = 5 customers/hour and service rate μ\mu μ = 10 customers/hour, the traffic intensity (ρ\rho ρ) is _____.
   a) 0.2
   b) 0.5
   c) 0.8
   d) 2.0

Seat No.	

Set **Q**

Fourth. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Operations Research (BTN02712)

Day & Date: Wednesday, 13-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Solve any two questions from each section.
2) Use of a calculator is allowed.
3) Figures to the right indicate full marks.
4) Assume additional suitable data, if necessary and mention it clearly

SECTION – I

Q.2 **a)** Maximize by Graphical Method. **07**

Maximize $Z = 3x_1 + 4x_2$,
Subject to, $5x_1 + 4x_2 \leq 200$,
$3x_1 + 5x_2 \leq 150$,
$5x_1 + 4x_2 \geq 100$,
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$x_1, x_2 \geq 0$.

b) Solve the minimal assignment problem whose effectiveness matrix is: **07**

	1	**2**	**3**	**4**
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Q.3 **a)** A firm marketing a product has four salesmen S_1, S_2, S_3 and S_4. There are three customers C_1, C_2 and C_3. The probability of making a sale to a customer depends upon the salesman-customer support. The table below represents the probability with which each of the salesmen can sell to each of the customers: **07**

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C_3	0.3	0.9	0.6	0.2

b) Solve the following unbalanced transportation problem: **07**

	1	**2**	**3**	**Supply**
1	5	1	7	10
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3	3	2	5	15
Demand	75	20	50	

Q.4 **a)** Explain the methodology of Operations Research (OR) and its applications in mechanical engineering. **07**

b) A company manufacturing air coolers has two plants located at Mumbai and Kolkata with a capacity of 200 units and 100 units per week respectively. The company supplies the air coolers to its four show rooms situated at Ranchi, Delhi, Lucknow and Kanpur which have a maximum demand of 75, 100, 100 and 30 units respectively. Due to the differences in raw material cost and transportation cost, the profit per unit in rupees differs which is shown in the table below. **07**

	Ranchi	*Delhi*	*Lucknow*	*Kanpur*
Mumbai	90	90	100	110
Kolkata	50	70	130	85

SECTION – II

Q.5 **a)** Explain the concept of idle time and its impact on production scheduling. **05**

Estimated times for the jobs of a project are given below:

Job	A	B	C	D	E	F	G	H	I	J	K	L
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b) The constraints governing the jobs are as follows: **09**

A and B are start jobs; A controls C, D and E; B controls F and J; G depends upon C; H depends on D; E and F control I and L; K follows J; L is also controlled by K; G, H, I and L are the last jobs. Draw the network; determine project duration and the critical path.

Q.6 **a)** Explain the procedure for constructing a PERT network and how time estimates are used to calculate the probability of completing a project within a scheduled time. **07**

b) A company plans to invest ₹1,00,000 in a project for 5 years at an annual interest rate of 10%. Calculate the compound interest earned at the end of 5 years. **07**

Q.7 **a)** There are seven jobs, each of which has to go through the machines A and B in the order AB. Processing times in hours are given as **07**

Job	1	2	3	4	5	6	7
Machine A	3	12	15	6	10	11	9
Machine B	8	10	10	6	12	1	3

Determine a sequence of these jobs that will minimize the total elapsed time T. Also find T and idle time for machines A and B.

b) Discuss the significance of inflation and its impact on cash flow analysis in engineering projects. **07**

SLR-QH-383

Seat No.	

Set R

Fourth. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Operations Research (BTN02712)

Day & Date: Wednesday, 13-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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3) Figures to the right indicates full marks.
4) Assume suitable data if necessary and mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) Which cost is an example of an intangible cost?
a) Labor cost b) Material cost
c) Lost customer goodwill d) Equipment cost

2) What is the purpose of calculating floats in CPM?
a) To reduce the project duration
b) To determine slack in non-critical activities
c) To identify the critical path
d) To calculate the expected completion time

3) What is the objective of linear programming?
a) Maximization or minimization of a linear function
b) Solving non-linear equations
c) Estimating probabilities
d) Scheduling projects

4) The term "waiting line" is associated with_____.
a) Assignment problems b) Queuing theory
c) Sequencing rules d) Transportation models

5) What is the full form of PERT?
a) Project Evaluation and Review Technique
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d) Project Estimation and Resource Technique

6) In a balanced assignment problem, the total supply is _____.
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c) More than total demand
d) Not related to total demand

7) Johnson's Rule is used for _____.
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8) Which method is used to calculate the earliest and latest times in CPM?
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d) Probability analysis

9) The critical path in a network represents _____.
a) The longest path and minimum time for completion
b) The shortest path and maximum time for completion
c) The longest path and cost minimization
d) None of the above

10) The graphical method of LPP is applicable for how many variables?
a) Two or more
b) Two only
c) One only
d) Three only

11) For a queuing system, if arrival rate λ\lambda λ = 5 customers/hour and service rate μ\mu μ = 10 customers/hour, the traffic intensity (ρ\rho ρ) is _____.
a) 0.2
b) 0.5
c) 0.8
d) 2.0

12) In the North-West Corner Rule, allocations start from _____.
a) The cell with the least cost
b) The top-left corner
c) The bottom-right corner
d) Any random cell

13) What does duality in LPP provide?
a) An alternative optimal solution
b) An infeasible solution
c) A solution to the primal problem
d) Insight into the shadow prices

14) A cash flow diagram is used in _____.
a) PERT analysis
b) Linear programming problems
c) Engineering economics
d) Transportation problems

Seat No.	

Set | **R**

Fourth. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Operations Research (BTN02712)

Day & Date: Wednesday, 13-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Solve any two questions from each section.
2) Use of a calculator is allowed.
3) Figures to the right indicate full marks.
4) Assume additional suitable data, if necessary and mention it clearly

SECTION – I

Q.2 **a)** Maximize by Graphical Method. **07**

Maximize $Z = 3x_1 + 4x_2$,
Subject to, $5x_1 + 4x_2 \leq 200$,
$3x_1 + 5x_2 \leq 150$,
$5x_1 + 4x_2 \geq 100$,
$8x_1 + 4x_2 \geq 80$,
$x_1, x_2 \geq 0$.

b) Solve the minimal assignment problem whose effectiveness matrix is: **07**

	1	**2**	**3**	**4**
I	2	3	4	5
II	4	5	6	7
III	7	8	9	8
IV	3	5	8	4

Q.3 **a)** A firm marketing a product has four salesmen S_1, S_2, S_3 and S_4. There are three customers C_1, C_2 and C_3. The probability of making a sale to a customer depends upon the salesman-customer support. The table below represents the probability with which each of the salesmen can sell to each of the customers: **07**

	S_1	**S_2**	**S_3**	**S_4**
C_1	0.7	0.4	0.5	0.8
C_2	0.5	0.8	0.6	0.7
C_3	0.3	0.9	0.6	0.2

b) Solve the following unbalanced transportation problem: **07**

	1	**2**	**3**	**Supply**
1	5	1	7	10
2	6	4	6	80
3	3	2	5	15
Demand	75	20	50	

Q.4 **a)** Explain the methodology of Operations Research (OR) and its applications in mechanical engineering. **07**

b) A company manufacturing air coolers has two plants located at Mumbai and Kolkata with a capacity of 200 units and 100 units per week respectively. The company supplies the air coolers to its four show rooms situated at Ranchi, Delhi, Lucknow and Kanpur which have a maximum demand of 75, 100, 100 and 30 units respectively. Due to the differences in raw material cost and transportation cost, the profit per unit in rupees differs which is shown in the table below. **07**

	Ranchi	*Delhi*	*Lucknow*	*Kanpur*
Mumbai	90	90	100	110
Kolkata	50	70	130	85

SECTION – II

Q.5 **a)** Explain the concept of idle time and its impact on production scheduling. **05**

Estimated times for the jobs of a project are given below:

Job	A	B	C	D	E	F	G	H	I	J	K	L
Time (Weeks)	13	5	8	10	9	7	7	12	8	9	4	17

b) The constraints governing the jobs are as follows: **09**

A and B are start jobs; A controls C, D and E; B controls F and J; G depends upon C; H depends on D; E and F control I and L; K follows J; L is also controlled by K; G, H, I and L are the last jobs. Draw the network; determine project duration and the critical path.

Q.6 **a)** Explain the procedure for constructing a PERT network and how time estimates are used to calculate the probability of completing a project within a scheduled time. **07**

b) A company plans to invest ₹1,00,000 in a project for 5 years at an annual interest rate of 10%. Calculate the compound interest earned at the end of 5 years. **07**

Q.7 **a)** There are seven jobs, each of which has to go through the machines A and B in the order AB. Processing times in hours are given as **07**

Job	1	2	3	4	5	6	7
Machine A	3	12	15	6	10	11	9
Machine B	8	10	10	6	12	1	3

Determine a sequence of these jobs that will minimize the total elapsed time T. Also find T and idle time for machines A and B.

b) Discuss the significance of inflation and its impact on cash flow analysis in engineering projects. **07**

SLR-QH-383

Seat No.	

Set S

Fourth. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Operations Research (BTN02712)

Day & Date: Wednesday, 13-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) The graphical method of LPP is applicable for how many variables?
a) Two or more b) Two only
c) One only d) Three only

2) For a queuing system, if arrival rate λ\lambda λ = 5 customers/hour and service rate μ\mu μ = 10 customers/hour, the traffic intensity (ρ\rho ρ) is _____.
a) 0.2 b) 0.5
c) 0.8 d) 2.0

3) In the North-West Corner Rule, allocations start from _____.
a) The cell with the least cost b) The top-left corner
c) The bottom-right corner d) Any random cell

4) What does duality in LPP provide?
a) An alternative optimal solution
b) An infeasible solution
c) A solution to the primal problem
d) Insight into the shadow prices

5) A cash flow diagram is used in _____.
a) PERT analysis
b) Linear programming problems
c) Engineering economics
d) Transportation problems

6) Which cost is an example of an intangible cost?
a) Labor cost
b) Material cost
c) Lost customer goodwill
d) Equipment cost

7) What is the purpose of calculating floats in CPM?
a) To reduce the project duration
b) To determine slack in non-critical activities
c) To identify the critical path
d) To calculate the expected completion time

8) What is the objective of linear programming?
a) Maximization or minimization of a linear function
b) Solving non-linear equations
c) Estimating probabilities
d) Scheduling projects

9) The term “waiting line” is associated with_____.
a) Assignment problems
b) Queuing theory
c) Sequencing rules
d) Transportation models

10) What is the full form of PERT?
a) Project Evaluation and Review Technique
b) Program Evaluation and Resource Technique
c) Program Estimation and Review Technique
d) Project Estimation and Resource Technique

11) In a balanced assignment problem, the total supply is _____.
a) Less than total demand
b) Equal to total demand
c) More than total demand
d) Not related to total demand

12) Johnson’s Rule is used for _____.
a) Queuing problems
b) Project scheduling
c) Sequencing jobs on machines
d) Linear programming

13) Which method is used to calculate the earliest and latest times in CPM?
a) Backward pass and forward pass
b) Simplex method
c) Johnson’s Rule
d) Probability analysis

14) The critical path in a network represents _____.
a) The longest path and minimum time for completion
b) The shortest path and maximum time for completion
c) The longest path and cost minimization
d) None of the above

Seat No.	

Set | S

Fourth. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Operations Research (BTN02712)

Day & Date: Wednesday, 13-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Solve any two questions from each section.
2) Use of a calculator is allowed.
3) Figures to the right indicate full marks.
4) Assume additional suitable data, if necessary and mention it clearly

SECTION – I

Q.2 **a)** Maximize by Graphical Method. **07**

Maximize $Z = 3x_1 + 4x_2$,
Subject to, $5x_1 + 4x_2 \leq 200$,
$3x_1 + 5x_2 \leq 150$,
$5x_1 + 4x_2 \geq 100$,
$8x_1 + 4x_2 \geq 80$,
$x_1, x_2 \geq 0$.

b) Solve the minimal assignment problem whose effectiveness matrix is: **07**

	1	**2**	**3**	**4**
I	2	3	4	5
II	4	5	6	7
III	7	8	9	8
IV	3	5	8	4

Q.3 **a)** A firm marketing a product has four salesmen S_1, S_2, S_3 and S_4. There are three customers C_1, C_2 and C_3. The probability of making a sale to a customer depends upon the salesman-customer support. The table below represents the probability with which each of the salesmen can sell to each of the customers: **07**

	S_1	**S_2**	**S_3**	**S_4**
C_1	0.7	0.4	0.5	0.8
C_2	0.5	0.8	0.6	0.7
C_3	0.3	0.9	0.6	0.2

b) Solve the following unbalanced transportation problem: **07**

	1	**2**	**3**	**Supply**
1	5	1	7	10
2	6	4	6	80
3	3	2	5	15
Demand	75	20	50	

Q.4 **a)** Explain the methodology of Operations Research (OR) and its applications in mechanical engineering. **07**

b) A company manufacturing air coolers has two plants located at Mumbai and Kolkata with a capacity of 200 units and 100 units per week respectively. The company supplies the air coolers to its four show rooms situated at Ranchi, Delhi, Lucknow and Kanpur which have a maximum demand of 75, 100, 100 and 30 units respectively. Due to the differences in raw material cost and transportation cost, the profit per unit in rupees differs which is shown in the table below. **07**

	Ranchi	*Delhi*	*Lucknow*	*Kanpur*
Mumbai	90	90	100	110
Kolkata	50	70	130	85

SECTION – II

Q.5 **a)** Explain the concept of idle time and its impact on production scheduling. **05**

Estimated times for the jobs of a project are given below:

Job	A	B	C	D	E	F	G	H	I	J	K	L
Time (Weeks)	13	5	8	10	9	7	7	12	8	9	4	17

b) The constraints governing the jobs are as follows: **09**

A and B are start jobs; A controls C, D and E; B controls F and J; G depends upon C; H depends on D; E and F control I and L; K follows J; L is also controlled by K; G, H, I and L are the last jobs. Draw the network; determine project duration and the critical path.

Q.6 **a)** Explain the procedure for constructing a PERT network and how time estimates are used to calculate the probability of completing a project within a scheduled time. **07**

b) A company plans to invest ₹1,00,000 in a project for 5 years at an annual interest rate of 10%. Calculate the compound interest earned at the end of 5 years. **07**

Q.7 **a)** There are seven jobs, each of which has to go through the machines A and B in the order AB. Processing times in hours are given as **07**

Job	1	2	3	4	5	6	7
Machine A	3	12	15	6	10	11	9
Machine B	8	10	10	6	12	1	3

Determine a sequence of these jobs that will minimize the total elapsed time T. Also find T and idle time for machines A and B.

b) Discuss the significance of inflation and its impact on cash flow analysis in engineering projects. **07**

SLR-QH-384

Seat No.	

Set P

Fourth. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Research Methodology (BTN02713)

Day & Date: Wednesday, 13-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions, if required and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Give the correct option for the following questions. 14

1) Which of the following best defines "Research"?
a) A systematic process of collecting data from published sources
b) A set of organized actions aimed at developing a product
c) A scientific and systematic inquiry into a subject to discover facts, principles, and theories
d) A series of observations about a particular phenomenon

2) Which of the following is true about "Applied Research"?
a) It is purely theoretical and aims at developing general principles
b) It is conducted with the aim of solving real-world problems
c) It only applies to scientific fields and excludes social sciences
d) It focuses on investigating basic laws and theories

3) Which research method is typically used when there is a need to understand a phenomenon in its natural context, often using interviews or case studies?
a) Quantitative Research b) Experimental Research
c) Qualitative Research d) Analytical Research

4) Which of the following is an example of a primary source in research?
a) Textbook summarizing previous research finding
b) A scientific journal article presenting new experimental data
c) A researcher's thesis on a specific topic
d) A website summarizing multiple academic papers

5) What is the main purpose of identifying gap areas in a literature review?
   a) To summarize the results of all the studies available
   b) To create a new research question or hypothesis based on the identified gaps
   c) To re-examine well-established theories
   d) To provide a historical context for the research topic

6) Which of the following is a primary characteristic of the “Historical Method” of research?
   a) It involves the collection of data through surveys and questionnaires
   b) It examines past events, documents, and records to understand patterns over time
   c) It uses statistical tools to analyse data
   d) It requires the researcher to conduct experiments in a controlled setting

7) In the “Ethical Method” of research, the primary concern is _____.
   a) Analysing social behaviours using statistical tools
   b) Understanding the philosophical underpinnings of human behavior
   c) Ensuring that research follows ethical guidelines and protects participants
   d) Investigating the causes of historical events

8) Why is research design important in a study?
   a) It helps in organizing the study's data and writing the report
   b) It ensures the research remains random and unpredictable
   c) It provides a structured framework to guide the research process and ensure reliable results
   d) It allows researchers to avoid using a methodology

9) Which of the following is a feature of a good research design?
   a) It is based on personal opinions rather than evidence
   b) It minimizes the potential for bias and errors in data collection
   c) It focuses on only one methodology, ignoring others
   d) It leaves the interpretation of data to chance

10) What is the first step in the formulation of a research design?
   a) Collecting data from a random sample
   b) Identifying the research problem and determining the objectives of the study
   c) Conducting statistical analysis
   d) Writing the final research report

11) Which of the following is the first step in the “Collection of Data” process?

a) Analysing the data
b) Presenting the data in graphical form
c) Defining the research problem and determining the data collection method
d) Writing the research report

12) Which of the following is the correct formula for calculating the mean of a data set?

a) Mean = (Sum of all values) / (Number of values)
b) Mean = (Sum of squares of all values) / (Number of values)
c) Mean = (Largest value + smallest value) / 2
d) Mean = (Sum of differences from the average) / (Number of values)

13) A report that provides an overview of existing knowledge in a specific area is known as _____.

a) Technical report
b) Review report
c) Incident report
d) Conference report

14) A paper that presents original research findings is called a _____.

a) Survey paper
b) Conference paper
c) Review paper
d) Journal paper

Seat No.	

Set | P

Fourth. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Research Methodology (BTN02713)

Day & Date: Wednesday, 13-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Answer any two questions from each Section.
2) Figures to the right indicates full marks.
3) Make suitable assumptions, if required and state them clearly.

Section – I

Q.2	**a)**	What are the main objectives of conducting research, and how do they contribute to scientific and societal progress?	**07**
	b)	Define conceptual and empirical research. How are these types of research used in different fields of study?	**07**
Q.3	**a)**	Discuss the advantages and limitations of using secondary sources, such as reviews and treatises, for literature review purposes.	**07**
	b)	Explain in details Critical literature review.	**07**
Q.4	**a)**	Describe the experimental method. What are the key steps involved?	**07**
	b)	What are brainstorming techniques, and how are they used to generate creative ideas during the research process?	**07**

Section – II

Q.5	**a)**	Explain the key concepts of observation and facts in the context of research design.	**07**
	b)	What are the key components of a research plan?	**07**
Q.6	**a)**	What are the different methods of observation used in research? Discuss their advantages and limitations.	**07**
	b)	Define sampling and explain its importance in research.	**07**
Q.7	**a)**	What is the typical structure of a journal paper?	**07**
	b)	What are the different types of reports commonly used in research? Provide examples for each.	**07**

SLR-QH-384

Seat No.	

Set Q

Fourth. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Research Methodology (BTN02713)

Day & Date: Wednesday, 13-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions, if required and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Give the correct option for the following questions. 14

1) Why is research design important in a study?
a) It helps in organizing the study's data and writing the report
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3) What is the first step in the formulation of a research design?
a) Collecting data from a random sample
b) Identifying the research problem and determining the objectives of the study
c) Conducting statistical analysis
d) Writing the final research report

4) Which of the following is the first step in the "Collection of Data" process?
a) Analysing the data
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5) Which of the following is the correct formula for calculating the mean of a data set?
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7) A paper that presents original research findings is called a _____.
   a) Survey paper
   b) Conference paper
   c) Review paper
   d) Journal paper

8) Which of the following best defines “Research”?
   a) A systematic process of collecting data from published sources
   b) A set of organized actions aimed at developing a product
   c) A scientific and systematic inquiry into a subject to discover facts, principles, and theories
   d) A series of observations about a particular phenomenon

9) Which of the following is true about “Applied Research”?
   a) It is purely theoretical and aims at developing general principles
   b) It is conducted with the aim of solving real-world problems
   c) It only applies to scientific fields and excludes social sciences
   d) It focuses on investigating basic laws and theories

10) Which research method is typically used when there is a need to understand a phenomenon in its natural context, often using interviews or case studies?
   a) Quantitative Research
   b) Experimental Research
   c) Qualitative Research
   d) Analytical Research

11) Which of the following is an example of a primary source in research?
   a) Textbook summarizing previous research finding
   b) A scientific journal article presenting new experimental data
   c) A researcher’s thesis on a specific topic
   d) A website summarizing multiple academic papers

12) What is the main purpose of identifying gap areas in a literature review?
   a) To summarize the results of all the studies available
   b) To create a new research question or hypothesis based on the identified gaps
   c) To re-examine well-established theories
   d) To provide a historical context for the research topic

13) Which of the following is a primary characteristic of the “Historical Method” of research?

a) It involves the collection of data through surveys and questionnaires
b) It examines past events, documents, and records to understand patterns over time
c) It uses statistical tools to analyse data
d) It requires the researcher to conduct experiments in a controlled setting

14) In the “Ethical Method” of research, the primary concern is _____.

a) Analysing social behaviours using statistical tools
b) Understanding the philosophical underpinnings of human behavior
c) Ensuring that research follows ethical guidelines and protects participants
d) Investigating the causes of historical events

Seat No.	

Set **Q**

Fourth. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Research Methodology (BTN02713)

Day & Date: Wednesday, 13-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Answer any two questions from each Section.
2) Figures to the right indicates full marks.
3) Make suitable assumptions, if required and state them clearly.

Section – I

Q.2	**a)**	What are the main objectives of conducting research, and how do they contribute to scientific and societal progress?	**07**
	b)	Define conceptual and empirical research. How are these types of research used in different fields of study?	**07**
Q.3	**a)**	Discuss the advantages and limitations of using secondary sources, such as reviews and treatises, for literature review purposes.	**07**
	b)	Explain in details Critical literature review.	**07**
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	b)	What are brainstorming techniques, and how are they used to generate creative ideas during the research process?	**07**

Section – II

Q.5	**a)**	Explain the key concepts of observation and facts in the context of research design.	**07**
	b)	What are the key components of a research plan?	**07**
Q.6	**a)**	What are the different methods of observation used in research? Discuss their advantages and limitations.	**07**
	b)	Define sampling and explain its importance in research.	**07**
Q.7	**a)**	What is the typical structure of a journal paper?	**07**
	b)	What are the different types of reports commonly used in research? Provide examples for each.	**07**

SLR-QH-384

Seat No.	

Set R

Fourth. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Research Methodology (BTN02713)

Day & Date: Wednesday, 13-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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3) Figures to the right indicates full marks.
4) Make suitable assumptions, if required and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Give the correct option for the following questions. 14

1) Which of the following is the first step in the "Collection of Data" process?
a) Analysing the data
b) Presenting the data in graphical form
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2) Which of the following is the correct formula for calculating the mean of a data set?
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3) A report that provides an overview of existing knowledge in a specific area is known as _____.
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14) What is the first step in the formulation of a research design?
   a) Collecting data from a random sample
   b) Identifying the research problem and determining the objectives of the study
   c) Conducting statistical analysis
   d) Writing the final research report

Seat No.	

Set **R**

Fourth. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Research Methodology (BTN02713)

Day & Date: Wednesday, 13-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Answer any two questions from each Section.
2) Figures to the right indicates full marks.
3) Make suitable assumptions, if required and state them clearly.

Section – I

Q.2	**a)**	What are the main objectives of conducting research, and how do they contribute to scientific and societal progress?	**07**
	b)	Define conceptual and empirical research. How are these types of research used in different fields of study?	**07**
Q.3	**a)**	Discuss the advantages and limitations of using secondary sources, such as reviews and treatises, for literature review purposes.	**07**
	b)	Explain in details Critical literature review.	**07**
Q.4	**a)**	Describe the experimental method. What are the key steps involved?	**07**
	b)	What are brainstorming techniques, and how are they used to generate creative ideas during the research process?	**07**

Section – II

Q.5	**a)**	Explain the key concepts of observation and facts in the context of research design.	**07**
	b)	What are the key components of a research plan?	**07**
Q.6	**a)**	What are the different methods of observation used in research? Discuss their advantages and limitations.	**07**
	b)	Define sampling and explain its importance in research.	**07**
Q.7	**a)**	What is the typical structure of a journal paper?	**07**
	b)	What are the different types of reports commonly used in research? Provide examples for each.	**07**

Seat No.	

Set **S**

Fourth. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Research Methodology (BTN02713)

Day & Date: Wednesday, 13-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions, if required and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Give the correct option for the following questions. 14

1) Which of the following is a primary characteristic of the "Historical Method" of research?
a) It involves the collection of data through surveys and questionnaires
b) It examines past events, documents, and records to understand patterns over time
c) It uses statistical tools to analyse data
d) It requires the researcher to conduct experiments in a controlled setting

2) In the "Ethical Method" of research, the primary concern is _____.
a) Analysing social behaviours using statistical tools
b) Understanding the philosophical underpinnings of human behavior
c) Ensuring that research follows ethical guidelines and protects participants
d) Investigating the causes of historical events

3) Why is research design important in a study?
a) It helps in organizing the study's data and writing the report
b) It ensures the research remains random and unpredictable
c) It provides a structured framework to guide the research process and ensure reliable results
d) It allows researchers to avoid using a methodology

4) Which of the following is a feature of a good research design?
a) It is based on personal opinions rather than evidence
b) It minimizes the potential for bias and errors in data collection
c) It focuses on only one methodology, ignoring others
d) It leaves the interpretation of data to chance

5) What is the first step in the formulation of a research design?
a) Collecting data from a random sample
b) Identifying the research problem and determining the objectives of the study
c) Conducting statistical analysis
d) Writing the final research report

6) Which of the following is the first step in the "Collection of Data" process?
a) Analysing the data
b) Presenting the data in graphical form
c) Defining the research problem and determining the data collection method
d) Writing the research report

7) Which of the following is the correct formula for calculating the mean of a data set?
a) Mean = (Sum of all values) / (Number of values)
b) Mean = (Sum of squares of all values) / (Number of values)
c) Mean = (Largest value + smallest value) / 2
d) Mean = (Sum of differences from the average) / (Number of values)

8) A report that provides an overview of existing knowledge in a specific area is known as _____.
a) Technical report
b) Review report
c) Incident report
d) Conference report

9) A paper that presents original research findings is called a _____.
a) Survey paper
b) Conference paper
c) Review paper
d) Journal paper

10) Which of the following best defines "Research"?
a) A systematic process of collecting data from published sources
b) A set of organized actions aimed at developing a product
c) A scientific and systematic inquiry into a subject to discover facts, principles, and theories
d) A series of observations about a particular phenomenon

11) Which of the following is true about "Applied Research"?
a) It is purely theoretical and aims at developing general principles
b) It is conducted with the aim of solving real-world problems
c) It only applies to scientific fields and excludes social sciences
d) It focuses on investigating basic laws and theories

12) Which research method is typically used when there is a need to understand a phenomenon in its natural context, often using interviews or case studies?

a) Quantitative Research
b) Experimental Research
c) Qualitative Research
d) Analytical Research

13) Which of the following is an example of a primary source in research?

a) Textbook summarizing previous research finding
b) A scientific journal article presenting new experimental data
c) A researcher's thesis on a specific topic
d) A website summarizing multiple academic papers

14) What is the main purpose of identifying gap areas in a literature review?

a) To summarize the results of all the studies available
b) To create a new research question or hypothesis based on the identified gaps
c) To re-examine well-established theories
d) To provide a historical context for the research topic

SLR-QH-384

Seat No.		Set	S

Fourth. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Research Methodology (BTN02713)

Day & Date: Wednesday, 13-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Answer any two questions from each Section.
2) Figures to the right indicates full marks.
3) Make suitable assumptions, if required and state them clearly.

Section – I

Q.2	**a)**	What are the main objectives of conducting research, and how do they contribute to scientific and societal progress?	**07**
	b)	Define conceptual and empirical research. How are these types of research used in different fields of study?	**07**
Q.3	**a)**	Discuss the advantages and limitations of using secondary sources, such as reviews and treatises, for literature review purposes.	**07**
	b)	Explain in details Critical literature review.	**07**
Q.4	**a)**	Describe the experimental method. What are the key steps involved?	**07**
	b)	What are brainstorming techniques, and how are they used to generate creative ideas during the research process?	**07**

Section – II

Q.5	**a)**	Explain the key concepts of observation and facts in the context of research design.	**07**
	b)	What are the key components of a research plan?	**07**
Q.6	**a)**	What are the different methods of observation used in research? Discuss their advantages and limitations.	**07**
	b)	Define sampling and explain its importance in research.	**07**
Q.7	**a)**	What is the typical structure of a journal paper?	**07**
	b)	What are the different types of reports commonly used in research? Provide examples for each.	**07**

SLR-QH-386

Seat No.		Set	P

Fourth. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Finite Element Method (BTN02715)

Day & Date: Wednesday, 13-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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4) Assume suitable data if necessary and mention it clearly.
5) Use of non-programmable scientific calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Select the correct alternative. **14**

1) Shape function is usually _____.
a) The coefficient that appears in the interpolation polynomial
b) Written for each individual node of finite element
c) Interchanged with the terminology interpolation polynomial
d) All of the above

2) If element size is reduced, number of elements _____.
a) increases b) decreases
c) remains constant d) gets deleted

3) The loading, constraints and other external effects applied to a model is _____.
a) Boundary conditions b) Meshing
c) Constraining d) Modeling

4) Preprocessing means _____.
a) Solving b) Meshing
c) Result analysis d) None of the above

5) Sum of all the natural coordinates of the node is _____.
a) One b) Zero
c) Can not be predicted d) None of the above

6) The interpolation function for a CST element is given by _____.
a) $U = a_1 + a_2x + a_3y$ b) $U = a_1 + a_2x + a_3x^2$
c) $U = a_1 + a_2x + a_3x^2 + a_4y$ d) $U = a_1 + a_2x + a_3y + a_4z$

7) Complex elements are defined as those elements which _____.
a) have higher order interpolation polynomials
b) have sides parallel to coordinate system
c) have sides parallel to coordinate system and use higher order interpolation polynomials
d) have polynomials with only linear and constant terms

8) Each node of beam element is having following degree of freedom.
a) 3 b) 4
c) 2 d) 1

9) In _____ element the value of field variable remains unchanged in the circumferential direction.
a) 1D and 2D b) Beam
c) Truss d) Axisymmetric

10) Size of shape function matrix of $2D$ element having 3 nodes is _____.
a) 2×6 b) 4×6
c) 3×3 d) 2×5

11) Formula for Galerkin method is _____.
a) $f(x)R(x)dx = 0$ b) $\int R(x)dx = 0$
c) $R(x) = 0$ d) $\int R2(x)dx = 0$

12) A measure of distortion of a element is _____.
a) Bandwidth b) Damping ratio
c) Aspect ratio d) Shape function

13) A problem which is not a function of a time _____.
a) Eigenvalue problem b) Steady state problem
c) Transient problem d) Propagation problem

14) The three most common cases on non-linearity are _____.
a) Fluttering, Geometric, Material
b) Material, Geometric, Contact
c) Material, Fluttering, Plasticity
d) Creep, Fluttering, Contact

Seat No.	

Set **P**

Fourth. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Finite Element Method (BTN02715)

Day & Date: Wednesday, 13-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Answer any two questions from each Section.
2) Figures to the right indicates full marks.
3) Assume suitable data if necessary and mention it clearly.
4) Use of non-programmable scientific calculator is allowed.

Section – I

Q.2 **a)** Obtain solution of differential equation by using Galerkin's method. **07**

$$\frac{\partial^2 u}{\partial x^2} + u - x^2 = 0, \quad 0 \le x \le 1$$

Take boundary conditions as $u(0) = 0, \frac{du}{dx}(1) = 1$

b) Explain Simplex, Complex and Multiplex elements. **07**

Q.3 **a)** Find nodal displacement in stepped bar as shown in figure **07**
Take $A_1 = 20\ \text{mm}^2$, $A_2 = 10\ \text{mm}^2$
$L_1 = L_2 = 100\ \text{mm}$, $E_1 = E_2 = 200 \times 10^3$ MPa

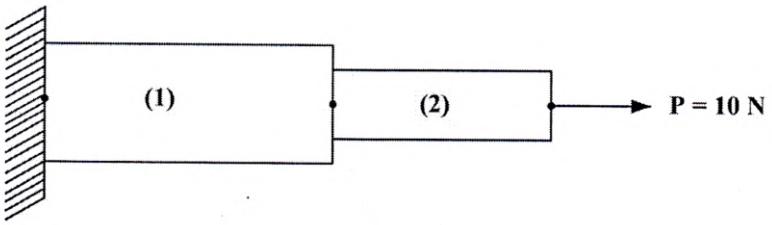

Figure 1:

b) Explain discretization in FEM with suitable example and also brief p-refinement and h-refinement. **07**

Q.4 Attempt the following.

a) What are the properties of Stiffness matrix? Explain. **04**

b) Write a note on FEM steps. **04**

c) Shape functions for 1D element in global and natural coordinates. **06**

Section – II

Q.5 **a)** Calculate the value of field variable at the point $A\ (2.5, 2.5)$, which is located inside the triangle as shown in figure 2. **07**

The nodal values for field variable are $U_i = 3.5, U_j = 2.2$ and $U_k = 4.4$

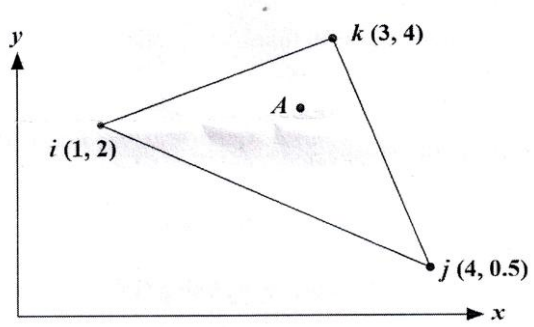

Figure 2:

b) Explain static analysis and modal analysis. **07**

Q.6 **a)** Solve the following problem for all unknowns. Impose the boundary conditions using the penalty method. Refer figure 3. **12**

$A_1 = 900\text{mm}^2, A_2 = 400\text{mm}^2, A_3 = 200\text{mm}^2$

$L_1 = 80\text{mm}, L_2 = 80\text{mm}, L_3 = 70\text{mm}$

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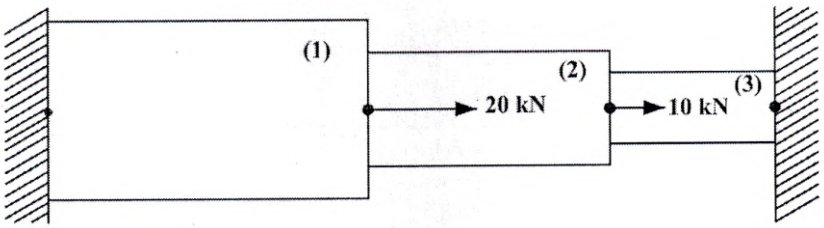

Figure 3:

b) What are the 3D elements? **02**

Q.7 **Write short note on. (Any Three)** **14**

a) Size and number of elements

b) Interpolation functions

c) Axisymmetric problems and axisymmetric elements

d) Transient thermal analysis

SLR-QH-386

Seat No.	

Set Q

Fourth. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Finite Element Method (BTN02715)

Day & Date: Wednesday, 13-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Select the correct alternative. **14**

1) Each node of beam element is having following degree of freedom.
a) 3 b) 4
c) 2 d) 1

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Seat No.		Set	Q

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Finite Element Method (BTN02715)

Day & Date: Wednesday, 13-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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Section – I

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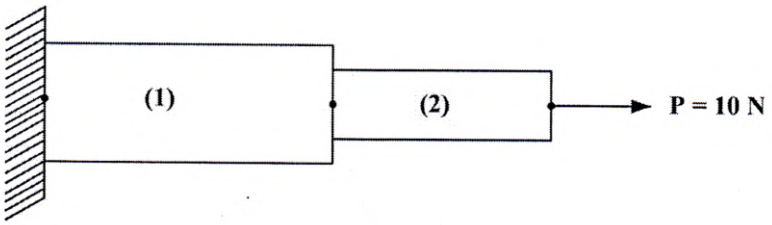

Figure 1:

b) Explain discretization in FEM with suitable example and also brief p-refinement and h-refinement. **07**

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b) Write a note on FEM steps. **04**

c) Shape functions for 1D element in global and natural coordinates. **06**

Section – II

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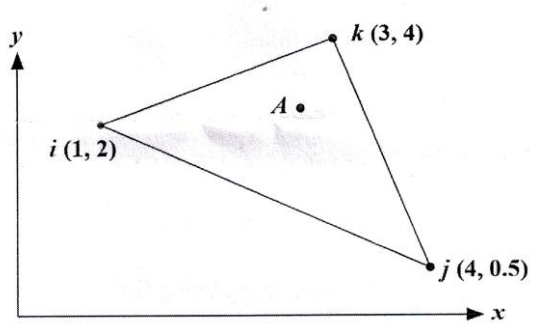

Figure 2:

b) Explain static analysis and modal analysis. **07**

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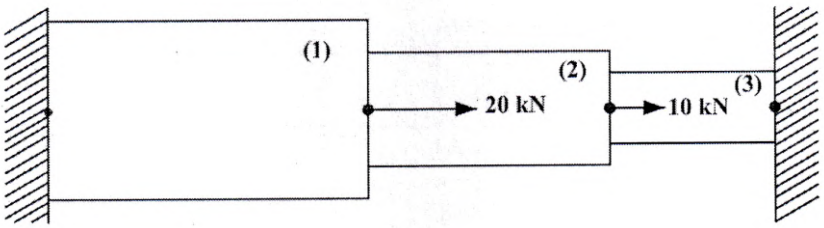

Figure 3:

b) What are the 3D elements? **02**

Q.7 **Write short note on. (Any Three)** **14**

a) Size and number of elements

b) Interpolation functions

c) Axisymmetric problems and axisymmetric elements

d) Transient thermal analysis

Seat No.	

Set R

Fourth. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Finite Element Method (BTN02715)

Day & Date: Wednesday, 13-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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b) 4
c) 2
d) 1

13) In _____ element the value of field variable remains unchanged in the circumferential direction.

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b) Beam
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d) Axisymmetric

14) Size of shape function matrix of $2D$ element having 3 nodes is _____.

a) 2×6
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d) 2×5

Seat No.	

Set **R**

Fourth. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Finite Element Method (BTN02715)

Day & Date: Wednesday, 13-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Answer any two questions from each Section.
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Section – I

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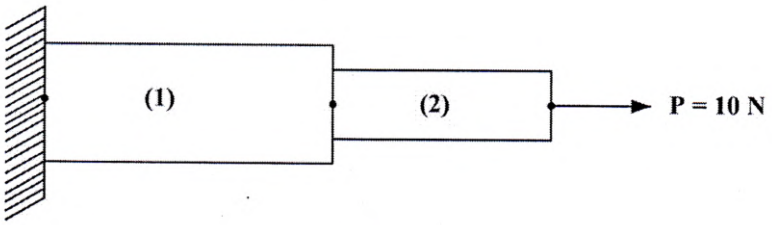

Figure 1:

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Section – II

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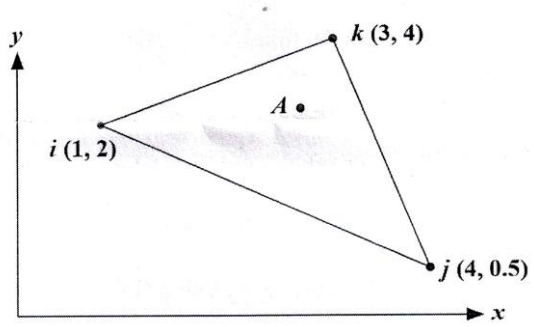

Figure 2:

b) Explain static analysis and modal analysis. **07**

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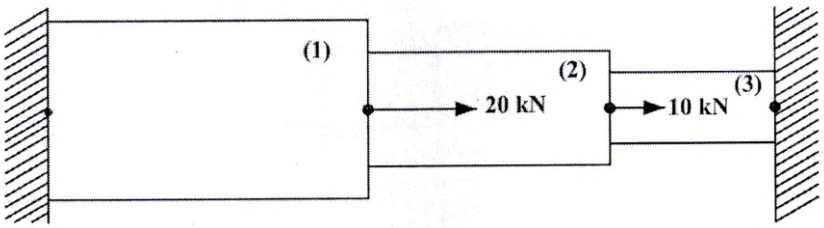

Figure 3:

b) What are the 3D elements? **02**

Q.7 **Write short note on. (Any Three)** **14**

a) Size and number of elements

b) Interpolation functions

c) Axisymmetric problems and axisymmetric elements

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SLR-QH-386

Seat No.		Set	S

Fourth. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Finite Element Method (BTN02715)

Day & Date: Wednesday, 13-05-2026 Max. Marks: 70
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Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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3) Figures to the right indicates full marks.
4) Assume suitable data if necessary and mention it clearly.
5) Use of non-programmable scientific calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Select the correct alternative. **14**

1) The interpolation function for a CST element is given by _____.
a) $U = a_1 + a_2x + a_3y$ b) $U = a_1 + a_2x + a_3x^2$
c) $U = a_1 + a_2x + a_3x^2 + a_4y$ d) $U = a_1 + a_2x + a_3y + a_4z$

2) Complex elements are defined as those elements which _____.
a) have higher order interpolation polynomials
b) have sides parallel to coordinate system
c) have sides parallel to coordinate system and use higher order interpolation polynomials
d) have polynomials with only linear and constant terms

3) Each node of beam element is having following degree of freedom.
a) 3 b) 4
c) 2 d) 1

4) In _____ element the value of field variable remains unchanged in the circumferential direction.
a) 1D and 2D b) Beam
c) Truss d) Axisymmetric

5) Size of shape function matrix of $2D$ element having 3 nodes is _____.
a) 2×6 b) 4×6
c) 3×3 d) 2×5

6) Formula for Galerkin method is _____.

a) $f(x)R(x)dx = 0$ b) $\int R(x)dx = 0$

c) $R(x) = 0$ d) $\int R2(x)dx = 0$

7) A measure of distortion of a element is _____.

a) Bandwidth b) Damping ratio

c) Aspect ratio d) Shape function

8) A problem which is not a function of a time _____.

a) Eigenvalue problem b) Steady state problem

c) Transient problem d) Propagation problem

9) The three most common cases on non-linearity are _____.

a) Fluttering, Geometric, Material

b) Material, Geometric, Contact

c) Material, Fluttering, Plasticity

d) Creep, Fluttering, Contact

10) Shape function is usually _____.

a) The coefficient that appears in the interpolation polynomial

b) Written for each individual node of finite element

c) Interchanged with the terminology interpolation polynomial

d) All of the above

11) If element size is reduced, number of elements _____.

a) increases b) decreases

c) remains constant d) gets deleted

12) The loading, constraints and other external effects applied to a model is _____.

a) Boundary conditions b) Meshing

c) Constraining d) Modeling

13) Preprocessing means _____.

a) Solving b) Meshing

c) Result analysis d) None of the above

14) Sum of all the natural coordinates of the node is _____.

a) One b) Zero

c) Can not be predicted d) None of the above

Seat No.		Set	S

Fourth. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Finite Element Method (BTN02715)

Day & Date: Wednesday, 13-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Answer any two questions from each Section.
2) Figures to the right indicates full marks.
3) Assume suitable data if necessary and mention it clearly.
4) Use of non-programmable scientific calculator is allowed.

Section – I

Q.2 **a)** Obtain solution of differential equation by using Galerkin's method. **07**

$$\frac{\partial^2 u}{\partial x^2} + u - x^2 = 0, \quad 0 \le x \le 1$$

Take boundary conditions as $u(0) = 0, \frac{du}{dx}(1) = 1$

b) Explain Simplex, Complex and Multiplex elements. **07**

Q.3 **a)** Find nodal displacement in stepped bar as shown in figure **07**
Take $A_1 = 20\ \text{mm}^2$, $A_2 = 10\ \text{mm}^2$
$L_1 = L_2 = 100\ \text{mm}$, $E_1 = E_2 = 200 \times 10^3$ MPa

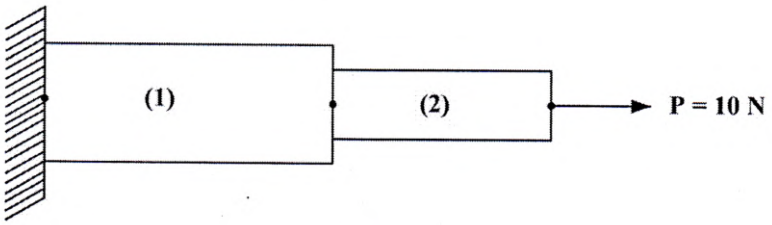

Figure 1:

b) Explain discretization in FEM with suitable example and also brief p-refinement and h-refinement. **07**

Q.4 Attempt the following.

a) What are the properties of Stiffness matrix? Explain. **04**

b) Write a note on FEM steps. **04**

c) Shape functions for 1D element in global and natural coordinates. **06**

Section – II

Q.5 **a)** Calculate the value of field variable at the point $A\ (2.5, 2.5)$, which is located inside the triangle as shown in figure 2. **07**

The nodal values for field variable are $U_i = 3.5, U_j = 2.2$ and $U_k = 4.4$

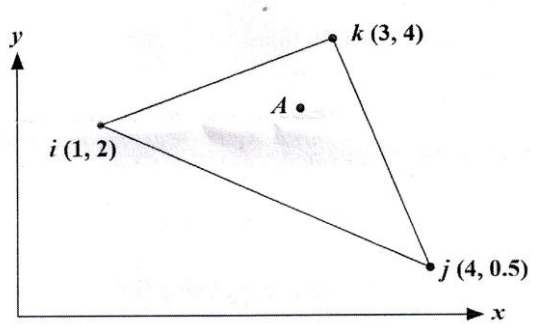

Figure 2:

b) Explain static analysis and modal analysis. **07**

Q.6 **a)** Solve the following problem for all unknowns. Impose the boundary conditions using the penalty method. Refer figure 3. **12**

$A_1 = 900\text{mm}^2, A_2 = 400\text{mm}^2, A_3 = 200\text{mm}^2$

$L_1 = 80\text{mm}, L_2 = 80\text{mm}, L_3 = 70\text{mm}$

$E_1 = 70\ \text{Gpa}, E_2 = 105\ \text{GPa}, E_3 = 200\ \text{GPa}$

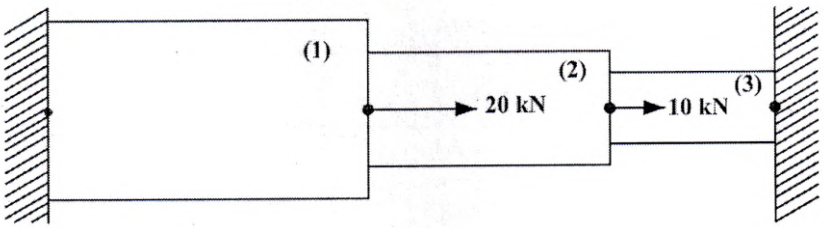

Figure 3:

b) What are the 3D elements? **02**

Q.7 **Write short note on. (Any Three)** **14**

a) Size and number of elements

b) Interpolation functions

c) Axisymmetric problems and axisymmetric elements

d) Transient thermal analysis

SLR-QH-387

Seat No.		Set	P

T.Y. (B.Tech.) (Electronics Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Digital Communication (BTN04501)

Day & Date: Saturday, 02-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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3) Figures to the right indicates full marks.
4) Assume suitable data whenever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Select suitable option. **14**

1) One of the disadvantages of PCM is _____.
a) It requires large bandwidth b) Very high noise
c) Cannot be decoded easily d) All of the above

2) The sequence of operations in which PCM is done is _____.
a) Sampling, quantizing, encoding
b) Quantizing, encoding, sampling
c) Quantizing, sampling, encoding
d) None of the above

3) The digital modulation scheme in which the step size is not fixed is _____.
a) Delta modulation b) Adaptive delta modulation
c) DPCM d) PCM

4) DPCM suffers from _____.
a) Slope over load distortion b) Quantization noise
c) Both a & b d) None of the above

5) The information rate R for given average information $H = 2.0$ for analog signal band limited to B Hz is _____.
a) 8 B bits/sec b) 4 B bits/sec
c) 2 B bits/sec d) 16 B bits/sec

6) The relation between entropy and mutual information is _____.
a) $I(X;Y) = H(X) - H(X/Y)$
b) $I(X;Y) = H(X/Y) - H(Y/X)$
c) $I(X;Y) = H(X) - H(Y)$
d) $I(X;Y) = H(Y) - H(X)$

7) ISI may be removed by using _____.
a) Differential coding b) Manchester coding
c) Polar NRZ d) None of the above

8) In coherent detection of signals,
a) Local carrier is generated
b) Carrier of frequency and phase as same as transmitted carrier is generated
c) The carrier is in synchronization with modulated carrier
d) All of the above

9) The code in convolution coding is generated using _____.
a) EX-OR logic b) AND logic
c) OR logic d) None of the above

10) Parity check bit coding is used for _____.
a) Error correction b) Error detection
c) Error correction and detection d) None of the above

11) For a noise to be white Gaussian noise, the optimum filter is known as _____.
a) Low pass filter b) Base band filter
c) Matched filter d) Bessel filter

12) ASK modulated signal has the bandwidth _____.
a) Same as the bandwidth of baseband signal
b) Half the bandwidth of baseband signal
c) Double the bandwidth of baseband signal
d) None of the above

13) Why spread spectrum technique is inefficient for a single user _____.
a) Large transmission bandwidth
b) Small transmission bandwidth
c) Fixed transmission bandwidth
d) Fixed null bandwidth

14) The early late gate synchronizer is a technique used for _____.
a) carrier synchronization b) symbol synchronization
c) frame synchronization d) None of these

Seat No.	

Set P

T.Y. (B.Tech.) (Electronics Engineering) (Semester - I) (New) (CBCS)
Examination: March/April - 2026
Digital Communication (BTN04501)

Day & Date: Saturday, 02-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data whenever necessary.

Section – I

Q.2 Attempt Any Four. **16**

a) Compare Analog Communication and digital Communication.

b) Explain Direct Method of generation of PPM and PWM.

c) Define the Information Theory and Mutual information.

d) How Delta modulation is different from PCM?

e) Verify the expression $I(X;Y) = I(Y;X)$.

Q.3 Attempt Any Two. **12**

a) With suitable diagram explain DPCM modulator & demodulator.

b) Derive the expression for condition of maximum entropy.

c) A DMS X has five symbols x_1, x_2, x_3, x_4 and x_5 with $0.4, 0.19, 0.16, 0.15$ and 0.1 respectively:
i) Construct a Shannon Fano code for X and calculate the efficiency of the code.
ii) Repeat for Huffman code and compare the result.

Section – II

Q.4 Attempt Any Four. **16**

a) Explain generation of ASK from baseband signal.

b) What is ARQ? Explain its type.

c) Explain Matched Filter BPSK Detector.

d) A convolution code is described by $g_1 = [1\ 0\ 0],\ g_2 = [1\ 0\ 1],$ $g_3 = [1\ 1\ 1]$
Find the advance transfer function and the free distance of this code.

e) Explain how a PN sequence is generated using ML linear shift register.

Q.5 Attempt Any Two. **12**

a) With suitable waveforms explain QPSK & OQPSK.

b) An error control code has the following parity check matrix.

$$H = \begin{matrix} 1 & 0 & 1 & 1 & 0 & 0 \\ 1 & 1 & 0 & 0 & 1 & 0 \\ 0 & 1 & 1 & 0 & 0 & 1 \end{matrix}$$

i) Determine the generator matrix G

ii) Find the code word that begin with $1\ 0\ 1$

iii) Decode the received code word $1\ 1\ 0\ 1\ 1\ 0$

c) With suitable diagram explain DSSS transmitter & receiver.

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Electronics Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Digital Communication (BTN04501)

Day & Date: Saturday, 02-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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4) Assume suitable data whenever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Select suitable option. **14**

1) In coherent detection of signals,
a) Local carrier is generated
b) Carrier of frequency and phase as same as transmitted carrier is generated
c) The carrier is in synchronization with modulated carrier
d) All of the above

2) The code in convolution coding is generated using _____.
a) EX-OR logic b) AND logic
c) OR logic d) None of the above

3) Parity check bit coding is used for _____.
a) Error correction b) Error detection
c) Error correction and detection d) None of the above

4) For a noise to be white Gaussian noise, the optimum filter is known as _____.
a) Low pass filter b) Base band filter
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5) ASK modulated signal has the bandwidth _____.
a) Same as the bandwidth of baseband signal
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c) Double the bandwidth of baseband signal
d) None of the above

6) Why spread spectrum technique is inefficient for a single user _____.
   a) Large transmission bandwidth
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   d) Fixed null bandwidth

7) The early late gate synchronizer is a technique used for _____.
   a) carrier synchronization
   b) symbol synchronization
   c) frame synchronization
   d) None of these

8) One of the disadvantages of PCM is _____.
   a) It requires large bandwidth
   b) Very high noise
   c) Cannot be decoded easily
   d) All of the above

9) The sequence of operations in which PCM is done is _____.
   a) Sampling, quantizing, encoding
   b) Quantizing, encoding, sampling
   c) Quantizing, sampling, encoding
   d) None of the above

10) The digital modulation scheme in which the step size is not fixed is _____.
   a) Delta modulation
   b) Adaptive delta modulation
   c) DPCM
   d) PCM

11) DPCM suffers from _____.
   a) Slope over load distortion
   b) Quantization noise
   c) Both a & b
   d) None of the above

12) The information rate R for given average information $H = 2.0$ for analog signal band limited to B Hz is _____.
   a) 8 B bits/sec
   b) 4 B bits/sec
   c) 2 B bits/sec
   d) 16 B bits/sec

13) The relation between entropy and mutual information is _____.
   a) $I(X;Y) = H(X) - H(X/Y)$
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14) ISI may be removed by using _____.
   a) Differential coding
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   c) Polar NRZ
   d) None of the above

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Electronics Engineering) (Semester - I) (New) (CBCS)
Examination: March/April - 2026
Digital Communication (BTN04501)

Day & Date: Saturday, 02-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
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Section – I

Q.2 Attempt Any Four. **16**

a) Compare Analog Communication and digital Communication.

b) Explain Direct Method of generation of PPM and PWM.

c) Define the Information Theory and Mutual information.

d) How Delta modulation is different from PCM?

e) Verify the expression $I(X;Y) = I(Y;X)$.

Q.3 Attempt Any Two. **12**

a) With suitable diagram explain DPCM modulator & demodulator.

b) Derive the expression for condition of maximum entropy.

c) A DMS X has five symbols x_1, x_2, x_3, x_4 and x_5 with $0.4, 0.19, 0.16, 0.15$ and 0.1 respectively:
i) Construct a Shannon Fano code for X and calculate the efficiency of the code.
ii) Repeat for Huffman code and compare the result.

Section – II

Q.4 Attempt Any Four. **16**

a) Explain generation of ASK from baseband signal.

b) What is ARQ? Explain its type.

c) Explain Matched Filter BPSK Detector.

d) A convolution code is described by $g_1 = [1\ 0\ 0],\ g_2 = [1\ 0\ 1],$ $g_3 = [1\ 1\ 1]$
Find the advance transfer function and the free distance of this code.

e) Explain how a PN sequence is generated using ML linear shift register.

Q.5 Attempt Any Two. **12**

a) With suitable waveforms explain QPSK & OQPSK.

b) An error control code has the following parity check matrix.

$$H = \begin{matrix} 1 & 0 & 1 & 1 & 0 & 0 \\ 1 & 1 & 0 & 0 & 1 & 0 \\ 0 & 1 & 1 & 0 & 0 & 1 \end{matrix}$$

i) Determine the generator matrix G

ii) Find the code word that begin with $1\ 0\ 1$

iii) Decode the received code word $1\ 1\ 0\ 1\ 1\ 0$

c) With suitable diagram explain DSSS transmitter & receiver.

Seat No.	

Set R

T.Y. (B.Tech.) (Electronics Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Digital Communication (BTN04501)

Day & Date: Saturday, 02-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

Duration: 30 Minutes Marks: 14

Q.1 Select suitable option. **14**

1) For a noise to be white Gaussian noise, the optimum filter is known as _____.
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c) Matched filter d) Bessel filter

2) ASK modulated signal has the bandwidth _____.
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b) Half the bandwidth of baseband signal
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3) Why spread spectrum technique is inefficient for a single user _____.
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b) Small transmission bandwidth
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4) The early late gate synchronizer is a technique used for _____.
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c) frame synchronization d) None of these

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6) The sequence of operations in which PCM is done is _____.
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   b) Quantization noise
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9) The information rate R for given average information $H = 2.0$ for analog signal band limited to B Hz is _____.
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   a) EX-OR logic
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   a) Error correction
   b) Error detection
   c) Error correction and detection
   d) None of the above

SLR-QH-387

Seat No.		Set	R

T.Y. (B.Tech.) (Electronics Engineering) (Semester - I) (New) (CBCS)
Examination: March/April - 2026
Digital Communication (BTN04501)

Day & Date: Saturday, 02-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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

Q.2 Attempt Any Four. **16**

a) Compare Analog Communication and digital Communication.

b) Explain Direct Method of generation of PPM and PWM.

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e) Verify the expression $I(X;Y) = I(Y;X)$.

Q.3 Attempt Any Two. **12**

a) With suitable diagram explain DPCM modulator & demodulator.

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Section – II

Q.4 Attempt Any Four. **16**

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Find the advance transfer function and the free distance of this code.

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$$H = \begin{matrix} 1 & 0 & 1 & 1 & 0 & 0 \\ 1 & 1 & 0 & 0 & 1 & 0 \\ 0 & 1 & 1 & 0 & 0 & 1 \end{matrix}$$

i) Determine the generator matrix G

ii) Find the code word that begin with $1\ 0\ 1$

iii) Decode the received code word $1\ 1\ 0\ 1\ 1\ 0$

c) With suitable diagram explain DSSS transmitter & receiver.

Seat No.	

Set **S**

T.Y. (B.Tech.) (Electronics Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Digital Communication (BTN04501)

Day & Date: Saturday, 02-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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3) Figures to the right indicates full marks.
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MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Select suitable option. **14**

1) The relation between entropy and mutual information is _____.
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   c) frame synchronization
   d) None of these

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   d) All of the above

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   c) DPCM
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13) DPCM suffers from _____.
   a) Slope over load distortion
   b) Quantization noise
   c) Both a & b
   d) None of the above

14) The information rate R for given average information $H = 2.0$ for analog signal band limited to B Hz is _____.
   a) 8 B bits/sec
   b) 4 B bits/sec
   c) 2 B bits/sec
   d) 16 B bits/sec

Seat No.		Set	S

T.Y. (B.Tech.) (Electronics Engineering) (Semester - I) (New) (CBCS)
Examination: March/April - 2026
Digital Communication (BTN04501)

Day & Date: Saturday, 02-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data whenever necessary.

Section – I

Q.2 Attempt Any Four. **16**

a) Compare Analog Communication and digital Communication.

b) Explain Direct Method of generation of PPM and PWM.

c) Define the Information Theory and Mutual information.

d) How Delta modulation is different from PCM?

e) Verify the expression $I(X;Y) = I(Y;X)$.

Q.3 Attempt Any Two. **12**

a) With suitable diagram explain DPCM modulator & demodulator.

b) Derive the expression for condition of maximum entropy.

c) A DMS X has five symbols x_1, x_2, x_3, x_4 and x_5 with $0.4, 0.19, 0.16, 0.15$ and 0.1 respectively:
i) Construct a Shannon Fano code for X and calculate the efficiency of the code.
ii) Repeat for Huffman code and compare the result.

Section – II

Q.4 Attempt Any Four. **16**

a) Explain generation of ASK from baseband signal.

b) What is ARQ? Explain its type.

c) Explain Matched Filter BPSK Detector.

d) A convolution code is described by $g_1 = [1\ 0\ 0],\ g_2 = [1\ 0\ 1],$ $g_3 = [1\ 1\ 1]$
Find the advance transfer function and the free distance of this code.

e) Explain how a PN sequence is generated using ML linear shift register.

Q.5 Attempt Any Two. **12**

a) With suitable waveforms explain QPSK & OQPSK.

b) An error control code has the following parity check matrix.

$$H = \begin{matrix} 1 & 0 & 1 & 1 & 0 & 0 \\ 1 & 1 & 0 & 0 & 1 & 0 \\ 0 & 1 & 1 & 0 & 0 & 1 \end{matrix}$$

i) Determine the generator matrix G

ii) Find the code word that begin with $1\ 0\ 1$

iii) Decode the received code word $1\ 1\ 0\ 1\ 1\ 0$

c) With suitable diagram explain DSSS transmitter & receiver.

SLR-QH-388

Seat No.	

Set P

T.Y. (B.Tech.) (Electronics Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Digital Signal Processing (BTN04502)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 MCQ/ Objective Type Questions: 14

1) The value of the twiddle factor W_4^8 is _____.
a) j b) 1
c) $-0.707 + j0.707$ d) $-j$

2) The following realization minimizes the delay elements.
a) Direct form-I realization b) Direct form-II realization
c) Cascade form realization d) Parallel realization

3) The ROC of Z-Transform $x[n] = \delta[n]$ is _____.
a) Entire Z-plane
b) Entire Z-plane expect $Z = 0$
c) Entire Z-plane expect $Z = \infty$
d) None of above

4) Which of the following is a method for implementing an FIR system?
a) Direct form b) Cascade form
c) Both a and b d) None of the above

5) Number of complex multiplications and complex additions required for 4 point DFT with direct computation method are _____.
a) $12, 8$ b) $16, 12$
c) $4, 8$ d) $20, 16$

6) With signal $x(n) = \{2, 4, 6, 7, 8\}$, if $x_1(n) = x\big((n-2)\big)_5$ then $x_1(n)$ will be _____.
a) $\{6, 7, 8, 2, 4\}$ b) $\{7, 8, 2, 4, 6\}$
c) $\{4, 6, 7, 8, 4\}$ d) $\{2, 4, 6, 7, 8\}$

7) The number of complex additions required DIT FFT algorithm to compute N point DFT is _____.

a) N^2 b) $N\log_2 N$

c) $(N/2)\log_2 N$ d) None of the above

8) The addressing mode that is convenient for FFT computation is _____.

a) Indirect addressing
b) Circular mode addressing
c) Bit reversed addressing
d) Memory mapped addressing

9) IIR filters are _____.

a) Recursive type
b) Non recursive type
c) Neither recursive nor non recursive
d) None of the above

10) Butterworth filters have _____.

a) Wide transition region b) Sharp transition region

c) Oscillation in transition region d) Maximally flat passband

11) Which of the following is not true for IIR filters _____.

a) Impulse response duration is infinite
b) They have poles
c) They give linear phase response
d) All of these

12) The FIR filter of order M gives linear phase response if _____.

a) $h(n) < \infty$ b) $h(n) = h(-n)$

c) $h(n) = h(M-1-n)$ d) None of these

13) The frequency mapping from s domain to z domain using impulse invariant technique is _____.

a) Many to many b) Many to one

c) One to many d) None of above

14) The main lobe width of the window of size M is _____.

a) Directly proportional to M b) Inversely proportional to M

c) Independent of M d) None of these

SLR-QH-388

Seat No.	

Set P

T.Y. (B.Tech.) (Electronics Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Digital Signal Processing (BTN04502)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data whenever necessary.

Section – I

Q.2 Solve any four of the followings. **16**

a) Compute 4 points DFT of the sequence $x(n) = \{4, 2, 3, 5\}$.

b) State and prove circular time shift property of DFT of a DT signal.

c) Compute circular convolution of the signal $x_1[n] = \{2, 1, 4, 3\}$ & $x_2[n] = \{1, 3, 5, 4\}$

d) Consider the signal $x(n) = \{5, 4, 3, 2, 7, 1\}$, obtain following sequences

i) $x_1(n) = x\big((-n)\big)_6$

ii) $x_2(n) = x\big((n-1)\big)_6$

e) Obtain the direct form realization of the system characterized by transfer function

$$H(z) = 1 + \frac{1}{2}Z^{-1} + \frac{1}{4}Z^{-2} + 2Z^{-3} + 3Z^{-4}$$

Q.3 Solve any two of the followings. **12**

a) Realize the FIR system given below in

i) Direct Form I

ii) Direct form II

$y(n) = -y(n-1) + 3y(n-2) + x(n) + 2x(n-1) + 2x(n-2)$

b) Prove that the multiplication of the DFT's of two sequences is equivalent to the DFT of time domain circular convolution of two sequences.

c) Obtain the output of a filter using overlap & save method whose input & impulse response are as below

$x(n) = \{1, 2, 1, 3, 1, 4, 1, 2, 1, 4\}$ & $h(n) = \{1, 2, 3\}$

Section – II

Q.4 Solve any four of the followings. **16**

a) Consider the analog transfer function

$$H(s) = \frac{1}{(s+1)} + \frac{3}{(s-2)}$$

Obtain the digital transfer function $H(z)$ using impulse invariant method. Use T = 1 s

b) Draw and explain the structure for 4 x 4 Baron Multiplier for unsigned numbers.

c) Design the first order low pass filter with fc = 1 kHz and sampling frequency fs = 10000 sps. Use bilinear transformation method.

d) Explain finite word length effect in designing FIR filters.

e) Explain in brief windowing. Compare different window characteristics based on transition width and stop band attenuation.

Q.5 Solve any two of the followings. **12**

a) Explain bilinear transformation along with mapping between s domain & z domain in this method.

b) The desired frequency response of a low pass filter is

$$Hd(e^{j\omega}) = \begin{cases} e^{-2j\omega} & -\frac{\pi}{4} \le |\omega| \le \pi/4 \\ 0 & \frac{\pi}{4} \le |\omega| \le \pi \end{cases}$$

Determine $hd(n)$. Also determine $h(n)$ using symmetric rectangular window of length 5.

c) Explain Impulse Invariant Technique along with mapping between s domain & z domain in this method.

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Electronics Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Digital Signal Processing (BTN04502)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 MCQ/ Objective Type Questions: 14

1) The addressing mode that is convenient for FFT computation is _____.
a) Indirect addressing
b) Circular mode addressing
c) Bit reversed addressing
d) Memory mapped addressing

2) IIR filters are _____.
a) Recursive type
b) Non recursive type
c) Neither recursive nor non recursive
d) None of the above

3) Butterworth filters have _____.
a) Wide transition region b) Sharp transition region
c) Oscillation in transition region d) Maximally flat passband

4) Which of the following is not true for IIR filters _____.
a) Impulse response duration is infinite
b) They have poles
c) They give linear phase response
d) All of these

5) The FIR filter of order M gives linear phase response if _____.
a) $h(n) < \infty$ b) $h(n) = h(-n)$
c) $h(n) = h(M-1-n)$ d) None of these

6) The frequency mapping from s domain to z domain using impulse invariant technique is _____.

a) Many to many
b) Many to one
c) One to many
d) None of above

7) The main lobe width of the window of size M is _____.

a) Directly proportional to M
b) Inversely proportional to M
c) Independent of M
d) None of these

8) The value of the twiddle factor W_4^8 is _____.

a) j
b) 1
c) $-0.707 + j0.707$
d) $-j$

9) The following realization minimizes the delay elements.

a) Direct form-I realization
b) Direct form-II realization
c) Cascade form realization
d) Parallel realization

10) The ROC of Z-Transform $x[n] = \delta[n]$ is _____.

a) Entire Z-plane
b) Entire Z-plane expect $Z = 0$
c) Entire Z-plane expect $Z = \infty$
d) None of above

11) Which of the following is a method for implementing an FIR system?

a) Direct form
b) Cascade form
c) Both a and b
d) None of the above

12) Number of complex multiplications and complex additions required for 4 point DFT with direct computation method are _____.

a) $12, 8$
b) $16, 12$
c) $4, 8$
d) $20, 16$

13) With signal $x(n) = \{2, 4, 6, 7, 8\}$, if $x_1(n) = x\big((n-2)\big)_5$ then $x_1(n)$ will be _____.

a) $\{6, 7, 8, 2, 4\}$
b) $\{7, 8, 2, 4, 6\}$
c) $\{4, 6, 7, 8, 4\}$
d) $\{2, 4, 6, 7, 8\}$

14) The number of complex additions required DIT FFT algorithm to compute N point DFT is _____.

a) N^2
b) $N\log_2 N$
c) $(N/2)\log_2 N$
d) None of the above

SLR-QH-388

Seat No.	

Set Q

T.Y. (B.Tech.) (Electronics Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Digital Signal Processing (BTN04502)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data whenever necessary.

Section – I

Q.2 Solve any four of the followings. **16**

a) Compute 4 points DFT of the sequence $x(n) = \{4, 2, 3, 5\}$.

b) State and prove circular time shift property of DFT of a DT signal.

c) Compute circular convolution of the signal $x_1[n] = \{2, 1, 4, 3\}$ & $x_2[n] = \{1, 3, 5, 4\}$

d) Consider the signal $x(n) = \{5, 4, 3, 2, 7, 1\}$, obtain following sequences

i) $x_1(n) = x\big((-n)\big)_6$

ii) $x_2(n) = x\big((n-1)\big)_6$

e) Obtain the direct form realization of the system characterized by transfer function

$$H(z) = 1 + \frac{1}{2}Z^{-1} + \frac{1}{4}Z^{-2} + 2Z^{-3} + 3Z^{-4}$$

Q.3 Solve any two of the followings. **12**

a) Realize the FIR system given below in

i) Direct Form I

ii) Direct form II

$y(n) = -y(n-1) + 3y(n-2) + x(n) + 2x(n-1) + 2x(n-2)$

b) Prove that the multiplication of the DFT's of two sequences is equivalent to the DFT of time domain circular convolution of two sequences.

c) Obtain the output of a filter using overlap & save method whose input & impulse response are as below

$x(n) = \{1, 2, 1, 3, 1, 4, 1, 2, 1, 4\}$ & $h(n) = \{1, 2, 3\}$

Section – II

Q.4 Solve any four of the followings. **16**

a) Consider the analog transfer function

$$H(s) = \frac{1}{(s+1)} + \frac{3}{(s-2)}$$

Obtain the digital transfer function $H(z)$ using impulse invariant method. Use T = 1 s

b) Draw and explain the structure for 4 x 4 Baron Multiplier for unsigned numbers.

c) Design the first order low pass filter with fc = 1 kHz and sampling frequency fs = 10000 sps. Use bilinear transformation method.

d) Explain finite word length effect in designing FIR filters.

e) Explain in brief windowing. Compare different window characteristics based on transition width and stop band attenuation.

Q.5 Solve any two of the followings. **12**

a) Explain bilinear transformation along with mapping between s domain & z domain in this method.

b) The desired frequency response of a low pass filter is

$$Hd(e^{j\omega}) = \begin{cases} e^{-2j\omega} & -\frac{\pi}{4} \le |\omega| \le \pi/4 \\ 0 & \frac{\pi}{4} \le |\omega| \le \pi \end{cases}$$

Determine $hd(n)$. Also determine $h(n)$ using symmetric rectangular window of length 5.

c) Explain Impulse Invariant Technique along with mapping between s domain & z domain in this method.

Seat No.	

Set **R**

T.Y. (B.Tech.) (Electronics Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Digital Signal Processing (BTN04502)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 MCQ/ Objective Type Questions: 14

1) Which of the following is not true for IIR filters _____.
a) Impulse response duration is infinite
b) They have poles
c) They give linear phase response
d) All of these

2) The FIR filter of order M gives linear phase response if _____.
a) $h(n) < \infty$ b) $h(n) = h(-n)$
c) $h(n) = h(M-1-n)$ d) None of these

3) The frequency mapping from s domain to z domain using impulse invariant technique is _____.
a) Many to many b) Many to one
c) One to many d) None of above

4) The main lobe width of the window of size M is _____.
a) Directly proportional to M b) Inversely proportional to M
c) Independent of M d) None of these

5) The value of the twiddle factor W_4^8 is _____.
a) j b) 1
c) $-0.707 + j0.707$ d) $-j$

6) The following realization minimizes the delay elements.
a) Direct form-I realization b) Direct form-II realization
c) Cascade form realization d) Parallel realization

7) The ROC of Z-Transform $x[n] = \delta[n]$ is _____.
a) Entire Z-plane
b) Entire Z-plane expect $Z = 0$
c) Entire Z-plane expect $Z = \infty$
d) None of above

8) Which of the following is a method for implementing an FIR system?
a) Direct form
b) Cascade form
c) Both a and b
d) None of the above

9) Number of complex multiplications and complex additions required for 4 point DFT with direct computation method are _____.
a) $12, 8$
b) $16, 12$
c) $4, 8$
d) $20, 16$

10) With signal $x(n) = \{2, 4, 6, 7, 8\}$, if $x_1(n) = x\big((n-2)\big)_5$ then $x_1(n)$ will be _____.
a) $\{6, 7, 8, 2, 4\}$
b) $\{7, 8, 2, 4, 6\}$
c) $\{4, 6, 7, 8, 4\}$
d) $\{2, 4, 6, 7, 8\}$

11) The number of complex additions required DIT FFT algorithm to compute N point DFT is _____.
a) N^2
b) $N\log_2 N$
c) $(N/2)\log_2 N$
d) None of the above

12) The addressing mode that is convenient for FFT computation is _____.
a) Indirect addressing
b) Circular mode addressing
c) Bit reversed addressing
d) Memory mapped addressing

13) IIR filters are _____.
a) Recursive type
b) Non recursive type
c) Neither recursive nor non recursive
d) None of the above

14) Butterworth filters have _____.
a) Wide transition region
b) Sharp transition region
c) Oscillation in transition region
d) Maximally flat passband

SLR-QH-388

Seat No.	

Set R

T.Y. (B.Tech.) (Electronics Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Digital Signal Processing (BTN04502)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data whenever necessary.

Section – I

Q.2 Solve any four of the followings. **16**

a) Compute 4 points DFT of the sequence $x(n) = \{4, 2, 3, 5\}$.

b) State and prove circular time shift property of DFT of a DT signal.

c) Compute circular convolution of the signal $x_1[n] = \{2, 1, 4, 3\}$ & $x_2[n] = \{1, 3, 5, 4\}$

d) Consider the signal $x(n) = \{5, 4, 3, 2, 7, 1\}$, obtain following sequences

i) $x_1(n) = x\big((-n)\big)_6$

ii) $x_2(n) = x\big((n-1)\big)_6$

e) Obtain the direct form realization of the system characterized by transfer function

$$H(z) = 1 + \frac{1}{2}Z^{-1} + \frac{1}{4}Z^{-2} + 2Z^{-3} + 3Z^{-4}$$

Q.3 Solve any two of the followings. **12**

a) Realize the FIR system given below in

i) Direct Form I

ii) Direct form II

$y(n) = -y(n-1) + 3y(n-2) + x(n) + 2x(n-1) + 2x(n-2)$

b) Prove that the multiplication of the DFT's of two sequences is equivalent to the DFT of time domain circular convolution of two sequences.

c) Obtain the output of a filter using overlap & save method whose input & impulse response are as below

$x(n) = \{1, 2, 1, 3, 1, 4, 1, 2, 1, 4\}$ & $h(n) = \{1, 2, 3\}$

Section – II

Q.4 Solve any four of the followings. **16**

a) Consider the analog transfer function

$$H(s) = \frac{1}{(s+1)} + \frac{3}{(s-2)}$$

Obtain the digital transfer function $H(z)$ using impulse invariant method. Use T = 1 s

b) Draw and explain the structure for 4 x 4 Baron Multiplier for unsigned numbers.

c) Design the first order low pass filter with fc = 1 kHz and sampling frequency fs = 10000 sps. Use bilinear transformation method.

d) Explain finite word length effect in designing FIR filters.

e) Explain in brief windowing. Compare different window characteristics based on transition width and stop band attenuation.

Q.5 Solve any two of the followings. **12**

a) Explain bilinear transformation along with mapping between s domain & z domain in this method.

b) The desired frequency response of a low pass filter is

$$Hd(e^{j\omega}) = \begin{cases} e^{-2j\omega} & -\frac{\pi}{4} \le |\omega| \le \pi/4 \\ 0 & \frac{\pi}{4} \le |\omega| \le \pi \end{cases}$$

Determine $hd(n)$. Also determine $h(n)$ using symmetric rectangular window of length 5.

c) Explain Impulse Invariant Technique along with mapping between s domain & z domain in this method.

Seat No.	

Set **S**

T.Y. (B.Tech.) (Electronics Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Digital Signal Processing (BTN04502)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 MCQ/ Objective Type Questions: 14

1) With signal $x(n) = \{2, 4, 6, 7, 8\}$, if $x_1(n) = x\big((n-2)\big)_5$ then $x_1(n)$ will be _____.
a) $\{6, 7, 8, 2, 4\}$ b) $\{7, 8, 2, 4, 6\}$
c) $\{4, 6, 7, 8, 4\}$ d) $\{2, 4, 6, 7, 8\}$

2) The number of complex additions required DIT FFT algorithm to compute N point DFT is _____.
a) N^2 b) $N\log_2 N$
c) $(N/2)\log_2 N$ d) None of the above

3) The addressing mode that is convenient for FFT computation is _____.
a) Indirect addressing
b) Circular mode addressing
c) Bit reversed addressing
d) Memory mapped addressing

4) IIR filters are _____.
a) Recursive type
b) Non recursive type
c) Neither recursive nor non recursive
d) None of the above

5) Butterworth filters have _____.
a) Wide transition region b) Sharp transition region
c) Oscillation in transition region d) Maximally flat passband

6) Which of the following is not true for IIR filters _____.
a) Impulse response duration is infinite
b) They have poles
c) They give linear phase response
d) All of these

7) The FIR filter of order M gives linear phase response if _____.
a) $h(n) < \infty$ b) $h(n) = h(-n)$
c) $h(n) = h(M-1-n)$ d) None of these

8) The frequency mapping from s domain to z domain using impulse invariant technique is _____.
a) Many to many b) Many to one
c) One to many d) None of above

9) The main lobe width of the window of size M is _____.
a) Directly proportional to M b) Inversely proportional to M
c) Independent of M d) None of these

10) The value of the twiddle factor W_4^8 is _____.
a) j b) 1
c) $-0.707 + j0.707$ d) $-j$

11) The following realization minimizes the delay elements.
a) Direct form-I realization b) Direct form-II realization
c) Cascade form realization d) Parallel realization

12) The ROC of Z-Transform $x[n] = \delta[n]$ is _____.
a) Entire Z-plane
b) Entire Z-plane expect $Z = 0$
c) Entire Z-plane expect $Z = \infty$
d) None of above

13) Which of the following is a method for implementing an FIR system?
a) Direct form b) Cascade form
c) Both a and b d) None of the above

14) Number of complex multiplications and complex additions required for 4 point DFT with direct computation method are _____.
a) $12, 8$ b) $16, 12$
c) $4, 8$ d) $20, 16$

SLR-QH-388

Seat No.		Set	S

T.Y. (B.Tech.) (Electronics Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Digital Signal Processing (BTN04502)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data whenever necessary.

Section – I

Q.2 Solve any four of the followings. **16**

a) Compute 4 points DFT of the sequence $x(n) = \{4, 2, 3, 5\}$.

b) State and prove circular time shift property of DFT of a DT signal.

c) Compute circular convolution of the signal $x_1[n] = \{2, 1, 4, 3\}$ & $x_2[n] = \{1, 3, 5, 4\}$

d) Consider the signal $x(n) = \{5, 4, 3, 2, 7, 1\}$, obtain following sequences

i) $x_1(n) = x\big((-n)\big)_6$

ii) $x_2(n) = x\big((n-1)\big)_6$

e) Obtain the direct form realization of the system characterized by transfer function

$$H(z) = 1 + \frac{1}{2}Z^{-1} + \frac{1}{4}Z^{-2} + 2Z^{-3} + 3Z^{-4}$$

Q.3 Solve any two of the followings. **12**

a) Realize the FIR system given below in

i) Direct Form I

ii) Direct form II

$y(n) = -y(n-1) + 3y(n-2) + x(n) + 2x(n-1) + 2x(n-2)$

b) Prove that the multiplication of the DFT's of two sequences is equivalent to the DFT of time domain circular convolution of two sequences.

c) Obtain the output of a filter using overlap & save method whose input & impulse response are as below

$x(n) = \{1, 2, 1, 3, 1, 4, 1, 2, 1, 4\}$ & $h(n) = \{1, 2, 3\}$

Section – II

Q.4 Solve any four of the followings. **16**

a) Consider the analog transfer function

$$H(s) = \frac{1}{(s+1)} + \frac{3}{(s-2)}$$

Obtain the digital transfer function $H(z)$ using impulse invariant method. Use T = 1 s

b) Draw and explain the structure for 4 x 4 Baron Multiplier for unsigned numbers.

c) Design the first order low pass filter with fc = 1 kHz and sampling frequency fs = 10000 sps. Use bilinear transformation method.

d) Explain finite word length effect in designing FIR filters.

e) Explain in brief windowing. Compare different window characteristics based on transition width and stop band attenuation.

Q.5 Solve any two of the followings. **12**

a) Explain bilinear transformation along with mapping between s domain & z domain in this method.

b) The desired frequency response of a low pass filter is

$$Hd(e^{j\omega}) = \begin{cases} e^{-2j\omega} & -\frac{\pi}{4} \le |\omega| \le \pi/4 \\ 0 & \frac{\pi}{4} \le |\omega| \le \pi \end{cases}$$

Determine $hd(n)$. Also determine $h(n)$ using symmetric rectangular window of length 5.

c) Explain Impulse Invariant Technique along with mapping between s domain & z domain in this method.

SLR-QH-389

Seat No.	

Set P

T.Y. (B.Tech.) (Electronics Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Micro Controllers (BTN04503)

Day & Date: Thursday, 07-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Objective questions: **14**

1) Which of the following instructions will load the value 35H into the high byte of timer 0?
a) MOV TH0, #35H
b) MOV TH0, 35H
c) MOV T0, #35H
d) MOV T0, 35H

2) Bit-addressable memory locations are _____.
a) 10H through 1FH
b) 20H through 2FH
c) 30H through 3FH
d) 40H through 4FH

3) The 8-bit address bus allows access to an address range of _____.
a) 0000 to FFFFH
b) 000 to FFFH
c) 00 to FFH
d) 0 to FH

4) The contents of the accumulator after this operation _____.
MOV A,#0BH
ANL A,#2CH
will be
a) 11010111
b) 11011010
c) 00001000
d) 00101000

5) Which of the following statements will add the accumulator and register 3?
a) ADD @R3, @A
b) ADD @A, R3
c) ADD R3, A
d) ADD A, R3

6) In 8051, serial communication mode 0, the baud rate will be _____.
a) variable
b) fosc/164
c) fosc/32
d) fosc/12

7) Which of the following signal(s) of 8051 must be used in accessing external data RAM?
a) RD b) WR
c) PSEN d) both a) and b)

8) What is the address range of SFR in internal RAM of 8051?
a) 00H-77H b) 40H-80H
c) 80H-7FH d) 80H-FFH

9) In 8051 Serial port interrupt vector address is _____.
a) 0003H b) 0023H
c) 0013H d) 001BH

10) In PIC to make Port B an output port, we must place _____ in register _____.
a) 00 h, PORTB b) FF h, PORTB
c) 00 h, TRISB d) FF h, TRISB

11) The PIC 16F877 has interrupt capability up to _____ sources.
a) 11 b) 13
c) 14 d) 16

12) Timer 1 of the PIC 16F877 is _____ bit, accessed as _____.
a) 8, timer/counter b) 16, timer/counter
c) 8, timer d) 8, counter

13) The _____ pins can become the I/O control inputs for the parallel slave port.
a) PORT A b) PORT B
c) PORT D d) PORT E

14) The PIC 16F877 MSSP module in I^2C mode, implements _____ bit and _____ bit addressing.
a) 7, 10 b) 10, 8
c) 7, 8 d) 11, 7

Seat No.	

Set **P**

T.Y. (B.Tech.) (Electronics Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Micro Controllers (BTN04503)

Day & Date: Thursday, 07-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data whenever necessary.

SECTION – I

Q.2 Attempt any four. **16**

a) Write a 8051 assembly program to find smallest number from given array of ten elements.

b) Compare microprocessor and microcontroller.

c) Define addressing mode. Explain the different addressing modes in 8051 with suitable example.

d) Draw and Explain Port structure in 8051.

e) Write 8051 assembly program to turn on and off alternative LEDs connected to PORT B by a delay of 25 msec. Use Timer1 interrupt. Assume crystal (XTAL) =11.0592 MHZ.

Q.3 Solve any two. **12**

a) Write an 8051 assembly or C program to generate a square wave of 50 Hz frequency on pin P2.3. Assume XTAL= 11.0592MHz. Use Timer interrupt.

b) Write a 8051 assembly program to add respective elements of two arrays of ten elements.

c) What happens in the following instructions?
i) Here: SJMP Here
ii) MOV SP, #74
iii) JZ FEh
iv) JC 02
v) INC @R3
vi) DEC 51h
vii) CPL 91h

SECTION – II

Q.4 Solve any four. **16**

a) Draw and explain addressing modes in PIC 16F877.

b) With block diagram Explain Timer-2 module used in PIC microcontroller.

c) Write PIC program to clear memory location 20 h to 2F h with indirect addressing mode. Also explain meaning of each used instructions.

d) Explain PWM mode used in PIC microcontroller.

e) Explain I^2C operation in PIC microcontroller.

Q.5 Solve any two. **12**

a) Interface ADC 0808/09 to 8051. Write a program to covert analog voltage on channel 1 to digital.

b) Draw and explain interfacing of 8K×8 Data ROM to 8051. Write a assembly program to read 10 bytes starting at 2000h in external ROM.

c) Interface two seven segment display to 8051 and write a program to display decimal values “00” to “99”.

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Electronics Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Micro Controllers (BTN04503)

Day & Date: Thursday, 07-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Objective questions: **14**

1) What is the address range of SFR in internal RAM of 8051?
a) 00H-77H b) 40H-80H
c) 80H-7FH d) 80H-FFH

2) In 8051 Serial port interrupt vector address is _____.
a) 0003H b) 0023H
c) 0013H d) 001BH

3) In PIC to make Port B an output port, we must place _____ in register _____.
a) 00 h, PORTB b) FF h, PORTB
c) 00 h, TRISB d) FF h, TRISB

4) The PIC 16F877 has interrupt capability up to _____ sources.
a) 11 b) 13
c) 14 d) 16

5) Timer 1 of the PIC 16F877 is _____ bit, accessed as _____.
a) 8, timer/counter b) 16, timer/counter
c) 8, timer d) 8, counter

6) The _____ pins can become the I/O control inputs for the parallel slave port.
a) PORT A b) PORT B
c) PORT D d) PORT E

7) The PIC 16F877 MSSP module in I^2C mode, implements _____ bit and _____ bit addressing.
a) 7, 10 b) 10, 8
c) 7, 8 d) 11, 7

8) Which of the following instructions will load the value 35H into the high byte of timer 0?

a) MOV TH0, #35H
b) MOV TH0, 35H
c) MOV T0, #35H
d) MOV T0, 35H

9) Bit-addressable memory locations are _____.

a) 10H through 1FH
b) 20H through 2FH
c) 30H through 3FH
d) 40H through 4FH

10) The 8-bit address bus allows access to an address range of _____.

a) 0000 to FFFFH
b) 000 to FFFH
c) 00 to FFH
d) 0 to FH

11) The contents of the accumulator after this operation _____.
MOV A,#0BH
ANL A,#2CH
will be

a) 11010111
b) 11011010
c) 00001000
d) 00101000

12) Which of the following statements will add the accumulator and register 3?

a) ADD @R3, @A
b) ADD @A, R3
c) ADD R3, A
d) ADD A, R3

13) In 8051, serial communication mode 0, the baud rate will be _____.

a) variable
b) fosc/164
c) fosc/32
d) fosc/12

14) Which of the following signal(s) of 8051 must be used in accessing external data RAM?

a) RD
b) WR
c) PSEN
d) both a) and b)

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Electronics Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Micro Controllers (BTN04503)

Day & Date: Thursday, 07-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data whenever necessary.

SECTION – I

Q.2 Attempt any four. **16**

a) Write a 8051 assembly program to find smallest number from given array of ten elements.

b) Compare microprocessor and microcontroller.

c) Define addressing mode. Explain the different addressing modes in 8051 with suitable example.

d) Draw and Explain Port structure in 8051.

e) Write 8051 assembly program to turn on and off alternative LEDs connected to PORT B by a delay of 25 msec. Use Timer1 interrupt. Assume crystal (XTAL) =11.0592 MHZ.

Q.3 Solve any two. **12**

a) Write an 8051 assembly or C program to generate a square wave of 50 Hz frequency on pin P2.3. Assume XTAL= 11.0592MHz. Use Timer interrupt.

b) Write a 8051 assembly program to add respective elements of two arrays of ten elements.

c) What happens in the following instructions?
i) Here: SJMP Here
ii) MOV SP, #74
iii) JZ FEh
iv) JC 02
v) INC @R3
vi) DEC 51h
vii) CPL 91h

SECTION – II

Q.4 Solve any four. **16**

a) Draw and explain addressing modes in PIC 16F877.

b) With block diagram Explain Timer-2 module used in PIC microcontroller.

c) Write PIC program to clear memory location 20 h to 2F h with indirect addressing mode. Also explain meaning of each used instructions.

d) Explain PWM mode used in PIC microcontroller.

e) Explain I^2C operation in PIC microcontroller.

Q.5 Solve any two. **12**

a) Interface ADC 0808/09 to 8051. Write a program to covert analog voltage on channel 1 to digital.

b) Draw and explain interfacing of 8K×8 Data ROM to 8051. Write a assembly program to read 10 bytes starting at 2000h in external ROM.

c) Interface two seven segment display to 8051 and write a program to display decimal values “00” to “99”.

Seat No.	

Set **R**

T.Y. (B.Tech.) (Electronics Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Micro Controllers (BTN04503)

Day & Date: Thursday, 07-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Objective questions: **14**

1) The PIC 16F877 has interrupt capability up to _____ sources.
a) 11 b) 13
c) 14 d) 16

2) Timer 1 of the PIC 16F877 is _____ bit, accessed as _____.
a) 8, timer/counter b) 16, timer/counter
c) 8, timer d) 8, counter

3) The _____ pins can become the I/O control inputs for the parallel slave port.
a) PORT A b) PORT B
c) PORT D d) PORT E

4) The PIC 16F877 MSSP module in I^2C mode, implements _____ bit and _____ bit addressing.
a) 7, 10 b) 10, 8
c) 7, 8 d) 11, 7

5) Which of the following instructions will load the value 35H into the high byte of timer 0?
a) MOV TH0, #35H b) MOV TH0, 35H
c) MOV T0, #35H d) MOV T0, 35H

6) Bit-addressable memory locations are _____.
a) 10H through 1FH b) 20H through 2FH
c) 30H through 3FH d) 40H through 4FH

7) The 8-bit address bus allows access to an address range of _____.
a) 0000 to FFFFH b) 000 to FFFH
c) 00 to FFH d) 0 to FH

8) The contents of the accumulator after this operation _____.
MOV A,#0BH
ANL A,#2CH
will be
a) 11010111 b) 11011010
c) 00001000 d) 00101000

9) Which of the following statements will add the accumulator and register 3?
a) ADD @R3, @A b) ADD @A, R3
c) ADD R3, A d) ADD A, R3

10) In 8051, serial communication mode 0, the baud rate will be _____.
a) variable b) fosc/164
c) fosc/32 d) fosc/12

11) Which of the following signal(s) of 8051 must be used in accessing external data RAM?
a) RD b) WR
c) PSEN d) both a) and b)

12) What is the address range of SFR in internal RAM of 8051?
a) 00H-77H b) 40H-80H
c) 80H-7FH d) 80H-FFH

13) In 8051 Serial port interrupt vector address is _____.
a) 0003H b) 0023H
c) 0013H d) 001BH

14) In PIC to make Port B an output port, we must place _____ in register _____.
a) 00 h, PORTB b) FF h, PORTB
c) 00 h, TRISB d) FF h, TRISB

Seat No.	

Set **R**

T.Y. (B.Tech.) (Electronics Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Micro Controllers (BTN04503)

Day & Date: Thursday, 07-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data whenever necessary.

SECTION – I

Q.2 Attempt any four. **16**

a) Write a 8051 assembly program to find smallest number from given array of ten elements.

b) Compare microprocessor and microcontroller.

c) Define addressing mode. Explain the different addressing modes in 8051 with suitable example.

d) Draw and Explain Port structure in 8051.

e) Write 8051 assembly program to turn on and off alternative LEDs connected to PORT B by a delay of 25 msec. Use Timer1 interrupt. Assume crystal (XTAL) =11.0592 MHZ.

Q.3 Solve any two. **12**

a) Write an 8051 assembly or C program to generate a square wave of 50 Hz frequency on pin P2.3. Assume XTAL= 11.0592MHz. Use Timer interrupt.

b) Write a 8051 assembly program to add respective elements of two arrays of ten elements.

c) What happens in the following instructions?
i) Here: SJMP Here
ii) MOV SP, #74
iii) JZ FEh
iv) JC 02
v) INC @R3
vi) DEC 51h
vii) CPL 91h

SECTION – II

Q.4 Solve any four. **16**

a) Draw and explain addressing modes in PIC 16F877.

b) With block diagram Explain Timer-2 module used in PIC microcontroller.

c) Write PIC program to clear memory location 20 h to 2F h with indirect addressing mode. Also explain meaning of each used instructions.

d) Explain PWM mode used in PIC microcontroller.

e) Explain I^2C operation in PIC microcontroller.

Q.5 Solve any two. **12**

a) Interface ADC 0808/09 to 8051. Write a program to covert analog voltage on channel 1 to digital.

b) Draw and explain interfacing of 8K×8 Data ROM to 8051. Write a assembly program to read 10 bytes starting at 2000h in external ROM.

c) Interface two seven segment display to 8051 and write a program to display decimal values “00” to “99”.

Seat No.	

Set **S**

T.Y. (B.Tech.) (Electronics Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Micro Controllers (BTN04503)

Day & Date: Thursday, 07-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Objective questions: **14**

1) In 8051, serial communication mode 0, the baud rate will be _____.
a) variable b) fosc/164
c) fosc/32 d) fosc/12

2) Which of the following signal(s) of 8051 must be used in accessing external data RAM?
a) RD b) WR
c) PSEN d) both a) and b)

3) What is the address range of SFR in internal RAM of 8051?
a) 00H-77H b) 40H-80H
c) 80H-7FH d) 80H-FFH

4) In 8051 Serial port interrupt vector address is _____.
a) 0003H b) 0023H
c) 0013H d) 001BH

5) In PIC to make Port B an output port, we must place _____ in register _____.
a) 00 h, PORTB b) FF h, PORTB
c) 00 h, TRISB d) FF h, TRISB

6) The PIC 16F877 has interrupt capability up to _____ sources.
a) 11 b) 13
c) 14 d) 16

7) Timer 1 of the PIC 16F877 is _____ bit, accessed as _____.
a) 8, timer/counter b) 16, timer/counter
c) 8, timer d) 8, counter

8) The _____ pins can become the I/O control inputs for the parallel slave port.

a) PORT A
b) PORT B
c) PORT D
d) PORT E

9) The PIC 16F877 MSSP module in I^2C mode, implements _____ bit and _____ bit addressing.

a) 7, 10
b) 10, 8
c) 7, 8
d) 11, 7

10) Which of the following instructions will load the value 35H into the high byte of timer 0?

a) MOV TH0, #35H
b) MOV TH0, 35H
c) MOV T0, #35H
d) MOV T0, 35H

11) Bit-addressable memory locations are _____.

a) 10H through 1FH
b) 20H through 2FH
c) 30H through 3FH
d) 40H through 4FH

12) The 8-bit address bus allows access to an address range of _____.

a) 0000 to FFFFH
b) 000 to FFFH
c) 00 to FFH
d) 0 to FH

13) The contents of the accumulator after this operation _____.
MOV A,#0BH
ANL A,#2CH
will be

a) 11010111
b) 11011010
c) 00001000
d) 00101000

14) Which of the following statements will add the accumulator and register 3?

a) ADD @R3, @A
b) ADD @A, R3
c) ADD R3, A
d) ADD A, R3

Seat No.	

Set **S**

T.Y. (B.Tech.) (Electronics Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Micro Controllers (BTN04503)

Day & Date: Thursday, 07-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data whenever necessary.

SECTION – I

Q.2 Attempt any four. **16**

a) Write a 8051 assembly program to find smallest number from given array of ten elements.

b) Compare microprocessor and microcontroller.

c) Define addressing mode. Explain the different addressing modes in 8051 with suitable example.

d) Draw and Explain Port structure in 8051.

e) Write 8051 assembly program to turn on and off alternative LEDs connected to PORT B by a delay of 25 msec. Use Timer1 interrupt. Assume crystal (XTAL) =11.0592 MHZ.

Q.3 Solve any two. **12**

a) Write an 8051 assembly or C program to generate a square wave of 50 Hz frequency on pin P2.3. Assume XTAL= 11.0592MHz. Use Timer interrupt.

b) Write a 8051 assembly program to add respective elements of two arrays of ten elements.

c) What happens in the following instructions?
i) Here: SJMP Here
ii) MOV SP, #74
iii) JZ FEh
iv) JC 02
v) INC @R3
vi) DEC 51h
vii) CPL 91h

SECTION – II

Q.4 Solve any four. **16**

a) Draw and explain addressing modes in PIC 16F877.

b) With block diagram Explain Timer-2 module used in PIC microcontroller.

c) Write PIC program to clear memory location 20 h to 2F h with indirect addressing mode. Also explain meaning of each used instructions.

d) Explain PWM mode used in PIC microcontroller.

e) Explain I^2C operation in PIC microcontroller.

Q.5 Solve any two. **12**

a) Interface ADC 0808/09 to 8051. Write a program to covert analog voltage on channel 1 to digital.

b) Draw and explain interfacing of 8K×8 Data ROM to 8051. Write a assembly program to read 10 bytes starting at 2000h in external ROM.

c) Interface two seven segment display to 8051 and write a program to display decimal values “00” to “99”.

SLR-QH-390

Seat No.	

Set P

T. Y. (B.Tech.) (Electronics Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Information Technology and Management (BTN04513)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Select suitable option. **14**

1) Organizations sell products to other organizations electronically is called _____ marketplace.
a) buy side b) sell side
c) virtual d) electronic exchange

2) A SDLC model in which all phases are cascaded to each other in which progress is seen as flowing steadily downwards is _____ model.
a) spiral b) waterfall
c) downfall d) big bang

3) Which of below is an example of TPS?
a) payroll b) business intelligence
c) ERP d) expert system

4) The major cost incurred in implementing ERP is due to _____.
a) hardware b) software
c) training d) reengineering

5) Which of below is a workplace monitoring method in an organization?
a) digital video cameras
b) computer network logs
c) ID cards for movement tracking
d) All of these

6) Which of below is not the function of information system related to data?
a) collection b) duplication
c) analysis d) storage

7) Which of below is not true about OLTP?
a) serve operational levels
b) used for high level decisions
c) record daily routine transactions
d) allow status monitoring

8) Which of below is not a part of IT architecture?
a) data
b) finance
c) applications
d) business processes

9) What for IS & IT are used in digital enterprises?
a) research
b) boost employee productivity
c) customer support
d) All of these

10) Which of below is not true about organizations?
a) closed system
b) social unit
c) interact with environment
d) have a structure

11) Which of below is not true for IT project?
a) it has start and end
b) it has objectives
c) it involves software development only
d) it requires resources

12) Model driven and data driven are the two types of _____.
a) TPS
b) DSS
c) ERP
d) process control system

13) _____ facilitates individual payments like telephone bills, electricity bills.
a) ECS debit
b) debit push
c) ECS credit
d) All of these

14) _____ is about change in organizational structure due to adoption of IS/IT.
a) technical view
b) behavioral view
c) CRM
d) All of these

Seat No.	

Set **P**

T. Y. (B.Tech.) (Electronics Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Information Technology and Management (BTN04513)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

Section – I

Q.2 Solve the following. (Any Two) **12**

a) With suitable example evaluate various components of a typical information system.

b) To whom and how IT supports in enterprise? Support your answer by examples.

c) With suitable diagram explain flow of e-payment with credit/debit card.

Q.3 Solve the following. (Any Four) **16**

a) With one suitable application discuss electronic content management.

b) Evaluate data management problems and challenges.

c) Compare centralized and distributed databases.

d) Describe any four models of e-business.

e) With suitable example compare forward and reverse auctions.

Section – II

Q.4 Solve the following. (Any Two) **12**

a) With suitable example explain how ERP interfaces with other enterprise systems.

b) With suitable diagram and example explain various flows and processes in supply chain management.

c) With suitable example explain economical impact of IS on organization.

Q.5 Attempt the following. (Any Four) **16**

a) Comment on ‘doing business in digital economy’.

b) What is de-skilling and alienation? How it affects performance of an organization?

c) Justify - green IT is the need of the time.

d) With suitable example explain how ERP is beneficial for organizations.

e) Justify - software project needs a good manager.

Seat No.	

Set **Q**

T. Y. (B.Tech.) (Electronics Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Information Technology and Management (BTN04513)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No.1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Select suitable option. **14**

1) Which of below is not a part of IT architecture?
a) data b) finance
c) applications d) business processes

2) What for IS & IT are used in digital enterprises?
a) research b) boost employee productivity
c) customer support d) All of these

3) Which of below is not true about organizations?
a) closed system b) social unit
c) interact with environment d) have a structure

4) Which of below is not true for IT project?
a) it has start and end
b) it has objectives
c) it involves software development only
d) it requires resources

5) Model driven and data driven are the two types of _____.
a) TPS b) DSS
c) ERP d) process control system

6) _____ facilitates individual payments like telephone bills, electricity bills.
a) ECS debit b) debit push
c) ECS credit d) All of these

7) _____ is about change in organizational structure due to adoption of IS/IT.
a) technical view
b) behavioral view
c) CRM
d) All of these

8) Organizations sell products to other organizations electronically is called _____ marketplace.
a) buy side
b) sell side
c) virtual
d) electronic exchange

9) A SDLC model in which all phases are cascaded to each other in which progress is seen as flowing steadily downwards is _____ model.
a) spiral
b) waterfall
c) downfall
d) big bang

10) Which of below is an example of TPS?
a) payroll
b) business intelligence
c) ERP
d) expert system

11) The major cost incurred in implementing ERP is due to _____.
a) hardware
b) software
c) training
d) reengineering

12) Which of below is a workplace monitoring method in an organization?
a) digital video cameras
b) computer network logs
c) ID cards for movement tracking
d) All of these

13) Which of below is not the function of information system related to data?
a) collection
b) duplication
c) analysis
d) storage

14) Which of below is not true about OLTP?
a) serve operational levels
b) used for high level decisions
c) record daily routine transactions
d) allow status monitoring

Seat No.	

Set **Q**

T. Y. (B.Tech.) (Electronics Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Information Technology and Management (BTN04513)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

Section – I

Q.2 Solve the following. (Any Two) **12**

a) With suitable example evaluate various components of a typical information system.

b) To whom and how IT supports in enterprise? Support your answer by examples.

c) With suitable diagram explain flow of e-payment with credit/debit card.

Q.3 Solve the following. (Any Four) **16**

a) With one suitable application discuss electronic content management.

b) Evaluate data management problems and challenges.

c) Compare centralized and distributed databases.

d) Describe any four models of e-business.

e) With suitable example compare forward and reverse auctions.

Section – II

Q.4 Solve the following. (Any Two) **12**

a) With suitable example explain how ERP interfaces with other enterprise systems.

b) With suitable diagram and example explain various flows and processes in supply chain management.

c) With suitable example explain economical impact of IS on organization.

Q.5 Attempt the following. (Any Four) **16**

a) Comment on ‘doing business in digital economy’.

b) What is de-skilling and alienation? How it affects performance of an organization?

c) Justify - green IT is the need of the time.

d) With suitable example explain how ERP is beneficial for organizations.

e) Justify - software project needs a good manager.

Seat No.	

Set **R**

T. Y. (B.Tech.) (Electronics Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Information Technology and Management (BTN04513)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Select suitable option. **14**

1) Which of below is not true for IT project?
a) it has start and end
b) it has objectives
c) it involves software development only
d) it requires resources

2) Model driven and data driven are the two types of _____.
a) TPS b) DSS
c) ERP d) process control system

3) _____ facilitates individual payments like telephone bills, electricity bills.
a) ECS debit b) debit push
c) ECS credit d) All of these

4) _____ is about change in organizational structure due to adoption of IS/IT.
a) technical view b) behavioral view
c) CRM d) All of these

5) Organizations sell products to other organizations electronically is called _____ marketplace.
a) buy side b) sell side
c) virtual d) electronic exchange

6) A SDLC model in which all phases are cascaded to each other in which progress is seen as flowing steadily downwards is _____ model.
a) spiral
b) waterfall
c) downfall
d) big bang

7) Which of below is an example of TPS?
a) payroll
b) business intelligence
c) ERP
d) expert system

8) The major cost incurred in implementing ERP is due to _____.
a) hardware
b) software
c) training
d) reengineering

9) Which of below is a workplace monitoring method in an organization?
a) digital video cameras
b) computer network logs
c) ID cards for movement tracking
d) All of these

10) Which of below is not the function of information system related to data?
a) collection
b) duplication
c) analysis
d) storage

11) Which of below is not true about OLTP?
a) serve operational levels
b) used for high level decisions
c) record daily routine transactions
d) allow status monitoring

12) Which of below is not a part of IT architecture?
a) data
b) finance
c) applications
d) business processes

13) What for IS & IT are used in digital enterprises?
a) research
b) boost employee productivity
c) customer support
d) All of these

14) Which of below is not true about organizations?
a) closed system
b) social unit
c) interact with environment
d) have a structure

Seat No.	

Set **R**

T. Y. (B.Tech.) (Electronics Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Information Technology and Management (BTN04513)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

Section – I

Q.2 Solve the following. (Any Two) **12**

a) With suitable example evaluate various components of a typical information system.

b) To whom and how IT supports in enterprise? Support your answer by examples.

c) With suitable diagram explain flow of e-payment with credit/debit card.

Q.3 Solve the following. (Any Four) **16**

a) With one suitable application discuss electronic content management.

b) Evaluate data management problems and challenges.

c) Compare centralized and distributed databases.

d) Describe any four models of e-business.

e) With suitable example compare forward and reverse auctions.

Section – II

Q.4 Solve the following. (Any Two) **12**

a) With suitable example explain how ERP interfaces with other enterprise systems.

b) With suitable diagram and example explain various flows and processes in supply chain management.

c) With suitable example explain economical impact of IS on organization.

Q.5 Attempt the following. (Any Four) **16**

a) Comment on ‘doing business in digital economy’.

b) What is de-skilling and alienation? How it affects performance of an organization?

c) Justify - green IT is the need of the time.

d) With suitable example explain how ERP is beneficial for organizations.

e) Justify - software project needs a good manager.

SLR-QH-390

Seat No.	

Set S

T. Y. (B.Tech.) (Electronics Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Information Technology and Management (BTN04513)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Select suitable option. 14

1) Which of below is not the function of information system related to data?
a) collection b) duplication
c) analysis d) storage

2) Which of below is not true about OLTP?
a) serve operational levels
b) used for high level decisions
c) record daily routine transactions
d) allow status monitoring

3) Which of below is not a part of IT architecture?
a) data b) finance
c) applications d) business processes

4) What for IS & IT are used in digital enterprises?
a) research b) boost employee productivity
c) customer support d) All of these

5) Which of below is not true about organizations?
a) closed system b) social unit
c) interact with environment d) have a structure

6) Which of below is not true for IT project?
a) it has start and end
b) it has objectives
c) it involves software development only
d) it requires resources

7) Model driven and data driven are the two types of _____.
a) TPS b) DSS
c) ERP d) process control system

8) _____ facilitates individual payments like telephone bills, electricity bills.
a) ECS debit b) debit push
c) ECS credit d) All of these

9) _____ is about change in organizational structure due to adoption of IS/IT.
a) technical view b) behavioral view
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a) buy side b) sell side
c) virtual d) electronic exchange

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c) downfall d) big bang

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a) payroll b) business intelligence
c) ERP d) expert system

13) The major cost incurred in implementing ERP is due to _____.
a) hardware b) software
c) training d) reengineering

14) Which of below is a workplace monitoring method in an organization?
a) digital video cameras
b) computer network logs
c) ID cards for movement tracking
d) All of these

Seat No.	

Set **S**

T. Y. (B.Tech.) (Electronics Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Information Technology and Management (BTN04513)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

Section – I

Q.2 Solve the following. (Any Two) **12**

a) With suitable example evaluate various components of a typical information system.

b) To whom and how IT supports in enterprise? Support your answer by examples.

c) With suitable diagram explain flow of e-payment with credit/debit card.

Q.3 Solve the following. (Any Four) **16**

a) With one suitable application discuss electronic content management.

b) Evaluate data management problems and challenges.

c) Compare centralized and distributed databases.

d) Describe any four models of e-business.

e) With suitable example compare forward and reverse auctions.

Section – II

Q.4 Solve the following. (Any Two) **12**

a) With suitable example explain how ERP interfaces with other enterprise systems.

b) With suitable diagram and example explain various flows and processes in supply chain management.

c) With suitable example explain economical impact of IS on organization.

Q.5 Attempt the following. (Any Four) **16**

a) Comment on ‘doing business in digital economy’.

b) What is de-skilling and alienation? How it affects performance of an organization?

c) Justify - green IT is the need of the time.

d) With suitable example explain how ERP is beneficial for organizations.

e) Justify - software project needs a good manager.

SLR-QH-391

Seat No.	

Set P

T. Y. (B.Tech.) (Electronics Engineering) (Sem - I) (New) (CBCS)
Examination: March/April - 2026
Managerial Economics (BTN04514)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) Demand is determined by _____.
a) Price of product
b) Relative Price of Other Goods
c) Tastes and habits
d) All of the above

2) Managerial economics generally refers to the integration of economic theory with business _____.
a) Ethics b) Management
c) Practice d) All of the Above

3) In economics, desire backed by purchasing power is known as _____.
a) Utility b) Demand
c) Consumption d) Scarcity

4) In the case of perfect elasticity, the demand curve is _____.
a) Vertical b) Horizontal
c) Flat d) Steep

5) Law of Demand is a _____ statement.
a) Quantitative b) Qualitative
c) Universal d) Reverse

6) Car and petrol are _____.
a) complementary goods b) substitute goods
c) supplementary goods d) reserve goods

7) The market with a single producer _____.
a) Perfect Completion
b) Monopolistic Competition
c) Oligopoly
d) Monopoly

8) Oligopoly is a type of _____ market. A _____ exists in the industry.
a) Perfect Few Firms
b) Imperfect Few Firms
c) Perfect many Firms
d) Imperfect many Firm

9) Which one is the method for measurement of elasticity _____.
a) Proportional or Percentage Method
b) Outlay Method
c) Geometric method
d) All of the above

10) Tea and coffee are _____.
a) Complimentary goods
b) Substitute goods
c) Supplementary goods
d) Reserve goods

11) Which one of the following is an internal factor influencing pricing?
a) Demand
b) Competition
c) Distribution Channel
d) Product Life Cycle

12) In a perfect market both buyers and sellers are _____.
a) Price maker
b) Price Giver
c) Price taker
d) All of the above

13) Functional relationship between input and output known as _____.
a) Conversation
b) Production Function
c) Work in progress
d) Output function

14) The factors used in the production _____.
a) Land and labor
b) Capital and Entrepreneurship
c) Both a) & b)
d) Only Capital

Seat No.	

Set | P

T. Y. (B.Tech.) (Electronics Engineering) (Sem - I) (New) (CBCS)
Examination: March/April - 2026
Managerial Economics (BTN04514)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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

Section – I

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

a) Explain the scope of managerial Economics for business decision.

b) Explain the following terms
i) Microeconomics
ii) Macroeconomics

c) Explain the following terms
i) Demand
ii) Market demand
iii) Supply
iv) Market equilibrium

d) Explain elasticity of supply. Also state the factors affecting the elasticity of supply.

e) Explain Price of Elasticity of demand.

Q.3 Attempt the following. (Any Two) **12**

a) Explain Demand Utility and consumer demand analysis.

b) State and explain the determinants of demand.

c) Explain the concept Price of celling and Price Floors.

Section – II

Q.4 Attempt the following. (Any Four) **16**

a) What is Production? Explain the concept of production function.

b) What Is market? Explain the various type of Market.

c) Explain the various costs of production in details.

d) Explain the concept of demand side of market.

e) Explain the concept profit margin of safety.

Q.5 Attempt the following. (Any Two) **12**

a) Describe Survey methods for demand Forecasting.

b) State and explain the Characteristics of market structure.

c) Explain the trend of Projection Method for demand Forecasting.

Seat No.	

Set **Q**

T. Y. (B.Tech.) (Electronics Engineering) (Sem - I) (New) (CBCS)
Examination: March/April - 2026
Managerial Economics (BTN04514)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) Oligopoly is a type of _____ market. A _____ exists in the industry.
a) Perfect Few Firms b) Imperfect Few Firms
c) Perfect many Firms d) Imperfect many Firm

2) Which one is the method for measurement of elasticity _____.
a) Proportional or Percentage Method
b) Outlay Method
c) Geometric method
d) All of the above

3) Tea and coffee are _____.
a) Complimentary goods b) Substitute goods
c) Supplementary goods d) Reserve goods

4) Which one of the following is an internal factor influencing pricing?
a) Demand b) Competition
c) Distribution Channel d) Product Life Cycle

5) In a perfect market both buyers and sellers are _____.
a) Price maker b) Price Giver
c) Price taker d) All of the above

6) Functional relationship between input and output known as _____.
a) Conversation b) Production Function
c) Work in progress d) Output function

7) The factors used in the production _____.
   a) Land and labor
   b) Capital and Entrepreneurship
   c) Both a) & b)
   d) Only Capital

8) Demand is determined by _____.
   a) Price of product
   b) Relative Price of Other Goods
   c) Tastes and habits
   d) All of the above

9) Managerial economics generally refers to the integration of economic theory with business _____.
   a) Ethics
   b) Management
   c) Practice
   d) All of the Above

10) In economics, desire backed by purchasing power is known as _____.
   a) Utility
   b) Demand
   c) Consumption
   d) Scarcity

11) In the case of perfect elasticity, the demand curve is _____.
   a) Vertical
   b) Horizontal
   c) Flat
   d) Steep

12) Law of Demand is a _____ statement.
   a) Quantitative
   b) Qualitative
   c) Universal
   d) Reverse

13) Car and petrol are _____.
   a) complementary goods
   b) substitute goods
   c) supplementary goods
   d) reserve goods

14) The market with a single producer _____.
   a) Perfect Completion
   b) Monopolistic Competition
   c) Oligopoly
   d) Monopoly

Seat No.	

Set **Q**

T. Y. (B.Tech.) (Electronics Engineering) (Sem - I) (New) (CBCS)
Examination: March/April - 2026
Managerial Economics (BTN04514)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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

Section – I

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

a) Explain the scope of managerial Economics for business decision.

b) Explain the following terms
i) Microeconomics
ii) Macroeconomics

c) Explain the following terms
i) Demand
ii) Market demand
iii) Supply
iv) Market equilibrium

d) Explain elasticity of supply. Also state the factors affecting the elasticity of supply.

e) Explain Price of Elasticity of demand.

Q.3 Attempt the following. (Any Two) **12**

a) Explain Demand Utility and consumer demand analysis.

b) State and explain the determinants of demand.

c) Explain the concept Price of celling and Price Floors.

Section – II

Q.4 Attempt the following. (Any Four) **16**

a) What is Production? Explain the concept of production function.

b) What Is market? Explain the various type of Market.

c) Explain the various costs of production in details.

d) Explain the concept of demand side of market.

e) Explain the concept profit margin of safety.

Q.5 Attempt the following. (Any Two) **12**

a) Describe Survey methods for demand Forecasting.

b) State and explain the Characteristics of market structure.

c) Explain the trend of Projection Method for demand Forecasting.

SLR-QH-391

Seat No.	

Set R

T. Y. (B.Tech.) (Electronics Engineering) (Sem - I) (New) (CBCS)
Examination: March/April - 2026
Managerial Economics (BTN04514)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) Which one of the following is an internal factor influencing pricing?
a) Demand b) Competition
c) Distribution Channel d) Product Life Cycle

2) In a perfect market both buyers and sellers are _____.
a) Price maker b) Price Giver
c) Price taker d) All of the above

3) Functional relationship between input and output known as _____.
a) Conversation b) Production Function
c) Work in progress d) Output function

4) The factors used in the production _____.
a) Land and labor
b) Capital and Entrepreneurship
c) Both a) & b)
d) Only Capital

5) Demand is determined by _____.
a) Price of product
b) Relative Price of Other Goods
c) Tastes and habits
d) All of the above

6) Managerial economics generally refers to the integration of economic theory with business _____.
a) Ethics b) Management
c) Practice d) All of the Above

7) In economics, desire backed by purchasing power is known as _____.
a) Utility b) Demand
c) Consumption d) Scarcity

8) In the case of perfect elasticity, the demand curve is _____.
a) Vertical b) Horizontal
c) Flat d) Steep

9) Law of Demand is a _____ statement.
a) Quantitative b) Qualitative
c) Universal d) Reverse

10) Car and petrol are _____.
a) complementary goods b) substitute goods
c) supplementary goods d) reserve goods

11) The market with a single producer _____.
a) Perfect Completion b) Monopolistic Competition
c) Oligopoly d) Monopoly

12) Oligopoly is a type of _____ market. A _____ exists in the industry.
a) Perfect Few Firms b) Imperfect Few Firms
c) Perfect many Firms d) Imperfect many Firm

13) Which one is the method for measurement of elasticity _____.
a) Proportional or Percentage Method
b) Outlay Method
c) Geometric method
d) All of the above

14) Tea and coffee are _____.
a) Complimentary goods b) Substitute goods
c) Supplementary goods d) Reserve goods

Seat No.	

Set **R**

T. Y. (B.Tech.) (Electronics Engineering) (Sem - I) (New) (CBCS)
Examination: March/April - 2026
Managerial Economics (BTN04514)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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

Section – I

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

a) Explain the scope of managerial Economics for business decision.

b) Explain the following terms
i) Microeconomics
ii) Macroeconomics

c) Explain the following terms
i) Demand
ii) Market demand
iii) Supply
iv) Market equilibrium

d) Explain elasticity of supply. Also state the factors affecting the elasticity of supply.

e) Explain Price of Elasticity of demand.

Q.3 Attempt the following. (Any Two) **12**

a) Explain Demand Utility and consumer demand analysis.

b) State and explain the determinants of demand.

c) Explain the concept Price of celling and Price Floors.

Section – II

Q.4 Attempt the following. (Any Four) **16**

a) What is Production? Explain the concept of production function.

b) What Is market? Explain the various type of Market.

c) Explain the various costs of production in details.

d) Explain the concept of demand side of market.

e) Explain the concept profit margin of safety.

Q.5 Attempt the following. (Any Two) **12**

a) Describe Survey methods for demand Forecasting.

b) State and explain the Characteristics of market structure.

c) Explain the trend of Projection Method for demand Forecasting.

Seat No.		Set	S

T. Y. (B.Tech.) (Electronics Engineering) (Sem - I) (New) (CBCS)
Examination: March/April - 2026
Managerial Economics (BTN04514)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) Car and petrol are _____.
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c) supplementary goods d) reserve goods

2) The market with a single producer _____.
a) Perfect Completion b) Monopolistic Competition
c) Oligopoly d) Monopoly

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a) Demand b) Competition
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b) Production Function
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9) The factors used in the production _____.
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c) Tastes and habits
d) All of the above

11) Managerial economics generally refers to the integration of economic theory with business _____.
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b) Management
c) Practice
d) All of the Above

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13) In the case of perfect elasticity, the demand curve is _____.
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b) Horizontal
c) Flat
d) Steep

14) Law of Demand is a _____ statement.
a) Quantitative
b) Qualitative
c) Universal
d) Reverse

Seat No.	

Set | S

T. Y. (B.Tech.) (Electronics Engineering) (Sem - I) (New) (CBCS)
Examination: March/April - 2026
Managerial Economics (BTN04514)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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

Section – I

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

a) Explain the scope of managerial Economics for business decision.

b) Explain the following terms
i) Microeconomics
ii) Macroeconomics

c) Explain the following terms
i) Demand
ii) Market demand
iii) Supply
iv) Market equilibrium

d) Explain elasticity of supply. Also state the factors affecting the elasticity of supply.

e) Explain Price of Elasticity of demand.

Q.3 Attempt the following. (Any Two) **12**

a) Explain Demand Utility and consumer demand analysis.

b) State and explain the determinants of demand.

c) Explain the concept Price of celling and Price Floors.

Section – II

Q.4 Attempt the following. (Any Four) **16**

a) What is Production? Explain the concept of production function.

b) What Is market? Explain the various type of Market.

c) Explain the various costs of production in details.

d) Explain the concept of demand side of market.

e) Explain the concept profit margin of safety.

Q.5 Attempt the following. (Any Two) **12**

a) Describe Survey methods for demand Forecasting.

b) State and explain the Characteristics of market structure.

c) Explain the trend of Projection Method for demand Forecasting.

SLR-QH-393

Seat No.	

Set P

T. Y. (B.Tech.) (Electronics Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Business Ethics (BTN04516)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Choose the correct answer. **14**

1) Why business ethics are important?
a) It formulates the firm's image and builds the brand
b) It influences the buying decision of the customers
c) Build confidence within employees
d) All of the above

2) The need for social responsibility arises due to the _____.
a) Firm's interest
b) Interest of society
c) Both firms and society interest
d) None of the above

3) Code of conduct does not include _____.
a) Dishonesty b) Rules
c) Morality d) Integrity

4) The disadvantage of the social responsibility is _____.
a) Possession of resources
b) Ethical obligation
c) Public image
d) Violation of profit maximization

5) The four types of social responsibility include _____.
a) legal, philanthropic, economic, and ethical
b) ethical, moral, social, and economic
c) philanthropic, justice, economic, and ethical
d) legal, moral, ethical, and economic

6) The primary stakeholders are _____.
a) Customers b) Suppliers
c) Shareholders d) Creditors

7) Most companies begin the process of establishing organizational ethics programs by developing _____.
a) ethics training programs
b) codes of conduct
c) ethics enforcement mechanisms
d) hidden agendas

8) What is the main characteristic of the stakeholder approach?
a) The idea that many different groups have a legitimate interest in the corporation
b) It is a critical perspective on corporations and business
c) A focus on social and environmental responsibilities of a corporation
d) The assumption that shareholders are not the main stakeholders in the corporation

9) Which of the following is not one the underlying principles of the corporate governance Combined Code of Practice?
a) Integrity b) Accountability
c) Openness d) Acceptability

10) The framework for establishing good corporate governance and accountability was originally set up by the _____.
a) Cadbury Committee b) Nestle Committee
c) Rowntree Committee d) Thornton Committee

11) All definitions of Corporate Social Responsibility recognize that _____.
a) Companies have a responsibility for their impact on society and environment
b) The natural environment should be the main focus of CSR activities
c) Business ethics is a complex issue
d) Companies must pay equal attention to business ethics and sustainability

12) _____ are those individuals who raise ethical concerns or issues to others inside or outside the organisation.
a) Entrepreneur b) Whistle blowers
c) Social entrepreneur d) Social impact management

13) Which of the following alone can ensure effective ethics programme in a business enterprise?

a) Publication of a code
b) Involvement of employees
c) Establishment of compliance mechanisms
d) None of them

14) Ethics is _____.

a) Morals + Reasoning
b) Morals + Values
c) Values + Beliefs
d) Values + Philosophy

Seat No.	

Set **P**

T. Y. (B.Tech.) (Electronics Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Business Ethics (BTN04516)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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

SECTION – I

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

a) Explain the purpose and importance of business ethics.
b) Discuss role of globalization and ethics in business management.
c) Explain the individual and situational influences on decision making.
d) Describe the steps for setting standards of ethical behavior.
e) Explain the objectives and importance of CSR.
f) State and explain the essential elements of corporate governance.

Q.3 Solve the following. (Any Two) **12**

a) Discuss various theories of business ethics.
b) Explain various models of ethical decision making.
c) Define corporate governance. Explain the principles of corporate governance.

SECTION – II

Q.4 Solve the following. (Any Four) **16**

a) Describe the ethics in production, marketing and HR.
b) Describe corporate citizen and employee relations towards sustainable employment.
c) Discuss various approaches to environmental ethics.
d) Discuss the ethics of conserving depletable resources.
e) Explain moral significance of information technology towards business.
f) Describe IT code of conduct.

Q.5 Solve the following. (Any Two) **12**

a) Describe the ethical challenges of globalization.
b) Explain the functions of CSO.
c) Describe ethical issues in the relation between business and government.

Seat No.	

Set **Q**

T. Y. (B.Tech.) (Electronics Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Business Ethics (BTN04516)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Choose the correct answer. **14**

1) What is the main characteristic of the stakeholder approach?
a) The idea that many different groups have a legitimate interest in the corporation
b) It is a critical perspective on corporations and business
c) A focus on social and environmental responsibilities of a corporation
d) The assumption that shareholders are not the main stakeholders in the corporation

2) Which of the following is not one the underlying principles of the corporate governance Combined Code of Practice?
a) Integrity b) Accountability
c) Openness d) Acceptability

3) The framework for establishing good corporate governance and accountability was originally set up by the _____.
a) Cadbury Committee b) Nestle Committee
c) Rowntree Committee d) Thornton Committee

4) All definitions of Corporate Social Responsibility recognize that _____.
a) Companies have a responsibility for their impact on society and environment
b) The natural environment should be the main focus of CSR activities
c) Business ethics is a complex issue
d) Companies must pay equal attention to business ethics and sustainability

5) _____ are those individuals who raise ethical concerns or issues to others inside or outside the organisation.
a) Entrepreneur
b) Whistle blowers
c) Social entrepreneur
d) Social impact management

6) Which of the following alone can ensure effective ethics programme in a business enterprise?
a) Publication of a code
b) Involvement of employees
c) Establishment of compliance mechanisms
d) None of them

7) Ethics is _____.
a) Morals + Reasoning
b) Morals + Values
c) Values + Beliefs
d) Values + Philosophy

8) Why business ethics are important?
a) It formulates the firm's image and builds the brand
b) It influences the buying decision of the customers
c) Build confidence within employees
d) All of the above

9) The need for social responsibility arises due to the _____.
a) Firm's interest
b) Interest of society
c) Both firms and society interest
d) None of the above

10) Code of conduct does not include _____.
a) Dishonesty
b) Rules
c) Morality
d) Integrity

11) The disadvantage of the social responsibility is _____.
a) Possession of resources
b) Ethical obligation
c) Public image
d) Violation of profit maximization

12) The four types of social responsibility include _____.
a) legal, philanthropic, economic, and ethical
b) ethical, moral, social, and economic
c) philanthropic, justice, economic, and ethical
d) legal, moral, ethical, and economic

13) The primary stakeholders are _____.
a) Customers
b) Suppliers
c) Shareholders
d) Creditors

14) Most companies begin the process of establishing organizational ethics programs by developing _____.

a) ethics training programs
b) codes of conduct
c) ethics enforcement mechanisms
d) hidden agendas

SLR-QH-393

Seat No.	

Set Q

T. Y. (B.Tech.) (Electronics Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Business Ethics (BTN04516)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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

SECTION – I

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

a) Explain the purpose and importance of business ethics.
b) Discuss role of globalization and ethics in business management.
c) Explain the individual and situational influences on decision making.
d) Describe the steps for setting standards of ethical behavior.
e) Explain the objectives and importance of CSR.
f) State and explain the essential elements of corporate governance.

Q.3 Solve the following. (Any Two) **12**

a) Discuss various theories of business ethics.
b) Explain various models of ethical decision making.
c) Define corporate governance. Explain the principles of corporate governance.

SECTION – II

Q.4 Solve the following. (Any Four) **16**

a) Describe the ethics in production, marketing and HR.
b) Describe corporate citizen and employee relations towards sustainable employment.
c) Discuss various approaches to environmental ethics.
d) Discuss the ethics of conserving depletable resources.
e) Explain moral significance of information technology towards business.
f) Describe IT code of conduct.

Q.5 Solve the following. (Any Two) **12**

a) Describe the ethical challenges of globalization.
b) Explain the functions of CSO.
c) Describe ethical issues in the relation between business and government.

Seat No.	

Set **R**

T. Y. (B.Tech.) (Electronics Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Business Ethics (BTN04516)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Choose the correct answer. 14

1) All definitions of Corporate Social Responsibility recognize that _____.
a) Companies have a responsibility for their impact on society and environment
b) The natural environment should be the main focus of CSR activities
c) Business ethics is a complex issue
d) Companies must pay equal attention to business ethics and sustainability

2) _____ are those individuals who raise ethical concerns or issues to others inside or outside the organisation.
a) Entrepreneur b) Whistle blowers
c) Social entrepreneur d) Social impact management

3) Which of the following alone can ensure effective ethics programme in a business enterprise?
a) Publication of a code
b) Involvement of employees
c) Establishment of compliance mechanisms
d) None of them

4) Ethics is _____.
a) Morals + Reasoning b) Morals + Values
c) Values + Beliefs d) Values + Philosophy

5) Why business ethics are important?
a) It formulates the firm's image and builds the brand
b) It influences the buying decision of the customers
c) Build confidence within employees
d) All of the above

6) The need for social responsibility arises due to the _____.
   a) Firm's interest
   b) Interest of society
   c) Both firms and society interest
   d) None of the above

7) Code of conduct does not include _____.
   a) Dishonesty
   b) Rules
   c) Morality
   d) Integrity

8) The disadvantage of the social responsibility is _____.
   a) Possession of resources
   b) Ethical obligation
   c) Public image
   d) Violation of profit maximization

9) The four types of social responsibility include _____.
   a) legal, philanthropic, economic, and ethical
   b) ethical, moral, social, and economic
   c) philanthropic, justice, economic, and ethical
   d) legal, moral, ethical, and economic

10) The primary stakeholders are _____.
   a) Customers
   b) Suppliers
   c) Shareholders
   d) Creditors

11) Most companies begin the process of establishing organizational ethics programs by developing _____.
   a) ethics training programs
   b) codes of conduct
   c) ethics enforcement mechanisms
   d) hidden agendas

12) What is the main characteristic of the stakeholder approach?
   a) The idea that many different groups have a legitimate interest in the corporation
   b) It is a critical perspective on corporations and business
   c) A focus on social and environmental responsibilities of a corporation
   d) The assumption that shareholders are not the main stakeholders in the corporation

13) Which of the following is not one the underlying principles of the corporate governance Combined Code of Practice?
   a) Integrity
   b) Accountability
   c) Openness
   d) Acceptability

14) The framework for establishing good corporate governance and accountability was originally set up by the _____.

a) Cadbury Committee
b) Nestle Committee
c) Rowntree Committee
d) Thornton Committee

SLR-QH-393

Seat No.	

Set R

T. Y. (B.Tech.) (Electronics Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Business Ethics (BTN04516)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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

SECTION – I

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

a) Explain the purpose and importance of business ethics.
b) Discuss role of globalization and ethics in business management.
c) Explain the individual and situational influences on decision making.
d) Describe the steps for setting standards of ethical behavior.
e) Explain the objectives and importance of CSR.
f) State and explain the essential elements of corporate governance.

Q.3 Solve the following. (Any Two) **12**

a) Discuss various theories of business ethics.
b) Explain various models of ethical decision making.
c) Define corporate governance. Explain the principles of corporate governance.

SECTION – II

Q.4 Solve the following. (Any Four) **16**

a) Describe the ethics in production, marketing and HR.
b) Describe corporate citizen and employee relations towards sustainable employment.
c) Discuss various approaches to environmental ethics.
d) Discuss the ethics of conserving depletable resources.
e) Explain moral significance of information technology towards business.
f) Describe IT code of conduct.

Q.5 Solve the following. (Any Two) **12**

a) Describe the ethical challenges of globalization.
b) Explain the functions of CSO.
c) Describe ethical issues in the relation between business and government.

Seat No.	

Set **S**

T. Y. (B.Tech.) (Electronics Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Business Ethics (BTN04516)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Choose the correct answer. **14**

1) The primary stakeholders are _____.
a) Customers b) Suppliers
c) Shareholders d) Creditors

2) Most companies begin the process of establishing organizational ethics programs by developing _____.
a) ethics training programs
b) codes of conduct
c) ethics enforcement mechanisms
d) hidden agendas

3) What is the main characteristic of the stakeholder approach?
a) The idea that many different groups have a legitimate interest in the corporation
b) It is a critical perspective on corporations and business
c) A focus on social and environmental responsibilities of a corporation
d) The assumption that shareholders are not the main stakeholders in the corporation

4) Which of the following is not one the underlying principles of the corporate governance Combined Code of Practice?
a) Integrity b) Accountability
c) Openness d) Acceptability

5) The framework for establishing good corporate governance and accountability was originally set up by the _____.
a) Cadbury Committee b) Nestle Committee
c) Rowntree Committee d) Thornton Committee

6) All definitions of Corporate Social Responsibility recognize that _____.
   a) Companies have a responsibility for their impact on society and environment
   b) The natural environment should be the main focus of CSR activities
   c) Business ethics is a complex issue
   d) Companies must pay equal attention to business ethics and sustainability

7) _____ are those individuals who raise ethical concerns or issues to others inside or outside the organisation.
   a) Entrepreneur
   b) Whistle blowers
   c) Social entrepreneur
   d) Social impact management

8) Which of the following alone can ensure effective ethics programme in a business enterprise?
   a) Publication of a code
   b) Involvement of employees
   c) Establishment of compliance mechanisms
   d) None of them

9) Ethics is _____.
   a) Morals + Reasoning
   b) Morals + Values
   c) Values + Beliefs
   d) Values + Philosophy

10) Why business ethics are important?
   a) It formulates the firm's image and builds the brand
   b) It influences the buying decision of the customers
   c) Build confidence within employees
   d) All of the above

11) The need for social responsibility arises due to the _____.
   a) Firm's interest
   b) Interest of society
   c) Both firms and society interest
   d) None of the above

12) Code of conduct does not include _____.
   a) Dishonesty
   b) Rules
   c) Morality
   d) Integrity

13) The disadvantage of the social responsibility is _____.
   a) Possession of resources
   b) Ethical obligation
   c) Public image
   d) Violation of profit maximization

14) The four types of social responsibility include _____.

a) legal, philanthropic, economic, and ethical
b) ethical, moral, social, and economic
c) philanthropic, justice, economic, and ethical
d) legal, moral, ethical, and economic

SLR-QH-393

Seat No.	

Set S

T. Y. (B.Tech.) (Electronics Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Business Ethics (BTN04516)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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

SECTION – I

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

a) Explain the purpose and importance of business ethics.
b) Discuss role of globalization and ethics in business management.
c) Explain the individual and situational influences on decision making.
d) Describe the steps for setting standards of ethical behavior.
e) Explain the objectives and importance of CSR.
f) State and explain the essential elements of corporate governance.

Q.3 Solve the following. (Any Two) **12**

a) Discuss various theories of business ethics.
b) Explain various models of ethical decision making.
c) Define corporate governance. Explain the principles of corporate governance.

SECTION – II

Q.4 Solve the following. (Any Four) **16**

a) Describe the ethics in production, marketing and HR.
b) Describe corporate citizen and employee relations towards sustainable employment.
c) Discuss various approaches to environmental ethics.
d) Discuss the ethics of conserving depletable resources.
e) Explain moral significance of information technology towards business.
f) Describe IT code of conduct.

Q.5 Solve the following. (Any Two) **12**

a) Describe the ethical challenges of globalization.
b) Explain the functions of CSO.
c) Describe ethical issues in the relation between business and government.

SLR-QH-396

Seat No.	

Set P

T.Y. (B.Tech.) (Electronics Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Industrial IoT (BTN04519)

Day & Date: Tuesday, 12-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) Which of the following is NOT mentioned as a part of the hands-on prerequisites?
a) Knowledge of Python
b) Understanding of machine learning concepts
c) Experience with cloud computing
d) Familiarity with IoT devices

2) What is IoT Greengrass primarily used for in edge ML solutions?
a) Data visualization
b) Edge device management
c) Cloud storage
d) Machine learning model training

3) Which aspect of IoT Greengrass installation focuses on network connectivity?
a) Device registration
b) Compatibility testing
c) Core software deployment
d) Configuration settings

4) What is the first step in connecting a sensing device at the edge?
a) Configuring cloud synchronization
b) Installing IoT Greengrass
c) Connecting to a power source
d) Setting up machine learning models

5) Which device characteristic is essential for effective sensing at the edge?
a) High computational power
b) Low power consumption
c) Large storage capacity
d) High-speed network connectivity

6) What is a primary challenge of storing logs in the cloud?
   a) Data inconsistency
   b) Security vulnerabilities
   c) Network latency
   d) Limited storage capacity

7) Which component is responsible for synchronizing the state between the edge and the cloud?
   a) IoT Greengrass
   b) EdgeML Toolkit
   c) Stream Manager
   d) Cloud synchronization module

8) What is the main objective of building data orchestration workflows on the edge?
   a) Minimizing cloud storage costs
   b) Enhancing machine learning model training
   c) Optimizing data processing efficiency
   d) Centralizing data analytics

9) How does defining big data for IoT workloads help in handling diverse data sources?
   a) By centralizing data processing
   b) By ensuring interoperability between devices
   c) By optimizing machine learning model training
   d) By facilitating efficient data ingestion and processing

10) Why is it important to remember data flow anti-patterns for edge workloads?
   a) To centralize data processing
   b) To optimize machine learning model training
   c) To avoid common pitfalls in data processing workflows
   d) To minimize cloud storage costs

11) Which aspect of processing and consuming data on the cloud focuses on data consistency?
   a) Defining big data for IoT workloads
   b) Introduction to Domain-Driven Design (DDD) concepts
   c) Designing data flow patterns on the cloud
   d) Remembering data flow anti-patterns for edge workloads

12) Which aspect of streaming from the edge to a data lake on the cloud focuses on scalability?
   a) Data consistency
   b) Network bandwidth utilization
   c) Real-time data analysis
   d) Centralized data processing

13) What is the primary advantage of designing data patterns for the edge?

a) Minimizing cloud storage costs
b) Enhancing machine learning model accuracy
c) Optimizing network bandwidth utilization
d) Centralizing data processing

14) Which aspect of edge computing deployment focuses on ensuring data consistency?

a) Remote deployment
b) Cloud-edge synchronization
c) Storing logs in the cloud
d) ML model deployment

Seat No.	

Set **P**

T.Y. (B.Tech.) (Electronics Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Industrial IoT (BTN04519)

Day & Date: Tuesday, 12-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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

SECTION – I

Q.2 Attempt Any Three. **12**

a) Discuss the significance of edge device drivers in the functionality of IoT Greengrass.

b) Evaluate the impact of IoT Greengrass on optimizing data transmission to the cloud.

c) Explain the importance of device connectivity in enhancing the functionality of edge computing solutions.

d) Analyze the significance of synchronizing the state between the edge and the cloud in edge computing.

Q.3 Attempt Any Two. **16**

a) Outline the hands-on prerequisites necessary for implementing edge ML solutions effectively.

b) Evaluate the role of security protocols in safeguarding data integrity and privacy at the edge.

c) Explain the process of setting the scene for a modern, smart home solution.

SECTION – II

Q.4 Attempt Any Three. **12**

a) Explain the process of defining data models for IoT workloads and discuss their significance in facilitating interoperability and data consistency.

b) Evaluate the role of designing data patterns for optimizing data flow in edge computing environments and analyze their impact on data transmission efficiency.

c) Discuss the challenges and advantages of building data orchestration workflows on the edge for enhancing real-time data processing capabilities and system reliability.

d) Analyze the role of cloud computing in facilitating efficient data processing and consumption in IoT deployments and its impact on system performance and reliability.

Q.5 Attempt Any Two. **16**

a) Describe the anatomy of an edge ML solution and the role of IoT Greengrass within it.

b) Analyze the implications of streaming from the edge to a data lake on the cloud for enabling predictive analytics and machine learning applications in IoT environments.

c) Analyze the implications of cloud-based data processing and consumption for enabling data-driven insights, business intelligence, and value creation in IoT ecosystems.

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Electronics Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Industrial IoT (BTN04519)

Day & Date: Tuesday, 12-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) What is the main objective of building data orchestration workflows on the edge?
a) Minimizing cloud storage costs
b) Enhancing machine learning model training
c) Optimizing data processing efficiency
d) Centralizing data analytics

2) How does defining big data for IoT workloads help in handling diverse data sources?
a) By centralizing data processing
b) By ensuring interoperability between devices
c) By optimizing machine learning model training
d) By facilitating efficient data ingestion and processing

3) Why is it important to remember data flow anti-patterns for edge workloads?
a) To centralize data processing
b) To optimize machine learning model training
c) To avoid common pitfalls in data processing workflows
d) To minimize cloud storage costs

4) Which aspect of processing and consuming data on the cloud focuses on data consistency?
a) Defining big data for IoT workloads
b) Introduction to Domain-Driven Design (DDD) concepts
c) Designing data flow patterns on the cloud
d) Remembering data flow anti-patterns for edge workloads

5) Which aspect of streaming from the edge to a data lake on the cloud focuses on scalability?
   a) Data consistency
   b) Network bandwidth utilization
   c) Real-time data analysis
   d) Centralized data processing

6) What is the primary advantage of designing data patterns for the edge?
   a) Minimizing cloud storage costs
   b) Enhancing machine learning model accuracy
   c) Optimizing network bandwidth utilization
   d) Centralizing data processing

7) Which aspect of edge computing deployment focuses on ensuring data consistency?
   a) Remote deployment
   b) Cloud-edge synchronization
   c) Storing logs in the cloud
   d) ML model deployment

8) Which of the following is NOT mentioned as a part of the hands-on prerequisites?
   a) Knowledge of Python
   b) Understanding of machine learning concepts
   c) Experience with cloud computing
   d) Familiarity with IoT devices

9) What is IoT Greengrass primarily used for in edge ML solutions?
   a) Data visualization
   b) Edge device management
   c) Cloud storage
   d) Machine learning model training

10) Which aspect of IoT Greengrass installation focuses on network connectivity?
   a) Device registration
   b) Compatibility testing
   c) Core software deployment
   d) Configuration settings

11) What is the first step in connecting a sensing device at the edge?
   a) Configuring cloud synchronization
   b) Installing IoT Greengrass
   c) Connecting to a power source
   d) Setting up machine learning models

12) Which device characteristic is essential for effective sensing at the edge?
   a) High computational power
   b) Low power consumption
   c) Large storage capacity
   d) High-speed network connectivity

13) What is a primary challenge of storing logs in the cloud?

a) Data inconsistency
b) Security vulnerabilities
c) Network latency
d) Limited storage capacity

14) Which component is responsible for synchronizing the state between the edge and the cloud?

a) IoT Greengrass
b) EdgeML Toolkit
c) Stream Manager
d) Cloud synchronization module

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Electronics Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Industrial IoT (BTN04519)

Day & Date: Tuesday, 12-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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

SECTION – I

Q.2 Attempt Any Three. **12**

a) Discuss the significance of edge device drivers in the functionality of IoT Greengrass.

b) Evaluate the impact of IoT Greengrass on optimizing data transmission to the cloud.

c) Explain the importance of device connectivity in enhancing the functionality of edge computing solutions.

d) Analyze the significance of synchronizing the state between the edge and the cloud in edge computing.

Q.3 Attempt Any Two. **16**

a) Outline the hands-on prerequisites necessary for implementing edge ML solutions effectively.

b) Evaluate the role of security protocols in safeguarding data integrity and privacy at the edge.

c) Explain the process of setting the scene for a modern, smart home solution.

SECTION – II

Q.4 Attempt Any Three. **12**

a) Explain the process of defining data models for IoT workloads and discuss their significance in facilitating interoperability and data consistency.

b) Evaluate the role of designing data patterns for optimizing data flow in edge computing environments and analyze their impact on data transmission efficiency.

c) Discuss the challenges and advantages of building data orchestration workflows on the edge for enhancing real-time data processing capabilities and system reliability.

d) Analyze the role of cloud computing in facilitating efficient data processing and consumption in IoT deployments and its impact on system performance and reliability.

Q.5 Attempt Any Two. **16**

a) Describe the anatomy of an edge ML solution and the role of IoT Greengrass within it.

b) Analyze the implications of streaming from the edge to a data lake on the cloud for enabling predictive analytics and machine learning applications in IoT environments.

c) Analyze the implications of cloud-based data processing and consumption for enabling data-driven insights, business intelligence, and value creation in IoT ecosystems.

Seat No.	

Set **R**

T.Y. (B.Tech.) (Electronics Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Industrial IoT (BTN04519)

Day & Date: Tuesday, 12-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) Which aspect of processing and consuming data on the cloud focuses on data consistency?
a) Defining big data for IoT workloads
b) Introduction to Domain-Driven Design (DDD) concepts
c) Designing data flow patterns on the cloud
d) Remembering data flow anti-patterns for edge workloads

2) Which aspect of streaming from the edge to a data lake on the cloud focuses on scalability?
a) Data consistency
b) Network bandwidth utilization
c) Real-time data analysis
d) Centralized data processing

3) What is the primary advantage of designing data patterns for the edge?
a) Minimizing cloud storage costs
b) Enhancing machine learning model accuracy
c) Optimizing network bandwidth utilization
d) Centralizing data processing

4) Which aspect of edge computing deployment focuses on ensuring data consistency?
a) Remote deployment
b) Cloud-edge synchronization
c) Storing logs in the cloud
d) ML model deployment

5) Which of the following is NOT mentioned as a part of the hands-on prerequisites?
a) Knowledge of Python
b) Understanding of machine learning concepts
c) Experience with cloud computing
d) Familiarity with IoT devices

6) What is IoT Greengrass primarily used for in edge ML solutions?
   a) Data visualization
   b) Edge device management
   c) Cloud storage
   d) Machine learning model training

7) Which aspect of IoT Greengrass installation focuses on network connectivity?
   a) Device registration
   b) Compatibility testing
   c) Core software deployment
   d) Configuration settings

8) What is the first step in connecting a sensing device at the edge?
   a) Configuring cloud synchronization
   b) Installing IoT Greengrass
   c) Connecting to a power source
   d) Setting up machine learning models

9) Which device characteristic is essential for effective sensing at the edge?
   a) High computational power
   b) Low power consumption
   c) Large storage capacity
   d) High-speed network connectivity

10) What is a primary challenge of storing logs in the cloud?
   a) Data inconsistency
   b) Security vulnerabilities
   c) Network latency
   d) Limited storage capacity

11) Which component is responsible for synchronizing the state between the edge and the cloud?
   a) IoT Greengrass
   b) EdgeML Toolkit
   c) Stream Manager
   d) Cloud synchronization module

12) What is the main objective of building data orchestration workflows on the edge?
   a) Minimizing cloud storage costs
   b) Enhancing machine learning model training
   c) Optimizing data processing efficiency
   d) Centralizing data analytics

13) How does defining big data for IoT workloads help in handling diverse data sources?
   a) By centralizing data processing
   b) By ensuring interoperability between devices
   c) By optimizing machine learning model training
   d) By facilitating efficient data ingestion and processing

14) Why is it important to remember data flow anti-patterns for edge workloads?

a) To centralize data processing
b) To optimize machine learning model training
c) To avoid common pitfalls in data processing workflows
d) To minimize cloud storage costs

Seat No.	

Set **R**

T.Y. (B.Tech.) (Electronics Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Industrial IoT (BTN04519)

Day & Date: Tuesday, 12-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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

SECTION – I

Q.2 Attempt Any Three. **12**

a) Discuss the significance of edge device drivers in the functionality of IoT Greengrass.

b) Evaluate the impact of IoT Greengrass on optimizing data transmission to the cloud.

c) Explain the importance of device connectivity in enhancing the functionality of edge computing solutions.

d) Analyze the significance of synchronizing the state between the edge and the cloud in edge computing.

Q.3 Attempt Any Two. **16**

a) Outline the hands-on prerequisites necessary for implementing edge ML solutions effectively.

b) Evaluate the role of security protocols in safeguarding data integrity and privacy at the edge.

c) Explain the process of setting the scene for a modern, smart home solution.

SECTION – II

Q.4 Attempt Any Three. **12**

a) Explain the process of defining data models for IoT workloads and discuss their significance in facilitating interoperability and data consistency.

b) Evaluate the role of designing data patterns for optimizing data flow in edge computing environments and analyze their impact on data transmission efficiency.

c) Discuss the challenges and advantages of building data orchestration workflows on the edge for enhancing real-time data processing capabilities and system reliability.

d) Analyze the role of cloud computing in facilitating efficient data processing and consumption in IoT deployments and its impact on system performance and reliability.

Q.5 Attempt Any Two. **16**

a) Describe the anatomy of an edge ML solution and the role of IoT Greengrass within it.

b) Analyze the implications of streaming from the edge to a data lake on the cloud for enabling predictive analytics and machine learning applications in IoT environments.

c) Analyze the implications of cloud-based data processing and consumption for enabling data-driven insights, business intelligence, and value creation in IoT ecosystems.

Seat No.		Set	S

T.Y. (B.Tech.) (Electronics Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Industrial IoT (BTN04519)

Day & Date: Tuesday, 12-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) What is a primary challenge of storing logs in the cloud?
a) Data inconsistency
b) Security vulnerabilities
c) Network latency
d) Limited storage capacity

2) Which component is responsible for synchronizing the state between the edge and the cloud?
a) IoT Greengrass
b) EdgeML Toolkit
c) Stream Manager
d) Cloud synchronization module

3) What is the main objective of building data orchestration workflows on the edge?
a) Minimizing cloud storage costs
b) Enhancing machine learning model training
c) Optimizing data processing efficiency
d) Centralizing data analytics

4) How does defining big data for IoT workloads help in handling diverse data sources?
a) By centralizing data processing
b) By ensuring interoperability between devices
c) By optimizing machine learning model training
d) By facilitating efficient data ingestion and processing

5) Why is it important to remember data flow anti-patterns for edge workloads?
a) To centralize data processing
b) To optimize machine learning model training
c) To avoid common pitfalls in data processing workflows
d) To minimize cloud storage costs

6) Which aspect of processing and consuming data on the cloud focuses on data consistency?
   a) Defining big data for IoT workloads
   b) Introduction to Domain-Driven Design (DDD) concepts
   c) Designing data flow patterns on the cloud
   d) Remembering data flow anti-patterns for edge workloads

7) Which aspect of streaming from the edge to a data lake on the cloud focuses on scalability?
   a) Data consistency
   b) Network bandwidth utilization
   c) Real-time data analysis
   d) Centralized data processing

8) What is the primary advantage of designing data patterns for the edge?
   a) Minimizing cloud storage costs
   b) Enhancing machine learning model accuracy
   c) Optimizing network bandwidth utilization
   d) Centralizing data processing

9) Which aspect of edge computing deployment focuses on ensuring data consistency?
   a) Remote deployment
   b) Cloud-edge synchronization
   c) Storing logs in the cloud
   d) ML model deployment

10) Which of the following is NOT mentioned as a part of the hands-on prerequisites?
   a) Knowledge of Python
   b) Understanding of machine learning concepts
   c) Experience with cloud computing
   d) Familiarity with IoT devices

11) What is IoT Greengrass primarily used for in edge ML solutions?
   a) Data visualization
   b) Edge device management
   c) Cloud storage
   d) Machine learning model training

12) Which aspect of IoT Greengrass installation focuses on network connectivity?
   a) Device registration
   b) Compatibility testing
   c) Core software deployment
   d) Configuration settings

13) What is the first step in connecting a sensing device at the edge?
   a) Configuring cloud synchronization
   b) Installing IoT Greengrass
   c) Connecting to a power source
   d) Setting up machine learning models

14) Which device characteristic is essential for effective sensing at the edge?

a) High computational power
b) Low power consumption
c) Large storage capacity
d) High-speed network connectivity

SLR-QH-396

Seat No.	

Set S

T.Y. (B.Tech.) (Electronics Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Industrial IoT (BTN04519)

Day & Date: Tuesday, 12-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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

SECTION – I

Q.2 Attempt Any Three. **12**

a) Discuss the significance of edge device drivers in the functionality of IoT Greengrass.

b) Evaluate the impact of IoT Greengrass on optimizing data transmission to the cloud.

c) Explain the importance of device connectivity in enhancing the functionality of edge computing solutions.

d) Analyze the significance of synchronizing the state between the edge and the cloud in edge computing.

Q.3 Attempt Any Two. **16**

a) Outline the hands-on prerequisites necessary for implementing edge ML solutions effectively.

b) Evaluate the role of security protocols in safeguarding data integrity and privacy at the edge.

c) Explain the process of setting the scene for a modern, smart home solution.

SECTION – II

Q.4 Attempt Any Three. **12**

a) Explain the process of defining data models for IoT workloads and discuss their significance in facilitating interoperability and data consistency.

b) Evaluate the role of designing data patterns for optimizing data flow in edge computing environments and analyze their impact on data transmission efficiency.

c) Discuss the challenges and advantages of building data orchestration workflows on the edge for enhancing real-time data processing capabilities and system reliability.

d) Analyze the role of cloud computing in facilitating efficient data processing and consumption in IoT deployments and its impact on system performance and reliability.

Q.5 Attempt Any Two. **16**

a) Describe the anatomy of an edge ML solution and the role of IoT Greengrass within it.

b) Analyze the implications of streaming from the edge to a data lake on the cloud for enabling predictive analytics and machine learning applications in IoT environments.

c) Analyze the implications of cloud-based data processing and consumption for enabling data-driven insights, business intelligence, and value creation in IoT ecosystems.

SLR-QH-402

Seat No.	

Set P

T.Y. (B.Tech.) (Electronics Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Computer Networks (BTN04601)

Day & Date: Friday, 15-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Choose the correct Answer. 14

1) Network device HUB is _____ layer device.
a) Physical b) Data Link
c) Network d) Application

2) The MAC id $09:12:EA:4F:30:98$ is _____ type.
a) Unicast b) Multicast
c) Broadcast d) None of these

3) The ARQ stands for _____.
a) All Repeat Queue b) Automatic Repeat Request
c) Automatic Resolve Question d) None of these

4) Physical or logical arrangement of network is _____.
a) Topology b) Routing
c) Group d) None of these

5) Error Correction at the data link level is achieved by _____.
a) Bit stuffing b) Equalization
c) Frame formation d) Hamming Code

6) The maximum throughput for pure ALOHA is _____ percent.
a) 12.2 b) 18.4
c) 36.8 d) None of these

7) The network IP address or logical address present for each node in the network is of _____ bits.
a) 12 b) 32
c) 64 d) 48

8) The IP address 143.155.66.63 belongs to _____.
a) Class A b) Class B
c) Class C d) Class D

9) The data unit in transport layer in TCP/IP is called _____.
a) A datagram b) A segment
c) Frame d) Bit-string

10) Which of the following is false with respect to UDP?
a) Connection oriented b) Unreliable
c) Transport layer protocol d) All of the mentioned

11) UDP packets have a fixed-size header of _____ bytes.
a) 8 b) 16
c) 40 d) 64

12) Router can recognize and work with _____ addresses.
a) Data Link Layer b) Physical Layer
c) Network Layer d) Session Layer

13) Count to infinity problem is present _____ Routing Protocol.
a) Shortest Path b) Distance Vector
c) Link State d) None of these

14) A _____ is one endpoint of a two-way communication link between two programs running on the network.
a) Gateway b) Semaphore
c) Socket d) None of these

SLR-QH-402

Seat No.	

Set P

T.Y. (B.Tech.) (Electronics Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Computer Networks (BTN04601)

Day & Date: Friday, 15-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary and state them clearly.
4) Draw neat diagrams.

SECTION – I

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

a) With the help of diagram explain different network topologies.

b) How CRC is used to detect the error in message transmission? For given message bits "1110101011" and divisor polynomial "1011" calculate CRC.

c) Calculate Hamming code-word for an ASCII character - 1101011. Assume even parity during transmission.

d) With neat diagram discuss the Sliding window protocol Mechanism in detail.

e) What are different types of network devices? Discuss any one in detail.

Q.3 Answer the following. (Any Two) **12**

a) Explain in detail IEEE 802.15 Bluetooth Protocol.

b) Draw and explain ISO-OSI reference model and discuss various issues handled by the layers.

c) What are different types of network devices? Discuss any two in detail.

SECTION – II

Q.4 Answer the following. (Any Four) **16**

a) Draw UDP packet format and explain its header in detail.

b) What are different IP address classes? Write ranges of different IP addresses. What is network mask for IP address 192.168.100.15?

c) Explain IP packet Header in detail with help of diagram.

d) Give the difference between circuit switching and packet switching techniques.

e) Explain Shortest path routing Protocol in computer networks.

Q.5 Answer the following. (Any Two) **12**

a) What encapsulation and Decapsulation in TCP/IP? Discuss three - way handshake in TCP.

b) With neat diagram, explain Distance Vector Routing in detail.

c) With the help of diagram, explain Client - Server Model.

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Electronics Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Computer Networks (BTN04601)

Day & Date: Friday, 15-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Choose the correct Answer. **14**

1) The IP address 143.155.66.63 belongs to _____.
a) Class A b) Class B
c) Class C d) Class D

2) The data unit in transport layer in TCP/IP is called _____.
a) A datagram b) A segment
c) Frame d) Bit-string

3) Which of the following is false with respect to UDP?
a) Connection oriented b) Unreliable
c) Transport layer protocol d) All of the mentioned

4) UDP packets have a fixed-size header of _____ bytes.
a) 8 b) 16
c) 40 d) 64

5) Router can recognize and work with _____ addresses.
a) Data Link Layer b) Physical Layer
c) Network Layer d) Session Layer

6) Count to infinity problem is present _____ Routing Protocol.
a) Shortest Path b) Distance Vector
c) Link State d) None of these

7) A _____ is one endpoint of a two-way communication link between two programs running on the network.
a) Gateway b) Semaphore
c) Socket d) None of these

8) Network device HUB is _____ layer device.
a) Physical b) Data Link
c) Network d) Application

9) The MAC id $09:12:EA:4F:30:98$ is _____ type.
a) Unicast b) Multicast
c) Broadcast d) None of these

10) The ARQ stands for _____.
a) All Repeat Queue b) Automatic Repeat Request
c) Automatic Resolve Question d) None of these

11) Physical or logical arrangement of network is _____.
a) Topology b) Routing
c) Group d) None of these

12) Error Correction at the data link level is achieved by _____.
a) Bit stuffing b) Equalization
c) Frame formation d) Hamming Code

13) The maximum throughput for pure ALOHA is _____ percent.
a) 12.2 b) 18.4
c) 36.8 d) None of these

14) The network IP address or logical address present for each node in the network is of _____ bits.
a) 12 b) 32
c) 64 d) 48

SLR-QH-402

Seat No.	

Set Q

T.Y. (B.Tech.) (Electronics Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Computer Networks (BTN04601)

Day & Date: Friday, 15-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary and state them clearly.
4) Draw neat diagrams.

SECTION – I

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

a) With the help of diagram explain different network topologies.

b) How CRC is used to detect the error in message transmission? For given message bits "1110101011" and divisor polynomial "1011" calculate CRC.

c) Calculate Hamming code-word for an ASCII character - 1101011. Assume even parity during transmission.

d) With neat diagram discuss the Sliding window protocol Mechanism in detail.

e) What are different types of network devices? Discuss any one in detail.

Q.3 Answer the following. (Any Two) **12**

a) Explain in detail IEEE 802.15 Bluetooth Protocol.

b) Draw and explain ISO-OSI reference model and discuss various issues handled by the layers.

c) What are different types of network devices? Discuss any two in detail.

SECTION – II

Q.4 Answer the following. (Any Four) **16**

a) Draw UDP packet format and explain its header in detail.

b) What are different IP address classes? Write ranges of different IP addresses. What is network mask for IP address 192.168.100.15?

c) Explain IP packet Header in detail with help of diagram.

d) Give the difference between circuit switching and packet switching techniques.

e) Explain Shortest path routing Protocol in computer networks.

Q.5 Answer the following. (Any Two) **12**

a) What encapsulation and Decapsulation in TCP/IP? Discuss three - way handshake in TCP.

b) With neat diagram, explain Distance Vector Routing in detail.

c) With the help of diagram, explain Client - Server Model.

Seat No.	

Set | **R**

T.Y. (B.Tech.) (Electronics Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Computer Networks (BTN04601)

Day & Date: Friday, 15-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Choose the correct Answer. **14**

1) UDP packets have a fixed-size header of _____ bytes.
a) 8 b) 16
c) 40 d) 64

2) Router can recognize and work with _____ addresses.
a) Data Link Layer b) Physical Layer
c) Network Layer d) Session Layer

3) Count to infinity problem is present _____ Routing Protocol.
a) Shortest Path b) Distance Vector
c) Link State d) None of these

4) A _____ is one endpoint of a two-way communication link between two programs running on the network.
a) Gateway b) Semaphore
c) Socket d) None of these

5) Network device HUB is _____ layer device.
a) Physical b) Data Link
c) Network d) Application

6) The MAC id $09:12:EA:4F:30:98$ is _____ type.
a) Unicast b) Multicast
c) Broadcast d) None of these

7) The ARQ stands for _____.
a) All Repeat Queue b) Automatic Repeat Request
c) Automatic Resolve Question d) None of these

8) Physical or logical arrangement of network is _____.
a) Topology b) Routing
c) Group d) None of these

9) Error Correction at the data link level is achieved by _____.
a) Bit stuffing b) Equalization
c) Frame formation d) Hamming Code

10) The maximum throughput for pure ALOHA is _____ percent.
a) 12.2 b) 18.4
c) 36.8 d) None of these

11) The network IP address or logical address present for each node in the network is of _____ bits.
a) 12 b) 32
c) 64 d) 48

12) The IP address 143.155.66.63 belongs to _____.
a) Class A b) Class B
c) Class C d) Class D

13) The data unit in transport layer in TCP/IP is called _____.
a) A datagram b) A segment
c) Frame d) Bit-string

14) Which of the following is false with respect to UDP?
a) Connection oriented b) Unreliable
c) Transport layer protocol d) All of the mentioned

SLR-QH-402

Seat No.	

Set R

T.Y. (B.Tech.) (Electronics Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Computer Networks (BTN04601)

Day & Date: Friday, 15-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary and state them clearly.
4) Draw neat diagrams.

SECTION – I

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

a) With the help of diagram explain different network topologies.

b) How CRC is used to detect the error in message transmission? For given message bits "1110101011" and divisor polynomial "1011" calculate CRC.

c) Calculate Hamming code-word for an ASCII character - 1101011. Assume even parity during transmission.

d) With neat diagram discuss the Sliding window protocol Mechanism in detail.

e) What are different types of network devices? Discuss any one in detail.

Q.3 Answer the following. (Any Two) **12**

a) Explain in detail IEEE 802.15 Bluetooth Protocol.

b) Draw and explain ISO-OSI reference model and discuss various issues handled by the layers.

c) What are different types of network devices? Discuss any two in detail.

SECTION – II

Q.4 Answer the following. (Any Four) **16**

a) Draw UDP packet format and explain its header in detail.

b) What are different IP address classes? Write ranges of different IP addresses. What is network mask for IP address 192.168.100.15?

c) Explain IP packet Header in detail with help of diagram.

d) Give the difference between circuit switching and packet switching techniques.

e) Explain Shortest path routing Protocol in computer networks.

Q.5 Answer the following. (Any Two) **12**

a) What encapsulation and Decapsulation in TCP/IP? Discuss three - way handshake in TCP.

b) With neat diagram, explain Distance Vector Routing in detail.

c) With the help of diagram, explain Client - Server Model.

SLR-QH-402

Seat No.	

Set S

T.Y. (B.Tech.) (Electronics Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Computer Networks (BTN04601)

Day & Date: Friday, 15-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Choose the correct Answer. 14

1) The maximum throughput for pure ALOHA is _____ percent.
a) 12.2 b) 18.4
c) 36.8 d) None of these

2) The network IP address or logical address present for each node in the network is of _____ bits.
a) 12 b) 32
c) 64 d) 48

3) The IP address 143.155.66.63 belongs to _____.
a) Class A b) Class B
c) Class C d) Class D

4) The data unit in transport layer in TCP/IP is called _____.
a) A datagram b) A segment
c) Frame d) Bit-string

5) Which of the following is false with respect to UDP?
a) Connection oriented b) Unreliable
c) Transport layer protocol d) All of the mentioned

6) UDP packets have a fixed-size header of _____ bytes.
a) 8 b) 16
c) 40 d) 64

7) Router can recognize and work with _____ addresses.
a) Data Link Layer b) Physical Layer
c) Network Layer d) Session Layer

8) Count to infinity problem is present _____ Routing Protocol.
a) Shortest Path b) Distance Vector
c) Link State d) None of these

9) A _____ is one endpoint of a two-way communication link between two programs running on the network.
a) Gateway b) Semaphore
c) Socket d) None of these

10) Network device HUB is _____ layer device.
a) Physical b) Data Link
c) Network d) Application

11) The MAC id $09:12:EA:4F:30:98$ is _____ type.
a) Unicast b) Multicast
c) Broadcast d) None of these

12) The ARQ stands for _____.
a) All Repeat Queue b) Automatic Repeat Request
c) Automatic Resolve Question d) None of these

13) Physical or logical arrangement of network is _____.
a) Topology b) Routing
c) Group d) None of these

14) Error Correction at the data link level is achieved by _____.
a) Bit stuffing b) Equalization
c) Frame formation d) Hamming Code

SLR-QH-402

Seat No.	

Set S

T.Y. (B.Tech.) (Electronics Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Computer Networks (BTN04601)

Day & Date: Friday, 15-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary and state them clearly.
4) Draw neat diagrams.

SECTION – I

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

a) With the help of diagram explain different network topologies.

b) How CRC is used to detect the error in message transmission? For given message bits "1110101011" and divisor polynomial "1011" calculate CRC.

c) Calculate Hamming code-word for an ASCII character - 1101011. Assume even parity during transmission.

d) With neat diagram discuss the Sliding window protocol Mechanism in detail.

e) What are different types of network devices? Discuss any one in detail.

Q.3 Answer the following. (Any Two) **12**

a) Explain in detail IEEE 802.15 Bluetooth Protocol.

b) Draw and explain ISO-OSI reference model and discuss various issues handled by the layers.

c) What are different types of network devices? Discuss any two in detail.

SECTION – II

Q.4 Answer the following. (Any Four) **16**

a) Draw UDP packet format and explain its header in detail.

b) What are different IP address classes? Write ranges of different IP addresses. What is network mask for IP address 192.168.100.15?

c) Explain IP packet Header in detail with help of diagram.

d) Give the difference between circuit switching and packet switching techniques.

e) Explain Shortest path routing Protocol in computer networks.

Q.5 Answer the following. (Any Two) **12**

a) What encapsulation and Decapsulation in TCP/IP? Discuss three - way handshake in TCP.

b) With neat diagram, explain Distance Vector Routing in detail.

c) With the help of diagram, explain Client - Server Model.

SLR-QH-403

Seat No.	

Set P

T. Y. (B.Tech.) (Electronics Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Embedded Systems (BTN04602)

Day & Date: Monday, 18-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Multiple choice question. **14**

1) ARM7 architecture support total _____ interrupt sources.
a) 20 b) 30
c) 32 d) 10

2) LPC2148's maximum operating frequency is _____ MHz.
a) 100 b) 80
c) 50 d) 60

3) The _____ directive aligns the current location to a specified boundary by padding with zeros.
a) ALIGN b) AREA
c) END d) DCD

4) Let r0=0x02020202 and r1=0x00009000. What will be the content of r1 after execution of instruction "LDR r0, [r1], #4"?
a) 0x00009000 b) 0x02020202
c) 0x00009004 d) 0x00008ffb

5) The ARM register _____ is called link register.
a) R12 b) R13
c) R14 d) R15

6) _____ vector is used when the processor cannot decode an instruction.
a) Undefined b) Abort
c) Reset d) Data abort

7) Let r5=5 and r7=8. What will be the content of r7 after execution of instruction “MOV r7, r5, LSL #2”?

a) 20 b) 14
c) 5 d) 8

8) In ARM _____ exception is having the lowest priority.

a) Reset b) Supervisor
c) System d) Undefined instruction

9) In ARM7TDMI-S D stands for _____.

a) Debug b) Divider
c) Difference d) None of the above

10) In LPC2148 _____ pin select register is used to configure port pins P1.1 to P1.31.

a) PINSEL2 b) PINSEL0
c) IODIR2 d) IOSET0

11) Information about a task is maintained in a _____.

a) Stack
b) Translation Look aside Buffer
c) Task Control Block
d) Task Condition Block

12) A _____ is software for controlling, receiving, and sending a byte or stream of bytes from or to device.

a) Kernel b) Shell
c) Processor d) Device Driver

13) Binary, Mutual exclusion, Counting are the types of _____.

a) Queues b) Pipes
c) Semaphores d) Mailboxes

14) Inter task communication can be done through _____.

a) Mailboxes b) Queues
c) Pipes d) All of above

SLR-QH-403

Seat No.		Set	P

T. Y. (B.Tech.) (Electronics Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Embedded Systems (BTN04602)

Day & Date: Monday, 18-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

Section – I

Q.2 Solve Any Four. **16**

a) Define Embedded System. Draw and explain basic structure of embedded system.

b) Explain different addressing modes of ARM7 in detail.

c) Sketch the general block diagram of embedded system hardware architecture and discuss it in detail.

d) Write an ARM assembly program to add two 32 bit numbers.

e) Define embedded system. Explain major characteristics which differs embedded system from desktop computer.

Q.3 Solve Any Two. **12**

a) What is an exception? Explain vector addresses and vector table.

b) What is pipeline? Explain it with suitable example.

c) Draw and explain ARM core data flow model.

Section – II

Q.4 Solve Any Four. **16**

a) Explain the use of IOSET and IOCLR registers in LPC2148 with example.

b) Explain the use of PINSEL and IODIR registers in LPC2148 with example.

c) Define RTOS. Explain preemptive and non-preemptive Kernel.

d) What is a task? Elaborate the task control box (TCB) and its data in detail.

e) List out the features of LPC2148.

Q.5 Solve Any Two. **12**

a) Explain three alternatives for RTOS to respond the interrupt.

b) Sketch and discuss interfacing of 16*2 LCD with LPC2148.

c) What is context switch or task switch? Explain with neat diagram.

SLR-QH-403

Seat No.	

Set Q

T. Y. (B.Tech.) (Electronics Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Embedded Systems (BTN04602)

Day & Date: Monday, 18-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No.1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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3) Figures to the right indicates full marks.
4) Assume suitable data whenever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Multiple choice question. **14**

1) In ARM _____ exception is having the lowest priority.
a) Reset b) Supervisor
c) System d) Undefined instruction

2) In ARM7TDMI-S D stands for _____.
a) Debug b) Divider
c) Difference d) None of the above

3) In LPC2148 _____ pin select register is used to configure port pins P1.1 to P1.31.
a) PINSEL2 b) PINSEL0
c) IODIR2 d) IOSET0

4) Information about a task is maintained in a _____.
a) Stack
b) Translation Look aside Buffer
c) Task Control Block
d) Task Condition Block

5) A _____ is software for controlling, receiving, and sending a byte or stream of bytes from or to device.
a) Kernel b) Shell
c) Processor d) Device Driver

6) Binary, Mutual exclusion, Counting are the types of _____.
a) Queues b) Pipes
c) Semaphores d) Mailboxes

7) Inter task communication can be done through _____.
a) Mailboxes b) Queues
c) Pipes d) All of above

8) ARM7 architecture support total _____ interrupt sources.
a) 20 b) 30
c) 32 d) 10

9) LPC2148's maximum operating frequency is _____ MHz.
a) 100 b) 80
c) 50 d) 60

10) The _____ directive aligns the current location to a specified boundary by padding with zeros.
a) ALIGN b) AREA
c) END d) DCD

11) Let r0=0x02020202 and r1=0x00009000. What will be the content of r1 after execution of instruction "LDR r0, [r1], #4"?
a) 0x00009000 b) 0x02020202
c) 0x00009004 d) 0x00008ffb

12) The ARM register _____ is called link register.
a) R12 b) R13
c) R14 d) R15

13) _____ vector is used when the processor cannot decode an instruction.
a) Undefined b) Abort
c) Reset d) Data abort

14) Let r5=5 and r7=8. What will be the content of r7 after execution of instruction "MOV r7, r5, LSL #2"?
a) 20 b) 14
c) 5 d) 8

SLR-QH-403

Seat No.	

Set Q

T. Y. (B.Tech.) (Electronics Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Embedded Systems (BTN04602)

Day & Date: Monday, 18-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

Section – I

Q.2 Solve Any Four. **16**

a) Define Embedded System. Draw and explain basic structure of embedded system.

b) Explain different addressing modes of ARM7 in detail.

c) Sketch the general block diagram of embedded system hardware architecture and discuss it in detail.

d) Write an ARM assembly program to add two 32 bit numbers.

e) Define embedded system. Explain major characteristics which differs embedded system from desktop computer.

Q.3 Solve Any Two. **12**

a) What is an exception? Explain vector addresses and vector table.

b) What is pipeline? Explain it with suitable example.

c) Draw and explain ARM core data flow model.

Section – II

Q.4 Solve Any Four. **16**

a) Explain the use of IOSET and IOCLR registers in LPC2148 with example.

b) Explain the use of PINSEL and IODIR registers in LPC2148 with example.

c) Define RTOS. Explain preemptive and non-preemptive Kernel.

d) What is a task? Elaborate the task control box (TCB) and its data in detail.

e) List out the features of LPC2148.

Q.5 Solve Any Two. **12**

a) Explain three alternatives for RTOS to respond the interrupt.

b) Sketch and discuss interfacing of 16*2 LCD with LPC2148.

c) What is context switch or task switch? Explain with neat diagram.

Seat No.	

Set R

T. Y. (B.Tech.) (Electronics Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Embedded Systems (BTN04602)

Day & Date: Monday, 18-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Multiple choice question. **14**

1) Information about a task is maintained in a _____.
a) Stack
b) Translation Look aside Buffer
c) Task Control Block
d) Task Condition Block

2) A _____ is software for controlling, receiving, and sending a byte or stream of bytes from or to device.
a) Kernel b) Shell
c) Processor d) Device Driver

3) Binary, Mutual exclusion, Counting are the types of _____.
a) Queues b) Pipes
c) Semaphores d) Mailboxes

4) Inter task communication can be done through _____.
a) Mailboxes b) Queues
c) Pipes d) All of above

5) ARM7 architecture support total _____ interrupt sources.
a) 20 b) 30
c) 32 d) 10

6) LPC2148's maximum operating frequency is _____ MHz.
a) 100 b) 80
c) 50 d) 60

7) The _____ directive aligns the current location to a specified boundary by padding with zeros.

a) ALIGN b) AREA
c) END d) DCD

8) Let r0=0x02020202 and r1=0x00009000. What will be the content of r1 after execution of instruction “LDR r0, [r1], #4”?

a) 0x00009000 b) 0x02020202
c) 0x00009004 d) 0x00008ffb

9) The ARM register _____ is called link register.

a) R12 b) R13
c) R14 d) R15

10) _____ vector is used when the processor cannot decode an instruction.

a) Undefined b) Abort
c) Reset d) Data abort

11) Let r5=5 and r7=8. What will be the content of r7 after execution of instruction “MOV r7, r5, LSL #2”?

a) 20 b) 14
c) 5 d) 8

12) In ARM _____ exception is having the lowest priority.

a) Reset b) Supervisor
c) System d) Undefined instruction

13) In ARM7TDMI-S D stands for _____.

a) Debug b) Divider
c) Difference d) None of the above

14) In LPC2148 _____ pin select register is used to configure port pins P1.1 to P1.31.

a) PINSEL2 b) PINSEL0
c) IODIR2 d) IOSET0

SLR-QH-403

Seat No.		Set	R

T. Y. (B.Tech.) (Electronics Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Embedded Systems (BTN04602)

Day & Date: Monday, 18-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

Section – I

Q.2 Solve Any Four. **16**

a) Define Embedded System. Draw and explain basic structure of embedded system.

b) Explain different addressing modes of ARM7 in detail.

c) Sketch the general block diagram of embedded system hardware architecture and discuss it in detail.

d) Write an ARM assembly program to add two 32 bit numbers.

e) Define embedded system. Explain major characteristics which differs embedded system from desktop computer.

Q.3 Solve Any Two. **12**

a) What is an exception? Explain vector addresses and vector table.

b) What is pipeline? Explain it with suitable example.

c) Draw and explain ARM core data flow model.

Section – II

Q.4 Solve Any Four. **16**

a) Explain the use of IOSET and IOCLR registers in LPC2148 with example.

b) Explain the use of PINSEL and IODIR registers in LPC2148 with example.

c) Define RTOS. Explain preemptive and non-preemptive Kernel.

d) What is a task? Elaborate the task control box (TCB) and its data in detail.

e) List out the features of LPC2148.

Q.5 Solve Any Two. **12**

a) Explain three alternatives for RTOS to respond the interrupt.

b) Sketch and discuss interfacing of 16*2 LCD with LPC2148.

c) What is context switch or task switch? Explain with neat diagram.

SLR-QH-403

Seat No.		Set	S

T. Y. (B.Tech.) (Electronics Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Embedded Systems (BTN04602)

Day & Date: Monday, 18-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Multiple choice question. **14**

1) _____ vector is used when the processor cannot decode an instruction.
a) Undefined b) Abort
c) Reset d) Data abort

2) Let r5=5 and r7=8. What will be the content of r7 after execution of instruction "MOV r7, r5, LSL #2"?
a) 20 b) 14
c) 5 d) 8

3) In ARM _____ exception is having the lowest priority.
a) Reset b) Supervisor
c) System d) Undefined instruction

4) In ARM7TDMI-S D stands for _____.
a) Debug b) Divider
c) Difference d) None of the above

5) In LPC2148 _____ pin select register is used to configure port pins P1.1 to P1.31.
a) PINSEL2 b) PINSEL0
c) IODIR2 d) IOSET0

6) Information about a task is maintained in a _____.
a) Stack
b) Translation Look aside Buffer
c) Task Control Block
d) Task Condition Block

7) A _____ is software for controlling, receiving, and sending a byte or stream of bytes from or to device.
a) Kernel b) Shell
c) Processor d) Device Driver

8) Binary, Mutual exclusion, Counting are the types of _____.
a) Queues b) Pipes
c) Semaphores d) Mailboxes

9) Inter task communication can be done through _____.
a) Mailboxes b) Queues
c) Pipes d) All of above

10) ARM7 architecture support total _____ interrupt sources.
a) 20 b) 30
c) 32 d) 10

11) LPC2148's maximum operating frequency is _____ MHz.
a) 100 b) 80
c) 50 d) 60

12) The _____ directive aligns the current location to a specified boundary by padding with zeros.
a) ALIGN b) AREA
c) END d) DCD

13) Let r0=0x02020202 and r1=0x00009000. What will be the content of r1 after execution of instruction "LDR r0, [r1], #4"?
a) 0x00009000 b) 0x02020202
c) 0x00009004 d) 0x00008ffb

14) The ARM register _____ is called link register.
a) R12 b) R13
c) R14 d) R15

SLR-QH-403

Seat No.		Set	S

T. Y. (B.Tech.) (Electronics Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Embedded Systems (BTN04602)

Day & Date: Monday, 18-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

Section – I

Q.2 Solve Any Four. **16**

a) Define Embedded System. Draw and explain basic structure of embedded system.

b) Explain different addressing modes of ARM7 in detail.

c) Sketch the general block diagram of embedded system hardware architecture and discuss it in detail.

d) Write an ARM assembly program to add two 32 bit numbers.

e) Define embedded system. Explain major characteristics which differs embedded system from desktop computer.

Q.3 Solve Any Two. **12**

a) What is an exception? Explain vector addresses and vector table.

b) What is pipeline? Explain it with suitable example.

c) Draw and explain ARM core data flow model.

Section – II

Q.4 Solve Any Four. **16**

a) Explain the use of IOSET and IOCLR registers in LPC2148 with example.

b) Explain the use of PINSEL and IODIR registers in LPC2148 with example.

c) Define RTOS. Explain preemptive and non-preemptive Kernel.

d) What is a task? Elaborate the task control box (TCB) and its data in detail.

e) List out the features of LPC2148.

Q.5 Solve Any Two. **12**

a) Explain three alternatives for RTOS to respond the interrupt.

b) Sketch and discuss interfacing of 16*2 LCD with LPC2148.

c) What is context switch or task switch? Explain with neat diagram.

SLR-QH-404

Seat No.	

Set P

T.Y. (B.Tech.) (Electronics Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
VLSI Design (BTN04603)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) A test bench is used _____.
a) Verify the functionality of a design
b) To generate primitives
c) To generate net list
d) None of above

2) Which of the following feature can be used to specify the parameters for a component at the time of instantiation?
a) Generate b) Attribute
c) Generics d) Signals

3) When the following signal assignment statement executes at $5\ ns$, the new value will be assigned to signal at what time?
$X <= 4$ after 5 ns ;
a) $10\ ns;$ b) $10\ ns + \Delta$
c) $5\ ns$ d) $5\ ns + \Delta$

4) The delay model models the delays introduced by wiring which simply delays the signal by specified delay is _____.
a) Transport b) Inertial
c) Delta d) None of these

5) Assuming the left operand as BIT − vector, "1101010" sla 2 is _____.
a) "0101010" b) "0101000"
c) "0101011" d) None of these

6) A process cannot have a sensitivity list when _____ is employed.
a) Loop b) If
c) Generate d) wait

7) VHDL statement Op <= input when e = 'l' else 'z'; infers _____.
a) 2: 1 multiplexer b) Tristate buffer
c) Buffer d) None of these

8) A single pattern that may be interpreted as a result of all the applied tests in testing is _____.
a) MIC b) PRBSG
c) SIC d) Signature

9) The Ability to Tolerate noise without affecting the correct operation of circuit is known as _____.
a) Dynamic Power Dissipation b) Static Power Dissipation
c) Noise Margin d) None of above

10) CMOS logic consists of _____.
a) Pull up network b) Pull down network
c) Both a) and b) d) None of above

11) Which of the following analog controls are provided in CPLD XC9500 IO Block?
a) Slew rate control b) I/P buffer
c) Pull down resistor d) All above

12) Which of the following method is used for testing the sequential circuit?
a) Random tests b) Scan path technique
c) Path sensitizing technique d) All of These

13) Under steady state condition power dissipated in CMOS circuit is _____.
a) $0\ w$ b) $100\ \mu w$
c) $10\ \mu w$ d) None of above

14) Input of synthesis process are _____.
a) RTL VHDL description
b) Circuit constraints and attributes design
c) Technology library
d) All of above

Seat No.	

Set | P

T.Y. (B.Tech.) (Electronics Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
VLSI Design (BTN04603)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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

Section – I

Q.2 Solve Any Four. **16**

a) Explain the transport and inertial delays in VHDL.

b) Write VHDL code for 2:4 Decoder.

c) Explain in brief different shift operators in VHDL with suitable example.

d) Write VHDL code for D flip flop with synchronous reset.

e) Explain with suitable example different forms of wait statement. What is the significance of wait for 0 ns?

Q.3 Solve Any Two. **12**

a) Explain following statement of VHDL with suitable example.
i) if – else
ii) case
iii) Loop statement
iv) When else

b) Write VHDL code for Full adder. Also write the test bench for testing it.

c) Write VHDL code for a Moore FSM to detect the sequence 101 at the input. It should produce output z equal to 1 whenever the sequence is detected on input x.

Section – II

Q.4 Solve Any Four. **16**

a) Explain the architecture of macrocell in Xilinx 9500 series CPLD.

b) How does a single input compressor (SIC) circuit play a role in Built in self test? Explain with example.

c) Explain place and route process of EDA tools.

d) Explain the CMOS noise margin in detail.

e) Draw and Explain CMOS NOR gate.

Q.5 Solve Any Two. **12**

a) Draw and explain the schematic arrangement for testing sequential circuits.

b) Explain in detail simulation steps in RTL simulation.

c) Draw and Explain DC characteristics of CMOS Inverter.

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Electronics Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
VLSI Design (BTN04603)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) A single pattern that may be interpreted as a result of all the applied tests in testing is _____.
a) MIC b) PRBSG
c) SIC d) Signature

2) The Ability to Tolerate noise without affecting the correct operation of circuit is known as _____.
a) Dynamic Power Dissipation b) Static Power Dissipation
c) Noise Margin d) None of above

3) CMOS logic consists of _____.
a) Pull up network b) Pull down network
c) Both a) and b) d) None of above

4) Which of the following analog controls are provided in CPLD XC9500 IO Block?
a) Slew rate control b) I/P buffer
c) Pull down resistor d) All above

5) Which of the following method is used for testing the sequential circuit?
a) Random tests b) Scan path technique
c) Path sensitizing technique d) All of These

6) Under steady state condition power dissipated in CMOS circuit is _____.
a) $0\ w$ b) $100\ \mu w$
c) $10\ \mu w$ d) None of above

7) Input of synthesis process are _____.
   a) RTL VHDL description
   b) Circuit constraints and attributes design
   c) Technology library
   d) All of above

8) A test bench is used _____.
   a) Verify the functionality of a design
   b) To generate primitives
   c) To generate net list
   d) None of above

9) Which of the following feature can be used to specify the parameters for a component at the time of instantiation?
   a) Generate
   b) Attribute
   c) Generics
   d) Signals

10) When the following signal assignment statement executes at $5\ ns$, the new value will be assigned to signal at what time?
$X <= 4$ after 5 ns ;
   a) $10\ ns;$
   b) $10\ ns + \Delta$
   c) $5\ ns$
   d) $5\ ns + \Delta$

11) The delay model models the delays introduced by wiring which simply delays the signal by specified delay is _____.
   a) Transport
   b) Inertial
   c) Delta
   d) None of these

12) Assuming the left operand as BIT − vector, "1101010" sla 2 is _____.
   a) "0101010"
   b) "0101000"
   c) "0101011"
   d) None of these

13) A process cannot have a sensitivity list when _____ is employed.
   a) Loop
   b) If
   c) Generate
   d) wait

14) VHDL statement Op <= input when e = 'l' else 'z'; infers _____.
   a) 2: 1 multiplexer
   b) Tristate buffer
   c) Buffer
   d) None of these

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Electronics Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
VLSI Design (BTN04603)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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

Section – I

Q.2 Solve Any Four. **16**

a) Explain the transport and inertial delays in VHDL.

b) Write VHDL code for 2:4 Decoder.

c) Explain in brief different shift operators in VHDL with suitable example.

d) Write VHDL code for D flip flop with synchronous reset.

e) Explain with suitable example different forms of wait statement. What is the significance of wait for 0 ns?

Q.3 Solve Any Two. **12**

a) Explain following statement of VHDL with suitable example.
i) if – else
ii) case
iii) Loop statement
iv) When else

b) Write VHDL code for Full adder. Also write the test bench for testing it.

c) Write VHDL code for a Moore FSM to detect the sequence 101 at the input. It should produce output z equal to 1 whenever the sequence is detected on input x.

Section – II

Q.4 Solve Any Four. **16**

a) Explain the architecture of macrocell in Xilinx 9500 series CPLD.

b) How does a single input compressor (SIC) circuit play a role in Built in self test? Explain with example.

c) Explain place and route process of EDA tools.

d) Explain the CMOS noise margin in detail.

e) Draw and Explain CMOS NOR gate.

Q.5 Solve Any Two. **12**

a) Draw and explain the schematic arrangement for testing sequential circuits.

b) Explain in detail simulation steps in RTL simulation.

c) Draw and Explain DC characteristics of CMOS Inverter.

Seat No.	

Set **R**

T.Y. (B.Tech.) (Electronics Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
VLSI Design (BTN04603)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) Which of the following analog controls are provided in CPLD XC9500 IO Block?
a) Slew rate control b) I/P buffer
c) Pull down resistor d) All above

2) Which of the following method is used for testing the sequential circuit?
a) Random tests b) Scan path technique
c) Path sensitizing technique d) All of These

3) Under steady state condition power dissipated in CMOS circuit is _____.
a) $0\ w$ b) $100\ \mu w$
c) $10\ \mu w$ d) None of above

4) Input of synthesis process are _____.
a) RTL VHDL description
b) Circuit constraints and attributes design
c) Technology library
d) All of above

5) A test bench is used _____.
a) Verify the functionality of a design
b) To generate primitives
c) To generate net list
d) None of above

6) Which of the following feature can be used to specify the parameters for a component at the time of instantiation?
a) Generate b) Attribute
c) Generics d) Signals

7) When the following signal assignment statement executes at $5\ ns$, the new value will be assigned to signal at what time?
$X <= 4$ after 5 ns ;

a) $10\ ns$; b) $10\ ns + \Delta$
c) $5\ ns$ d) $5\ ns + \Delta$

8) The delay model models the delays introduced by wiring which simply delays the signal by specified delay is _____.

a) Transport b) Inertial
c) Delta d) None of these

9) Assuming the left operand as BIT − vector, "1101010" sla 2 is _____.

a) "0101010" b) "0101000"
c) "0101011" d) None of these

10) A process cannot have a sensitivity list when _____ is employed.

a) Loop b) If
c) Generate d) wait

11) VHDL statement Op <= input when e = 'l' else 'z'; infers _____.

a) 2: 1 multiplexer b) Tristate buffer
c) Buffer d) None of these

12) A single pattern that may be interpreted as a result of all the applied tests in testing is _____.

a) MIC b) PRBSG
c) SIC d) Signature

13) The Ability to Tolerate noise without affecting the correct operation of circuit is known as _____.

a) Dynamic Power Dissipation b) Static Power Dissipation
c) Noise Margin d) None of above

14) CMOS logic consists of _____.

a) Pull up network b) Pull down network
c) Both a) and b) d) None of above

Seat No.	

Set **R**

T.Y. (B.Tech.) (Electronics Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
VLSI Design (BTN04603)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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

Section – I

Q.2 Solve Any Four. **16**

a) Explain the transport and inertial delays in VHDL.

b) Write VHDL code for 2:4 Decoder.

c) Explain in brief different shift operators in VHDL with suitable example.

d) Write VHDL code for D flip flop with synchronous reset.

e) Explain with suitable example different forms of wait statement. What is the significance of wait for 0 ns?

Q.3 Solve Any Two. **12**

a) Explain following statement of VHDL with suitable example.
i) if – else
ii) case
iii) Loop statement
iv) When else

b) Write VHDL code for Full adder. Also write the test bench for testing it.

c) Write VHDL code for a Moore FSM to detect the sequence 101 at the input. It should produce output z equal to 1 whenever the sequence is detected on input x.

Section – II

Q.4 Solve Any Four. **16**

a) Explain the architecture of macrocell in Xilinx 9500 series CPLD.

b) How does a single input compressor (SIC) circuit play a role in Built in self test? Explain with example.

c) Explain place and route process of EDA tools.

d) Explain the CMOS noise margin in detail.

e) Draw and Explain CMOS NOR gate.

Q.5 Solve Any Two. **12**

a) Draw and explain the schematic arrangement for testing sequential circuits.

b) Explain in detail simulation steps in RTL simulation.

c) Draw and Explain DC characteristics of CMOS Inverter.

Seat No.	

Set **S**

T.Y. (B.Tech.) (Electronics Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
VLSI Design (BTN04603)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) A process cannot have a sensitivity list when _____ is employed.
a) Loop b) If
c) Generate d) wait

2) VHDL statement Op <= input when e = 'l' else 'z'; infers _____.
a) 2: 1 multiplexer b) Tristate buffer
c) Buffer d) None of these

3) A single pattern that may be interpreted as a result of all the applied tests in testing is _____.
a) MIC b) PRBSG
c) SIC d) Signature

4) The Ability to Tolerate noise without affecting the correct operation of circuit is known as _____.
a) Dynamic Power Dissipation b) Static Power Dissipation
c) Noise Margin d) None of above

5) CMOS logic consists of _____.
a) Pull up network b) Pull down network
c) Both a) and b) d) None of above

6) Which of the following analog controls are provided in CPLD XC9500 IO Block?
a) Slew rate control b) I/P buffer
c) Pull down resistor d) All above

7) Which of the following method is used for testing the sequential circuit?
   a) Random tests
   b) Scan path technique
   c) Path sensitizing technique
   d) All of These

8) Under steady state condition power dissipated in CMOS circuit is _____.
   a) $0\ w$
   b) $100\ \mu w$
   c) $10\ \mu w$
   d) None of above

9) Input of synthesis process are _____.
   a) RTL VHDL description
   b) Circuit constraints and attributes design
   c) Technology library
   d) All of above

10) A test bench is used _____.
   a) Verify the functionality of a design
   b) To generate primitives
   c) To generate net list
   d) None of above

11) Which of the following feature can be used to specify the parameters for a component at the time of instantiation?
   a) Generate
   b) Attribute
   c) Generics
   d) Signals

12) When the following signal assignment statement executes at $5\ ns$, the new value will be assigned to signal at what time?
$X <= 4$ after 5 ns ;
   a) $10\ ns;$
   b) $10\ ns + \Delta$
   c) $5\ ns$
   d) $5\ ns + \Delta$

13) The delay model models the delays introduced by wiring which simply delays the signal by specified delay is _____.
   a) Transport
   b) Inertial
   c) Delta
   d) None of these

14) Assuming the left operand as BIT − vector, “1101010” sla 2 is _____.
   a) “0101010”
   b) “0101000”
   c) “0101011”
   d) None of these

Seat No.		Set	S

T.Y. (B.Tech.) (Electronics Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
VLSI Design (BTN04603)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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

Section – I

Q.2 Solve Any Four. **16**

a) Explain the transport and inertial delays in VHDL.

b) Write VHDL code for 2:4 Decoder.

c) Explain in brief different shift operators in VHDL with suitable example.

d) Write VHDL code for D flip flop with synchronous reset.

e) Explain with suitable example different forms of wait statement. What is the significance of wait for 0 ns?

Q.3 Solve Any Two. **12**

a) Explain following statement of VHDL with suitable example.
i) if – else
ii) case
iii) Loop statement
iv) When else

b) Write VHDL code for Full adder. Also write the test bench for testing it.

c) Write VHDL code for a Moore FSM to detect the sequence 101 at the input. It should produce output z equal to 1 whenever the sequence is detected on input x.

Section – II

Q.4 Solve Any Four. **16**

a) Explain the architecture of macrocell in Xilinx 9500 series CPLD.

b) How does a single input compressor (SIC) circuit play a role in Built in self test? Explain with example.

c) Explain place and route process of EDA tools.

d) Explain the CMOS noise margin in detail.

e) Draw and Explain CMOS NOR gate.

Q.5 Solve Any Two. **12**

a) Draw and explain the schematic arrangement for testing sequential circuits.

b) Explain in detail simulation steps in RTL simulation.

c) Draw and Explain DC characteristics of CMOS Inverter.

SLR-QH-405

Seat No.	

Set P

T.Y. (B.Tech.) (Electronics Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Image Processing (BTN04609)

Day & Date: Friday, 22-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Select suitable option. **14**

1) The field of digital image processing refers to processing digital images by means _____.
a) Digital computer b) Super computer
c) Mini computer d) None of these

2) First application of digital image was in the _____.
a) News paper industry b) communication system
c) a) & b) d) None of these

3) The sum of cosines and sines coefficient multiplied is _____.
a) Fourier series b) Fast Fourier series
c) Fourier transform d) Fast Fourier transform

4) Which is the image processing technique used to improve the quality of image for human viewing?
a) Compression b) Enhancement
c) Restoration d) Analysis

5) Which domain does the Laplacian filter operate in?
a) Time domain b) Frequency domain
c) Color domain d) Spatial domain

6) Discontinuity approach of segmentation depends upon _____.
a) low frequencies b) smooth changes
c) abrupt changes d) contrast

7) Two regions are said to be adjacent if their union forms _____.
a) connected set b) boundaries
c) region d) image

8) Example of similarity approach in image segmentation is _____.
a) edge based segmentation
b) boundary based segmentation
c) region based segmentation
d) Both a) and b)

9) Process of manipulating the digital image to make results more suitable is called _____.
a) manipulation b) improvement
c) enhancement d) degradation

10) High pass filters are used for image _____.
a) contrast b) sharpening
c) blurring d) resizing

11) Thresholding function in contrast stretching creates _____.
a) binary image b) high quality image
c) enhanced image d) low quality image

12) Process involved in linear spatial filtering is _____.
a) correlation b) convolution
c) histogram equalization d) Both a) and b)

13) _____ view a coordinate (x,y) as a complex number (x = real part and y = imaginary part) then apply the Fourier transform to a sequence of boundary points.
a) Fourier descriptor b) Laplace descriptor
c) Regional descriptor d) None

14) In geometric mean filters when alpha is equal to 0 then it works as _____.
a) notch filter b) bandpass filter
c) parametric wiener filter d) inverse filter

Seat No.	

Set **P**

T.Y. (B.Tech.) (Electronics Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Image Processing (BTN04609)

Day & Date: Friday, 22-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

SECTION – I

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

a) Write short notes on sampling and quantization.

b) Explain the basic relationships between pixels.

c) Explain Fast Fourier Transform (FFT) in detail.

d) Discuss the image smoothing filter with its model in the spatial domain.

e) Explain contrast stretching and masking.

Q.3 Attempt the following. (Any Two) **12**

a) What do you mean by Digital Image Processing? Discuss the different application areas of Digital Image Processing.

b) Compare the basic frequency domain filters

i) Ideal low pass
ii) Butterworth pass
iii) Gaussian low pass

c) Consider the image segment shown. Let V={0,1} and compute the length of the shortest 4-, 8- and m- path between p & q.

	3	1	2	1 ← q
	2	2	0	2
	1	2	1	1
p →	1	0	1	2

SECTION – II

Q.4 Attempt the following. (Any Four) **16**

a) What is the advantage of Sobel operator over Prewitt operator?

b) Explain region growing.

c) Write note on signatures.

d) Explain different Compression Methods.

e) Write a note on signatures and skeletons.

Q.5 Attempt the following. (Any Two) **12**

a) Explain following techniques for boundary approximations using polygon.
   i) Minimum perimeter Polygon
   ii) Splitting techniques

b) What is global threshold for segmentation? Give algorithm for obtaining threshold value.

c) Explain JPEG Compression and Decompression.

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Electronics Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Image Processing (BTN04609)

Day & Date: Friday, 22-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Select suitable option. **14**

1) Example of similarity approach in image segmentation is _____.
a) edge based segmentation
b) boundary based segmentation
c) region based segmentation
d) Both a) and b)

2) Process of manipulating the digital image to make results more suitable is called _____.
a) manipulation b) improvement
c) enhancement d) degradation

3) High pass filters are used for image _____.
a) contrast b) sharpening
c) blurring d) resizing

4) Thresholding function in contrast stretching creates _____.
a) binary image b) high quality image
c) enhanced image d) low quality image

5) Process involved in linear spatial filtering is _____.
a) correlation b) convolution
c) histogram equalization d) Both a) and b)

6) _____ view a coordinate (x,y) as a complex number (x = real part and y = imaginary part) then apply the Fourier transform to a sequence of boundary points.
a) Fourier descriptor b) Laplace descriptor
c) Regional descriptor d) None

7) In geometric mean filters when alpha is equal to 0 then it works as _____.
a) notch filter b) bandpass filter
c) parametric wiener filter d) inverse filter

8) The field of digital image processing refers to processing digital images by means _____.
a) Digital computer b) Super computer
c) Mini computer d) None of these

9) First application of digital image was in the _____.
a) News paper industry b) communication system
c) a) & b) d) None of these

10) The sum of cosines and sines coefficient multiplied is _____.
a) Fourier series b) Fast Fourier series
c) Fourier transform d) Fast Fourier transform

11) Which is the image processing technique used to improve the quality of image for human viewing?
a) Compression b) Enhancement
c) Restoration d) Analysis

12) Which domain does the Laplacian filter operate in?
a) Time domain b) Frequency domain
c) Color domain d) Spatial domain

13) Discontinuity approach of segmentation depends upon _____.
a) low frequencies b) smooth changes
c) abrupt changes d) contrast

14) Two regions are said to be adjacent if their union forms _____.
a) connected set b) boundaries
c) region d) image

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Electronics Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Image Processing (BTN04609)

Day & Date: Friday, 22-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

SECTION – I

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

a) Write short notes on sampling and quantization.

b) Explain the basic relationships between pixels.

c) Explain Fast Fourier Transform (FFT) in detail.

d) Discuss the image smoothing filter with its model in the spatial domain.

e) Explain contrast stretching and masking.

Q.3 Attempt the following. (Any Two) **12**

a) What do you mean by Digital Image Processing? Discuss the different application areas of Digital Image Processing.

b) Compare the basic frequency domain filters

i) Ideal low pass
ii) Butterworth pass
iii) Gaussian low pass

c) Consider the image segment shown. Let V={0,1} and compute the length of the shortest 4-, 8- and m- path between p & q.

	3	1	2	1 ← q
	2	2	0	2
	1	2	1	1
p →	1	0	1	2

SECTION – II

Q.4 Attempt the following. (Any Four) **16**

a) What is the advantage of Sobel operator over Prewitt operator?

b) Explain region growing.

c) Write note on signatures.

d) Explain different Compression Methods.

e) Write a note on signatures and skeletons.

Q.5 Attempt the following. (Any Two) **12**

a) Explain following techniques for boundary approximations using polygon.
   i) Minimum perimeter Polygon
   ii) Splitting techniques

b) What is global threshold for segmentation? Give algorithm for obtaining threshold value.

c) Explain JPEG Compression and Decompression.

Seat No.	

Set R

T.Y. (B.Tech.) (Electronics Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Image Processing (BTN04609)

Day & Date: Friday, 22-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Select suitable option. **14**

1) Thresholding function in contrast stretching creates _____.
a) binary image b) high quality image
c) enhanced image d) low quality image

2) Process involved in linear spatial filtering is _____.
a) correlation b) convolution
c) histogram equalization d) Both a) and b)

3) _____ view a coordinate (x,y) as a complex number (x = real part and y = imaginary part) then apply the Fourier transform to a sequence of boundary points.
a) Fourier descriptor b) Laplace descriptor
c) Regional descriptor d) None

4) In geometric mean filters when alpha is equal to 0 then it works as _____.
a) notch filter b) bandpass filter
c) parametric wiener filter d) inverse filter

5) The field of digital image processing refers to processing digital images by means _____.
a) Digital computer b) Super computer
c) Mini computer d) None of these

6) First application of digital image was in the _____.
a) News paper industry b) communication system
c) a) & b) d) None of these

7) The sum of cosines and sines coefficient multiplied is _____.
a) Fourier series b) Fast Fourier series
c) Fourier transform d) Fast Fourier transform

8) Which is the image processing technique used to improve the quality of image for human viewing?
a) Compression b) Enhancement
c) Restoration d) Analysis

9) Which domain does the Laplacian filter operate in?
a) Time domain b) Frequency domain
c) Color domain d) Spatial domain

10) Discontinuity approach of segmentation depends upon _____.
a) low frequencies b) smooth changes
c) abrupt changes d) contrast

11) Two regions are said to be adjacent if their union forms _____.
a) connected set b) boundaries
c) region d) image

12) Example of similarity approach in image segmentation is _____.
a) edge based segmentation
b) boundary based segmentation
c) region based segmentation
d) Both a) and b)

13) Process of manipulating the digital image to make results more suitable is called _____.
a) manipulation b) improvement
c) enhancement d) degradation

14) High pass filters are used for image _____.
a) contrast b) sharpening
c) blurring d) resizing

Seat No.	

Set **R**

T.Y. (B.Tech.) (Electronics Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Image Processing (BTN04609)

Day & Date: Friday, 22-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

SECTION – I

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

a) Write short notes on sampling and quantization.

b) Explain the basic relationships between pixels.

c) Explain Fast Fourier Transform (FFT) in detail.

d) Discuss the image smoothing filter with its model in the spatial domain.

e) Explain contrast stretching and masking.

Q.3 Attempt the following. (Any Two) **12**

a) What do you mean by Digital Image Processing? Discuss the different application areas of Digital Image Processing.

b) Compare the basic frequency domain filters

i) Ideal low pass
ii) Butterworth pass
iii) Gaussian low pass

c) Consider the image segment shown. Let V={0,1} and compute the length of the shortest 4-, 8- and m- path between p & q.

	3	1	2	1 ← q
	2	2	0	2
	1	2	1	1
p →	1	0	1	2

SECTION – II

Q.4 Attempt the following. (Any Four) **16**

a) What is the advantage of Sobel operator over Prewitt operator?

b) Explain region growing.

c) Write note on signatures.

d) Explain different Compression Methods.

e) Write a note on signatures and skeletons.

Q.5 Attempt the following. (Any Two) **12**

a) Explain following techniques for boundary approximations using polygon.
   i) Minimum perimeter Polygon
   ii) Splitting techniques

b) What is global threshold for segmentation? Give algorithm for obtaining threshold value.

c) Explain JPEG Compression and Decompression.

Seat No.	

Set **S**

T.Y. (B.Tech.) (Electronics Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Image Processing (BTN04609)

Day & Date: Friday, 22-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Select suitable option. **14**

1) Discontinuity approach of segmentation depends upon _____.
a) low frequencies b) smooth changes
c) abrupt changes d) contrast

2) Two regions are said to be adjacent if their union forms _____.
a) connected set b) boundaries
c) region d) image

3) Example of similarity approach in image segmentation is _____.
a) edge based segmentation
b) boundary based segmentation
c) region based segmentation
d) Both a) and b)

4) Process of manipulating the digital image to make results more suitable is called _____.
a) manipulation b) improvement
c) enhancement d) degradation

5) High pass filters are used for image _____.
a) contrast b) sharpening
c) blurring d) resizing

6) Thresholding function in contrast stretching creates _____.
a) binary image b) high quality image
c) enhanced image d) low quality image

7) Process involved in linear spatial filtering is _____.
a) correlation b) convolution
c) histogram equalization d) Both a) and b)

8) _____ view a coordinate (x,y) as a complex number (x = real part and y = imaginary part) then apply the Fourier transform to a sequence of boundary points.
a) Fourier descriptor b) Laplace descriptor
c) Regional descriptor d) None

9) In geometric mean filters when alpha is equal to 0 then it works as _____.
a) notch filter b) bandpass filter
c) parametric wiener filter d) inverse filter

10) The field of digital image processing refers to processing digital images by means _____.
a) Digital computer b) Super computer
c) Mini computer d) None of these

11) First application of digital image was in the _____.
a) News paper industry b) communication system
c) a) & b) d) None of these

12) The sum of cosines and sines coefficient multiplied is _____.
a) Fourier series b) Fast Fourier series
c) Fourier transform d) Fast Fourier transform

13) Which is the image processing technique used to improve the quality of image for human viewing?
a) Compression b) Enhancement
c) Restoration d) Analysis

14) Which domain does the Laplacian filter operate in?
a) Time domain b) Frequency domain
c) Color domain d) Spatial domain

Seat No.	

Set **S**

T.Y. (B.Tech.) (Electronics Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Image Processing (BTN04609)

Day & Date: Friday, 22-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

SECTION – I

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

a) Write short notes on sampling and quantization.

b) Explain the basic relationships between pixels.

c) Explain Fast Fourier Transform (FFT) in detail.

d) Discuss the image smoothing filter with its model in the spatial domain.

e) Explain contrast stretching and masking.

Q.3 Attempt the following. (Any Two) **12**

a) What do you mean by Digital Image Processing? Discuss the different application areas of Digital Image Processing.

b) Compare the basic frequency domain filters

i) Ideal low pass
ii) Butterworth pass
iii) Gaussian low pass

c) Consider the image segment shown. Let V={0,1} and compute the length of the shortest 4-, 8- and m- path between p & q.

	3	1	2	1 ← q
	2	2	0	2
	1	2	1	1
p →	1	0	1	2

SECTION – II

Q.4 Attempt the following. (Any Four) **16**

a) What is the advantage of Sobel operator over Prewitt operator?

b) Explain region growing.

c) Write note on signatures.

d) Explain different Compression Methods.

e) Write a note on signatures and skeletons.

Q.5 Attempt the following. (Any Two) **12**

a) Explain following techniques for boundary approximations using polygon.
   i) Minimum perimeter Polygon
   ii) Splitting techniques

b) What is global threshold for segmentation? Give algorithm for obtaining threshold value.

c) Explain JPEG Compression and Decompression.

SLR-QH-408

Seat No.	

Set P

T. Y. (B.Tech.) (Electronics Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Operating Systems (BTN04605)

Day & Date: Monday, 25-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Choose the correct answer. 14

1) In the Many to One model, if a thread makes a blocking system call _____.
a) the entire process will be blocked
b) a part of the process will stay blocked, with the rest running
c) the entire process will run
d) None of these

2) What is the primary purpose of cooperating processes in an operating system?
a) To enhance CPU scheduling algorithms
b) To share system resources and data among multiple processes
c) To reduce the number of system calls
d) To improve disk access speed

3) A parent process calling _____ system call will be suspended until children processes terminate.
a) fork b) wait
c) exit d) exec

4) To ensure difficulties do not arise in the readers - writers problem, _____ are given exclusive access to the shared object.
a) readers b) writers
c) both a) and b) d) None of these

5) Round robin scheduling falls under the category of: _____.
a) Non preemptive scheduling b) Preemptive scheduling
c) both a) and b) d) None of these

6) The entry of all the PCBs of the current processes is in: _____.
a) Process Register
b) Program Counter
c) Process Table
d) Process Unit

7) In a batch processing environment, what is a job queue?
a) A queue that stores processes waiting for CPU time
b) A queue that stores user input for processing
c) A queue that stores jobs awaiting execution
d) A queue that stores output data from completed processes

8) The circular wait condition can be prevented by _____.
a) defining a linear ordering of resource types
b) using thread
c) using pipes
d) All of the mentioned

9) A problem encountered in multitasking when a process is permanently denied necessary resources is called _____.
a) deadlock
b) starvation
c) inversion
d) aging

10) The _____ is used as an index into the page table.
a) frame bit
b) page number
c) page offset
d) frame offset

11) Paging increases the _____ time.
a) waiting
b) execution
c) context – switch
d) All of the mentioned

12) _____ is generally faster than _____ and _____.
a) first fit, best fit, worst fit
b) best fit, first fit, worst fit
c) worst fit, best fit, first fit
d) None of the mentioned

13) File attributes consist of _____.
a) name
b) type
c) identifier
d) All of the mentioned

14) Which process is busy swapping pages in and out.
a) Division
b) External Fragmentation
c) Thrashing
d) Compaction

Seat No.	

Set **P**

T. Y. (B.Tech.) (Electronics Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Operating Systems (BTN04605)

Day & Date: Monday, 25-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

Section – I

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

a) Analyze bounded buffer problem as classical problems of synchronization.

b) Write a short note on multiprogramming operating systems.

c) Explain the shared memory systems of interprocess communication.

d) Discuss the role of the process control block (PCB) in process management. Explain the information typically stored in a PCB.

e) Explain the difference between non-preemptive and preemptive scheduling algorithms. Discuss the advantages and disadvantages of each approach in terms of system responsiveness and fairness.

Q.3 Attempt the following. (Any Two) **12**

a) Explain process creation and termination operations in detail.

b) Define thread. Describe the three multithreading models with suitable diagram.

c) Consider four processes P1, P2, P3, and P4 with their priority and CPU burst in milliseconds

Process	CPU burst time (ms)	Priority
P1	10	4
P2	5	3
P3	2	1
P4	3	2

How these processes will be scheduled according to priority scheduling algorithm?
Compute the average waiting time and average turnaround time.

Section – II

Q.4 Answer the following. (Any Four) **16**

a) Elaborate terms swapping and paging. Compare swapping and paging.

b) Explain various methods for recovery from deadlock.

c) What is page fault? How is it handled by OS?

d) What is resource allocation graph in OS? What are the different elements of RAG? How is RAG utilized to decide about presence of deadlock?

e) What are the drawbacks of paging? Describe segmentation mechanism in OS.

Q.5 Answer the following. (Any Two) **12**

a) Explain FIFO and optimal page replacement algorithm in detail.

b) Explain various free space management approaches in OS.

c) What is internal and external fragmentation in OS? Differentiate between internal and external fragmentation.

Seat No.	

Set **Q**

T. Y. (B.Tech.) (Electronics Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Operating Systems (BTN04605)

Day & Date: Monday, 25-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Choose the correct answer. **14**

1) The circular wait condition can be prevented by _____.
a) defining a linear ordering of resource types
b) using thread
c) using pipes
d) All of the mentioned

2) A problem encountered in multitasking when a process is permanently denied necessary resources is called _____.
a) deadlock b) starvation
c) inversion d) aging

3) The _____ is used as an index into the page table.
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4) Paging increases the _____ time.
a) waiting b) execution
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5) _____ is generally faster than _____ and _____.
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6) File attributes consist of _____.
a) name b) type
c) identifier d) All of the mentioned

7) Which process is busy swapping pages in and out.
a) Division
b) External Fragmentation
c) Thrashing
d) Compaction

8) In the Many to One model, if a thread makes a blocking system call _____.
a) the entire process will be blocked
b) a part of the process will stay blocked, with the rest running
c) the entire process will run
d) None of these

9) What is the primary purpose of cooperating processes in an operating system?
a) To enhance CPU scheduling algorithms
b) To share system resources and data among multiple processes
c) To reduce the number of system calls
d) To improve disk access speed

10) A parent process calling _____ system call will be suspended until children processes terminate.
a) fork
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11) To ensure difficulties do not arise in the readers - writers problem, _____ are given exclusive access to the shared object.
a) readers
b) writers
c) both a) and b)
d) None of these

12) Round robin scheduling falls under the category of: _____.
a) Non preemptive scheduling
b) Preemptive scheduling
c) both a) and b)
d) None of these

13) The entry of all the PCBs of the current processes is in: _____.
a) Process Register
b) Program Counter
c) Process Table
d) Process Unit

14) In a batch processing environment, what is a job queue?
a) A queue that stores processes waiting for CPU time
b) A queue that stores user input for processing
c) A queue that stores jobs awaiting execution
d) A queue that stores output data from completed processes

Seat No.	

Set **Q**

T. Y. (B.Tech.) (Electronics Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Operating Systems (BTN04605)

Day & Date: Monday, 25-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

Section – I

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

a) Analyze bounded buffer problem as classical problems of synchronization.

b) Write a short note on multiprogramming operating systems.

c) Explain the shared memory systems of interprocess communication.

d) Discuss the role of the process control block (PCB) in process management. Explain the information typically stored in a PCB.

e) Explain the difference between non-preemptive and preemptive scheduling algorithms. Discuss the advantages and disadvantages of each approach in terms of system responsiveness and fairness.

Q.3 Attempt the following. (Any Two) **12**

a) Explain process creation and termination operations in detail.

b) Define thread. Describe the three multithreading models with suitable diagram.

c) Consider four processes P1, P2, P3, and P4 with their priority and CPU burst in milliseconds

Process	CPU burst time (ms)	Priority
P1	10	4
P2	5	3
P3	2	1
P4	3	2

How these processes will be scheduled according to priority scheduling algorithm?
Compute the average waiting time and average turnaround time.

Section – II

Q.4 Answer the following. (Any Four) **16**

a) Elaborate terms swapping and paging. Compare swapping and paging.

b) Explain various methods for recovery from deadlock.

c) What is page fault? How is it handled by OS?

d) What is resource allocation graph in OS? What are the different elements of RAG? How is RAG utilized to decide about presence of deadlock?

e) What are the drawbacks of paging? Describe segmentation mechanism in OS.

Q.5 Answer the following. (Any Two) **12**

a) Explain FIFO and optimal page replacement algorithm in detail.

b) Explain various free space management approaches in OS.

c) What is internal and external fragmentation in OS? Differentiate between internal and external fragmentation.

Seat No.	

Set **R**

T. Y. (B.Tech.) (Electronics Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Operating Systems (BTN04605)

Day & Date: Monday, 25-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Choose the correct answer. **14**

1) Paging increases the _____ time.
a) waiting b) execution
c) context – switch d) All of the mentioned

2) _____ is generally faster than _____ and _____.
a) first fit, best fit, worst fit b) best fit, first fit, worst fit
c) worst fit, best fit, first fit d) None of the mentioned

3) File attributes consist of _____.
a) name b) type
c) identifier d) All of the mentioned

4) Which process is busy swapping pages in and out.
a) Division b) External Fragmentation
c) Thrashing d) Compaction

5) In the Many to One model, if a thread makes a blocking system call _____.
a) the entire process will be blocked
b) a part of the process will stay blocked, with the rest running
c) the entire process will run
d) None of these

6) What is the primary purpose of cooperating processes in an operating system?
a) To enhance CPU scheduling algorithms
b) To share system resources and data among multiple processes
c) To reduce the number of system calls
d) To improve disk access speed

7) A parent process calling _____ system call will be suspended until children processes terminate.
a) fork b) wait
c) exit d) exec

8) To ensure difficulties do not arise in the readers - writers problem, _____ are given exclusive access to the shared object.
a) readers b) writers
c) both a) and b) d) None of these

9) Round robin scheduling falls under the category of: _____.
a) Non preemptive scheduling b) Preemptive scheduling
c) both a) and b) d) None of these

10) The entry of all the PCBs of the current processes is in: _____.
a) Process Register b) Program Counter
c) Process Table d) Process Unit

11) In a batch processing environment, what is a job queue?
a) A queue that stores processes waiting for CPU time
b) A queue that stores user input for processing
c) A queue that stores jobs awaiting execution
d) A queue that stores output data from completed processes

12) The circular wait condition can be prevented by _____.
a) defining a linear ordering of resource types
b) using thread
c) using pipes
d) All of the mentioned

13) A problem encountered in multitasking when a process is permanently denied necessary resources is called _____.
a) deadlock b) starvation
c) inversion d) aging

14) The _____ is used as an index into the page table.
a) frame bit b) page number
c) page offset d) frame offset

Seat No.	

Set **R**

T. Y. (B.Tech.) (Electronics Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Operating Systems (BTN04605)

Day & Date: Monday, 25-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

Section – I

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

a) Analyze bounded buffer problem as classical problems of synchronization.

b) Write a short note on multiprogramming operating systems.

c) Explain the shared memory systems of interprocess communication.

d) Discuss the role of the process control block (PCB) in process management. Explain the information typically stored in a PCB.

e) Explain the difference between non-preemptive and preemptive scheduling algorithms. Discuss the advantages and disadvantages of each approach in terms of system responsiveness and fairness.

Q.3 Attempt the following. (Any Two) **12**

a) Explain process creation and termination operations in detail.

b) Define thread. Describe the three multithreading models with suitable diagram.

c) Consider four processes P1, P2, P3, and P4 with their priority and CPU burst in milliseconds

Process	CPU burst time (ms)	Priority
P1	10	4
P2	5	3
P3	2	1
P4	3	2

How these processes will be scheduled according to priority scheduling algorithm?
Compute the average waiting time and average turnaround time.

Section – II

Q.4 Answer the following. (Any Four) **16**

a) Elaborate terms swapping and paging. Compare swapping and paging.

b) Explain various methods for recovery from deadlock.

c) What is page fault? How is it handled by OS?

d) What is resource allocation graph in OS? What are the different elements of RAG? How is RAG utilized to decide about presence of deadlock?

e) What are the drawbacks of paging? Describe segmentation mechanism in OS.

Q.5 Answer the following. (Any Two) **12**

a) Explain FIFO and optimal page replacement algorithm in detail.

b) Explain various free space management approaches in OS.

c) What is internal and external fragmentation in OS? Differentiate between internal and external fragmentation.

Seat No.	

Set **S**

T. Y. (B.Tech.) (Electronics Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Operating Systems (BTN04605)

Day & Date: Monday, 25-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Choose the correct answer. **14**

1) The entry of all the PCBs of the current processes is in: _____.
a) Process Register b) Program Counter
c) Process Table d) Process Unit

2) In a batch processing environment, what is a job queue?
a) A queue that stores processes waiting for CPU time
b) A queue that stores user input for processing
c) A queue that stores jobs awaiting execution
d) A queue that stores output data from completed processes

3) The circular wait condition can be prevented by _____.
a) defining a linear ordering of resource types
b) using thread
c) using pipes
d) All of the mentioned

4) A problem encountered in multitasking when a process is permanently denied necessary resources is called _____.
a) deadlock b) starvation
c) inversion d) aging

5) The _____ is used as an index into the page table.
a) frame bit b) page number
c) page offset d) frame offset

6) Paging increases the _____ time.
a) waiting b) execution
c) context – switch d) All of the mentioned

7) _____ is generally faster than _____ and _____.
a) first fit, best fit, worst fit
b) best fit, first fit, worst fit
c) worst fit, best fit, first fit
d) None of the mentioned

8) File attributes consist of _____.
a) name
b) type
c) identifier
d) All of the mentioned

9) Which process is busy swapping pages in and out.
a) Division
b) External Fragmentation
c) Thrashing
d) Compaction

10) In the Many to One model, if a thread makes a blocking system call _____.
a) the entire process will be blocked
b) a part of the process will stay blocked, with the rest running
c) the entire process will run
d) None of these

11) What is the primary purpose of cooperating processes in an operating system?
a) To enhance CPU scheduling algorithms
b) To share system resources and data among multiple processes
c) To reduce the number of system calls
d) To improve disk access speed

12) A parent process calling _____ system call will be suspended until children processes terminate.
a) fork
b) wait
c) exit
d) exec

13) To ensure difficulties do not arise in the readers - writers problem, _____ are given exclusive access to the shared object.
a) readers
b) writers
c) both a) and b)
d) None of these

14) Round robin scheduling falls under the category of: _____.
a) Non preemptive scheduling
b) Preemptive scheduling
c) both a) and b)
d) None of these

Seat No.	

Set **S**

T. Y. (B.Tech.) (Electronics Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Operating Systems (BTN04605)

Day & Date: Monday, 25-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

Section – I

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

a) Analyze bounded buffer problem as classical problems of synchronization.

b) Write a short note on multiprogramming operating systems.

c) Explain the shared memory systems of interprocess communication.

d) Discuss the role of the process control block (PCB) in process management. Explain the information typically stored in a PCB.

e) Explain the difference between non-preemptive and preemptive scheduling algorithms. Discuss the advantages and disadvantages of each approach in terms of system responsiveness and fairness.

Q.3 Attempt the following. (Any Two) **12**

a) Explain process creation and termination operations in detail.

b) Define thread. Describe the three multithreading models with suitable diagram.

c) Consider four processes P1, P2, P3, and P4 with their priority and CPU burst in milliseconds

Process	CPU burst time (ms)	Priority
P1	10	4
P2	5	3
P3	2	1
P4	3	2

How these processes will be scheduled according to priority scheduling algorithm?
Compute the average waiting time and average turnaround time.

Section – II

Q.4 Answer the following. (Any Four) **16**

a) Elaborate terms swapping and paging. Compare swapping and paging.

b) Explain various methods for recovery from deadlock.

c) What is page fault? How is it handled by OS?

d) What is resource allocation graph in OS? What are the different elements of RAG? How is RAG utilized to decide about presence of deadlock?

e) What are the drawbacks of paging? Describe segmentation mechanism in OS.

Q.5 Answer the following. (Any Two) **12**

a) Explain FIFO and optimal page replacement algorithm in detail.

b) Explain various free space management approaches in OS.

c) What is internal and external fragmentation in OS? Differentiate between internal and external fragmentation.

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Seat No.	

Set P

T. Y. (B.Tech.) (Electronics Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026
AI/MI - Machine Learning (BTN04612)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) What is the primary role of data preprocessing in Machine Learning?
a) To clean and transform data for effective analysis
b) To visualize the data
c) To train the model
d) To design algorithm

2) What is the purpose of cross-validation in Machine Learning?
a) To clean the data
b) To evaluate model performance
c) To optimize algorithm speed
d) To visualize patterns in data

3) Which of the following refers to raw input in Machine Learning?
a) Hypothesis b) Features
c) Predictions d) Labels

4) What is the hypothesis space in Machine Learning?
a) The set of all possible models b) The training data
c) The testing data d) The process of learning

5) Which learning type uses labeled data for training?
a) Supervised b) Unsupervised
c) Semi-supervised d) Reinforcement

6) Which is an example of reinforcement learning?
a) Predicting house prices
b) Grouping similar images
c) Training a robot to navigate a maze
d) Identifying spam emails

7) Which of the following uses unsupervised learning?
a) Spam classification
b) Customer segmentation
c) Stock price prediction
d) Image recognition

8) Which of the following is NOT a supervised learning algorithm?
a) Decision Tree
b) K-Means
c) Support Vector Machine
d) Naïve Bayes

9) Which algorithm is most suitable for predicting continuous numerical values?
a) K-Nearest Neighbors
b) Random Forest
c) Linear Regression
d) Naïve Bayes

10) Which technique combines multiple decision trees to improve accuracy?
a) Random Forest
b) K-Means Clustering
c) Neural Networks
d) Linear Regression

11) What is the primary goal of unsupervised learning?
a) Predicting outcomes based on labeled data
b) Grouping or clustering data without labels
c) Generating labeled data
d) Validating model accuracy

12) What is the role of an activation function in ANN?
a) To initialize weights
b) To introduce non-linearity into the network
c) To perform feature extraction
d) To optimize the model

13) What role does Machine Learning play in medical diagnosis?
a) Diagnosing diseases based on historical data
b) Replacing doctors with algorithms
c) Building medical equipment
d) Managing patient files

14) Which application of Machine Learning uses clustering?
a) Recommending movies
b) Customer segmentation
c) Predicting stock prices
d) Detecting email spam

Seat No.	

Set P

T. Y. (B.Tech.) (Electronics Engineering) (Semester - II) (New) (CBCS) Examination: March/April- 2026
AI/MI - Machine Learning (BTN04612)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data whenever necessary.

Section – I

Q.2 Solve Any Four of the following. **16**

a) Why is data preprocessing important in ML?

b) Explain overfitting and how to prevent it.

c) What is the difference between training and testing in ML?

d) Compare decision trees and random forests.

e) Explain overfitting and how to prevent it.

f) What is the purpose of assessing classification performance?

Q.3 Solve Any Two of the following. **12**

a) Define and differentiate between supervised, unsupervised and reinforcement learning with examples.

b) A confusion matrix for a binary classification problem is as follows:

	Predicted Positive	Predicted Negative
Actual Positive	50	10
Actual Negative	5	35

Calculate:
i) Accuracy
ii) Precision
iii) Recall (Sensitivity)
iv) Specificity
v) F1 Score

c) Discuss different Error measures used for Evaluation of Regression model.

Section – II

Q.4 Solve Any Four of the following. **16**

a) What are clustering techniques? Provide examples.

b) What is the use of Dendrogram?

c) Define activation functions and their importance.

d) What is the application of ML in traffic prediction?

e) Explain the concept of a Perceptron with a neat diagram.

f) What are the basic steps of Apriori algorithm for association rule learning?

Q.5 Solve Any Two of the following. **12**

a) Compare K-Medoids and K-Means clustering algorithms. Discuss their use cases.

b) Discuss the application of Machine Learning in medical diagnosis.

c) What are different Activation functions? Explain in details.

Seat No.	

Set **Q**

T. Y. (B.Tech.) (Electronics Engineering) (Semester - II) (New) (CBCS) Examination: March/April- 2026
AI/MI - Machine Learning (BTN04612)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no. 03 (Starting page of the Answer Book). Each question carries one mark.
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4) Assume suitable data whenever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) Which of the following is NOT a supervised learning algorithm?
a) Decision Tree b) K-Means
c) Support Vector Machine d) Naïve Bayes

2) Which algorithm is most suitable for predicting continuous numerical values?
a) K-Nearest Neighbors b) Random Forest
c) Linear Regression d) Naïve Bayes

3) Which technique combines multiple decision trees to improve accuracy?
a) Random Forest b) K-Means Clustering
c) Neural Networks d) Linear Regression

4) What is the primary goal of unsupervised learning?
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14) Which of the following uses unsupervised learning?
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c) Stock price prediction
d) Image recognition

Seat No.	

Set **Q**

T. Y. (B.Tech.) (Electronics Engineering) (Semester - II) (New) (CBCS) Examination: March/April- 2026
AI/MI - Machine Learning (BTN04612)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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

Q.2 Solve Any Four of the following. **16**

a) Why is data preprocessing important in ML?

b) Explain overfitting and how to prevent it.

c) What is the difference between training and testing in ML?

d) Compare decision trees and random forests.

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Q.3 Solve Any Two of the following. **12**

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Actual Negative	5	35

Calculate:
i) Accuracy
ii) Precision
iii) Recall (Sensitivity)
iv) Specificity
v) F1 Score

c) Discuss different Error measures used for Evaluation of Regression model.

Section – II

Q.4 Solve Any Four of the following. **16**

a) What are clustering techniques? Provide examples.

b) What is the use of Dendrogram?

c) Define activation functions and their importance.

d) What is the application of ML in traffic prediction?

e) Explain the concept of a Perceptron with a neat diagram.

f) What are the basic steps of Apriori algorithm for association rule learning?

Q.5 Solve Any Two of the following. **12**

a) Compare K-Medoids and K-Means clustering algorithms. Discuss their use cases.

b) Discuss the application of Machine Learning in medical diagnosis.

c) What are different Activation functions? Explain in details.

SLR-QH-412

Seat No.	

Set R

T. Y. (B.Tech.) (Electronics Engineering) (Semester - II) (New) (CBCS) Examination: March/April- 2026
AI/MI - Machine Learning (BTN04612)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) What is the primary goal of unsupervised learning?
a) Predicting outcomes based on labeled data
b) Grouping or clustering data without labels
c) Generating labeled data
d) Validating model accuracy

2) What is the role of an activation function in ANN?
a) To initialize weights
b) To introduce non-linearity into the network
c) To perform feature extraction
d) To optimize the model

3) What role does Machine Learning play in medical diagnosis?
a) Diagnosing diseases based on historical data
b) Replacing doctors with algorithms
c) Building medical equipment
d) Managing patient files

4) Which application of Machine Learning uses clustering?
a) Recommending movies b) Customer segmentation
c) Predicting stock prices d) Detecting email spam

5) What is the primary role of data preprocessing in Machine Learning?
a) To clean and transform data for effective analysis
b) To visualize the data
c) To train the model
d) To design algorithm

6) What is the purpose of cross-validation in Machine Learning?
a) To clean the data
b) To evaluate model performance
c) To optimize algorithm speed
d) To visualize patterns in data

7) Which of the following refers to raw input in Machine Learning?
a) Hypothesis
b) Features
c) Predictions
d) Labels

8) What is the hypothesis space in Machine Learning?
a) The set of all possible models
b) The training data
c) The testing data
d) The process of learning

9) Which learning type uses labeled data for training?
a) Supervised
b) Unsupervised
c) Semi-supervised
d) Reinforcement

10) Which is an example of reinforcement learning?
a) Predicting house prices
b) Grouping similar images
c) Training a robot to navigate a maze
d) Identifying spam emails

11) Which of the following uses unsupervised learning?
a) Spam classification
b) Customer segmentation
c) Stock price prediction
d) Image recognition

12) Which of the following is NOT a supervised learning algorithm?
a) Decision Tree
b) K-Means
c) Support Vector Machine
d) Naïve Bayes

13) Which algorithm is most suitable for predicting continuous numerical values?
a) K-Nearest Neighbors
b) Random Forest
c) Linear Regression
d) Naïve Bayes

14) Which technique combines multiple decision trees to improve accuracy?
a) Random Forest
b) K-Means Clustering
c) Neural Networks
d) Linear Regression

Seat No.	

Set R

T. Y. (B.Tech.) (Electronics Engineering) (Semester - II) (New) (CBCS) Examination: March/April- 2026
AI/MI - Machine Learning (BTN04612)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data whenever necessary.

Section – I

Q.2 Solve Any Four of the following. **16**

a) Why is data preprocessing important in ML?

b) Explain overfitting and how to prevent it.

c) What is the difference between training and testing in ML?

d) Compare decision trees and random forests.

e) Explain overfitting and how to prevent it.

f) What is the purpose of assessing classification performance?

Q.3 Solve Any Two of the following. **12**

a) Define and differentiate between supervised, unsupervised and reinforcement learning with examples.

b) A confusion matrix for a binary classification problem is as follows:

	Predicted Positive	Predicted Negative
Actual Positive	50	10
Actual Negative	5	35

Calculate:
i) Accuracy
ii) Precision
iii) Recall (Sensitivity)
iv) Specificity
v) F1 Score

c) Discuss different Error measures used for Evaluation of Regression model.

Section – II

Q.4 Solve Any Four of the following. **16**

a) What are clustering techniques? Provide examples.

b) What is the use of Dendrogram?

c) Define activation functions and their importance.

d) What is the application of ML in traffic prediction?

e) Explain the concept of a Perceptron with a neat diagram.

f) What are the basic steps of Apriori algorithm for association rule learning?

Q.5 Solve Any Two of the following. **12**

a) Compare K-Medoids and K-Means clustering algorithms. Discuss their use cases.

b) Discuss the application of Machine Learning in medical diagnosis.

c) What are different Activation functions? Explain in details.

SLR-QH-412

Seat No.		Set	S

T. Y. (B.Tech.) (Electronics Engineering) (Semester - II) (New) (CBCS) Examination: March/April- 2026
AI/MI - Machine Learning (BTN04612)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) Which is an example of reinforcement learning?
a) Predicting house prices
b) Grouping similar images
c) Training a robot to navigate a maze
d) Identifying spam emails

2) Which of the following uses unsupervised learning?
a) Spam classification b) Customer segmentation
c) Stock price prediction d) Image recognition

3) Which of the following is NOT a supervised learning algorithm?
a) Decision Tree b) K-Means
c) Support Vector Machine d) Naïve Bayes

4) Which algorithm is most suitable for predicting continuous numerical values?
a) K-Nearest Neighbors b) Random Forest
c) Linear Regression d) Naïve Bayes

5) Which technique combines multiple decision trees to improve accuracy?
a) Random Forest b) K-Means Clustering
c) Neural Networks d) Linear Regression

6) What is the primary goal of unsupervised learning?
a) Predicting outcomes based on labeled data
b) Grouping or clustering data without labels
c) Generating labeled data
d) Validating model accuracy

7) What is the role of an activation function in ANN?
   a) To initialize weights
   b) To introduce non-linearity into the network
   c) To perform feature extraction
   d) To optimize the model

8) What role does Machine Learning play in medical diagnosis?
   a) Diagnosing diseases based on historical data
   b) Replacing doctors with algorithms
   c) Building medical equipment
   d) Managing patient files

9) Which application of Machine Learning uses clustering?
   a) Recommending movies
   b) Customer segmentation
   c) Predicting stock prices
   d) Detecting email spam

10) What is the primary role of data preprocessing in Machine Learning?
   a) To clean and transform data for effective analysis
   b) To visualize the data
   c) To train the model
   d) To design algorithm

11) What is the purpose of cross-validation in Machine Learning?
   a) To clean the data
   b) To evaluate model performance
   c) To optimize algorithm speed
   d) To visualize patterns in data

12) Which of the following refers to raw input in Machine Learning?
   a) Hypothesis
   b) Features
   c) Predictions
   d) Labels

13) What is the hypothesis space in Machine Learning?
   a) The set of all possible models
   b) The training data
   c) The testing data
   d) The process of learning

14) Which learning type uses labeled data for training?
   a) Supervised
   b) Unsupervised
   c) Semi-supervised
   d) Reinforcement

Seat No.	

Set **S**

T. Y. (B.Tech.) (Electronics Engineering) (Semester - II) (New) (CBCS) Examination: March/April- 2026
AI/MI - Machine Learning (BTN04612)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data whenever necessary.

Section – I

Q.2 Solve Any Four of the following. **16**

a) Why is data preprocessing important in ML?

b) Explain overfitting and how to prevent it.

c) What is the difference between training and testing in ML?

d) Compare decision trees and random forests.

e) Explain overfitting and how to prevent it.

f) What is the purpose of assessing classification performance?

Q.3 Solve Any Two of the following. **12**

a) Define and differentiate between supervised, unsupervised and reinforcement learning with examples.

b) A confusion matrix for a binary classification problem is as follows:

	Predicted Positive	Predicted Negative
Actual Positive	50	10
Actual Negative	5	35

Calculate:
i) Accuracy
ii) Precision
iii) Recall (Sensitivity)
iv) Specificity
v) F1 Score

c) Discuss different Error measures used for Evaluation of Regression model.

Section – II

Q.4 Solve Any Four of the following. **16**

a) What are clustering techniques? Provide examples.

b) What is the use of Dendrogram?

c) Define activation functions and their importance.

d) What is the application of ML in traffic prediction?

e) Explain the concept of a Perceptron with a neat diagram.

f) What are the basic steps of Apriori algorithm for association rule learning?

Q.5 Solve Any Two of the following. **12**

a) Compare K-Medoids and K-Means clustering algorithms. Discuss their use cases.

b) Discuss the application of Machine Learning in medical diagnosis.

c) What are different Activation functions? Explain in details.

SLR-QH-414

Seat No.	

Set P

T. Y. (B.Tech.) (Electronics Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
IoT Cloud Platform (BTN04614)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) Which AWS service provides disaster recovery capabilities?
a) Amazon EC2 b) Amazon S3
c) Amazon RDS d) Amazon Glacier

2) What is the main purpose of the AWS dashboard?
a) Managing user accounts
b) Monitoring AWS service usage
c) Configuring virtual machines
d) Developing applications

3) What is the first step to create a new AWS account?
a) Choose a billing plan
b) Provide payment information
c) Verify email address
d) Set up multi-factor authentication

4) In IAM, what is a group?
a) A collection of IAM policies
b) A group of users with similar access requirements
c) A role assigned to an IAM user
d) A policy that defines resource permissions

5) What is an IAM role in AWS?
a) A group of users with administrative privileges
b) A temporary session to assume different user identities
c) A policy that defines permissions for a specific resource
d) An identity with specific permissions that can be assumed by AWS services or users

6) Which of the following is NOT an IAM best practice in AWS?
   a) Regularly reviewing and rotating access keys
   b) Using AWS root user for everyday tasks
   c) Granting least privilege to IAM users
   d) Enforcing strong password policies

7) Which AWS service provides firewall security for your VPC?
   a) Amazon EC2
   b) Amazon S3
   c) Amazon VPC Security Groups
   d) Amazon Route 53

8) What is NAT in the context of AWS VPC?
   a) Network Address Translation
   b) Network Access Token
   c) Network Availability Test
   d) Network Attached Storage

9) What is the primary purpose of Elastic Block Store (EBS) in EC2?
   a) Storing and retrieving data from S3
   b) Managing containerized applications
   c) Providing virtual network connectivity
   d) Offering persistent block-level storage for EC2 instances

10) Which of the following is NOT an EC2 instance type?
   a) t3.micro
   b) m5.large
   c) g2.2×large
   d) n2.nano

11) What are CloudWatch dashboards in AWS?
   a) Customizable visualizations of CloudWatch metrics and alarms
   b) Configurable firewall rules for inbound and outbound traffic
   c) Instances with preconfigured monitoring settings
   d) Predefined templates for launching EC2 instances

12) What are the two monitoring types available in Amazon CloudWatch?
   a) Basic and advanced
   b) Real-time and historical
   c) Manual and automated
   d) Basic and detailed

13) In Amazon S3, what are objects?
   a) Containers for organizing multiple buckets
   b) Virtual machines for running applications
   c) Data entities stored in S3 buckets
   d) Access control policies for S3 buckets

14) What is versioning in Amazon S3?
   a) A feature for managing different versions of an object in a bucket
   b) A way to categorize objects based on their content type
   c) A process for automatically migrating data between S3 storage classes
   d) A mechanism for distributing data across multiple S3 regions

Seat No.	

Set **P**

T. Y. (B.Tech.) (Electronics Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
IoT Cloud Platform (BTN04614)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Make suitable assumptions if necessary and state them clearly.

SECTION – I

Q.2 Attempt Any Three. **12**

a) What is the AWS dashboard and how can it be used to manage AWS resources?

b) Discuss the core AWS services and their functionalities.

c) Explain the concept of AWS free tier and its benefits for users.

d) What is Identity and Access Management (IAM)?

Q.3 Attempt Any Two. **16**

a) What is AWS CLI? Describe the basic structure of AWS CLI commands and how they are used to interact with AWS resources.

b) What is VPC peering? How does it work and what are some use cases for VPC peering?

c) What is NAT in VPC? Explain how NAT gateways can be used to enable outbound internet traffic for resources within a private subnet.

SECTION – II

Q.4 Attempt Any Three. **12**

a) What is the Elastic Compute Cloud (EC2) and how does it work?

b) How is the pricing structure for EC2 instances determined?

c) Explain the lifecycle of an EC2 instance.

d) Explain the concept of auto-scaling and how it relates to EC2 instances.

Q.5 Attempt Any Two. **16**

a) What is Amazon Simple Storage Service (S3) and how does it function as an object storage service.

b) What are the different storage classes available in S3 and how do they differ in terms of durability, availability, and cost?

c) Explain the key components of AWS VPC, including subnets, IP addressing, and routing tables. Describe how these components create a custom network topology within VPC.

Seat No.	

Set **Q**

T. Y. (B.Tech.) (Electronics Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
IoT Cloud Platform (BTN04614)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) What is NAT in the context of AWS VPC?
a) Network Address Translation b) Network Access Token
c) Network Availability Test d) Network Attached Storage

2) What is the primary purpose of Elastic Block Store (EBS) in EC2?
a) Storing and retrieving data from S3
b) Managing containerized applications
c) Providing virtual network connectivity
d) Offering persistent block-level storage for EC2 instances

3) Which of the following is NOT an EC2 instance type?
a) t3.micro b) m5.large
c) g2.2×large d) n2.nano

4) What are CloudWatch dashboards in AWS?
a) Customizable visualizations of CloudWatch metrics and alarms
b) Configurable firewall rules for inbound and outbound traffic
c) Instances with preconfigured monitoring settings
d) Predefined templates for launching EC2 instances

5) What are the two monitoring types available in Amazon CloudWatch?
a) Basic and advanced b) Real-time and historical
c) Manual and automated d) Basic and detailed

6) In Amazon S3, what are objects?
a) Containers for organizing multiple buckets
b) Virtual machines for running applications
c) Data entities stored in S3 buckets
d) Access control policies for S3 buckets

7) What is versioning in Amazon S3?
   a) A feature for managing different versions of an object in a bucket
   b) A way to categorize objects based on their content type
   c) A process for automatically migrating data between S3 storage classes
   d) A mechanism for distributing data across multiple S3 regions

8) Which AWS service provides disaster recovery capabilities?
   a) Amazon EC2
   b) Amazon S3
   c) Amazon RDS
   d) Amazon Glacier

9) What is the main purpose of the AWS dashboard?
   a) Managing user accounts
   b) Monitoring AWS service usage
   c) Configuring virtual machines
   d) Developing applications

10) What is the first step to create a new AWS account?
   a) Choose a billing plan
   b) Provide payment information
   c) Verify email address
   d) Set up multi-factor authentication

11) In IAM, what is a group?
   a) A collection of IAM policies
   b) A group of users with similar access requirements
   c) A role assigned to an IAM user
   d) A policy that defines resource permissions

12) What is an IAM role in AWS?
   a) A group of users with administrative privileges
   b) A temporary session to assume different user identities
   c) A policy that defines permissions for a specific resource
   d) An identity with specific permissions that can be assumed by AWS services or users

13) Which of the following is NOT an IAM best practice in AWS?
   a) Regularly reviewing and rotating access keys
   b) Using AWS root user for everyday tasks
   c) Granting least privilege to IAM users
   d) Enforcing strong password policies

14) Which AWS service provides firewall security for your VPC?
   a) Amazon EC2
   b) Amazon S3
   c) Amazon VPC Security Groups
   d) Amazon Route 53

Seat No.	

Set **Q**

T. Y. (B.Tech.) (Electronics Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
IoT Cloud Platform (BTN04614)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Make suitable assumptions if necessary and state them clearly.

SECTION – I

Q.2 Attempt Any Three. **12**

a) What is the AWS dashboard and how can it be used to manage AWS resources?

b) Discuss the core AWS services and their functionalities.

c) Explain the concept of AWS free tier and its benefits for users.

d) What is Identity and Access Management (IAM)?

Q.3 Attempt Any Two. **16**

a) What is AWS CLI? Describe the basic structure of AWS CLI commands and how they are used to interact with AWS resources.

b) What is VPC peering? How does it work and what are some use cases for VPC peering?

c) What is NAT in VPC? Explain how NAT gateways can be used to enable outbound internet traffic for resources within a private subnet.

SECTION – II

Q.4 Attempt Any Three. **12**

a) What is the Elastic Compute Cloud (EC2) and how does it work?

b) How is the pricing structure for EC2 instances determined?

c) Explain the lifecycle of an EC2 instance.

d) Explain the concept of auto-scaling and how it relates to EC2 instances.

Q.5 Attempt Any Two. **16**

a) What is Amazon Simple Storage Service (S3) and how does it function as an object storage service.

b) What are the different storage classes available in S3 and how do they differ in terms of durability, availability, and cost?

c) Explain the key components of AWS VPC, including subnets, IP addressing, and routing tables. Describe how these components create a custom network topology within VPC.

Seat No.	

Set **R**

T. Y. (B.Tech.) (Electronics Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
IoT Cloud Platform (BTN04614)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) What are CloudWatch dashboards in AWS?
a) Customizable visualizations of CloudWatch metrics and alarms
b) Configurable firewall rules for inbound and outbound traffic
c) Instances with preconfigured monitoring settings
d) Predefined templates for launching EC2 instances

2) What are the two monitoring types available in Amazon CloudWatch?
a) Basic and advanced b) Real-time and historical
c) Manual and automated d) Basic and detailed

3) In Amazon S3, what are objects?
a) Containers for organizing multiple buckets
b) Virtual machines for running applications
c) Data entities stored in S3 buckets
d) Access control policies for S3 buckets

4) What is versioning in Amazon S3?
a) A feature for managing different versions of an object in a bucket
b) A way to categorize objects based on their content type
c) A process for automatically migrating data between S3 storage classes
d) A mechanism for distributing data across multiple S3 regions

5) Which AWS service provides disaster recovery capabilities?
a) Amazon EC2 b) Amazon S3
c) Amazon RDS d) Amazon Glacier

6) What is the main purpose of the AWS dashboard?
   a) Managing user accounts
   b) Monitoring AWS service usage
   c) Configuring virtual machines
   d) Developing applications

7) What is the first step to create a new AWS account?
   a) Choose a billing plan
   b) Provide payment information
   c) Verify email address
   d) Set up multi-factor authentication

8) In IAM, what is a group?
   a) A collection of IAM policies
   b) A group of users with similar access requirements
   c) A role assigned to an IAM user
   d) A policy that defines resource permissions

9) What is an IAM role in AWS?
   a) A group of users with administrative privileges
   b) A temporary session to assume different user identities
   c) A policy that defines permissions for a specific resource
   d) An identity with specific permissions that can be assumed by AWS services or users

10) Which of the following is NOT an IAM best practice in AWS?
   a) Regularly reviewing and rotating access keys
   b) Using AWS root user for everyday tasks
   c) Granting least privilege to IAM users
   d) Enforcing strong password policies

11) Which AWS service provides firewall security for your VPC?
   a) Amazon EC2
   b) Amazon S3
   c) Amazon VPC Security Groups
   d) Amazon Route 53

12) What is NAT in the context of AWS VPC?
   a) Network Address Translation b) Network Access Token
   c) Network Availability Test d) Network Attached Storage

13) What is the primary purpose of Elastic Block Store (EBS) in EC2?
   a) Storing and retrieving data from S3
   b) Managing containerized applications
   c) Providing virtual network connectivity
   d) Offering persistent block-level storage for EC2 instances

14) Which of the following is NOT an EC2 instance type?
   a) t3.micro b) m5.large
   c) g2.2×large d) n2.nano

Seat No.	

Set **R**

T. Y. (B.Tech.) (Electronics Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
IoT Cloud Platform (BTN04614)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Make suitable assumptions if necessary and state them clearly.

SECTION – I

Q.2 Attempt Any Three. **12**

a) What is the AWS dashboard and how can it be used to manage AWS resources?

b) Discuss the core AWS services and their functionalities.

c) Explain the concept of AWS free tier and its benefits for users.

d) What is Identity and Access Management (IAM)?

Q.3 Attempt Any Two. **16**

a) What is AWS CLI? Describe the basic structure of AWS CLI commands and how they are used to interact with AWS resources.

b) What is VPC peering? How does it work and what are some use cases for VPC peering?

c) What is NAT in VPC? Explain how NAT gateways can be used to enable outbound internet traffic for resources within a private subnet.

SECTION – II

Q.4 Attempt Any Three. **12**

a) What is the Elastic Compute Cloud (EC2) and how does it work?

b) How is the pricing structure for EC2 instances determined?

c) Explain the lifecycle of an EC2 instance.

d) Explain the concept of auto-scaling and how it relates to EC2 instances.

Q.5 Attempt Any Two. **16**

a) What is Amazon Simple Storage Service (S3) and how does it function as an object storage service.

b) What are the different storage classes available in S3 and how do they differ in terms of durability, availability, and cost?

c) Explain the key components of AWS VPC, including subnets, IP addressing, and routing tables. Describe how these components create a custom network topology within VPC.

Seat No.	

Set **S**

T. Y. (B.Tech.) (Electronics Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
IoT Cloud Platform (BTN04614)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) Which of the following is NOT an IAM best practice in AWS?
a) Regularly reviewing and rotating access keys
b) Using AWS root user for everyday tasks
c) Granting least privilege to IAM users
d) Enforcing strong password policies

2) Which AWS service provides firewall security for your VPC?
a) Amazon EC2
b) Amazon S3
c) Amazon VPC Security Groups
d) Amazon Route 53

3) What is NAT in the context of AWS VPC?
a) Network Address Translation b) Network Access Token
c) Network Availability Test d) Network Attached Storage

4) What is the primary purpose of Elastic Block Store (EBS) in EC2?
a) Storing and retrieving data from S3
b) Managing containerized applications
c) Providing virtual network connectivity
d) Offering persistent block-level storage for EC2 instances

5) Which of the following is NOT an EC2 instance type?
a) t3.micro b) m5.large
c) g2.2×large d) n2.nano

6) What are CloudWatch dashboards in AWS?
a) Customizable visualizations of CloudWatch metrics and alarms
b) Configurable firewall rules for inbound and outbound traffic
c) Instances with preconfigured monitoring settings
d) Predefined templates for launching EC2 instances

7) What are the two monitoring types available in Amazon CloudWatch?
   a) Basic and advanced
   b) Real-time and historical
   c) Manual and automated
   d) Basic and detailed

8) In Amazon S3, what are objects?
   a) Containers for organizing multiple buckets
   b) Virtual machines for running applications
   c) Data entities stored in S3 buckets
   d) Access control policies for S3 buckets

9) What is versioning in Amazon S3?
   a) A feature for managing different versions of an object in a bucket
   b) A way to categorize objects based on their content type
   c) A process for automatically migrating data between S3 storage classes
   d) A mechanism for distributing data across multiple S3 regions

10) Which AWS service provides disaster recovery capabilities?
   a) Amazon EC2
   b) Amazon S3
   c) Amazon RDS
   d) Amazon Glacier

11) What is the main purpose of the AWS dashboard?
   a) Managing user accounts
   b) Monitoring AWS service usage
   c) Configuring virtual machines
   d) Developing applications

12) What is the first step to create a new AWS account?
   a) Choose a billing plan
   b) Provide payment information
   c) Verify email address
   d) Set up multi-factor authentication

13) In IAM, what is a group?
   a) A collection of IAM policies
   b) A group of users with similar access requirements
   c) A role assigned to an IAM user
   d) A policy that defines resource permissions

14) What is an IAM role in AWS?
   a) A group of users with administrative privileges
   b) A temporary session to assume different user identities
   c) A policy that defines permissions for a specific resource
   d) An identity with specific permissions that can be assumed by AWS services or users

SLR-QH-414

Seat No.	

Set S

T. Y. (B.Tech.) (Electronics Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
IoT Cloud Platform (BTN04614)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Make suitable assumptions if necessary and state them clearly.

SECTION – I

Q.2 Attempt Any Three. **12**

a) What is the AWS dashboard and how can it be used to manage AWS resources?

b) Discuss the core AWS services and their functionalities.

c) Explain the concept of AWS free tier and its benefits for users.

d) What is Identity and Access Management (IAM)?

Q.3 Attempt Any Two. **16**

a) What is AWS CLI? Describe the basic structure of AWS CLI commands and how they are used to interact with AWS resources.

b) What is VPC peering? How does it work and what are some use cases for VPC peering?

c) What is NAT in VPC? Explain how NAT gateways can be used to enable outbound internet traffic for resources within a private subnet.

SECTION – II

Q.4 Attempt Any Three. **12**

a) What is the Elastic Compute Cloud (EC2) and how does it work?

b) How is the pricing structure for EC2 instances determined?

c) Explain the lifecycle of an EC2 instance.

d) Explain the concept of auto-scaling and how it relates to EC2 instances.

Q.5 Attempt Any Two. **16**

a) What is Amazon Simple Storage Service (S3) and how does it function as an object storage service.

b) What are the different storage classes available in S3 and how do they differ in terms of durability, availability, and cost?

c) Explain the key components of AWS VPC, including subnets, IP addressing, and routing tables. Describe how these components create a custom network topology within VPC.

SLR-QH-415

Seat No.		Set	P

Fourth. Y. (B.Tech.) (Electronics Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Advanced Communication Engineering (BTN04701)

Day & Date: Saturday, 02-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Select suitable option. **14**

1) An isolator makes use of _____ twisted.
a) 45° b) 90°
c) Both a and b d) None

2) Voltage reflection coefficient is a ratio of _____ to the _____.
a) Reflected voltage, incident voltage
b) Incident voltage, reflected voltage
c) Both a & b
d) None

3) A microwave junction is supposed to be matched at all ports if in the S matrix _____.
a) all the diagonal elements are zero
b) all the diagonal elements are equal but not zero
c) all the diagonal elements are complex
d) is Hermitian

4) In the given magnetic field 'B', the radius of the path of electron is given by _____.
a) $R = \frac{mv}{eB}$ b) $R = \frac{vB}{em}$
c) $R = \frac{eV}{m}G$ d) None

5) The efficiency of Reflex Klystron is _____ than two cavity Klystron.
a) More b) Equal
c) Less d) None

6) What MESFETS stands for _____.
a) Metal oxide Semi Conductor Field Effect Transistor
b) Metal Semi Conductor Field Effect Transistor
c) Metal Electron Semi Conductor Field Effect Transistor
d) Magnetic Semi Conductor Field Effect Transistor

7) Pulse radar systems contain _____.
a) Trigger source b) Duplexer
c) Pulse modulator d) All the above

8) Which of the following is not the factor affecting range of radar?
a) Transmitter power b) Temperature
c) Frequency d) Target cross-sectional area

9) _____ is one of the most important elements in an optical fiber link.
a) Cabled fiber b) Optical Amplifiers
c) Photo-detectors d) Light sources

10) One of the principles characteristics of an optical fiber is _____ as a function of wavelength.
a) Transmission b) Communication
c) Attenuation d) Amplification

11) The maximum distance between earth satellite in an elliptical orbit is _____.
a) Posigrade b) Retrograde
c) Perigee d) Apogee

12) Collection of data from different sensors and sending them to earth station is done by _____.
a) Telemetry b) Tracking
c) Frequency translator d) Propulsion sub-system

13) The 3 axes of satellite are _____.
a) Pitch, roll & yaw b) Pitch, map & roll
c) Only a d) Only b

14) Transponder converts _____ frequency to _____ frequency.
a) Uplink, downlink b) Downlink, uplink
c) Both (a) & (b) d) None of these

Seat No.	

Set **P**

Fourth. Y. (B.Tech.) (Electronics Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Advanced Communication Engineering (BTN04701)

Day & Date: Saturday, 02-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data whenever necessary.

Section – I

Q.2 Attempt Any Four. **16**

a) With suitable diagram explain working of Isolator.

b) State and explain any three limitations of conversation devices over high frequency.

c) Write a note on FM-CW Radar.

d) Explain construction and working of IMPATT diode.

e) Derive radar range equation.

Q.3 Attempt Any Two. **12**

a) Explain construction and working of TWT (travelling wave tube). State its performance parameters.

b) Draw block diagram of MTI radar system and explain its working Principal.

c) Explain construction and working of π – mode magnetron. State its performance parameters.

Section – II

Q.4 Attempt Any Four. **16**

a) Derive numerical aperture for step index fiber.

b) Compare between TDMA, FDMA and DAMA.

c) Explain bending losses in optical fiber.

d) Explain single conversion and double conversion transponder system.

e) Explain the terms angle of inclination and angle of elevation with neat diagram.

Q.5 Attempt Any Two. **12**

a) With suitable block diagrams explain telemetry, tracking and command (TT&C) subsystem of satellite.

b) Explain construction and working of edge emitting double heterojunction LED.

c) Explain working of DBS-TV receiver.

Seat No.	

Set **Q**

Fourth. Y. (B.Tech.) (Electronics Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Advanced Communication Engineering (BTN04701)

Day & Date: Saturday, 02-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Select suitable option. **14**

1) Which of the following is not the factor affecting range of radar?
a) Transmitter power b) Temperature
c) Frequency d) Target cross-sectional area

2) _____ is one of the most important elements in an optical fiber link.
a) Cabled fiber b) Optical Amplifiers
c) Photo-detectors d) Light sources

3) One of the principles characteristics of an optical fiber is _____ as a function of wavelength.
a) Transmission b) Communication
c) Attenuation d) Amplification

4) The maximum distance between earth satellite in an elliptical orbit is _____.
a) Posigrade b) Retrograde
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5) Collection of data from different sensors and sending them to earth station is done by _____.
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a) Pitch, roll & yaw b) Pitch, map & roll
c) Only a d) Only b

7) Transponder converts _____ frequency to _____ frequency.
a) Uplink, downlink
b) Downlink, uplink
c) Both (a) & (b)
d) None of these

8) An isolator makes use of _____ twisted.
a) 45°
b) 90°
c) Both a and b
d) None

9) Voltage reflection coefficient is a ratio of _____ to the _____.
a) Reflected voltage, incident voltage
b) Incident voltage, reflected voltage
c) Both a & b
d) None

10) A microwave junction is supposed to be matched at all ports if in the S matrix _____.
a) all the diagonal elements are zero
b) all the diagonal elements are equal but not zero
c) all the diagonal elements are complex
d) is Hermitian

11) In the given magnetic field 'B', the radius of the path of electron is given by _____.
a) $R = \frac{mv}{eB}$
b) $R = \frac{vB}{em}$
c) $R = \frac{eV}{m}G$
d) None

12) The efficiency of Reflex Klystron is _____ than two cavity Klystron.
a) More
b) Equal
c) Less
d) None

13) What MESFETS stands for _____.
a) Metal oxide Semi Conductor Field Effect Transistor
b) Metal Semi Conductor Field Effect Transistor
c) Metal Electron Semi Conductor Field Effect Transistor
d) Magnetic Semi Conductor Field Effect Transistor

14) Pulse radar systems contain _____.
a) Trigger source
b) Duplexer
c) Pulse modulator
d) All the above

Seat No.	

Set **Q**

Fourth. Y. (B.Tech.) (Electronics Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Advanced Communication Engineering (BTN04701)

Day & Date: Saturday, 02-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data whenever necessary.

Section – I

Q.2 Attempt Any Four. **16**

a) With suitable diagram explain working of Isolator.

b) State and explain any three limitations of conversation devices over high frequency.

c) Write a note on FM-CW Radar.

d) Explain construction and working of IMPATT diode.

e) Derive radar range equation.

Q.3 Attempt Any Two. **12**

a) Explain construction and working of TWT (travelling wave tube). State its performance parameters.

b) Draw block diagram of MTI radar system and explain its working Principal.

c) Explain construction and working of π – mode magnetron. State its performance parameters.

Section – II

Q.4 Attempt Any Four. **16**

a) Derive numerical aperture for step index fiber.

b) Compare between TDMA, FDMA and DAMA.

c) Explain bending losses in optical fiber.

d) Explain single conversion and double conversion transponder system.

e) Explain the terms angle of inclination and angle of elevation with neat diagram.

Q.5 Attempt Any Two. **12**

a) With suitable block diagrams explain telemetry, tracking and command (TT&C) subsystem of satellite.

b) Explain construction and working of edge emitting double heterojunction LED.

c) Explain working of DBS-TV receiver.

Seat No.	

Set **R**

Fourth. Y. (B.Tech.) (Electronics Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Advanced Communication Engineering (BTN04701)

Day & Date: Saturday, 02-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Select suitable option. **14**

1) The maximum distance between earth satellite in an elliptical orbit is _____.
a) Posigrade b) Retrograde
c) Perigee d) Apogee

2) Collection of data from different sensors and sending them to earth station is done by _____.
a) Telemetry b) Tracking
c) Frequency translator d) Propulsion sub-system

3) The 3 axes of satellite are _____.
a) Pitch, roll & yaw b) Pitch, map & roll
c) Only a d) Only b

4) Transponder converts _____ frequency to _____ frequency.
a) Uplink, downlink b) Downlink, uplink
c) Both (a) & (b) d) None of these

5) An isolator makes use of _____ twisted.
a) 45° b) 90°
c) Both a and b d) None

6) Voltage reflection coefficient is a ratio of _____ to the _____.
a) Reflected voltage, incident voltage
b) Incident voltage, reflected voltage
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7) A microwave junction is supposed to be matched at all ports if in the S matrix _____.
   a) all the diagonal elements are zero
   b) all the diagonal elements are equal but not zero
   c) all the diagonal elements are complex
   d) is Hermitian

8) In the given magnetic field 'B', the radius of the path of electron is given by _____.
   a) $R = \frac{mv}{eB}$
   b) $R = \frac{vB}{em}$
   c) $R = \frac{eV}{m}G$
   d) None

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   a) More
   b) Equal
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11) Pulse radar systems contain _____.
   a) Trigger source
   b) Duplexer
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12) Which of the following is not the factor affecting range of radar?
   a) Transmitter power
   b) Temperature
   c) Frequency
   d) Target cross-sectional area

13) _____ is one of the most important elements in an optical fiber link.
   a) Cabled fiber
   b) Optical Amplifiers
   c) Photo-detectors
   d) Light sources

14) One of the principles characteristics of an optical fiber is _____ as a function of wavelength.
   a) Transmission
   b) Communication
   c) Attenuation
   d) Amplification

Seat No.	

Set R

Fourth. Y. (B.Tech.) (Electronics Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Advanced Communication Engineering (BTN04701)

Day & Date: Saturday, 02-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data whenever necessary.

Section – I

Q.2 Attempt Any Four. **16**

a) With suitable diagram explain working of Isolator.

b) State and explain any three limitations of conversation devices over high frequency.

c) Write a note on FM-CW Radar.

d) Explain construction and working of IMPATT diode.

e) Derive radar range equation.

Q.3 Attempt Any Two. **12**

a) Explain construction and working of TWT (travelling wave tube). State its performance parameters.

b) Draw block diagram of MTI radar system and explain its working Principal.

c) Explain construction and working of π – mode magnetron. State its performance parameters.

Section – II

Q.4 Attempt Any Four. **16**

a) Derive numerical aperture for step index fiber.

b) Compare between TDMA, FDMA and DAMA.

c) Explain bending losses in optical fiber.

d) Explain single conversion and double conversion transponder system.

e) Explain the terms angle of inclination and angle of elevation with neat diagram.

Q.5 Attempt Any Two. **12**

a) With suitable block diagrams explain telemetry, tracking and command (TT&C) subsystem of satellite.

b) Explain construction and working of edge emitting double heterojunction LED.

c) Explain working of DBS-TV receiver.

SLR-QH-415

Seat No.		Set	S

Fourth. Y. (B.Tech.) (Electronics Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Advanced Communication Engineering (BTN04701)

Day & Date: Saturday, 02-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Select suitable option. **14**

1) What MESFETS stands for _____.
a) Metal oxide Semi Conductor Field Effect Transistor
b) Metal Semi Conductor Field Effect Transistor
c) Metal Electron Semi Conductor Field Effect Transistor
d) Magnetic Semi Conductor Field Effect Transistor

2) Pulse radar systems contain _____.
a) Trigger source b) Duplexer
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3) Which of the following is not the factor affecting range of radar?
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c) Frequency d) Target cross-sectional area

4) _____ is one of the most important elements in an optical fiber link.
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c) Photo-detectors d) Light sources

5) One of the principles characteristics of an optical fiber is _____ as a function of wavelength.
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c) Attenuation d) Amplification

6) The maximum distance between earth satellite in an elliptical orbit is _____.
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c) Perigee d) Apogee

7) Collection of data from different sensors and sending them to earth station is done by _____.
a) Telemetry b) Tracking
c) Frequency translator d) Propulsion sub-system

8) The 3 axes of satellite are _____.
a) Pitch, roll & yaw b) Pitch, map & roll
c) Only a d) Only b

9) Transponder converts _____ frequency to _____ frequency.
a) Uplink, downlink b) Downlink, uplink
c) Both (a) & (b) d) None of these

10) An isolator makes use of _____ twisted.
a) 45° b) 90°
c) Both a and b d) None

11) Voltage reflection coefficient is a ratio of _____ to the _____.
a) Reflected voltage, incident voltage
b) Incident voltage, reflected voltage
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12) A microwave junction is supposed to be matched at all ports if in the S matrix _____.
a) all the diagonal elements are zero
b) all the diagonal elements are equal but not zero
c) all the diagonal elements are complex
d) is Hermitian

13) In the given magnetic field 'B', the radius of the path of electron is given by _____.
a) $R = \frac{mv}{eB}$ b) $R = \frac{vB}{em}$
c) $R = \frac{eV}{m}G$ d) None

14) The efficiency of Reflex Klystron is _____ than two cavity Klystron.
a) More b) Equal
c) Less d) None

Seat No.	

Set **S**

Fourth. Y. (B.Tech.) (Electronics Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Advanced Communication Engineering (BTN04701)

Day & Date: Saturday, 02-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data whenever necessary.

Section – I

Q.2 Attempt Any Four. **16**

a) With suitable diagram explain working of Isolator.

b) State and explain any three limitations of conversation devices over high frequency.

c) Write a note on FM-CW Radar.

d) Explain construction and working of IMPATT diode.

e) Derive radar range equation.

Q.3 Attempt Any Two. **12**

a) Explain construction and working of TWT (travelling wave tube). State its performance parameters.

b) Draw block diagram of MTI radar system and explain its working Principal.

c) Explain construction and working of π – mode magnetron. State its performance parameters.

Section – II

Q.4 Attempt Any Four. **16**

a) Derive numerical aperture for step index fiber.

b) Compare between TDMA, FDMA and DAMA.

c) Explain bending losses in optical fiber.

d) Explain single conversion and double conversion transponder system.

e) Explain the terms angle of inclination and angle of elevation with neat diagram.

Q.5 Attempt Any Two. **12**

a) With suitable block diagrams explain telemetry, tracking and command (TT&C) subsystem of satellite.

b) Explain construction and working of edge emitting double heterojunction LED.

c) Explain working of DBS-TV receiver.

SLR-QH-416

Seat No.		Set	P

Fourth. Y. (B.Tech.) (Electronics Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Power Electronics (BTN04702)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Choose the correct answer. 14

1) Inductor is connected in series with the thyristor to _____.
a) reduce dv/dt across it b) protect against di/dt
c) protect over voltage d) trigger thyristor

2) Thyristor is a _____.
a) Latching device b) Un-controlled device
c) Latch proof device d) Voltage controlled device

3) Class D commutation is _____.
a) Auxiliary commutation technique
b) Load commutation technique
c) Current commutation technique
d) Complementary commutation technique

4) A converter which can operate as 3 pulse converter is a _____.
a) 3-phase half wave b) 3-phase full-converter
c) 1-phase semi converter d) 1-phase dual converter

5) Three phase full wave bridge converter with inductive load acts as _____.
a) Single quadrant converter b) Two quadrant converters
c) Three quadrant converters d) Four quadrant converters

6) A six pulse thyristorized controlled rectifier is connected to a balanced 50 Hz three phase ac source. Output ripple frequency will be _____.
a) 100 Hz b) 150 Hz
c) 250 Hz d) 300 Hz

7) In Three phase full controlled bridge rectifier PIV across any thyristor is _____

a) $\sqrt{2}\,V_m$ b) $\sqrt{3}\,V_m$

c) V_m d) $\sqrt{3}\,V_{LL}$

8) The average value of the output voltage in a step - down dc chopper is given by _____.

a) $V_0 = V_s$ b) $V_0 = K\,V_s$

c) $V_0 = \mathrm{V}_s / \mathrm{K}$ d) $V_0 = \mathrm{V}_s / (1 - \mathrm{K})$

9) Class A and Class B choppers are _____.

a) Two quadrant converters b) Three quadrant converters

c) Single quadrant converters d) None

10) In thyristor dc chopper _____ type of commutation result in best performance.

a) Voltage commutation b) Current commutation

c) Load Commutation d) Supply commutation

11) A three phase to three cycloconverter using 3-pulse converter uses ___.

a) 6 SCR's b) 12 SCR's

c) 24 SCR's d) 18 SCR's

12) In single phase full bridge inverter has dc input voltage is 250V, RMS output voltage will be _____

a) 250V b) 125V

c) 176.77V d) 500V

13) In Three phase 120° conduction mode _____.

a) At any instant of time two thyristors are ON

b) Triplen harmonics are absent

c) No possibility of short circuit

d) All above

14) For the large D.C. motor control shown below, if the duty cycle of chopper circuit is reduces then _____.

a) Motor speed will increases

b) Motor speed will decrease

c) The speed will not be effected

d) Frequency of inverter output will decrease

SLR-QH-416

Seat No.	

Set P

Fourth. Y. (B.Tech.) (Electronics Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Power Electronics (BTN04702)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data whenever necessary.

Section – I

Q.2 Solve any four. **16**

a) Analyze VI Characteristics of thyristors.

b) A single phase fully controlled rectifier supplies an inductive load. Assuming I_L is constant 10A. Determine Average DC voltage and supply rms current if supply voltage is 230V, 50Hz and firing angle is 40°.

c) Derive an expression of average dc output voltage of single phase half wave controlled rectifier with resistive load. Draw associated waveforms.

d) A three phase semiconverter is operated from three phase 440V 60Hz mains supply and delivers power to sufficiently large inductive load having resistance of 20Ω. If it is required that average output voltage should be 40% of maximum possible voltage. Calculate
i) Firing angle
ii) Average dc load voltage

e) Derive an exp for Avg voltage for three phases fully wave controlled rectifier with inductive load. Sketch associated waveforms for $\alpha = 90^0$.

Q.3 Solve any two. **12**

a) What do you meant by forced commutation? Elaborate the process of commutation in class D auxiliary commutation. Sketch associated waveforms.

b) Derive an exp for average load voltage and RMS Voltage for single phase fully controlled bridge rectifier with resistive load. Sketch associated waveforms for $\alpha = 60^0$.

c) Design microcontroller based firing scheme for Three phase fully controlled rectifiers.

Section – II

Q.4 Solve any four. **16**

a) Design the control scheme for three phase cycloconverter.

b) Derive an expression for the average output voltage in terms of input dc voltage & duty cycle for step-up chopper. Sketch associated waveform.

c) Elaborate the process of commutation of main thyristor in Jones chopper with associated voltage and current waveform.

d) Explain operation of single phase half bridge voltage source inverter with inductive load. Draw associate waveforms.

e) Explain operation of basic parallel inverter. Draw associate waveforms.

Q.5 Solve any two. **12**

a) Elaborate the process of commutation in voltage commutated chopper with associated voltage and current waveform as a function of time.

b) Derive an expression of RMS output voltage for single pulse modulation technique. Prove that to eliminate n^{th} harmonic component from output voltage pulse width should be $2\pi/n$.

c) With suitable block diagram analyze the speed control of AC drive using fuzzy logic controller.

Seat No.	

Set Q

Fourth. Y. (B.Tech.) (Electronics Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Power Electronics (BTN04702)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Choose the correct answer. 14

1) The average value of the output voltage in a step - down dc chopper is given by _____.
a) $V_0 = V_s$ b) $V_0 = K\,V_s$
c) $V_0 = \mathrm{V}_s / \mathrm{K}$ d) $V_0 = \mathrm{V}_s / (1 - \mathrm{K})$

2) Class A and Class B choppers are _____.
a) Two quadrant converters b) Three quadrant converters
c) Single quadrant converters d) None

3) In thyristor dc chopper _____ type of commutation result in best performance.
a) Voltage commutation b) Current commutation
c) Load Commutation d) Supply commutation

4) A three phase to three cycloconverter using 3-pulse converter uses ___.
a) 6 SCR's b) 12 SCR's
c) 24 SCR's d) 18 SCR's

5) In single phase full bridge inverter has dc input voltage is 250V, RMS output voltage will be _____
a) 250V b) 125V
c) 176.77V d) 500V

6) In Three phase 120° conduction mode _____.
a) At any instant of time two thyristors are ON
b) Triplen harmonics are absent
c) No possibility of short circuit
d) All above

7) For the large D.C. motor control shown below, if the duty cycle of chopper circuit is reduces then _____.

a) Motor speed will increases
b) Motor speed will decrease
c) The speed will not be effected
d) Frequency of inverter output will decrease

8) Inductor is connected in series with the thyristor to _____.

a) reduce dv/dt across it
b) protect against di/dt
c) protect over voltage
d) trigger thyristor

9) Thyristor is a _____.

a) Latching device
b) Un-controlled device
c) Latch proof device
d) Voltage controlled device

10) Class D commutation is _____.

a) Auxiliary commutation technique
b) Load commutation technique
c) Current commutation technique
d) Complementary commutation technique

11) A converter which can operate as 3 pulse converter is a _____.

a) 3-phase half wave
b) 3-phase full-converter
c) 1-phase semi converter
d) 1-phase dual converter

12) Three phase full wave bridge converter with inductive load acts as _____.

a) Single quadrant converter
b) Two quadrant converters
c) Three quadrant converters
d) Four quadrant converters

13) A six pulse thyristorized controlled rectifier is connected to a balanced 50 Hz three phase ac source. Output ripple frequency will be _____.

a) 100 Hz
b) 150 Hz
c) 250 Hz
d) 300 Hz

14) In Three phase full controlled bridge rectifier PIV across any thyristor is _____

a) $\sqrt{2}\,V_m$
b) $\sqrt{3}\,V_m$
c) V_m
d) $\sqrt{3}\,V_{LL}$

SLR-QH-416

Seat No.	

Set Q

Fourth. Y. (B.Tech.) (Electronics Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Power Electronics (BTN04702)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data whenever necessary.

Section – I

Q.2 Solve any four. **16**

a) Analyze VI Characteristics of thyristors.

b) A single phase fully controlled rectifier supplies an inductive load. Assuming I_L is constant 10A. Determine Average DC voltage and supply rms current if supply voltage is 230V, 50Hz and firing angle is 40°.

c) Derive an expression of average dc output voltage of single phase half wave controlled rectifier with resistive load. Draw associated waveforms.

d) A three phase semiconverter is operated from three phase 440V 60Hz mains supply and delivers power to sufficiently large inductive load having resistance of 20Ω. If it is required that average output voltage should be 40% of maximum possible voltage. Calculate
i) Firing angle
ii) Average dc load voltage

e) Derive an exp for Avg voltage for three phases fully wave controlled rectifier with inductive load. Sketch associated waveforms for $\alpha = 90^0$.

Q.3 Solve any two. **12**

a) What do you meant by forced commutation? Elaborate the process of commutation in class D auxiliary commutation. Sketch associated waveforms.

b) Derive an exp for average load voltage and RMS Voltage for single phase fully controlled bridge rectifier with resistive load. Sketch associated waveforms for $\alpha = 60^0$.

c) Design microcontroller based firing scheme for Three phase fully controlled rectifiers.

Section – II

Q.4 Solve any four. **16**

a) Design the control scheme for three phase cycloconverter.

b) Derive an expression for the average output voltage in terms of input dc voltage & duty cycle for step-up chopper. Sketch associated waveform.

c) Elaborate the process of commutation of main thyristor in Jones chopper with associated voltage and current waveform.

d) Explain operation of single phase half bridge voltage source inverter with inductive load. Draw associate waveforms.

e) Explain operation of basic parallel inverter. Draw associate waveforms.

Q.5 Solve any two. **12**

a) Elaborate the process of commutation in voltage commutated chopper with associated voltage and current waveform as a function of time.

b) Derive an expression of RMS output voltage for single pulse modulation technique. Prove that to eliminate n^{th} harmonic component from output voltage pulse width should be $2\pi/n$.

c) With suitable block diagram analyze the speed control of AC drive using fuzzy logic controller.

Seat No.	

Set **R**

Fourth. Y. (B.Tech.) (Electronics Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Power Electronics (BTN04702)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Choose the correct answer. 14

1) A three phase to three cycloconverter using 3-pulse converter uses ___.
a) 6 SCR's b) 12 SCR's
c) 24 SCR's d) 18 SCR's

2) In single phase full bridge inverter has dc input voltage is 250V, RMS output voltage will be _____
a) 250V b) 125V
c) 176.77V d) 500V

3) In Three phase 120° conduction mode _____.
a) At any instant of time two thyristors are ON
b) Triplen harmonics are absent
c) No possibility of short circuit
d) All above

4) For the large D.C. motor control shown below, if the duty cycle of chopper circuit is reduces then _____.

a) Motor speed will increases
b) Motor speed will decrease
c) The speed will not be effected
d) Frequency of inverter output will decrease

5) Inductor is connected in series with the thyristor to _____.
a) reduce dv/dt across it b) protect against di/dt
c) protect over voltage d) trigger thyristor

6) Thyristor is a _____.
a) Latching device
b) Un-controlled device
c) Latch proof device
d) Voltage controlled device

7) Class D commutation is _____.
a) Auxiliary commutation technique
b) Load commutation technique
c) Current commutation technique
d) Complementary commutation technique

8) A converter which can operate as 3 pulse converter is a _____.
a) 3-phase half wave
b) 3-phase full-converter
c) 1-phase semi converter
d) 1-phase dual converter

9) Three phase full wave bridge converter with inductive load acts as _____.
a) Single quadrant converter
b) Two quadrant converters
c) Three quadrant converters
d) Four quadrant converters

10) A six pulse thyristorized controlled rectifier is connected to a balanced 50 Hz three phase ac source. Output ripple frequency will be _____.
a) 100 Hz
b) 150 Hz
c) 250 Hz
d) 300 Hz

11) In Three phase full controlled bridge rectifier PIV across any thyristor is _____
a) $\sqrt{2}\,V_m$
b) $\sqrt{3}\,V_m$
c) V_m
d) $\sqrt{3}\,V_{LL}$

12) The average value of the output voltage in a step - down dc chopper is given by _____.
a) $V_0 = V_s$
b) $V_0 = K\,V_s$
c) $V_0 = \mathrm{V}_s / \mathrm{K}$
d) $V_0 = \mathrm{V}_s / (1 - \mathrm{K})$

13) Class A and Class B choppers are _____.
a) Two quadrant converters
b) Three quadrant converters
c) Single quadrant converters
d) None

14) In thyristor dc chopper _____ type of commutation result in best performance.
a) Voltage commutation
b) Current commutation
c) Load Commutation
d) Supply commutation

Seat No.	

Set R

Fourth. Y. (B.Tech.) (Electronics Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Power Electronics (BTN04702)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data whenever necessary.

Section – I

Q.2 Solve any four. **16**

a) Analyze VI Characteristics of thyristors.

b) A single phase fully controlled rectifier supplies an inductive load. Assuming I_L is constant 10A. Determine Average DC voltage and supply rms current if supply voltage is 230V, 50Hz and firing angle is 40°.

c) Derive an expression of average dc output voltage of single phase half wave controlled rectifier with resistive load. Draw associated waveforms.

d) A three phase semiconverter is operated from three phase 440V 60Hz mains supply and delivers power to sufficiently large inductive load having resistance of 20Ω. If it is required that average output voltage should be 40% of maximum possible voltage. Calculate
i) Firing angle
ii) Average dc load voltage

e) Derive an exp for Avg voltage for three phases fully wave controlled rectifier with inductive load. Sketch associated waveforms for $\alpha = 90^0$.

Q.3 Solve any two. **12**

a) What do you meant by forced commutation? Elaborate the process of commutation in class D auxiliary commutation. Sketch associated waveforms.

b) Derive an exp for average load voltage and RMS Voltage for single phase fully controlled bridge rectifier with resistive load. Sketch associated waveforms for $\alpha = 60^0$.

c) Design microcontroller based firing scheme for Three phase fully controlled rectifiers.

Section – II

Q.4 Solve any four. **16**

a) Design the control scheme for three phase cycloconverter.

b) Derive an expression for the average output voltage in terms of input dc voltage & duty cycle for step-up chopper. Sketch associated waveform.

c) Elaborate the process of commutation of main thyristor in Jones chopper with associated voltage and current waveform.

d) Explain operation of single phase half bridge voltage source inverter with inductive load. Draw associate waveforms.

e) Explain operation of basic parallel inverter. Draw associate waveforms.

Q.5 Solve any two. **12**

a) Elaborate the process of commutation in voltage commutated chopper with associated voltage and current waveform as a function of time.

b) Derive an expression of RMS output voltage for single pulse modulation technique. Prove that to eliminate n^{th} harmonic component from output voltage pulse width should be $2\pi/n$.

c) With suitable block diagram analyze the speed control of AC drive using fuzzy logic controller.

Seat No.		Set	S

Fourth. Y. (B.Tech.) (Electronics Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Power Electronics (BTN04702)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Choose the correct answer. **14**

1) A six pulse thyristorized controlled rectifier is connected to a balanced 50 Hz three phase ac source. Output ripple frequency will be _____.
a) 100 Hz b) 150 Hz
c) 250 Hz d) 300 Hz

2) In Three phase full controlled bridge rectifier PIV across any thyristor is _____
a) $\sqrt{2}\,V_m$ b) $\sqrt{3}\,V_m$
c) V_m d) $\sqrt{3}\,V_{LL}$

3) The average value of the output voltage in a step - down dc chopper is given by _____.
a) $V_0 = V_s$ b) $V_0 = K\,V_s$
c) $V_0 = \mathrm{V}_s / \mathrm{K}$ d) $V_0 = \mathrm{V}_s / (1 - \mathrm{K})$

4) Class A and Class B choppers are _____.
a) Two quadrant converters b) Three quadrant converters
c) Single quadrant converters d) None

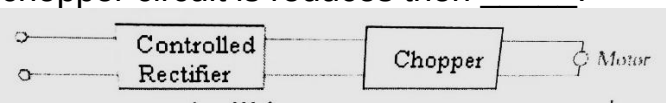
5) In thyristor dc chopper _____ type of commutation result in best performance.
a) Voltage commutation b) Current commutation
c) Load Commutation d) Supply commutation

6) A three phase to three cycloconverter using 3-pulse converter uses ___.
a) 6 SCR's
b) 12 SCR's
c) 24 SCR's
d) 18 SCR's

7) In single phase full bridge inverter has dc input voltage is 250V, RMS output voltage will be _____
a) 250V
b) 125V
c) 176.77V
d) 500V

8) In Three phase 120° conduction mode _____.
a) At any instant of time two thyristors are ON
b) Triplen harmonics are absent
c) No possibility of short circuit
d) All above

9) For the large D.C. motor control shown below, if the duty cycle of chopper circuit is reduces then _____.



a) Motor speed will increases
b) Motor speed will decrease
c) The speed will not be effected
d) Frequency of inverter output will decrease

10) Inductor is connected in series with the thyristor to _____.
a) reduce dv/dt across it
b) protect against di/dt
c) protect over voltage
d) trigger thyristor

11) Thyristor is a _____.
a) Latching device
b) Un-controlled device
c) Latch proof device
d) Voltage controlled device

12) Class D commutation is _____.
a) Auxiliary commutation technique
b) Load commutation technique
c) Current commutation technique
d) Complementary commutation technique

13) A converter which can operate as 3 pulse converter is a _____.
a) 3-phase half wave
b) 3-phase full-converter
c) 1-phase semi converter
d) 1-phase dual converter

14) Three phase full wave bridge converter with inductive load acts as _____.
a) Single quadrant converter
b) Two quadrant converters
c) Three quadrant converters
d) Four quadrant converters

SLR-QH-416

Seat No.		Set	S

Fourth. Y. (B.Tech.) (Electronics Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Power Electronics (BTN04702)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data whenever necessary.

Section – I

Q.2 Solve any four. **16**

a) Analyze VI Characteristics of thyristors.

b) A single phase fully controlled rectifier supplies an inductive load. Assuming I_L is constant 10A. Determine Average DC voltage and supply rms current if supply voltage is 230V, 50Hz and firing angle is 40°.

c) Derive an expression of average dc output voltage of single phase half wave controlled rectifier with resistive load. Draw associated waveforms.

d) A three phase semiconverter is operated from three phase 440V 60Hz mains supply and delivers power to sufficiently large inductive load having resistance of 20Ω. If it is required that average output voltage should be 40% of maximum possible voltage. Calculate
i) Firing angle
ii) Average dc load voltage

e) Derive an exp for Avg voltage for three phases fully wave controlled rectifier with inductive load. Sketch associated waveforms for $\alpha = 90^0$.

Q.3 Solve any two. **12**

a) What do you meant by forced commutation? Elaborate the process of commutation in class D auxiliary commutation. Sketch associated waveforms.

b) Derive an exp for average load voltage and RMS Voltage for single phase fully controlled bridge rectifier with resistive load. Sketch associated waveforms for $\alpha = 60^0$.

c) Design microcontroller based firing scheme for Three phase fully controlled rectifiers.

Section – II

Q.4 Solve any four. **16**

a) Design the control scheme for three phase cycloconverter.

b) Derive an expression for the average output voltage in terms of input dc voltage & duty cycle for step-up chopper. Sketch associated waveform.

c) Elaborate the process of commutation of main thyristor in Jones chopper with associated voltage and current waveform.

d) Explain operation of single phase half bridge voltage source inverter with inductive load. Draw associate waveforms.

e) Explain operation of basic parallel inverter. Draw associate waveforms.

Q.5 Solve any two. **12**

a) Elaborate the process of commutation in voltage commutated chopper with associated voltage and current waveform as a function of time.

b) Derive an expression of RMS output voltage for single pulse modulation technique. Prove that to eliminate n^{th} harmonic component from output voltage pulse width should be $2\pi/n$.

c) With suitable block diagram analyze the speed control of AC drive using fuzzy logic controller.

SLR-QH-417

Seat No.		Set	P

Fourth. Y. (B.Tech.) (Electronics Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Mobile Technology (BTN04703)

Day & Date: Thursday, 07-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Multiple choice question. **14**

1) Wireless communication is the transfer of _____ between two or more points that are not connected by an electrical conductor.
a) Information b) Power
c) Both a & b d) None of above

2) Universal Frequency Reuse is a property of _____.
a) GSM b) CDMA
c) both GSM & CDMA d) None of above

3) What is the dimension of object as compared to wavelength of propagating wave when reflection occurs?
a) Small b) Same
c) Very small d) Large

4) What is the set of possible carrier frequencies in FH-SS?
a) Hop b) Hopset
c) Symbols d) Chips

5) In a GSM system, handover between BTS belonging to the same BSC are handled by _____.
a) BTS b) BSC
c) mobile station d) None of above

6) A GSM frame is of _____.
a) 577 μsec b) 4.615 msec
c) 577 msec d) 4.615 μsec

7) For a cellular system, if there are N cells and each cell is allocated k channel. What is the total number of available radio channels, S?
a) S=k*N b) S=k/N
c) S=N/k d) S=k+N

8) The main advantage(s) of infra-red technology _____.
a) simple b) cheap
c) no license d) All of above

9) Spread spectrum is _____ technique.
a) decoding b) encoding
c) both encoding and decoding d) None of mentioned

10) Chips are the _____.
a) Repeated symbols b) Non repeated symbols
c) Smallest length symbols d) None of the mentioned

11) Interference on voice channels causes _____.
a) Blocked calls b) Cross talk
c) Queuing d) Missed calls

12) The smallest building block of a wireless LAN is _____.
a) Unit server set b) Unit service set
c) Basic server set d) Basic service set

13) A GPRS Core network is part of System in a GSM Network Structure?
a) Mobile Station b) BSS
c) MSS d) NSS

14) The frequency band of Bluetooth radio is around _____.
a) 2.1GHz b) 2.2GHz
c) 2.4GHz d) 3.3GHz

Seat No.	

Set **P**

Fourth. Y. (B.Tech.) (Electronics Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Mobile Technology (BTN04703)

Day & Date: Thursday, 07-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

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

SECTION – I

Q.2 Answer Any FOUR. **16**

a) Discuss fixed and dynamic channel assignment strategy with its pros and cons.

b) Define the terms cluster size, frequency reuse factor and total capacity of mobile networks. Explain frequency planning in cellular networks.

c) Consider the chip sequence of 100001, demonstrate operation at transmitter and receiver for 4-bit data 1010 communication using DSSS.

d) Compare CDMA and GSM mobile technologies.

e) Explain call origination operation in GSM system.

Q.3 Answer any TWO. **12**

a) Draw GSM architecture and describe its functionality. List the objectives of GSM system.

b) Discuss GPRS architecture for packet data access in GSM.

c) Explain in detail following terms related to wireless communication-
i) Propagation
ii) Fading
iii) Shadowing

SECTION – II

Q.4 Answer any FOUR. **16**

a) Differentiate between Bluetooth and wireless PAN standard.

b) What is Hidden & Exposed Terminal Problem? How exposed station problem can be solved?

c) What is agent discovery? Why is it required? Explain agent discovery packet.

d) What is tunneling? What is its requirement.

e) How does mobile IP work?

Q.5 Answer any TWO. **12**

a) Describe IEEE 802.11 architecture and explain its operation.

b) Draw protocol stack of Bluetooth and describe its operation.

c) How is packet data handled in GSM? Specify mechanism used for packet data communication in GSM.

Seat No.	

Set **Q**

Fourth. Y. (B.Tech.) (Electronics Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Mobile Technology (BTN04703)

Day & Date: Thursday, 07-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

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

Duration: 30 Minutes Marks: 14

Q.1 Multiple choice question. **14**

1) The main advantage(s) of infra-red technology _____.
a) simple b) cheap
c) no license d) All of above

2) Spread spectrum is _____ technique.
a) decoding b) encoding
c) both encoding and decoding d) None of mentioned

3) Chips are the _____.
a) Repeated symbols b) Non repeated symbols
c) Smallest length symbols d) None of the mentioned

4) Interference on voice channels causes _____.
a) Blocked calls b) Cross talk
c) Queuing d) Missed calls

5) The smallest building block of a wireless LAN is _____.
a) Unit server set b) Unit service set
c) Basic server set d) Basic service set

6) A GPRS Core network is part of System in a GSM Network Structure?
a) Mobile Station b) BSS
c) MSS d) NSS

7) The frequency band of Bluetooth radio is around _____.
a) 2.1GHz b) 2.2GHz
c) 2.4GHz d) 3.3GHz

8) Wireless communication is the transfer of _____ between two or more points that are not connected by an electrical conductor.
a) Information b) Power
c) Both a & b d) None of above

9) Universal Frequency Reuse is a property of _____.

a) GSM
b) CDMA
c) both GSM & CDMA
d) None of above

10) What is the dimension of object as compared to wavelength of propagating wave when reflection occurs?

a) Small
b) Same
c) Very small
d) Large

11) What is the set of possible carrier frequencies in FH-SS?

a) Hop
b) Hopset
c) Symbols
d) Chips

12) In a GSM system, handover between BTS belonging to the same BSC are handled by _____.

a) BTS
b) BSC
c) mobile station
d) None of above

13) A GSM frame is of _____.

a) 577 μsec
b) 4.615 msec
c) 577 msec
d) 4.615 μsec

14) For a cellular system, if there are N cells and each cell is allocated k channel. What is the total number of available radio channels, S?

a) S=k*N
b) S=k/N
c) S=N/k
d) S=k+N

Seat No.	

Set **Q**

Fourth. Y. (B.Tech.) (Electronics Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Mobile Technology (BTN04703)

Day & Date: Thursday, 07-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

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

SECTION – I

Q.2 Answer Any FOUR. **16**

a) Discuss fixed and dynamic channel assignment strategy with its pros and cons.

b) Define the terms cluster size, frequency reuse factor and total capacity of mobile networks. Explain frequency planning in cellular networks.

c) Consider the chip sequence of 100001, demonstrate operation at transmitter and receiver for 4-bit data 1010 communication using DSSS.

d) Compare CDMA and GSM mobile technologies.

e) Explain call origination operation in GSM system.

Q.3 Answer any TWO. **12**

a) Draw GSM architecture and describe its functionality. List the objectives of GSM system.

b) Discuss GPRS architecture for packet data access in GSM.

c) Explain in detail following terms related to wireless communication-
i) Propagation
ii) Fading
iii) Shadowing

SECTION – II

Q.4 Answer any FOUR. **16**

a) Differentiate between Bluetooth and wireless PAN standard.

b) What is Hidden & Exposed Terminal Problem? How exposed station problem can be solved?

c) What is agent discovery? Why is it required? Explain agent discovery packet.

d) What is tunneling? What is its requirement.

e) How does mobile IP work?

Q.5 Answer any TWO. **12**

a) Describe IEEE 802.11 architecture and explain its operation.

b) Draw protocol stack of Bluetooth and describe its operation.

c) How is packet data handled in GSM? Specify mechanism used for packet data communication in GSM.

Seat No.	

Set R

Fourth. Y. (B.Tech.) (Electronics Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Mobile Technology (BTN04703)

Day & Date: Thursday, 07-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Multiple choice question. **14**

1) Interference on voice channels causes _____.
a) Blocked calls b) Cross talk
c) Queuing d) Missed calls

2) The smallest building block of a wireless LAN is _____.
a) Unit server set b) Unit service set
c) Basic server set d) Basic service set

3) A GPRS Core network is part of System in a GSM Network Structure?
a) Mobile Station b) BSS
c) MSS d) NSS

4) The frequency band of Bluetooth radio is around _____.
a) 2.1GHz b) 2.2GHz
c) 2.4GHz d) 3.3GHz

5) Wireless communication is the transfer of _____ between two or more points that are not connected by an electrical conductor.
a) Information b) Power
c) Both a & b d) None of above

6) Universal Frequency Reuse is a property of _____.
a) GSM b) CDMA
c) both GSM & CDMA d) None of above

7) What is the dimension of object as compared to wavelength of propagating wave when reflection occurs?
a) Small b) Same
c) Very small d) Large

8) What is the set of possible carrier frequencies in FH-SS?
a) Hop
b) Hopset
c) Symbols
d) Chips

9) In a GSM system, handover between BTS belonging to the same BSC are handled by _____.
a) BTS
b) BSC
c) mobile station
d) None of above

10) A GSM frame is of _____.
a) 577 μsec
b) 4.615 msec
c) 577 msec
d) 4.615 μsec

11) For a cellular system, if there are N cells and each cell is allocated k channel. What is the total number of available radio channels, S?
a) S=k*N
b) S=k/N
c) S=N/k
d) S=k+N

12) The main advantage(s) of infra-red technology _____.
a) simple
b) cheap
c) no license
d) All of above

13) Spread spectrum is _____ technique.
a) decoding
b) encoding
c) both encoding and decoding
d) None of mentioned

14) Chips are the _____.
a) Repeated symbols
b) Non repeated symbols
c) Smallest length symbols
d) None of the mentioned

Seat No.	

Set **R**

Fourth. Y. (B.Tech.) (Electronics Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Mobile Technology (BTN04703)

Day & Date: Thursday, 07-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

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

SECTION – I

Q.2 Answer Any FOUR. **16**

a) Discuss fixed and dynamic channel assignment strategy with its pros and cons.

b) Define the terms cluster size, frequency reuse factor and total capacity of mobile networks. Explain frequency planning in cellular networks.

c) Consider the chip sequence of 100001, demonstrate operation at transmitter and receiver for 4-bit data 1010 communication using DSSS.

d) Compare CDMA and GSM mobile technologies.

e) Explain call origination operation in GSM system.

Q.3 Answer any TWO. **12**

a) Draw GSM architecture and describe its functionality. List the objectives of GSM system.

b) Discuss GPRS architecture for packet data access in GSM.

c) Explain in detail following terms related to wireless communication-
i) Propagation
ii) Fading
iii) Shadowing

SECTION – II

Q.4 Answer any FOUR. **16**

a) Differentiate between Bluetooth and wireless PAN standard.

b) What is Hidden & Exposed Terminal Problem? How exposed station problem can be solved?

c) What is agent discovery? Why is it required? Explain agent discovery packet.

d) What is tunneling? What is its requirement.

e) How does mobile IP work?

Q.5 Answer any TWO. **12**

a) Describe IEEE 802.11 architecture and explain its operation.

b) Draw protocol stack of Bluetooth and describe its operation.

c) How is packet data handled in GSM? Specify mechanism used for packet data communication in GSM.

Seat No.	

Set **S**

Fourth. Y. (B.Tech.) (Electronics Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Mobile Technology (BTN04703)

Day & Date: Thursday, 07-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Multiple choice question. **14**

1) A GSM frame is of _____.
a) 577 μsec b) 4.615 msec
c) 577 msec d) 4.615 μsec

2) For a cellular system, if there are N cells and each cell is allocated k channel. What is the total number of available radio channels, S?
a) S=k*N b) S=k/N
c) S=N/k d) S=k+N

3) The main advantage(s) of infra-red technology _____.
a) simple b) cheap
c) no license d) All of above

4) Spread spectrum is _____ technique.
a) decoding b) encoding
c) both encoding and decoding d) None of mentioned

5) Chips are the _____.
a) Repeated symbols b) Non repeated symbols
c) Smallest length symbols d) None of the mentioned

6) Interference on voice channels causes _____.
a) Blocked calls b) Cross talk
c) Queuing d) Missed calls

7) The smallest building block of a wireless LAN is _____.
a) Unit server set b) Unit service set
c) Basic server set d) Basic service set

8) A GPRS Core network is part of System in a GSM Network Structure?
a) Mobile Station b) BSS
c) MSS d) NSS

9) The frequency band of Bluetooth radio is around _____.
a) 2.1GHz b) 2.2GHz
c) 2.4GHz d) 3.3GHz

10) Wireless communication is the transfer of _____ between two or more points that are not connected by an electrical conductor.
a) Information b) Power
c) Both a & b d) None of above

11) Universal Frequency Reuse is a property of _____.
a) GSM b) CDMA
c) both GSM & CDMA d) None of above

12) What is the dimension of object as compared to wavelength of propagating wave when reflection occurs?
a) Small b) Same
c) Very small d) Large

13) What is the set of possible carrier frequencies in FH-SS?
a) Hop b) Hopset
c) Symbols d) Chips

14) In a GSM system, handover between BTS belonging to the same BSC are handled by _____.
a) BTS b) BSC
c) mobile station d) None of above

SLR-QH-417

Seat No.	

Set S

Fourth. Y. (B.Tech.) (Electronics Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Mobile Technology (BTN04703)

Day & Date: Thursday, 07-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

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

SECTION – I

Q.2 Answer Any FOUR. **16**

a) Discuss fixed and dynamic channel assignment strategy with its pros and cons.

b) Define the terms cluster size, frequency reuse factor and total capacity of mobile networks. Explain frequency planning in cellular networks.

c) Consider the chip sequence of 100001, demonstrate operation at transmitter and receiver for 4-bit data 1010 communication using DSSS.

d) Compare CDMA and GSM mobile technologies.

e) Explain call origination operation in GSM system.

Q.3 Answer any TWO. **12**

a) Draw GSM architecture and describe its functionality. List the objectives of GSM system.

b) Discuss GPRS architecture for packet data access in GSM.

c) Explain in detail following terms related to wireless communication-
i) Propagation
ii) Fading
iii) Shadowing

SECTION – II

Q.4 Answer any FOUR. **16**

a) Differentiate between Bluetooth and wireless PAN standard.

b) What is Hidden & Exposed Terminal Problem? How exposed station problem can be solved?

c) What is agent discovery? Why is it required? Explain agent discovery packet.

d) What is tunneling? What is its requirement.

e) How does mobile IP work?

Q.5 Answer any TWO. **12**

a) Describe IEEE 802.11 architecture and explain its operation.

b) Draw protocol stack of Bluetooth and describe its operation.

c) How is packet data handled in GSM? Specify mechanism used for packet data communication in GSM.

SLR-QH-418

Seat No.	

Set P

Fourth. Y. (B.Tech.) (Electronics Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
CMOS VLSI Design (BTN04706)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Choose the correct Answer. **14**

1) What is the condition for linear region?
a) V_{gs} lesser than V_t b) V_{gs} greater than V_t
c) V_{ds} lesser than V_{gs} d) V_{ds} greater than V_{gs}

2) As source drain voltage increases, channel depth _____.
a) increases b) decreases
c) logarithmically increases d) exponentially increases

3) Gate area can be given as _____.
a) L/W b) L * W
c) 2L/W d) L/2W

4) The overall delay is _____ to the relative resistance r.
a) directly proportional b) inversely proportional
c) exponentially proportional d) not dependent

5) Increase in switching speed _____ the noise problems.
a) increases b) decreases
c) remains same d) None of these

6) To design 3 input NOR Gate using CMOS Logic _____ number of Transistors are required if input signal is available in double rail format.
a) 4 b) 6
c) 8 d) 10

7) To design 3 input NAND Gate using Ratioed Logic _____ number of Transistors are required if inputs are available in double rail format.
a) 4 b) 5
c) 6 d) 8

8) A stored value remains valid as long as supply voltage is applied to the circuit is known as _____ storage device.
a) Dynamic b) Bistable
c) Static d) None of these

9) The _____ circuit store a charge on parasitic capacitor for temporary basis and it requires a periodic refresh of its stored value.
a) Dynamic b) Bistable
c) Static d) None of these

10) The amount of time the input signal should be stable before the clock edge occurs is called as _____.
a) Dynamic Time b) Static Time
c) Hold Time d) Setup Time

11) A _____ signal is one that has the same frequency but an unknown phase offset with respect to the local clock.
a) Synchronous b) Mesochronous
c) Plesiochronous d) Asynchronous

12) The spatial variation in arrival time of a clock transition on an integrated circuit is commonly referred to as _____.
a) Clock Skew b) Clock Jitter
c) Handshaking d) Normalization

13) For synchronous circuits to solve the clock related to problem _____ is/are the solutions.
a) Clock Distribution
b) Use synchronizers and Arbiters
c) use PLL
d) All of these

14) With 4 bit select lines _____ operations can be performed by ALU.
a) 10 b) 12
c) 16 d) 18

Seat No.	

Set **P**

Fourth. Y. (B.Tech.) (Electronics Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
CMOS VLSI Design (BTN04706)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.
4) Draw neat diagrams.

SECTION – I

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

a) With the help of diagram discuss construction and working of n-MOS also calculate value of β for given parameters of n-MOS transistor designed using Si as W / L ratio is 3.5. oxide layer thickness is 1.15 nm, the electron mobility is 85 sq. cm/V sec. The threshold voltage is 0.3V. The Si specific permittivity is 3.5 and permittivity of free space is $8.85 \times 10^{-14}\ \mathrm{F/cm}$.

b) What do you mean by technology scaling and how it is achieved in MOS transistor design?

c) Draw and Explain CMOS inverter in detail and discuss transfer characteristics.

d) How Dynamic Logic is used in CMOS Design explain using example?

e) What is pass transistor? How it is used in designing CMOS Logic Gate using Example explain?

Q.3 Attempt the following. (Any Two) **12**

a) Briefly explain in detail accumulation, depletion and inversion modes in MOS transistors.

b) Calculate total power dissipation in CMOS inverter for frequency 10 MHz with Static power dissipation of $15\mu\mathrm{W}, \mathrm{VDD} = 3.3\ \mathrm{V}$ and $\mathrm{C} = 30\mathrm{fF}$

c) Design 2 input XOR gate using CMOS Logic and comment on number of transistors required to implement it.

SECTION – II

Q.4 Attempt the following. (Any Four) **16**

a) What is bi-stability Principle? How it is used to design Latch explain using example?

b) What is multiplexer-based latch? Explain the use of multiplexer-based latch to implement D Latch.

c) With the help of diagram explain use of PLL for clock synchronization.

d) What is clock skew and clock jitter? What are the reasons of clock skew and jitter?

e) With the help of circuits explain ALU in detail.

Q.5 Attempt the following. (Any Two) **12**

a) Explain operating principle of True single phase clocked register (TSPCR) with help of diagram.

b) Explain liming classification in interconnect design.

c) With the help of Diagram explain Static RAM implementation.

Seat No.	

Set **Q**

Fourth. Y. (B.Tech.) (Electronics Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
CMOS VLSI Design (BTN04706)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Choose the correct Answer. **14**

1) A stored value remains valid as long as supply voltage is applied to the circuit is known as _____ storage device.
a) Dynamic b) Bistable
c) Static d) None of these

2) The _____ circuit store a charge on parasitic capacitor for temporary basis and it requires a periodic refresh of its stored value.
a) Dynamic b) Bistable
c) Static d) None of these

3) The amount of time the input signal should be stable before the clock edge occurs is called as _____.
a) Dynamic Time b) Static Time
c) Hold Time d) Setup Time

4) A _____ signal is one that has the same frequency but an unknown phase offset with respect to the local clock.
a) Synchronous b) Mesochronous
c) Plesiochronous d) Asynchronous

5) The spatial variation in arrival time of a clock transition on an integrated circuit is commonly referred to as _____.
a) Clock Skew b) Clock Jitter
c) Handshaking d) Normalization

6) For synchronous circuits to solve the clock related to problem _____ is/are the solutions.
a) Clock Distribution
b) Use synchronizers and Arbiters
c) use PLL
d) All of these

7) With 4 bit select lines _____ operations can be performed by ALU.
a) 10 b) 12
c) 16 d) 18

8) What is the condition for linear region?
a) V_{gs} lesser than V_t b) V_{gs} greater than V_t
c) V_{ds} lesser than V_{gs} d) V_{ds} greater than V_{gs}

9) As source drain voltage increases, channel depth _____.
a) increases b) decreases
c) logarithmically increases d) exponentially increases

10) Gate area can be given as _____.
a) L/W b) L * W
c) 2L/W d) L/2W

11) The overall delay is _____ to the relative resistance r.
a) directly proportional b) inversely proportional
c) exponentially proportional d) not dependent

12) Increase in switching speed _____ the noise problems.
a) increases b) decreases
c) remains same d) None of these

13) To design 3 input NOR Gate using CMOS Logic _____ number of Transistors are required if input signal is available in double rail format.
a) 4 b) 6
c) 8 d) 10

14) To design 3 input NAND Gate using Ratioed Logic _____ number of Transistors are required if inputs are available in double rail format.
a) 4 b) 5
c) 6 d) 8

Seat No.	

Set **Q**

Fourth. Y. (B.Tech.) (Electronics Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
CMOS VLSI Design (BTN04706)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.
4) Draw neat diagrams.

SECTION – I

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

a) With the help of diagram discuss construction and working of n-MOS also calculate value of β for given parameters of n-MOS transistor designed using Si as W / L ratio is 3.5. oxide layer thickness is 1.15 nm, the electron mobility is 85 sq. cm/V sec. The threshold voltage is 0.3V. The Si specific permittivity is 3.5 and permittivity of free space is $8.85 \times 10^{-14}\ \mathrm{F/cm}$.

b) What do you mean by technology scaling and how it is achieved in MOS transistor design?

c) Draw and Explain CMOS inverter in detail and discuss transfer characteristics.

d) How Dynamic Logic is used in CMOS Design explain using example?

e) What is pass transistor? How it is used in designing CMOS Logic Gate using Example explain?

Q.3 Attempt the following. (Any Two) **12**

a) Briefly explain in detail accumulation, depletion and inversion modes in MOS transistors.

b) Calculate total power dissipation in CMOS inverter for frequency 10 MHz with Static power dissipation of $15\mu\mathrm{W}, \mathrm{VDD} = 3.3\ \mathrm{V}$ and $\mathrm{C} = 30\mathrm{fF}$

c) Design 2 input XOR gate using CMOS Logic and comment on number of transistors required to implement it.

SECTION – II

Q.4 Attempt the following. (Any Four) **16**

a) What is bi-stability Principle? How it is used to design Latch explain using example?

b) What is multiplexer-based latch? Explain the use of multiplexer-based latch to implement D Latch.

c) With the help of diagram explain use of PLL for clock synchronization.

d) What is clock skew and clock jitter? What are the reasons of clock skew and jitter?

e) With the help of circuits explain ALU in detail.

Q.5 Attempt the following. (Any Two) **12**

a) Explain operating principle of True single phase clocked register (TSPCR) with help of diagram.

b) Explain liming classification in interconnect design.

c) With the help of Diagram explain Static RAM implementation.

Seat No.	

Set **R**

Fourth. Y. (B.Tech.) (Electronics Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
CMOS VLSI Design (BTN04706)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Choose the correct Answer. **14**

1) A _____ signal is one that has the same frequency but an unknown phase offset with respect to the local clock.
a) Synchronous b) Mesochronous
c) Plesiochronous d) Asynchronous

2) The spatial variation in arrival time of a clock transition on an integrated circuit is commonly referred to as _____.
a) Clock Skew b) Clock Jitter
c) Handshaking d) Normalization

3) For synchronous circuits to solve the clock related to problem _____ is/are the solutions.
a) Clock Distribution
b) Use synchronizers and Arbiters
c) use PLL
d) All of these

4) With 4 bit select lines _____ operations can be performed by ALU.
a) 10 b) 12
c) 16 d) 18

5) What is the condition for linear region?
a) V_{gs} lesser than V_t b) V_{gs} greater than V_t
c) V_{ds} lesser than V_{gs} d) V_{ds} greater than V_{gs}

6) As source drain voltage increases, channel depth _____.
a) increases b) decreases
c) logarithmically increases d) exponentially increases

7) Gate area can be given as _____.
a) L/W b) L * W
c) 2L/W d) L/2W

8) The overall delay is _____ to the relative resistance r.
a) directly proportional b) inversely proportional
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9) Increase in switching speed _____ the noise problems.
a) increases b) decreases
c) remains same d) None of these

10) To design 3 input NOR Gate using CMOS Logic _____ number of Transistors are required if input signal is available in double rail format.
a) 4 b) 6
c) 8 d) 10

11) To design 3 input NAND Gate using Ratioed Logic _____ number of Transistors are required if inputs are available in double rail format.
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a) Dynamic b) Bistable
c) Static d) None of these

13) The _____ circuit store a charge on parasitic capacitor for temporary basis and it requires a periodic refresh of its stored value.
a) Dynamic b) Bistable
c) Static d) None of these

14) The amount of time the input signal should be stable before the clock edge occurs is called as _____.
a) Dynamic Time b) Static Time
c) Hold Time d) Setup Time

Seat No.	

Set **R**

Fourth. Y. (B.Tech.) (Electronics Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
CMOS VLSI Design (BTN04706)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.
4) Draw neat diagrams.

SECTION – I

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

a) With the help of diagram discuss construction and working of n-MOS also calculate value of β for given parameters of n-MOS transistor designed using Si as W / L ratio is 3.5. oxide layer thickness is 1.15 nm, the electron mobility is 85 sq. cm/V sec. The threshold voltage is 0.3V. The Si specific permittivity is 3.5 and permittivity of free space is $8.85 \times 10^{-14}\ \mathrm{F/cm}$.

b) What do you mean by technology scaling and how it is achieved in MOS transistor design?

c) Draw and Explain CMOS inverter in detail and discuss transfer characteristics.

d) How Dynamic Logic is used in CMOS Design explain using example?

e) What is pass transistor? How it is used in designing CMOS Logic Gate using Example explain?

Q.3 Attempt the following. (Any Two) **12**

a) Briefly explain in detail accumulation, depletion and inversion modes in MOS transistors.

b) Calculate total power dissipation in CMOS inverter for frequency 10 MHz with Static power dissipation of $15\mu\mathrm{W}, \mathrm{VDD} = 3.3\ \mathrm{V}$ and $\mathrm{C} = 30\mathrm{fF}$

c) Design 2 input XOR gate using CMOS Logic and comment on number of transistors required to implement it.

SECTION – II

Q.4 Attempt the following. (Any Four) **16**

a) What is bi-stability Principle? How it is used to design Latch explain using example?

b) What is multiplexer-based latch? Explain the use of multiplexer-based latch to implement D Latch.

c) With the help of diagram explain use of PLL for clock synchronization.

d) What is clock skew and clock jitter? What are the reasons of clock skew and jitter?

e) With the help of circuits explain ALU in detail.

Q.5 Attempt the following. (Any Two) **12**

a) Explain operating principle of True single phase clocked register (TSPCR) with help of diagram.

b) Explain liming classification in interconnect design.

c) With the help of Diagram explain Static RAM implementation.

Seat No.		Set	S

Fourth. Y. (B.Tech.) (Electronics Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
CMOS VLSI Design (BTN04706)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Choose the correct Answer. 14

1) To design 3 input NOR Gate using CMOS Logic _____ number of Transistors are required if input signal is available in double rail format.
a) 4 b) 6
c) 8 d) 10

2) To design 3 input NAND Gate using Ratioed Logic _____ number of Transistors are required if inputs are available in double rail format.
a) 4 b) 5
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3) A stored value remains valid as long as supply voltage is applied to the circuit is known as _____ storage device.
a) Dynamic b) Bistable
c) Static d) None of these

4) The _____ circuit store a charge on parasitic capacitor for temporary basis and it requires a periodic refresh of its stored value.
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5) The amount of time the input signal should be stable before the clock edge occurs is called as _____.
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7) The spatial variation in arrival time of a clock transition on an integrated circuit is commonly referred to as _____.

a) Clock Skew
b) Clock Jitter
c) Handshaking
d) Normalization

8) For synchronous circuits to solve the clock related to problem _____ is/are the solutions.

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b) Use synchronizers and Arbiters
c) use PLL
d) All of these

9) With 4 bit select lines _____ operations can be performed by ALU.

a) 10
b) 12
c) 16
d) 18

10) What is the condition for linear region?

a) V_{gs} lesser than V_t
b) V_{gs} greater than V_t
c) V_{ds} lesser than V_{gs}
d) V_{ds} greater than V_{gs}

11) As source drain voltage increases, channel depth _____.

a) increases
b) decreases
c) logarithmically increases
d) exponentially increases

12) Gate area can be given as _____.

a) L/W
b) L * W
c) 2L/W
d) L/2W

13) The overall delay is _____ to the relative resistance r.

a) directly proportional
b) inversely proportional
c) exponentially proportional
d) not dependent

14) Increase in switching speed _____ the noise problems.

a) increases
b) decreases
c) remains same
d) None of these

SLR-QH-418

Seat No.	

Set S

Fourth. Y. (B.Tech.) (Electronics Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
CMOS VLSI Design (BTN04706)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.
4) Draw neat diagrams.

SECTION – I

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

a) With the help of diagram discuss construction and working of n-MOS also calculate value of β for given parameters of n-MOS transistor designed using Si as W / L ratio is 3.5. oxide layer thickness is 1.15 nm, the electron mobility is 85 sq. cm/V sec. The threshold voltage is 0.3V. The Si specific permittivity is 3.5 and permittivity of free space is $8.85 \times 10^{-14}\ \mathrm{F/cm}$.

b) What do you mean by technology scaling and how it is achieved in MOS transistor design?

c) Draw and Explain CMOS inverter in detail and discuss transfer characteristics.

d) How Dynamic Logic is used in CMOS Design explain using example?

e) What is pass transistor? How it is used in designing CMOS Logic Gate using Example explain?

Q.3 Attempt the following. (Any Two) **12**

a) Briefly explain in detail accumulation, depletion and inversion modes in MOS transistors.

b) Calculate total power dissipation in CMOS inverter for frequency 10 MHz with Static power dissipation of $15\mu\mathrm{W}, \mathrm{VDD} = 3.3\ \mathrm{V}$ and $\mathrm{C} = 30\mathrm{fF}$

c) Design 2 input XOR gate using CMOS Logic and comment on number of transistors required to implement it.

SECTION – II

Q.4 Attempt the following. (Any Four) **16**

a) What is bi-stability Principle? How it is used to design Latch explain using example?

b) What is multiplexer-based latch? Explain the use of multiplexer-based latch to implement D Latch.

c) With the help of diagram explain use of PLL for clock synchronization.

d) What is clock skew and clock jitter? What are the reasons of clock skew and jitter?

e) With the help of circuits explain ALU in detail.

Q.5 Attempt the following. (Any Two) **12**

a) Explain operating principle of True single phase clocked register (TSPCR) with help of diagram.

b) Explain liming classification in interconnect design.

c) With the help of Diagram explain Static RAM implementation.

SLR-QH-420

Seat No.	

Set P

Fourth. Y. (B.Tech.) (Electronics Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Software Engineering (BTN04708)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which development model is characterized by a linear progression of stages with no revisiting of earlier stages?
a) Spiral model b) Incremental model
c) Waterfall model d) Agile model

2) Which software development model involves risk assessment and management throughout the development process?
a) Waterfall model b) Incremental model
c) Prototype model d) Spiral model

3) Why is creating a Software Requirements Specification (SRS) important in software development?
a) To start coding immediately
b) To clearly define what the software should do
c) To save development time
d) To create user interfaces

4) What are characteristics of a good SRS?
a) Ambiguity, inconsistency, and incompleteness
b) Understandability, consistency, and traceability
c) Vagueness, lack of details, and redundancy
d) Inaccuracy, simplicity, and redundancy

5) Why is it important to consider non-functional requirements in software development?
a) They ensure the software is bug-free
b) They determine the software's design
c) They define how the system performs its functions
d) They help in coding the software

6) What does software architecture primarily focus on?
   a) Writing code
   b) Designing the overall structure of the software
   c) Running software programs
   d) Testing software functionality

7) What does a component and connector view in software architecture represent?
   a) How the software behaves in different scenarios
   b) The individual parts of the software and how they are connected
   c) The flow of data within the software
   d) The step-by-step execution of the software

8) What type of testing examines the software from the user's perspective without knowledge of its internal structure?
   a) Black-box testing
   b) White-box testing
   c) Functional testing
   d) System testing

9) What is the primary goal of software testing?
   a) To find and fix bugs in the software
   b) To design the software architecture
   c) To write the initial code for the software
   d) To create software documentation

10) What is the focus of “quality planning” in project management?
   a) Identifying project risks
   b) Planning for quality throughout the project
   c) Identifying project requirements
   d) Planning for project staffing

11) In project management, what does “staffing” primarily involve?
   a) Allocating tasks to team members
   b) Setting the project budget
   c) Defining the project scope
   d) Identifying potential risks

12) What does APM stand for in project management?
   a) Agile Project Management
   b) Advanced Project Metrics
   c) Automated Project Management
   d) Associated Project Methodology

13) What is a fundamental aspect of Agile methodologies like Scrum?
   a) Extensive upfront planning
   b) Fixed scope and requirements
   c) Iterative cycles of work and continuous feedback
   d) Linear progression of project phases

14) Which toolkit is often utilized to enhance project management efficiency and effectiveness?

a) Gantt Chart
b) APM Toolkit
c) RACI Matrix
d) SWOT Analysis

Seat No.	

Set **P**

Fourth. Y. (B.Tech.) (Electronics Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Software Engineering (BTN04708)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.
4) Draw neat diagrams.

SECTION – I

Q.2 Attempt any Four. **16**

a) How Waterfall model can be used in Software Development explain with the help of Example.

b) What are the different challenges involved in Software Development?

c) With the help of Use case diagram explain Online commerce business model.

d) With the help of real-world example draw Data Flow Diagram state the process step by step.

e) Compare Low-Level Design and High-Level Design in software development.

f) How Coupling and Cohesions are useful in Design Concepts of Software Engineering determine with the help of example.

Q.3 Attempt any Two. **12**

a) The Training Institute is in process of developing new student management software from Company PQR. With the help of Use case diagram explain Module of Student enrollment in the Course.

b) Explain the concept of “component and connector view” in software architecture and why it’s important to visualize how different parts of the software connect.

c) With the help of example and neat diagram explain how Prototype Model is used in software development.

SECTION – II

Q.4 Attempt any Four. **16**

a) What are the levels of Testing and illustrate its importance at every level?

b) Explain the concepts of black-box testing and white-box testing.

c) Differentiate Between Procedural and Quantitative Approaches of Quality Planning.

d) Discuss risk management planning in software engineering projects. Explain the process of identifying, analyzing, and mitigating risks throughout the project lifecycle.

e) How the “iterative project management life cycle” works and why it is beneficial for managing projects.

f) Explain the role of the “APM Toolkit” in Agile Project Management and how it helps in managing projects efficiently.

Q.5 Attempt any Two. **12**

a) Explain the concept of “CMM project management process” and its significance in ensuring the quality and efficiency of project management.

b) You are working as Software Development Team member illustrate with help of example following Terminologies used in the Agile Project Management.

i) Sprint
ii) Sprint review
iii) Scrum Master
iv) Backlog
v) Sprint retrospective
vi) Product Owner

c) Explain how “system testing” differs from "unit testing” in software engineering. Provide a simple example to illustrate each.

Seat No.	

Set **Q**

Fourth. Y. (B.Tech.) (Electronics Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Software Engineering (BTN04708)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) What type of testing examines the software from the user's perspective without knowledge of its internal structure?
a) Black-box testing b) White-box testing
c) Functional testing d) System testing

2) What is the primary goal of software testing?
a) To find and fix bugs in the software
b) To design the software architecture
c) To write the initial code for the software
d) To create software documentation

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a) Identifying project risks
b) Planning for quality throughout the project
c) Identifying project requirements
d) Planning for project staffing

4) In project management, what does "staffing" primarily involve?
a) Allocating tasks to team members
b) Setting the project budget
c) Defining the project scope
d) Identifying potential risks

5) What does APM stand for in project management?
a) Agile Project Management
b) Advanced Project Metrics
c) Automated Project Management
d) Associated Project Methodology

6) What is a fundamental aspect of Agile methodologies like Scrum?
   a) Extensive upfront planning
   b) Fixed scope and requirements
   c) Iterative cycles of work and continuous feedback
   d) Linear progression of project phases

7) Which toolkit is often utilized to enhance project management efficiency and effectiveness?
   a) Gantt Chart
   b) APM Toolkit
   c) RACI Matrix
   d) SWOT Analysis

8) Which development model is characterized by a linear progression of stages with no revisiting of earlier stages?
   a) Spiral model
   b) Incremental model
   c) Waterfall model
   d) Agile model

9) Which software development model involves risk assessment and management throughout the development process?
   a) Waterfall model
   b) Incremental model
   c) Prototype model
   d) Spiral model

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   c) To save development time
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   b) Designing the overall structure of the software
   c) Running software programs
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14) What does a component and connector view in software architecture represent?

a) How the software behaves in different scenarios
b) The individual parts of the software and how they are connected
c) The flow of data within the software
d) The step-by-step execution of the software

Seat No.	

Set **Q**

Fourth. Y. (B.Tech.) (Electronics Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Software Engineering (BTN04708)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.
4) Draw neat diagrams.

SECTION – I

Q.2 Attempt any Four. **16**

a) How Waterfall model can be used in Software Development explain with the help of Example.

b) What are the different challenges involved in Software Development?

c) With the help of Use case diagram explain Online commerce business model.

d) With the help of real-world example draw Data Flow Diagram state the process step by step.

e) Compare Low-Level Design and High-Level Design in software development.

f) How Coupling and Cohesions are useful in Design Concepts of Software Engineering determine with the help of example.

Q.3 Attempt any Two. **12**

a) The Training Institute is in process of developing new student management software from Company PQR. With the help of Use case diagram explain Module of Student enrollment in the Course.

b) Explain the concept of “component and connector view” in software architecture and why it’s important to visualize how different parts of the software connect.

c) With the help of example and neat diagram explain how Prototype Model is used in software development.

SECTION – II

Q.4 Attempt any Four. **16**

a) What are the levels of Testing and illustrate its importance at every level?

b) Explain the concepts of black-box testing and white-box testing.

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d) Discuss risk management planning in software engineering projects. Explain the process of identifying, analyzing, and mitigating risks throughout the project lifecycle.

e) How the “iterative project management life cycle” works and why it is beneficial for managing projects.

f) Explain the role of the “APM Toolkit” in Agile Project Management and how it helps in managing projects efficiently.

Q.5 Attempt any Two. **12**

a) Explain the concept of “CMM project management process” and its significance in ensuring the quality and efficiency of project management.

b) You are working as Software Development Team member illustrate with help of example following Terminologies used in the Agile Project Management.

i) Sprint
ii) Sprint review
iii) Scrum Master
iv) Backlog
v) Sprint retrospective
vi) Product Owner

c) Explain how “system testing” differs from "unit testing” in software engineering. Provide a simple example to illustrate each.

Seat No.	

Set **R**

Fourth. Y. (B.Tech.) (Electronics Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Software Engineering (BTN04708)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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3) Figures to right indicate full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) In project management, what does "staffing" primarily involve?
a) Allocating tasks to team members
b) Setting the project budget
c) Defining the project scope
d) Identifying potential risks

2) What does APM stand for in project management?
a) Agile Project Management
b) Advanced Project Metrics
c) Automated Project Management
d) Associated Project Methodology

3) What is a fundamental aspect of Agile methodologies like Scrum?
a) Extensive upfront planning
b) Fixed scope and requirements
c) Iterative cycles of work and continuous feedback
d) Linear progression of project phases

4) Which toolkit is often utilized to enhance project management efficiency and effectiveness?
a) Gantt Chart b) APM Toolkit
c) RACI Matrix d) SWOT Analysis

5) Which development model is characterized by a linear progression of stages with no revisiting of earlier stages?
a) Spiral model b) Incremental model
c) Waterfall model d) Agile model

6) Which software development model involves risk assessment and management throughout the development process?

a) Waterfall model
b) Incremental model
c) Prototype model
d) Spiral model

7) Why is creating a Software Requirements Specification (SRS) important in software development?

a) To start coding immediately
b) To clearly define what the software should do
c) To save development time
d) To create user interfaces

8) What are characteristics of a good SRS?

a) Ambiguity, inconsistency, and incompleteness
b) Understandability, consistency, and traceability
c) Vagueness, lack of details, and redundancy
d) Inaccuracy, simplicity, and redundancy

9) Why is it important to consider non-functional requirements in software development?

a) They ensure the software is bug-free
b) They determine the software's design
c) They define how the system performs its functions
d) They help in coding the software

10) What does software architecture primarily focus on?

a) Writing code
b) Designing the overall structure of the software
c) Running software programs
d) Testing software functionality

11) What does a component and connector view in software architecture represent?

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12) What type of testing examines the software from the user's perspective without knowledge of its internal structure?

a) Black-box testing
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13) What is the primary goal of software testing?

a) To find and fix bugs in the software
b) To design the software architecture
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14) What is the focus of “quality planning” in project management?

a) Identifying project risks
b) Planning for quality throughout the project
c) Identifying project requirements
d) Planning for project staffing

Seat No.	

Set **R**

Fourth. Y. (B.Tech.) (Electronics Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Software Engineering (BTN04708)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
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4) Draw neat diagrams.

SECTION – I

Q.2 Attempt any Four. **16**

a) How Waterfall model can be used in Software Development explain with the help of Example.

b) What are the different challenges involved in Software Development?

c) With the help of Use case diagram explain Online commerce business model.

d) With the help of real-world example draw Data Flow Diagram state the process step by step.

e) Compare Low-Level Design and High-Level Design in software development.

f) How Coupling and Cohesions are useful in Design Concepts of Software Engineering determine with the help of example.

Q.3 Attempt any Two. **12**

a) The Training Institute is in process of developing new student management software from Company PQR. With the help of Use case diagram explain Module of Student enrollment in the Course.

b) Explain the concept of “component and connector view” in software architecture and why it’s important to visualize how different parts of the software connect.

c) With the help of example and neat diagram explain how Prototype Model is used in software development.

SECTION – II

Q.4 Attempt any Four. **16**

a) What are the levels of Testing and illustrate its importance at every level?

b) Explain the concepts of black-box testing and white-box testing.

c) Differentiate Between Procedural and Quantitative Approaches of Quality Planning.

d) Discuss risk management planning in software engineering projects. Explain the process of identifying, analyzing, and mitigating risks throughout the project lifecycle.

e) How the “iterative project management life cycle” works and why it is beneficial for managing projects.

f) Explain the role of the “APM Toolkit” in Agile Project Management and how it helps in managing projects efficiently.

Q.5 Attempt any Two. **12**

a) Explain the concept of “CMM project management process” and its significance in ensuring the quality and efficiency of project management.

b) You are working as Software Development Team member illustrate with help of example following Terminologies used in the Agile Project Management.

i) Sprint
ii) Sprint review
iii) Scrum Master
iv) Backlog
v) Sprint retrospective
vi) Product Owner

c) Explain how “system testing” differs from "unit testing” in software engineering. Provide a simple example to illustrate each.

Seat No.	

Set **S**

Fourth. Y. (B.Tech.) (Electronics Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Software Engineering (BTN04708)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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3) Figures to right indicate full marks.
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MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) What does software architecture primarily focus on?
a) Writing code
b) Designing the overall structure of the software
c) Running software programs
d) Testing software functionality

2) What does a component and connector view in software architecture represent?
a) How the software behaves in different scenarios
b) The individual parts of the software and how they are connected
c) The flow of data within the software
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3) What type of testing examines the software from the user's perspective without knowledge of its internal structure?
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4) What is the primary goal of software testing?
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   c) Automated Project Management
   d) Associated Project Methodology

8) What is a fundamental aspect of Agile methodologies like Scrum?
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b) They determine the software's design
c) They define how the system performs its functions
d) They help in coding the software

SLR-QH-420

Seat No.	

Set S

Fourth. Y. (B.Tech.) (Electronics Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Software Engineering (BTN04708)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.
4) Draw neat diagrams.

SECTION – I

Q.2 Attempt any Four. **16**

a) How Waterfall model can be used in Software Development explain with the help of Example.

b) What are the different challenges involved in Software Development?

c) With the help of Use case diagram explain Online commerce business model.

d) With the help of real-world example draw Data Flow Diagram state the process step by step.

e) Compare Low-Level Design and High-Level Design in software development.

f) How Coupling and Cohesions are useful in Design Concepts of Software Engineering determine with the help of example.

Q.3 Attempt any Two. **12**

a) The Training Institute is in process of developing new student management software from Company PQR. With the help of Use case diagram explain Module of Student enrollment in the Course.

b) Explain the concept of “component and connector view” in software architecture and why it’s important to visualize how different parts of the software connect.

c) With the help of example and neat diagram explain how Prototype Model is used in software development.

SECTION – II

Q.4 Attempt any Four. **16**

a) What are the levels of Testing and illustrate its importance at every level?

b) Explain the concepts of black-box testing and white-box testing.

c) Differentiate Between Procedural and Quantitative Approaches of Quality Planning.

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i) Sprint
ii) Sprint review
iii) Scrum Master
iv) Backlog
v) Sprint retrospective
vi) Product Owner

c) Explain how “system testing” differs from "unit testing” in software engineering. Provide a simple example to illustrate each.

SLR-QH-421

Seat No.	

Set P

Fourth. Y. (B.Tech.) (Electronics Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
AI Applications (BTN04710)

Day & Date: Monday, 11-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Artificial Intelligence is about _____.
a) Playing a game on Computer
b) Making a machine Intelligent
c) Programming on Machine with your own Intelligence
d) Putting your intelligence in Machine

2) The main tasks of an Al agent are _____.
a) Input and Output
b) Moment and Humanly Actions
c) Perceiving, thinking, and acting on the environment
d) None of the above

3) The main function of problem-solving agent is to _____.
a) solve the given problem and reach the goal.
b) find out which sequence of action will get it to the goal state.
c) Both a) & b)
d) None of these

4) The component of an Expert system is _____.
a) Knowledge Base b) Inference Engine
c) User Interface d) All of these

5) The inference engine works on _____.
a) Forward Chaining b) Backward Chaining
c) Both a) and b) d) None of these

6) Web Crawler is an example of _____.
a) Intelligent Agent b) Problem-solving Agent
c) Simple reflex Agent d) Model-based Agent

7) Which of the given statement is true for Conditional results.
a) Conditional Probability gives 100% accurate results.
b) Conditional Probability can be applied to a single event.
c) Conditional Probability has no effect or relevance on independent events.
d) None of the above

8) If a robot is able to change its own trajectory as per the external conditions, then the robot is considered as the _____.
a) Mobile b) Non-Servo
c) Open Loop d) Intelligent

9) The probabilistic reasoning depends upon _____.
a) Estimation b) Observations
c) Likelihood d) All of these

10) Who is known as the - Father of Al"?
a) Fisher Ada b) Alan Turing
c) John McCarthy d) Allen Newell

11) Which term describes the common-sense of the judgmental part of problem-solving?
a) Values-based b) Critical
c) Analytical d) Heuristic

12) An Al agent perceives and acts upon the environment using _____.
a) Sensors b) Perceiver
c) Actuators d) Both a) and c)

13) Which Al technique enables the computers to understand the associations and relationships between objects and events?
a) Heuristic Processing b) Cognitive Science
c) Relative Symbolism d) Pattern Matching

14) A technique that was developed to determine whether a machine could or could not demonstrate the artificial intelligence known as the _____.
a) Boolean Algebra b) Turing Test
c) Logarithm d) Algorithm

Seat No.	

Set **P**

Fourth. Y. (B.Tech.) (Electronics Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
AI Applications (BTN04710)

Day & Date: Monday, 11-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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

SECTION – I

Q.2 Attempt any Four. **16**

a) State & Explain different types of Intelligent Agents.

b) Explain the various Branches of Al in brief.

c) Explain Man Vs Computers in brief.

d) Explain the Visual perception in Al in brief.

e) Explain the Pattern Recognition in brief.

Q.3 Attempt any Two. **12**

a) Explain the major components of Intelligent System.

b) Explain the Knowledge, acquisition, Expert system tools in brief.

c) Explain the Basic architecture of an Expert system.

SECTION - II

Q.4 Attempt any Four. **16**

a) Explain the Language Models of NLP in brief.

b) Explain the Planning Uncertain in Robotics.

c) Explain the Augmented Grammars and Semantic in brief.

d) Discuss the Robotic Perception in brief.

e) Explain the Passive Reinforcement Learning in brief.

Q.5 Attempt any Two. **12**

a) Explain the Speech Recognition and Machine Translation in NLP in detail.

b) Explain the Robotic Software Architectures in brief.

c) Explain the Applications of Reinforcement Learning in brief.

Seat No.	

Set **Q**

Fourth. Y. (B.Tech.) (Electronics Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
AI Applications (BTN04710)

Day & Date: Monday, 11-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) If a robot is able to change its own trajectory as per the external conditions, then the robot is considered as the _____.
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a) Fisher Ada b) Alan Turing
c) John McCarthy d) Allen Newell

4) Which term describes the common-sense of the judgmental part of problem-solving?
a) Values-based b) Critical
c) Analytical d) Heuristic

5) An Al agent perceives and acts upon the environment using _____.
a) Sensors b) Perceiver
c) Actuators d) Both a) and c)

6) Which Al technique enables the computers to understand the associations and relationships between objects and events?
a) Heuristic Processing b) Cognitive Science
c) Relative Symbolism d) Pattern Matching

7) A technique that was developed to determine whether a machine could or could not demonstrate the artificial intelligence known as the _____.
a) Boolean Algebra b) Turing Test
c) Logarithm d) Algorithm

8) Artificial Intelligence is about _____.
   a) Playing a game on Computer
   b) Making a machine Intelligent
   c) Programming on Machine with your own Intelligence
   d) Putting your intelligence in Machine

9) The main tasks of an Al agent are _____.
   a) Input and Output
   b) Moment and Humanly Actions
   c) Perceiving, thinking, and acting on the environment
   d) None of the above

10) The main function of problem-solving agent is to _____.
   a) solve the given problem and reach the goal.
   b) find out which sequence of action will get it to the goal state.
   c) Both a) & b)
   d) None of these

11) The component of an Expert system is _____.
   a) Knowledge Base
   b) Inference Engine
   c) User Interface
   d) All of these

12) The inference engine works on _____.
   a) Forward Chaining
   b) Backward Chaining
   c) Both a) and b)
   d) None of these

13) Web Crawler is an example of _____.
   a) Intelligent Agent
   b) Problem-solving Agent
   c) Simple reflex Agent
   d) Model-based Agent

14) Which of the given statement is true for Conditional results.
   a) Conditional Probability gives 100% accurate results.
   b) Conditional Probability can be applied to a single event.
   c) Conditional Probability has no effect or relevance on independent events.
   d) None of the above

SLR-QH-421

Seat No.	

Set Q

Fourth. Y. (B.Tech.) (Electronics Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
AI Applications (BTN04710)

Day & Date: Monday, 11-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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

SECTION – I

Q.2 Attempt any Four. **16**

a) State & Explain different types of Intelligent Agents.

b) Explain the various Branches of Al in brief.

c) Explain Man Vs Computers in brief.

d) Explain the Visual perception in Al in brief.

e) Explain the Pattern Recognition in brief.

Q.3 Attempt any Two. **12**

a) Explain the major components of Intelligent System.

b) Explain the Knowledge, acquisition, Expert system tools in brief.

c) Explain the Basic architecture of an Expert system.

SECTION - II

Q.4 Attempt any Four. **16**

a) Explain the Language Models of NLP in brief.

b) Explain the Planning Uncertain in Robotics.

c) Explain the Augmented Grammars and Semantic in brief.

d) Discuss the Robotic Perception in brief.

e) Explain the Passive Reinforcement Learning in brief.

Q.5 Attempt any Two. **12**

a) Explain the Speech Recognition and Machine Translation in NLP in detail.

b) Explain the Robotic Software Architectures in brief.

c) Explain the Applications of Reinforcement Learning in brief.

SLR-QH-421

Seat No.	

Set R

Fourth. Y. (B.Tech.) (Electronics Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
AI Applications (BTN04710)

Day & Date: Monday, 11-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which term describes the common-sense of the judgmental part of problem-solving?
a) Values-based b) Critical
c) Analytical d) Heuristic

2) An Al agent perceives and acts upon the environment using _____.
a) Sensors b) Perceiver
c) Actuators d) Both a) and c)

3) Which Al technique enables the computers to understand the associations and relationships between objects and events?
a) Heuristic Processing b) Cognitive Science
c) Relative Symbolism d) Pattern Matching

4) A technique that was developed to determine whether a machine could or could not demonstrate the artificial intelligence known as the _____.
a) Boolean Algebra b) Turing Test
c) Logarithm d) Algorithm

5) Artificial Intelligence is about _____.
a) Playing a game on Computer
b) Making a machine Intelligent
c) Programming on Machine with your own Intelligence
d) Putting your intelligence in Machine

6) The main tasks of an Al agent are _____.
a) Input and Output
b) Moment and Humanly Actions
c) Perceiving, thinking, and acting on the environment
d) None of the above

7) The main function of problem-solving agent is to _____.
   a) solve the given problem and reach the goal.
   b) find out which sequence of action will get it to the goal state.
   c) Both a) & b)
   d) None of these

8) The component of an Expert system is _____.
   a) Knowledge Base
   b) Inference Engine
   c) User Interface
   d) All of these

9) The inference engine works on _____.
   a) Forward Chaining
   b) Backward Chaining
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10) Web Crawler is an example of _____.
   a) Intelligent Agent
   b) Problem-solving Agent
   c) Simple reflex Agent
   d) Model-based Agent

11) Which of the given statement is true for Conditional results.
   a) Conditional Probability gives 100% accurate results.
   b) Conditional Probability can be applied to a single event.
   c) Conditional Probability has no effect or relevance on independent events.
   d) None of the above

12) If a robot is able to change its own trajectory as per the external conditions, then the robot is considered as the _____.
   a) Mobile
   b) Non-Servo
   c) Open Loop
   d) Intelligent

13) The probabilistic reasoning depends upon _____.
   a) Estimation
   b) Observations
   c) Likelihood
   d) All of these

14) Who is known as the - Father of AI”?
   a) Fisher Ada
   b) Alan Turing
   c) John McCarthy
   d) Allen Newell

SLR-QH-421

Seat No.	

Set R

Fourth. Y. (B.Tech.) (Electronics Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
AI Applications (BTN04710)

Day & Date: Monday, 11-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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

SECTION – I

Q.2 Attempt any Four. **16**

a) State & Explain different types of Intelligent Agents.

b) Explain the various Branches of Al in brief.

c) Explain Man Vs Computers in brief.

d) Explain the Visual perception in Al in brief.

e) Explain the Pattern Recognition in brief.

Q.3 Attempt any Two. **12**

a) Explain the major components of Intelligent System.

b) Explain the Knowledge, acquisition, Expert system tools in brief.

c) Explain the Basic architecture of an Expert system.

SECTION - II

Q.4 Attempt any Four. **16**

a) Explain the Language Models of NLP in brief.

b) Explain the Planning Uncertain in Robotics.

c) Explain the Augmented Grammars and Semantic in brief.

d) Discuss the Robotic Perception in brief.

e) Explain the Passive Reinforcement Learning in brief.

Q.5 Attempt any Two. **12**

a) Explain the Speech Recognition and Machine Translation in NLP in detail.

b) Explain the Robotic Software Architectures in brief.

c) Explain the Applications of Reinforcement Learning in brief.

Seat No.		Set	S

Fourth. Y. (B.Tech.) (Electronics Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
AI Applications (BTN04710)

Day & Date: Monday, 11-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Web Crawler is an example of _____.
a) Intelligent Agent b) Problem-solving Agent
c) Simple reflex Agent d) Model-based Agent

2) Which of the given statement is true for Conditional results.
a) Conditional Probability gives 100% accurate results.
b) Conditional Probability can be applied to a single event.
c) Conditional Probability has no effect or relevance on independent events.
d) None of the above

3) If a robot is able to change its own trajectory as per the external conditions, then the robot is considered as the _____.
a) Mobile b) Non-Servo
c) Open Loop d) Intelligent

4) The probabilistic reasoning depends upon _____.
a) Estimation b) Observations
c) Likelihood d) All of these

5) Who is known as the - Father of AI"?
a) Fisher Ada b) Alan Turing
c) John McCarthy d) Allen Newell

6) Which term describes the common-sense of the judgmental part of problem-solving?
a) Values-based b) Critical
c) Analytical d) Heuristic

7) An Al agent perceives and acts upon the environment using _____.
   a) Sensors
   b) Perceiver
   c) Actuators
   d) Both a) and c)

8) Which Al technique enables the computers to understand the associations and relationships between objects and events?
   a) Heuristic Processing
   b) Cognitive Science
   c) Relative Symbolism
   d) Pattern Matching

9) A technique that was developed to determine whether a machine could or could not demonstrate the artificial intelligence known as the _____.
   a) Boolean Algebra
   b) Turing Test
   c) Logarithm
   d) Algorithm

10) Artificial Intelligence is about _____.
   a) Playing a game on Computer
   b) Making a machine Intelligent
   c) Programming on Machine with your own Intelligence
   d) Putting your intelligence in Machine

11) The main tasks of an Al agent are _____.
   a) Input and Output
   b) Moment and Humanly Actions
   c) Perceiving, thinking, and acting on the environment
   d) None of the above

12) The main function of problem-solving agent is to _____.
   a) solve the given problem and reach the goal.
   b) find out which sequence of action will get it to the goal state.
   c) Both a) & b)
   d) None of these

13) The component of an Expert system is _____.
   a) Knowledge Base
   b) Inference Engine
   c) User Interface
   d) All of these

14) The inference engine works on _____.
   a) Forward Chaining
   b) Backward Chaining
   c) Both a) and b)
   d) None of these

SLR-QH-421

Seat No.	

Set S

Fourth. Y. (B.Tech.) (Electronics Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
AI Applications (BTN04710)

Day & Date: Monday, 11-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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

SECTION – I

Q.2 Attempt any Four. **16**

a) State & Explain different types of Intelligent Agents.

b) Explain the various Branches of Al in brief.

c) Explain Man Vs Computers in brief.

d) Explain the Visual perception in Al in brief.

e) Explain the Pattern Recognition in brief.

Q.3 Attempt any Two. **12**

a) Explain the major components of Intelligent System.

b) Explain the Knowledge, acquisition, Expert system tools in brief.

c) Explain the Basic architecture of an Expert system.

SECTION - II

Q.4 Attempt any Four. **16**

a) Explain the Language Models of NLP in brief.

b) Explain the Planning Uncertain in Robotics.

c) Explain the Augmented Grammars and Semantic in brief.

d) Discuss the Robotic Perception in brief.

e) Explain the Passive Reinforcement Learning in brief.

Q.5 Attempt any Two. **12**

a) Explain the Speech Recognition and Machine Translation in NLP in detail.

b) Explain the Robotic Software Architectures in brief.

c) Explain the Applications of Reinforcement Learning in brief.

SLR-QH-422

Seat No.		Set	P

Fourth. Y. (B.Tech.) (Electronics Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Data Science - Business Intelligence (BTN04712)

Day & Date: Monday, 11-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which of the following is NOT a component of BI architecture?
a) Data sources b) Data warehouse
c) OLAP servers d) Web browser only

2) i) Data mart is a subset of data warehouse.
ii) Data marts contain repositories of summarized data collected for analysis on a specific section or unit within an organization.
a) Only i) is correct b) Only ii) is correct
c) Both i) and ii) are correct d) Both are wrong

3) Which of the following best describes the primary goal of Business Intelligence (BI)?
a) Storing large amounts of data
b) Supporting effective and timely decision-making
c) Replacing human decision-makers
d) Designing marketing campaigns

4) Which of the following is a major purpose of a DSS?
a) Automate all decision-making
b) Assist in making unstructured and semi-structured decisions
c) Store transactional data
d) Replace managerial roles

5) Decisions can be classified into their _____.
a) Concept and thoughts b) Supply and Demand
c) Nature and scope d) Techniques

6) Data mining activities can be subdivided into two major investigation streams, which are _____.
   a) Interpretation and Sampling
   b) Interpretation and Prediction
   c) Forecast and Prediction
   d) Forecast and Interpretation

7) A data warehouse is _____.
   a) A transactional database
   b) A type of OLAP server
   c) Only a storage for operational data
   d) A centralized repository of integrated data used for analysis

8) What is the focus of relational marketing?
   a) Building long-term customer relationships
   b) Maximizing individual transactions
   c) Ignoring customer feedback
   d) Minimizing customer engagement

9) Which of the following is NOT commonly used for data visualization?
   a) Pie charts
   b) Line graphs
   c) Histograms
   d) SQL Queries

10) Which of the following is not a stage in “Lifetime of a Customer”?
   a) Acquisition
   b) Cross/Up Selling
   c) Bargaining
   d) Retention

11) What is the purpose of introducing backlogging in logistic systems?
   a) Reduce demand variability
   b) Minimize inventory costs
   c) Address unfulfilled demand situations
   d) Avoid capacity constraints

12) What does DMAIC stand for in Six Sigma methodology?
   a) Define, Measure, Analyze, Improve, Control
   b) Determine, Manage, Assess, Implement, Correct
   c) Data, Metrics, Analysis, Improvement, Control
   d) Develop, Maintain, Audit, Innovate, Collaborate

13) Optimization models for logistics planning are used to _____.
   a) Store transactional data
   b) Determine the best routes, inventory levels, and production schedules
   c) Build dashboards
   d) Create marketing campaigns

14) Balanced Scorecard (BSC) helps organizations assess performance from which perspective?

a) Marketing only
b) Four perspectives: Financial, Customer, Internal Processes, Learning & Growth
c) Financial perspective only
d) Operational perspective only

Seat No.	

Set **P**

Fourth. Y. (B.Tech.) (Electronics Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Data Science - Business Intelligence (BTN04712)

Day & Date: Monday, 11-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

SECTION – I

Q.2 Attempt any four. **16**

a) What is the purpose of ETL (Extract, Transform, Load) tools in the context of data warehousing, and how do they facilitate the movement and transformation of data?

b) Describe the ways in which the implementation of Business Intelligence (BI) supports organizations in enhancing decision-making effectiveness and ensuring timely actions.

c) Discuss in detail the nature and characteristics of structured, unstructured, and semi-structured decisions in the decision-making process.

d) Differentiate between OLAP (Online Analytical Processing) and OLTP (Online Transaction Processing) systems.

e) Explain the key distinctions between data, information, and knowledge in the context of business intelligence and describe how each contributes to effective decision-making.

Q.3 Attempt any two. **12**

a) Elaborate with diagram the different phases in the development of a decision support system.

b) What are the fundamental components of a typical business intelligence (BI) architecture, and how do they work together to support data analysis and decision-making?

c) Describe the data mining process comprehensively and include a suitable diagram to illustrate each step.

SECTION – II

Q.4 Attempt any four. **16**

a) Explain the concept of supply chain optimization and its significance in logistics.

b) Identify and explain the three main categories of business reports, highlighting their purpose and characteristics.

c) Explain the four perspectives of the Balanced Scorecard (BSC) that organizations use to assess and monitor their performance.

d) Elaborate four different types of charts commonly used for data visualization in Business Intelligence (BI), highlighting their purposes and uses.

e) Describe the term market basket analysis in context to relational marketing.

Q.5 Attempt any two. **12**

a) Describe tactical planning and backlogging in context to optimization models for logistic planning.

b) Define Business Performance Management (BPM) and briefly explain the four phases of the BPM cycle.

c) Discuss the role of Salesforce management in achieving organizational success and describe the essential decision-making processes it includes as a necessary part.

SLR-QH-422

Seat No.	

Set Q

Fourth. Y. (B.Tech.) (Electronics Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Data Science - Business Intelligence (BTN04712)

Day & Date: Monday, 11-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) What is the focus of relational marketing?
a) Building long-term customer relationships
b) Maximizing individual transactions
c) Ignoring customer feedback
d) Minimizing customer engagement

2) Which of the following is NOT commonly used for data visualization?
a) Pie charts b) Line graphs
c) Histograms d) SQL Queries

3) Which of the following is not a stage in "Lifetime of a Customer"?
a) Acquisition b) Cross/Up Selling
c) Bargaining d) Retention

4) What is the purpose of introducing backlogging in logistic systems?
a) Reduce demand variability
b) Minimize inventory costs
c) Address unfulfilled demand situations
d) Avoid capacity constraints

5) What does DMAIC stand for in Six Sigma methodology?
a) Define, Measure, Analyze, Improve, Control
b) Determine, Manage, Assess, Implement, Correct
c) Data, Metrics, Analysis, Improvement, Control
d) Develop, Maintain, Audit, Innovate, Collaborate

6) Optimization models for logistics planning are used to _____.
   a) Store transactional data
   b) Determine the best routes, inventory levels, and production schedules
   c) Build dashboards
   d) Create marketing campaigns

7) Balanced Scorecard (BSC) helps organizations assess performance from which perspective?
   a) Marketing only
   b) Four perspectives: Financial, Customer, Internal Processes, Learning & Growth
   c) Financial perspective only
   d) Operational perspective only

8) Which of the following is NOT a component of BI architecture?
   a) Data sources
   b) Data warehouse
   c) OLAP servers
   d) Web browser only

9) i) Data mart is a subset of data warehouse.
   ii) Data marts contain repositories of summarized data collected for analysis on a specific section or unit within an organization.
   a) Only i) is correct
   b) Only ii) is correct
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10) Which of the following best describes the primary goal of Business Intelligence (BI)?
   a) Storing large amounts of data
   b) Supporting effective and timely decision-making
   c) Replacing human decision-makers
   d) Designing marketing campaigns

11) Which of the following is a major purpose of a DSS?
   a) Automate all decision-making
   b) Assist in making unstructured and semi-structured decisions
   c) Store transactional data
   d) Replace managerial roles

12) Decisions can be classified into their _____.
   a) Concept and thoughts
   b) Supply and Demand
   c) Nature and scope
   d) Techniques

13) Data mining activities can be subdivided into two major investigation streams, which are _____.
   a) Interpretation and Sampling
   b) Interpretation and Prediction
   c) Forecast and Prediction
   d) Forecast and Interpretation

14) A data warehouse is _____.

a) A transactional database
b) A type of OLAP server
c) Only a storage for operational data
d) A centralized repository of integrated data used for analysis

Seat No.	

Set **Q**

Fourth. Y. (B.Tech.) (Electronics Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Data Science - Business Intelligence (BTN04712)

Day & Date: Monday, 11-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

SECTION – I

Q.2 Attempt any four. **16**

a) What is the purpose of ETL (Extract, Transform, Load) tools in the context of data warehousing, and how do they facilitate the movement and transformation of data?

b) Describe the ways in which the implementation of Business Intelligence (BI) supports organizations in enhancing decision-making effectiveness and ensuring timely actions.

c) Discuss in detail the nature and characteristics of structured, unstructured, and semi-structured decisions in the decision-making process.

d) Differentiate between OLAP (Online Analytical Processing) and OLTP (Online Transaction Processing) systems.

e) Explain the key distinctions between data, information, and knowledge in the context of business intelligence and describe how each contributes to effective decision-making.

Q.3 Attempt any two. **12**

a) Elaborate with diagram the different phases in the development of a decision support system.

b) What are the fundamental components of a typical business intelligence (BI) architecture, and how do they work together to support data analysis and decision-making?

c) Describe the data mining process comprehensively and include a suitable diagram to illustrate each step.

SECTION – II

Q.4 Attempt any four. **16**

a) Explain the concept of supply chain optimization and its significance in logistics.

b) Identify and explain the three main categories of business reports, highlighting their purpose and characteristics.

c) Explain the four perspectives of the Balanced Scorecard (BSC) that organizations use to assess and monitor their performance.

d) Elaborate four different types of charts commonly used for data visualization in Business Intelligence (BI), highlighting their purposes and uses.

e) Describe the term market basket analysis in context to relational marketing.

Q.5 Attempt any two. **12**

a) Describe tactical planning and backlogging in context to optimization models for logistic planning.

b) Define Business Performance Management (BPM) and briefly explain the four phases of the BPM cycle.

c) Discuss the role of Salesforce management in achieving organizational success and describe the essential decision-making processes it includes as a necessary part.

Seat No.	

Set **R**

Fourth. Y. (B.Tech.) (Electronics Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Data Science - Business Intelligence (BTN04712)

Day & Date: Monday, 11-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) What is the purpose of introducing backlogging in logistic systems?
a) Reduce demand variability
b) Minimize inventory costs
c) Address unfulfilled demand situations
d) Avoid capacity constraints

2) What does DMAIC stand for in Six Sigma methodology?
a) Define, Measure, Analyze, Improve, Control
b) Determine, Manage, Assess, Implement, Correct
c) Data, Metrics, Analysis, Improvement, Control
d) Develop, Maintain, Audit, Innovate, Collaborate

3) Optimization models for logistics planning are used to _____.
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4) Balanced Scorecard (BSC) helps organizations assess performance from which perspective?
a) Marketing only
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5) Which of the following is NOT a component of BI architecture?
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b) Data warehouse
c) OLAP servers
d) Web browser only

6) i) Data mart is a subset of data warehouse.
ii) Data marts contain repositories of summarized data collected for analysis on a specific section or unit within an organization.
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d) Replace managerial roles

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b) Maximizing individual transactions
c) Ignoring customer feedback
d) Minimizing customer engagement

13) Which of the following is NOT commonly used for data visualization?
a) Pie charts
b) Line graphs
c) Histograms
d) SQL Queries

14) Which of the following is not a stage in “Lifetime of a Customer”?

a) Acquisition
b) Cross/Up Selling
c) Bargaining
d) Retention

Seat No.	

Set **R**

Fourth. Y. (B.Tech.) (Electronics Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Data Science - Business Intelligence (BTN04712)

Day & Date: Monday, 11-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

SECTION – I

Q.2 Attempt any four. **16**

a) What is the purpose of ETL (Extract, Transform, Load) tools in the context of data warehousing, and how do they facilitate the movement and transformation of data?

b) Describe the ways in which the implementation of Business Intelligence (BI) supports organizations in enhancing decision-making effectiveness and ensuring timely actions.

c) Discuss in detail the nature and characteristics of structured, unstructured, and semi-structured decisions in the decision-making process.

d) Differentiate between OLAP (Online Analytical Processing) and OLTP (Online Transaction Processing) systems.

e) Explain the key distinctions between data, information, and knowledge in the context of business intelligence and describe how each contributes to effective decision-making.

Q.3 Attempt any two. **12**

a) Elaborate with diagram the different phases in the development of a decision support system.

b) What are the fundamental components of a typical business intelligence (BI) architecture, and how do they work together to support data analysis and decision-making?

c) Describe the data mining process comprehensively and include a suitable diagram to illustrate each step.

SECTION – II

Q.4 Attempt any four. **16**

a) Explain the concept of supply chain optimization and its significance in logistics.

b) Identify and explain the three main categories of business reports, highlighting their purpose and characteristics.

c) Explain the four perspectives of the Balanced Scorecard (BSC) that organizations use to assess and monitor their performance.

d) Elaborate four different types of charts commonly used for data visualization in Business Intelligence (BI), highlighting their purposes and uses.

e) Describe the term market basket analysis in context to relational marketing.

Q.5 Attempt any two. **12**

a) Describe tactical planning and backlogging in context to optimization models for logistic planning.

b) Define Business Performance Management (BPM) and briefly explain the four phases of the BPM cycle.

c) Discuss the role of Salesforce management in achieving organizational success and describe the essential decision-making processes it includes as a necessary part.

Seat No.		Set	S

Fourth. Y. (B.Tech.) (Electronics Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Data Science - Business Intelligence (BTN04712)

Day & Date: Monday, 11-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Data mining activities can be subdivided into two major investigation streams, which are _____.
a) Interpretation and Sampling b) Interpretation and Prediction
c) Forecast and Prediction d) Forecast and Interpretation

2) A data warehouse is _____.
a) A transactional database
b) A type of OLAP server
c) Only a storage for operational data
d) A centralized repository of integrated data used for analysis

3) What is the focus of relational marketing?
a) Building long-term customer relationships
b) Maximizing individual transactions
c) Ignoring customer feedback
d) Minimizing customer engagement

4) Which of the following is NOT commonly used for data visualization?
a) Pie charts b) Line graphs
c) Histograms d) SQL Queries

5) Which of the following is not a stage in "Lifetime of a Customer"?
a) Acquisition b) Cross/Up Selling
c) Bargaining d) Retention

6) What is the purpose of introducing backlogging in logistic systems?
a) Reduce demand variability
b) Minimize inventory costs
c) Address unfulfilled demand situations
d) Avoid capacity constraints

7) What does DMAIC stand for in Six Sigma methodology?
a) Define, Measure, Analyze, Improve, Control
b) Determine, Manage, Assess, Implement, Correct
c) Data, Metrics, Analysis, Improvement, Control
d) Develop, Maintain, Audit, Innovate, Collaborate

8) Optimization models for logistics planning are used to _____.
a) Store transactional data
b) Determine the best routes, inventory levels, and production schedules
c) Build dashboards
d) Create marketing campaigns

9) Balanced Scorecard (BSC) helps organizations assess performance from which perspective?
a) Marketing only
b) Four perspectives: Financial, Customer, Internal Processes, Learning & Growth
c) Financial perspective only
d) Operational perspective only

10) Which of the following is NOT a component of BI architecture?
a) Data sources
b) Data warehouse
c) OLAP servers
d) Web browser only

11) i) Data mart is a subset of data warehouse.
ii) Data marts contain repositories of summarized data collected for analysis on a specific section or unit within an organization.
a) Only i) is correct
b) Only ii) is correct
c) Both i) and ii) are correct
d) Both are wrong

12) Which of the following best describes the primary goal of Business Intelligence (BI)?
a) Storing large amounts of data
b) Supporting effective and timely decision-making
c) Replacing human decision-makers
d) Designing marketing campaigns

13) Which of the following is a major purpose of a DSS?
a) Automate all decision-making
b) Assist in making unstructured and semi-structured decisions
c) Store transactional data
d) Replace managerial roles

14) Decisions can be classified into their _____.
a) Concept and thoughts
b) Supply and Demand
c) Nature and scope
d) Techniques

Seat No.	

Set **S**

Fourth. Y. (B.Tech.) (Electronics Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Data Science - Business Intelligence (BTN04712)

Day & Date: Monday, 11-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

SECTION – I

Q.2 Attempt any four. **16**

a) What is the purpose of ETL (Extract, Transform, Load) tools in the context of data warehousing, and how do they facilitate the movement and transformation of data?

b) Describe the ways in which the implementation of Business Intelligence (BI) supports organizations in enhancing decision-making effectiveness and ensuring timely actions.

c) Discuss in detail the nature and characteristics of structured, unstructured, and semi-structured decisions in the decision-making process.

d) Differentiate between OLAP (Online Analytical Processing) and OLTP (Online Transaction Processing) systems.

e) Explain the key distinctions between data, information, and knowledge in the context of business intelligence and describe how each contributes to effective decision-making.

Q.3 Attempt any two. **12**

a) Elaborate with diagram the different phases in the development of a decision support system.

b) What are the fundamental components of a typical business intelligence (BI) architecture, and how do they work together to support data analysis and decision-making?

c) Describe the data mining process comprehensively and include a suitable diagram to illustrate each step.

SECTION – II

Q.4 Attempt any four. **16**

a) Explain the concept of supply chain optimization and its significance in logistics.

b) Identify and explain the three main categories of business reports, highlighting their purpose and characteristics.

c) Explain the four perspectives of the Balanced Scorecard (BSC) that organizations use to assess and monitor their performance.

d) Elaborate four different types of charts commonly used for data visualization in Business Intelligence (BI), highlighting their purposes and uses.

e) Describe the term market basket analysis in context to relational marketing.

Q.5 Attempt any two. **12**

a) Describe tactical planning and backlogging in context to optimization models for logistic planning.

b) Define Business Performance Management (BPM) and briefly explain the four phases of the BPM cycle.

c) Discuss the role of Salesforce management in achieving organizational success and describe the essential decision-making processes it includes as a necessary part.

SLR-QH-423

Seat No.	

Set P

Fourth. Y. (B.Tech.) (Electronics Engineering) (Sem - I) (New) (CBCS)
Examination: March/April – 2026
IOT- Architecting IOT Solutions (BTN04714)

Day & Date: Monday, 11-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) When considering AWS cost optimization, what is the process of choosing the most cost-effective pricing model for a service?
a) Cost forecasting b) Cost allocation
c) Cost analysis d) Cost optimization

2) What factor should be considered when selecting an AWS region for hosting data that must comply with specific regulatory requirements?
a) Network latency b) Cost optimization
c) Data sovereignty d) Scalability

3) Which AWS service enables the automatic scaling of compute capacity based on traffic and demand?
a) Amazon CloudFront b) AWS Lambda
c) Amazon Auto Scaling d) Amazon Route 53

4) What is the primary objective of the "Performance Efficiency" pillar in the AWS Well-Architected Framework?
a) Minimizing costs
b) Ensuring high availability
c) Achieving optimal system performance
d) Maximizing security

5) Which AWS Well-Architected Framework pillar focuses on the ability to recover from infrastructure or service failures and dynamically scale to meet demand?
a) Security b) Cost Optimization
c) Reliability d) Performance Efficiency

6) What is the primary goal of “Cost Optimization” in the AWS Well-Architected Framework?
   a) Achieving the highest performance possible
   b) Minimizing costs without considering performance
   c) Reducing complexity at all costs
   d) Reducing costs while maintaining or improving performance

7) Which pillar of the AWS Well-Architected Framework emphasizes the importance of creating a well-structured and accountable team to manage cloud resources effectively?
   a) Operational Excellence
   b) Organization
   c) Prepare
   d) Operate
   e) Evolve

8) What is the primary objective of “Detection” in cloud security?
   a) Preventing all security incidents
   b) Identifying security threats and vulnerabilities
   c) Managing access to cloud resources
   d) Protecting data at rest

9) In cloud security, “Infrastructure Protection” focuses on _____.
   a) Managing user access
   b) Protecting the physical data centers
   c) Detecting and responding to security incidents
   d) Protecting the cloud infrastructure from attacks and vulnerabilities

10) What is the main goal of “Change Management” within the Reliability pillar of the AWS Well-Architected Framework?
   a) Promoting frequent and uncontrolled changes
   b) Reducing the overall cost of change
   c) Maintaining system stability while making changes
   d) Avoiding any changes to the system

11) What is the primary role of “Foundations” in ensuring Reliability within the AWS Well-Architected Framework?
   a) Building a strong architectural base for your workloads
   b) Managing workload changes
   c) Monitoring performance and efficiency
   d) Addressing operational issues

12) In the context of the AWS Well-Architected Framework, what is “Failure Mode Analysis” used for?
   a) Identifying potential system failures
   b) Ignoring system failures
   c) Maximizing system performance
   d) Reducing costs

13) What is the key aspect of managing demand and supply resources in cloud financial management?

a) Increasing resource costs
b) Matching resource demand to supply
c) Ignoring resource scaling
d) Avoiding resource trade-offs

14) Cloud cost optimization is a process that involves _____.

a) Increasing your cloud expenses
b) Minimizing cloud resource usage
c) Achieving the best value for your cloud investment
d) Eliminating cloud services

Seat No.	

Set **P**

Fourth. Y. (B.Tech.) (Electronics Engineering) (Sem - I) (New) (CBCS)
Examination: March/April – 2026
IOT- Architecting IOT Solutions (BTN04714)

Day & Date: Monday, 11-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Make suitable assumptions if necessary and state them clearly.

SECTION – I

Q.2 Attempt Any THREE. **12**

a) What are some key design principles that AWS follows in its framework?

b) Explain the significance of defining the scope of an AWS project.

c) What are the best practices for achieving Security in a cloud architecture according to the AWS Well-Architected Framework?

d) Discuss the concept of Reliability in the context of the AWS Well-Architected Framework and provide examples of how to achieve it.

Q.3 Attempt Any TWO. **16**

a) Describe the process of selecting an appropriate AWS region for hosting applications. Consider factors like latency, compliance, and data sovereignty.

b) Discuss the role of automation and DevOps practices in achieving Operational Excellence in cloud operations. How do these practices contribute to organizational success?

c) What is the significance of Identity and Access Management (IAM) in cloud security, and how does it contribute to a secure cloud environment?

SECTION – II

Q.4 Attempt Any THREE. **12**

a) Describe the key strategies and measures for protecting the infrastructure in a cloud environment. What are some common infrastructure protection techniques?

b) What are the critical aspects of data protection in cloud computing, and how can organizations ensure the confidentiality and integrity of their data?

c) What are the foundational principles of reliability in cloud computing, and why is reliability critical for organizations?

d) Explain the process of resource selection in achieving Performance Efficiency within the cloud. What factors should organizations consider when selecting resources for their workloads?

Q.5 Attempt Any TWO. **16**

a) Discuss the components and key concepts of the AWS Well-Architected Framework for Failure Management. How can organizations use this framework to enhance the reliability of their applications?

b) Discuss the role of automated scaling and load balancing in maintaining the reliability of applications during varying workloads.

c) Provide examples of cost-effective cloud resources and services that organizations can leverage to optimize their performance while minimizing costs.

SLR-QH-423

Seat No.	

Set Q

Fourth. Y. (B.Tech.) (Electronics Engineering) (Sem - I) (New) (CBCS)
Examination: March/April – 2026
IOT- Architecting IOT Solutions (BTN04714)

Day & Date: Monday, 11-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) What is the primary objective of "Detection" in cloud security?
a) Preventing all security incidents
b) Identifying security threats and vulnerabilities
c) Managing access to cloud resources
d) Protecting data at rest

2) In cloud security, "Infrastructure Protection" focuses on _____.
a) Managing user access
b) Protecting the physical data centers
c) Detecting and responding to security incidents
d) Protecting the cloud infrastructure from attacks and vulnerabilities

3) What is the main goal of "Change Management" within the Reliability pillar of the AWS Well-Architected Framework?
a) Promoting frequent and uncontrolled changes
b) Reducing the overall cost of change
c) Maintaining system stability while making changes
d) Avoiding any changes to the system

4) What is the primary role of "Foundations" in ensuring Reliability within the AWS Well-Architected Framework?
a) Building a strong architectural base for your workloads
b) Managing workload changes
c) Monitoring performance and efficiency
d) Addressing operational issues

5) In the context of the AWS Well-Architected Framework, what is "Failure Mode Analysis" used for?
   a) Identifying potential system failures
   b) Ignoring system failures
   c) Maximizing system performance
   d) Reducing costs

6) What is the key aspect of managing demand and supply resources in cloud financial management?
   a) Increasing resource costs
   b) Matching resource demand to supply
   c) Ignoring resource scaling
   d) Avoiding resource trade-offs

7) Cloud cost optimization is a process that involves _____.
   a) Increasing your cloud expenses
   b) Minimizing cloud resource usage
   c) Achieving the best value for your cloud investment
   d) Eliminating cloud services

8) When considering AWS cost optimization, what is the process of choosing the most cost-effective pricing model for a service?
   a) Cost forecasting
   b) Cost allocation
   c) Cost analysis
   d) Cost optimization

9) What factor should be considered when selecting an AWS region for hosting data that must comply with specific regulatory requirements?
   a) Network latency
   b) Cost optimization
   c) Data sovereignty
   d) Scalability

10) Which AWS service enables the automatic scaling of compute capacity based on traffic and demand?
   a) Amazon CloudFront
   b) AWS Lambda
   c) Amazon Auto Scaling
   d) Amazon Route 53

11) What is the primary objective of the "Performance Efficiency" pillar in the AWS Well-Architected Framework?
   a) Minimizing costs
   b) Ensuring high availability
   c) Achieving optimal system performance
   d) Maximizing security

12) Which AWS Well-Architected Framework pillar focuses on the ability to recover from infrastructure or service failures and dynamically scale to meet demand?
   a) Security
   b) Cost Optimization
   c) Reliability
   d) Performance Efficiency

13) What is the primary goal of “Cost Optimization” in the AWS Well-Architected Framework?

a) Achieving the highest performance possible
b) Minimizing costs without considering performance
c) Reducing complexity at all costs
d) Reducing costs while maintaining or improving performance

14) Which pillar of the AWS Well-Architected Framework emphasizes the importance of creating a well-structured and accountable team to manage cloud resources effectively?

a) Operational Excellence
b) Organization
c) Prepare
d) Operate
e) Evolve

SLR-QH-423

Seat No.	

Set Q

Fourth. Y. (B.Tech.) (Electronics Engineering) (Sem - I) (New) (CBCS)
Examination: March/April – 2026
IOT- Architecting IOT Solutions (BTN04714)

Day & Date: Monday, 11-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Make suitable assumptions if necessary and state them clearly.

SECTION – I

Q.2 Attempt Any THREE. **12**

a) What are some key design principles that AWS follows in its framework?

b) Explain the significance of defining the scope of an AWS project.

c) What are the best practices for achieving Security in a cloud architecture according to the AWS Well-Architected Framework?

d) Discuss the concept of Reliability in the context of the AWS Well-Architected Framework and provide examples of how to achieve it.

Q.3 Attempt Any TWO. **16**

a) Describe the process of selecting an appropriate AWS region for hosting applications. Consider factors like latency, compliance, and data sovereignty.

b) Discuss the role of automation and DevOps practices in achieving Operational Excellence in cloud operations. How do these practices contribute to organizational success?

c) What is the significance of Identity and Access Management (IAM) in cloud security, and how does it contribute to a secure cloud environment?

SECTION – II

Q.4 Attempt Any THREE. **12**

a) Describe the key strategies and measures for protecting the infrastructure in a cloud environment. What are some common infrastructure protection techniques?

b) What are the critical aspects of data protection in cloud computing, and how can organizations ensure the confidentiality and integrity of their data?

c) What are the foundational principles of reliability in cloud computing, and why is reliability critical for organizations?

d) Explain the process of resource selection in achieving Performance Efficiency within the cloud. What factors should organizations consider when selecting resources for their workloads?

Q.5 Attempt Any TWO. **16**

a) Discuss the components and key concepts of the AWS Well-Architected Framework for Failure Management. How can organizations use this framework to enhance the reliability of their applications?

b) Discuss the role of automated scaling and load balancing in maintaining the reliability of applications during varying workloads.

c) Provide examples of cost-effective cloud resources and services that organizations can leverage to optimize their performance while minimizing costs.

SLR-QH-423

Seat No.	

Set R

Fourth. Y. (B.Tech.) (Electronics Engineering) (Sem - I) (New) (CBCS)
Examination: March/April – 2026
IOT- Architecting IOT Solutions (BTN04714)

Day & Date: Monday, 11-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) What is the primary role of "Foundations" in ensuring Reliability within the AWS Well-Architected Framework?
a) Building a strong architectural base for your workloads
b) Managing workload changes
c) Monitoring performance and efficiency
d) Addressing operational issues

2) In the context of the AWS Well-Architected Framework, what is "Failure Mode Analysis" used for?
a) Identifying potential system failures
b) Ignoring system failures
c) Maximizing system performance
d) Reducing costs

3) What is the key aspect of managing demand and supply resources in cloud financial management?
a) Increasing resource costs
b) Matching resource demand to supply
c) Ignoring resource scaling
d) Avoiding resource trade-offs

4) Cloud cost optimization is a process that involves _____.
a) Increasing your cloud expenses
b) Minimizing cloud resource usage
c) Achieving the best value for your cloud investment
d) Eliminating cloud services

5) When considering AWS cost optimization, what is the process of choosing the most cost-effective pricing model for a service?
a) Cost forecasting
b) Cost allocation
c) Cost analysis
d) Cost optimization

6) What factor should be considered when selecting an AWS region for hosting data that must comply with specific regulatory requirements?
a) Network latency
b) Cost optimization
c) Data sovereignty
d) Scalability

7) Which AWS service enables the automatic scaling of compute capacity based on traffic and demand?
a) Amazon CloudFront
b) AWS Lambda
c) Amazon Auto Scaling
d) Amazon Route 53

8) What is the primary objective of the “Performance Efficiency” pillar in the AWS Well-Architected Framework?
a) Minimizing costs
b) Ensuring high availability
c) Achieving optimal system performance
d) Maximizing security

9) Which AWS Well-Architected Framework pillar focuses on the ability to recover from infrastructure or service failures and dynamically scale to meet demand?
a) Security
b) Cost Optimization
c) Reliability
d) Performance Efficiency

10) What is the primary goal of “Cost Optimization” in the AWS Well-Architected Framework?
a) Achieving the highest performance possible
b) Minimizing costs without considering performance
c) Reducing complexity at all costs
d) Reducing costs while maintaining or improving performance

11) Which pillar of the AWS Well-Architected Framework emphasizes the importance of creating a well-structured and accountable team to manage cloud resources effectively?
a) Operational Excellence
b) Organization
c) Prepare
d) Operate
e) Evolve

12) What is the primary objective of “Detection” in cloud security?
a) Preventing all security incidents
b) Identifying security threats and vulnerabilities
c) Managing access to cloud resources
d) Protecting data at rest

13) In cloud security, “Infrastructure Protection” focuses on _____.

a) Managing user access
b) Protecting the physical data centers
c) Detecting and responding to security incidents
d) Protecting the cloud infrastructure from attacks and vulnerabilities

14) What is the main goal of “Change Management” within the Reliability pillar of the AWS Well-Architected Framework?

a) Promoting frequent and uncontrolled changes
b) Reducing the overall cost of change
c) Maintaining system stability while making changes
d) Avoiding any changes to the system

Seat No.	

Set **R**

Fourth. Y. (B.Tech.) (Electronics Engineering) (Sem - I) (New) (CBCS)
Examination: March/April – 2026
IOT- Architecting IOT Solutions (BTN04714)

Day & Date: Monday, 11-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Make suitable assumptions if necessary and state them clearly.

SECTION – I

Q.2 Attempt Any THREE. **12**

a) What are some key design principles that AWS follows in its framework?

b) Explain the significance of defining the scope of an AWS project.

c) What are the best practices for achieving Security in a cloud architecture according to the AWS Well-Architected Framework?

d) Discuss the concept of Reliability in the context of the AWS Well-Architected Framework and provide examples of how to achieve it.

Q.3 Attempt Any TWO. **16**

a) Describe the process of selecting an appropriate AWS region for hosting applications. Consider factors like latency, compliance, and data sovereignty.

b) Discuss the role of automation and DevOps practices in achieving Operational Excellence in cloud operations. How do these practices contribute to organizational success?

c) What is the significance of Identity and Access Management (IAM) in cloud security, and how does it contribute to a secure cloud environment?

SECTION – II

Q.4 Attempt Any THREE. **12**

a) Describe the key strategies and measures for protecting the infrastructure in a cloud environment. What are some common infrastructure protection techniques?

b) What are the critical aspects of data protection in cloud computing, and how can organizations ensure the confidentiality and integrity of their data?

c) What are the foundational principles of reliability in cloud computing, and why is reliability critical for organizations?

d) Explain the process of resource selection in achieving Performance Efficiency within the cloud. What factors should organizations consider when selecting resources for their workloads?

Q.5 Attempt Any TWO. **16**

a) Discuss the components and key concepts of the AWS Well-Architected Framework for Failure Management. How can organizations use this framework to enhance the reliability of their applications?

b) Discuss the role of automated scaling and load balancing in maintaining the reliability of applications during varying workloads.

c) Provide examples of cost-effective cloud resources and services that organizations can leverage to optimize their performance while minimizing costs.

Seat No.	

Set **S**

Fourth. Y. (B.Tech.) (Electronics Engineering) (Sem - I) (New) (CBCS)
Examination: March/April – 2026
IOT- Architecting IOT Solutions (BTN04714)

Day & Date: Monday, 11-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) What is the primary goal of "Cost Optimization" in the AWS Well-Architected Framework?
a) Achieving the highest performance possible
b) Minimizing costs without considering performance
c) Reducing complexity at all costs
d) Reducing costs while maintaining or improving performance

2) Which pillar of the AWS Well-Architected Framework emphasizes the importance of creating a well-structured and accountable team to manage cloud resources effectively?
a) Operational Excellence b) Organization
c) Prepare d) Operate
e) Evolve

3) What is the primary objective of "Detection" in cloud security?
a) Preventing all security incidents
b) Identifying security threats and vulnerabilities
c) Managing access to cloud resources
d) Protecting data at rest

4) In cloud security, "Infrastructure Protection" focuses on _____.
a) Managing user access
b) Protecting the physical data centers
c) Detecting and responding to security incidents
d) Protecting the cloud infrastructure from attacks and vulnerabilities

5) What is the main goal of “Change Management” within the Reliability pillar of the AWS Well-Architected Framework?
   a) Promoting frequent and uncontrolled changes
   b) Reducing the overall cost of change
   c) Maintaining system stability while making changes
   d) Avoiding any changes to the system

6) What is the primary role of “Foundations” in ensuring Reliability within the AWS Well-Architected Framework?
   a) Building a strong architectural base for your workloads
   b) Managing workload changes
   c) Monitoring performance and efficiency
   d) Addressing operational issues

7) In the context of the AWS Well-Architected Framework, what is “Failure Mode Analysis” used for?
   a) Identifying potential system failures
   b) Ignoring system failures
   c) Maximizing system performance
   d) Reducing costs

8) What is the key aspect of managing demand and supply resources in cloud financial management?
   a) Increasing resource costs
   b) Matching resource demand to supply
   c) Ignoring resource scaling
   d) Avoiding resource trade-offs

9) Cloud cost optimization is a process that involves _____.
   a) Increasing your cloud expenses
   b) Minimizing cloud resource usage
   c) Achieving the best value for your cloud investment
   d) Eliminating cloud services

10) When considering AWS cost optimization, what is the process of choosing the most cost-effective pricing model for a service?
   a) Cost forecasting
   b) Cost allocation
   c) Cost analysis
   d) Cost optimization

11) What factor should be considered when selecting an AWS region for hosting data that must comply with specific regulatory requirements?
   a) Network latency
   b) Cost optimization
   c) Data sovereignty
   d) Scalability

12) Which AWS service enables the automatic scaling of compute capacity based on traffic and demand?
   a) Amazon CloudFront
   b) AWS Lambda
   c) Amazon Auto Scaling
   d) Amazon Route 53

13) What is the primary objective of the “Performance Efficiency” pillar in the AWS Well-Architected Framework?

a) Minimizing costs
b) Ensuring high availability
c) Achieving optimal system performance
d) Maximizing security

14) Which AWS Well-Architected Framework pillar focuses on the ability to recover from infrastructure or service failures and dynamically scale to meet demand?

a) Security
b) Cost Optimization
c) Reliability
d) Performance Efficiency

SLR-QH-423

Seat No.		Set	S

Fourth. Y. (B.Tech.) (Electronics Engineering) (Sem - I) (New) (CBCS)
Examination: March/April – 2026
IOT- Architecting IOT Solutions (BTN04714)

Day & Date: Monday, 11-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Make suitable assumptions if necessary and state them clearly.

SECTION – I

Q.2 Attempt Any THREE. **12**

a) What are some key design principles that AWS follows in its framework?

b) Explain the significance of defining the scope of an AWS project.

c) What are the best practices for achieving Security in a cloud architecture according to the AWS Well-Architected Framework?

d) Discuss the concept of Reliability in the context of the AWS Well-Architected Framework and provide examples of how to achieve it.

Q.3 Attempt Any TWO. **16**

a) Describe the process of selecting an appropriate AWS region for hosting applications. Consider factors like latency, compliance, and data sovereignty.

b) Discuss the role of automation and DevOps practices in achieving Operational Excellence in cloud operations. How do these practices contribute to organizational success?

c) What is the significance of Identity and Access Management (IAM) in cloud security, and how does it contribute to a secure cloud environment?

SECTION – II

Q.4 Attempt Any THREE. **12**

a) Describe the key strategies and measures for protecting the infrastructure in a cloud environment. What are some common infrastructure protection techniques?

b) What are the critical aspects of data protection in cloud computing, and how can organizations ensure the confidentiality and integrity of their data?

c) What are the foundational principles of reliability in cloud computing, and why is reliability critical for organizations?

d) Explain the process of resource selection in achieving Performance Efficiency within the cloud. What factors should organizations consider when selecting resources for their workloads?

Q.5 Attempt Any TWO. **16**

a) Discuss the components and key concepts of the AWS Well-Architected Framework for Failure Management. How can organizations use this framework to enhance the reliability of their applications?

b) Discuss the role of automated scaling and load balancing in maintaining the reliability of applications during varying workloads.

c) Provide examples of cost-effective cloud resources and services that organizations can leverage to optimize their performance while minimizing costs.

SLR-QH-426

Seat No.		Set	P

Fourth Y. (B.Tech.) (Electronics Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Cloud Computing (BTN04808)

Day & Date: Thursday, 14-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) What is a key characteristic of cloud computing?
a) Limited scalability b) High upfront costs
c) On-demand self-service d) Restricted network access

2) Which of the following is NOT a benefit of cloud computing?
a) Cost-effectiveness b) Improved security
c) Limited accessibility d) Scalability

3) Which service model allows developers to build, deploy, and manage applications without worrying about the underlying infrastructure, including servers, storage, and networking?
a) Infrastructure as a Service (IaaS)
b) Platform as a Service (PaaS)
c) Software as a Service (SaaS)
d) Database as a Service (DBaaS)

4) Which virtualization technology provides lightweight, portable, and isolated environments for running applications, enabling faster development and deployment cycles?
a) Type 1 hypervisor b) Type 2 hypervisor
c) Bare-metal hypervisor d) Containerization

5) Which cloud infrastructure component enables users to provision virtual machines, containers, or serverless computing resources on-demand?
a) Compute
b) Storage
c) Networking
d) Identity and Access Management (IAM)

6) In cloud computing, what technology enables automated provisioning and management of resources based on predefined policies and workflows?

a) Configuration management b) Orchestration
c) Virtualization d) Load balancing

7) What design consideration should be taken into account when designing cloud applications for cost optimization?

a) Maximize data redundancy
b) Minimize network latency
c) Optimize resource utilization
d) Increase security measures

8) According to the case study, which cloud provider stands out for its focus on innovation and cutting-edge technologies, such as Kubernetes and Anthos?

a) AWS b) Google Cloud
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9) What is a key characteristic of cloud-native application architecture?

a) Monolithic design
b) Tight coupling between components
c) Reliance on virtual machines
d) Use of microservices

10) What is the primary goal of using microservices architecture?

a) Centralized control of application components
b) Monolithic design for simplicity
c) Loosely coupled and independently deployable services
d) Minimal use of virtualization technologies

11) Which of the following is a best practice to enhance cloud security?

a) Sharing passwords across multiple accounts
b) Storing sensitive data in plain text format
c) Implementing multi-factor authentication
d) Granting unrestricted access to all users

12) What is one of the primary goals of cloud service management?

a) Maximizing upfront costs
b) Minimizing resource utilization
c) Ensuring optimal performance and availability
d) Increasing manual intervention in resource provisioning

13) What is the purpose of the Edge Computing layer in IoT architecture?

a) It processes data closer to the IoT devices, reducing latency
b) It stores historical data for long-term analysis
c) It provides a graphical user interface for data visualization
d) It manages device authentication and access control

14) What does IoT stand for?

a) Internet of Technology
b) Internet of Things
c) Internet of Telecommunications
d) Internet of Transactions

SLR-QH-426

Seat No.		Set	P

Fourth Y. (B.Tech.) (Electronics Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Cloud Computing (BTN04808)

Day & Date: Thursday, 14-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

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

Section – I

Q.2 Solve (Any Three). **12**

a) Discuss the benefits ana challenges of cloud computing with suitable examples.

b) Define and describe the concept of "hybrid cloud".

c) Name one example of a containerization technology commonly used in cloud environments.

d) Define cloud resource provisioning.

e) What are the three primary cloud service models? Explain.

Q.3 Solve (Any One). **08**

a) Explain the key components of cloud infrastructure, including compute, storage, and networking, and discuss how cloud resource provisioning and management contribute to efficient resource allocation and utilization.

b) Compare and contrast the three primary cloud service models (IaaS, PaaS, and SaaS), highlighting their key features and use cases.

Q.4 Discuss the benefits of cloud adoption for businesses, citing examples of cost efficiency, scalability, and flexibility, while addressing potential challenges and proposing mitigation strategies. **08**

Section – II

Q.5 Solve (Any Three). **12**

a) Describe AWS Lambda.

b) What are key characteristics of serverless computing?

c) How can organizations ensure data privacy in the cloud?

d) Discuss common cloud service management tools.

e) Give an example of an IoT application in smart cities and discuss.

Q.6 Solve (Any One), **08**

a) What are key characteristics of Serverless Computing and FaaS (Function as a Service)? List the benefits and challenges associated with them.

b) Explain the architecture of IoT systems. Identify and describe the key components involved in an IoT ecosystem, including devices/sensors, connectivity, data processing, and applications.

Q.7 What is Cloud-native application architecture? Discuss key characteristics of Cloud-Native Application Architecture. **08**

SLR-QH-426

Seat No.		Set	Q

Fourth Y. (B.Tech.) (Electronics Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Cloud Computing (BTN04808)

Day & Date: Thursday, 14-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

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   d) Restricted network access

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   c) Limited accessibility
   d) Scalability

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   c) Software as a Service (SaaS)
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   b) Storage
   c) Networking
   d) Identity and Access Management (IAM)

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   a) Configuration management
   b) Orchestration
   c) Virtualization
   d) Load balancing

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a) Maximize data redundancy
b) Minimize network latency
c) Optimize resource utilization
d) Increase security measures

SLR-QH-426

Seat No.	

Set Q

Fourth Y. (B.Tech.) (Electronics Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Cloud Computing (BTN04808)

Day & Date: Thursday, 14-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

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

Section – I

Q.2 Solve (Any Three). **12**

a) Discuss the benefits ana challenges of cloud computing with suitable examples.

b) Define and describe the concept of "hybrid cloud".

c) Name one example of a containerization technology commonly used in cloud environments.

d) Define cloud resource provisioning.

e) What are the three primary cloud service models? Explain.

Q.3 Solve (Any One). **08**

a) Explain the key components of cloud infrastructure, including compute, storage, and networking, and discuss how cloud resource provisioning and management contribute to efficient resource allocation and utilization.

b) Compare and contrast the three primary cloud service models (IaaS, PaaS, and SaaS), highlighting their key features and use cases.

Q.4 Discuss the benefits of cloud adoption for businesses, citing examples of cost efficiency, scalability, and flexibility, while addressing potential challenges and proposing mitigation strategies. **08**

Section – II

Q.5 Solve (Any Three). **12**

a) Describe AWS Lambda.

b) What are key characteristics of serverless computing?

c) How can organizations ensure data privacy in the cloud?

d) Discuss common cloud service management tools.

e) Give an example of an IoT application in smart cities and discuss.

Q.6 Solve (Any One), **08**

a) What are key characteristics of Serverless Computing and FaaS (Function as a Service)? List the benefits and challenges associated with them.

b) Explain the architecture of IoT systems. Identify and describe the key components involved in an IoT ecosystem, including devices/sensors, connectivity, data processing, and applications.

Q.7 What is Cloud-native application architecture? Discuss key characteristics of Cloud-Native Application Architecture. **08**

SLR-QH-426

Seat No.		Set	R

Fourth Y. (B.Tech.) (Electronics Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Cloud Computing (BTN04808)

Day & Date: Thursday, 14-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which of the following is a best practice to enhance cloud security?
a) Sharing passwords across multiple accounts
b) Storing sensitive data in plain text format
c) Implementing multi-factor authentication
d) Granting unrestricted access to all users

2) What is one of the primary goals of cloud service management?
a) Maximizing upfront costs
b) Minimizing resource utilization
c) Ensuring optimal performance and availability
d) Increasing manual intervention in resource provisioning

3) What is the purpose of the Edge Computing layer in IoT architecture?
a) It processes data closer to the IoT devices, reducing latency
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c) It provides a graphical user interface for data visualization
d) It manages device authentication and access control

4) What does IoT stand for?
a) Internet of Technology
b) Internet of Things
c) Internet of Telecommunications
d) Internet of Transactions

5) What is a key characteristic of cloud computing?
a) Limited scalability b) High upfront costs
c) On-demand self-service d) Restricted network access

6) Which of the following is NOT a benefit of cloud computing?
a) Cost-effectiveness b) Improved security
c) Limited accessibility d) Scalability

7) Which service model allows developers to build, deploy, and manage applications without worrying about the underlying infrastructure, including servers, storage, and networking?
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c) Software as a Service (SaaS)
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9) Which cloud infrastructure component enables users to provision virtual machines, containers, or serverless computing resources on-demand?
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11) What design consideration should be taken into account when designing cloud applications for cost optimization?
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b) Minimize network latency
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12) According to the case study, which cloud provider stands out for its focus on innovation and cutting-edge technologies, such as Kubernetes and Anthos?
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a) Monolithic design
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14) What is the primary goal of using microservices architecture?
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Seat No.	

Set **R**

Fourth Y. (B.Tech.) (Electronics Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Cloud Computing (BTN04808)

Day & Date: Thursday, 14-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

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

Section – I

Q.2 Solve (Any Three). **12**

a) Discuss the benefits ana challenges of cloud computing with suitable examples.

b) Define and describe the concept of "hybrid cloud".

c) Name one example of a containerization technology commonly used in cloud environments.

d) Define cloud resource provisioning.

e) What are the three primary cloud service models? Explain.

Q.3 Solve (Any One). **08**

a) Explain the key components of cloud infrastructure, including compute, storage, and networking, and discuss how cloud resource provisioning and management contribute to efficient resource allocation and utilization.

b) Compare and contrast the three primary cloud service models (IaaS, PaaS, and SaaS), highlighting their key features and use cases.

Q.4 Discuss the benefits of cloud adoption for businesses, citing examples of cost efficiency, scalability, and flexibility, while addressing potential challenges and proposing mitigation strategies. **08**

Section – II

Q.5 Solve (Any Three). **12**

a) Describe AWS Lambda.

b) What are key characteristics of serverless computing?

c) How can organizations ensure data privacy in the cloud?

d) Discuss common cloud service management tools.

e) Give an example of an IoT application in smart cities and discuss.

Q.6 Solve (Any One), **08**

a) What are key characteristics of Serverless Computing and FaaS (Function as a Service)? List the benefits and challenges associated with them.

b) Explain the architecture of IoT systems. Identify and describe the key components involved in an IoT ecosystem, including devices/sensors, connectivity, data processing, and applications.

Q.7 What is Cloud-native application architecture? Discuss key characteristics of Cloud-Native Application Architecture. **08**

SLR-QH-426

Seat No.		Set	S

Fourth Y. (B.Tech.) (Electronics Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Cloud Computing (BTN04808)

Day & Date: Thursday, 14-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) In cloud computing, what technology enables automated provisioning and management of resources based on predefined policies and workflows?
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c) Virtualization d) Load balancing

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b) High upfront costs
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d) Containerization

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a) Compute
b) Storage
c) Networking
d) Identity and Access Management (IAM)

SLR-QH-426

Seat No.		Set	S

Fourth Y. (B.Tech.) (Electronics Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Cloud Computing (BTN04808)

Day & Date: Thursday, 14-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

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

Section – I

Q.2 Solve (Any Three). **12**

a) Discuss the benefits ana challenges of cloud computing with suitable examples.

b) Define and describe the concept of "hybrid cloud".

c) Name one example of a containerization technology commonly used in cloud environments.

d) Define cloud resource provisioning.

e) What are the three primary cloud service models? Explain.

Q.3 Solve (Any One). **08**

a) Explain the key components of cloud infrastructure, including compute, storage, and networking, and discuss how cloud resource provisioning and management contribute to efficient resource allocation and utilization.

b) Compare and contrast the three primary cloud service models (IaaS, PaaS, and SaaS), highlighting their key features and use cases.

Q.4 Discuss the benefits of cloud adoption for businesses, citing examples of cost efficiency, scalability, and flexibility, while addressing potential challenges and proposing mitigation strategies. **08**

Section – II

Q.5 Solve (Any Three). **12**

a) Describe AWS Lambda.

b) What are key characteristics of serverless computing?

c) How can organizations ensure data privacy in the cloud?

d) Discuss common cloud service management tools.

e) Give an example of an IoT application in smart cities and discuss.

Q.6 Solve (Any One), **08**

a) What are key characteristics of Serverless Computing and FaaS (Function as a Service)? List the benefits and challenges associated with them.

b) Explain the architecture of IoT systems. Identify and describe the key components involved in an IoT ecosystem, including devices/sensors, connectivity, data processing, and applications.

Q.7 What is Cloud-native application architecture? Discuss key characteristics of Cloud-Native Application Architecture. **08**

SLR-QH-427

Seat No.		Set	P

Fourth Y. (B.Tech.) (Electronics Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026
Electronic Instrumentation (BTN04802)

Day & Date: Monday, 18-05-2026 Max. Marks: 50
Time: 03:00 PM To 05:00 PM

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

MCQ/Objective Type Questions

Duration: 20 Minutes Marks: 10

Q.1 Choose the correct Answer. **10**

1) In FFT Spectrum Analyzer, FFT stands for _____.
a) Frequency Fourier Transform
b) Fast Fourier Transmission
c) Frequency Fourier Transmission
d) Fast Fourier Transform

2) Error of measurement is the difference between _____.
a) True value & Measured Value
b) Precision & True value
c) Measured Value & Precision
d) None of the above

3) In liquid crystal displays, the liquid crystal exhibits properties of _____.
a) Liquid b) Solids
c) Gases d) Both a) and b)

4) Which is the latest ISO 9001 version in the ISO 9000 family?
a) ISO 9001:1994 b) ISO 9001:2000
c) ISO 9001:2008 d) ISO 9001:2015

5) Data loggers are used _____.
a) to store data b) to process data
c) to manipulate data d) None of above

6) Wave analyzers are used in the frequency range of _____.
a) VHF b) UHF
c) lower RF d) higher RF

7) FFT analyzer can be used to find the _____.
   a) natural frequencies
   b) mode shapes
   c) both natural frequencies and mode shapes
   d) none of the above

8) Which of the following is not a type of systematic error?
   a) Instrumental Errors
   b) Environmental Errors
   c) Observational Errors
   d) Gross error

9) In function generator, the output waveform of integrator is _____.
   a) Sinusoidal
   b) Square
   c) Triangular
   d) Saw-tooth

10) Which of the following represents India in ISO?
   a) PFRDA
   b) FSSAI
   c) BIS
   d) BCCI

Seat No.		Set	P

Fourth Y. (B.Tech.) (Electronics Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026
Electronic Instrumentation (BTN04802)

Day & Date: Monday, 18-05-2026 Max. Marks: 40
Time: 03:00 PM To 05:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if required.

Section – I

Q.2 Solve Any Two. **08**

a) Explain the various types of systematic errors encountered in measurements.

b) Draw the block diagram of function generator and explain method of producing sine wave.

c) With suitable diagram explain LED display.

Q.3 Solve Any Two. **12**

a) Explain operation of data generator with suitable block diagram.

b) Explain dynamic characteristic of electronic instruments.

c) What is static error? Explain different types of static errors.

Section – II

Q.4 Solve Any Two. **08**

a) Describe operation of Logic Analyzer with suitable block diagram.

b) Draw the Quality Loop and label all the segments.

c) Explain the Deming cycle of quality control.

Q.5 Solve Any Two. **12**

a) Explain with help of suitable block diagram the working of spectrum analyzer.

b) What is DAS? Explain working of multichannel DAS with suitable block diagram.

c) What is meant by Total Quality Management? What are the basic principles? Explain the underlying steps to Total Quality Management.

SLR-QH-427

Seat No.	

Set Q

Fourth Y. (B.Tech.) (Electronics Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026
Electronic Instrumentation (BTN04802)

Day & Date: Monday, 18-05-2026 Max. Marks: 50
Time: 03:00 PM To 05:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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4) Assume suitable data if required.

MCQ/Objective Type Questions

Duration: 20 Minutes Marks: 10

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   c) ISO 9001:2008
   d) ISO 9001:2015

10) Data loggers are used _____.
   a) to store data
   b) to process data
   c) to manipulate data
   d) None of above

SLR-QH-427

Seat No.	

Set Q

Fourth Y. (B.Tech.) (Electronics Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026
Electronic Instrumentation (BTN04802)

Day & Date: Monday, 18-05-2026 Max. Marks: 40
Time: 03:00 PM To 05:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if required.

Section – I

Q.2 Solve Any Two. **08**

a) Explain the various types of systematic errors encountered in measurements.

b) Draw the block diagram of function generator and explain method of producing sine wave.

c) With suitable diagram explain LED display.

Q.3 Solve Any Two. **12**

a) Explain operation of data generator with suitable block diagram.

b) Explain dynamic characteristic of electronic instruments.

c) What is static error? Explain different types of static errors.

Section – II

Q.4 Solve Any Two. **08**

a) Describe operation of Logic Analyzer with suitable block diagram.

b) Draw the Quality Loop and label all the segments.

c) Explain the Deming cycle of quality control.

Q.5 Solve Any Two. **12**

a) Explain with help of suitable block diagram the working of spectrum analyzer.

b) What is DAS? Explain working of multichannel DAS with suitable block diagram.

c) What is meant by Total Quality Management? What are the basic principles? Explain the underlying steps to Total Quality Management.

SLR-QH-427

Seat No.	

Set R

Fourth Y. (B.Tech.) (Electronics Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026
Electronic Instrumentation (BTN04802)

Day & Date: Monday, 18-05-2026 Max. Marks: 50
Time: 03:00 PM To 05:00 PM

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

MCQ/Objective Type Questions

Duration: 20 Minutes Marks: 10

Q.1 Choose the correct Answer. **10**

1) In function generator, the output waveform of integrator is _____.
a) Sinusoidal b) Square
c) Triangular d) Saw-tooth

2) Which of the following represents India in ISO?
a) PFRDA b) FSSAI
c) BIS d) BCCI

3) In FFT Spectrum Analyzer, FFT stands for _____.
a) Frequency Fourier Transform
b) Fast Fourier Transmission
c) Frequency Fourier Transmission
d) Fast Fourier Transform

4) Error of measurement is the difference between _____.
a) True value & Measured Value
b) Precision & True value
c) Measured Value & Precision
d) None of the above

5) In liquid crystal displays, the liquid crystal exhibits properties of _____.
a) Liquid b) Solids
c) Gases d) Both a) and b)

6) Which is the latest ISO 9001 version in the ISO 9000 family?
a) ISO 9001:1994 b) ISO 9001:2000
c) ISO 9001:2008 d) ISO 9001:2015

7) Data loggers are used _____.

a) to store data
b) to process data
c) to manipulate data
d) None of above

8) Wave analyzers are used in the frequency range of _____.

a) VHF
b) UHF
c) lower RF
d) higher RF

9) FFT analyzer can be used to find the _____.

a) natural frequencies
b) mode shapes
c) both natural frequencies and mode shapes
d) none of the above

10) Which of the following is not a type of systematic error?

a) Instrumental Errors
b) Environmental Errors
c) Observational Errors
d) Gross error

SLR-QH-427

Seat No.	

Set R

Fourth Y. (B.Tech.) (Electronics Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026
Electronic Instrumentation (BTN04802)

Day & Date: Monday, 18-05-2026 Max. Marks: 40
Time: 03:00 PM To 05:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if required.

Section – I

Q.2 Solve Any Two. **08**

a) Explain the various types of systematic errors encountered in measurements.

b) Draw the block diagram of function generator and explain method of producing sine wave.

c) With suitable diagram explain LED display.

Q.3 Solve Any Two. **12**

a) Explain operation of data generator with suitable block diagram.

b) Explain dynamic characteristic of electronic instruments.

c) What is static error? Explain different types of static errors.

Section – II

Q.4 Solve Any Two. **08**

a) Describe operation of Logic Analyzer with suitable block diagram.

b) Draw the Quality Loop and label all the segments.

c) Explain the Deming cycle of quality control.

Q.5 Solve Any Two. **12**

a) Explain with help of suitable block diagram the working of spectrum analyzer.

b) What is DAS? Explain working of multichannel DAS with suitable block diagram.

c) What is meant by Total Quality Management? What are the basic principles? Explain the underlying steps to Total Quality Management.

SLR-QH-427

Seat No.		Set	S

Fourth Y. (B.Tech.) (Electronics Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026
Electronic Instrumentation (BTN04802)

Day & Date: Monday, 18-05-2026 Max. Marks: 50
Time: 03:00 PM To 05:00 PM

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

MCQ/Objective Type Questions

Duration: 20 Minutes Marks: 10

Q.1 Choose the correct Answer. **10**

1) In liquid crystal displays, the liquid crystal exhibits properties of _____.
a) Liquid b) Solids
c) Gases d) Both a) and b)

2) Which is the latest ISO 9001 version in the ISO 9000 family?
a) ISO 9001:1994 b) ISO 9001:2000
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3) Data loggers are used _____.
a) to store data b) to process data
c) to manipulate data d) None of above

4) Wave analyzers are used in the frequency range of _____.
a) VHF b) UHF
c) lower RF d) higher RF

5) FFT analyzer can be used to find the _____.
a) natural frequencies
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c) both natural frequencies and mode shapes
d) none of the above

6) Which of the following is not a type of systematic error?
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7) In function generator, the output waveform of integrator is _____.

a) Sinusoidal
b) Square
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d) Saw-tooth

8) Which of the following represents India in ISO?

a) PFRDA
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c) BIS
d) BCCI

9) In FFT Spectrum Analyzer, FFT stands for _____.

a) Frequency Fourier Transform
b) Fast Fourier Transmission
c) Frequency Fourier Transmission
d) Fast Fourier Transform

10) Error of measurement is the difference between _____.

a) True value & Measured Value
b) Precision & True value
c) Measured Value & Precision
d) None of the above

SLR-QH-427

Seat No.	

Set S

Fourth Y. (B.Tech.) (Electronics Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026
Electronic Instrumentation (BTN04802)

Day & Date: Monday, 18-05-2026 Max. Marks: 40
Time: 03:00 PM To 05:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if required.

Section – I

Q.2 Solve Any Two. **08**

a) Explain the various types of systematic errors encountered in measurements.

b) Draw the block diagram of function generator and explain method of producing sine wave.

c) With suitable diagram explain LED display.

Q.3 Solve Any Two. **12**

a) Explain operation of data generator with suitable block diagram.

b) Explain dynamic characteristic of electronic instruments.

c) What is static error? Explain different types of static errors.

Section – II

Q.4 Solve Any Two. **08**

a) Describe operation of Logic Analyzer with suitable block diagram.

b) Draw the Quality Loop and label all the segments.

c) Explain the Deming cycle of quality control.

Q.5 Solve Any Two. **12**

a) Explain with help of suitable block diagram the working of spectrum analyzer.

b) What is DAS? Explain working of multichannel DAS with suitable block diagram.

c) What is meant by Total Quality Management? What are the basic principles? Explain the underlying steps to Total Quality Management.

SLR-QH-429

Seat No.	

Set P

Fourth Y. (B.Tech.) (Electronics Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026
Cyber Security (BTN04804)

Day & Date: Monday, 18-05-2026 Max. Marks: 50
Time: 03:00 PM To 05:00 PM

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

MCQ/Objective Type Questions

Duration: 20 Minutes Marks: 10

Q.1 Choose the correct alternative from the options and rewrite the sentence. **10**

1) How do black-hats typically find vulnerable systems?
a) Scanning networks
b) Watching YouTube
c) Purchasing them legally
d) Reporting them to companies

2) Which of the following is NOT a type of malware?
a) Worm b) Trojan Horse
c) Firewall d) Ransomware

3) What type of malware encrypts a user's files and demands payment for a decryption key?
a) Spyware b) Ransomware
c) Adware d) Worm

4) What is a common cloud attack?
a) DNS hijacking b) Data exfiltration
c) Overclocking d) Data compression

5) What is Cryptography used for?
a) Encrypting and decrypting data
b) Defragmenting disks
c) Installing software
d) Sending emails

6) What is "salting" in cryptography?
   a) Adding extra text to encrypt data
   b) Adding random data to hashes
   c) Removing encrypted data
   d) Changing file permissions

7) What is one method to protect your network from attacks'?
   a) Ignoring updates
   b) Using strong firewalls
   c) Disabling antivirus
   d) Allowing open access

8) Which protocol is used for secure communication in cloud computing?
   a) HTTPS
   b) HTTP
   c) FTP
   d) DNS

9) Which wireless security protocol is the most secure?
   a) WEP
   b) WPA
   c) WPA2
   d) Open network

10) What is Network Tapping?
   a) Installing software updates
   b) Cleaning network cables
   c) Setting up a Wi-Fi router
   d) Intercepting data on a network

Seat No.	

Set **P**

Fourth Y. (B.Tech.) (Electronics Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026
Cyber Security (BTN04804)

Day & Date: Monday, 18-05-2026 Max. Marks: 40
Time: 03:00 PM To 05:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

Section – I

Q.2 Attempt the following. (Any Five) **20**

a) Describe the basic steps in the Black-hat attack methodology.

b) Explain how Black-hats find vulnerable networks.

c) Explain the different types of malware.

d) Explain common methods of password theft.

e) Describe how malware can be deployed and methods to defend against it.

f) Discuss multi-factor authentication and its benefits.

Section – II

Q.3 Attempt the following. (Any Five) **20**

a) What are the key steps to set up a firewall for network protection?

b) Explain how a firewall defends against network attacks.

c) Explain the differences between WEP, WPA, and WPA2.

d) Describe the process of setting up a secure wireless network.

e) Discuss the importance of key protection in cryptography.

f) Explain how "salting” enhances password security.

SLR-QH-429

Seat No.	

Set Q

Fourth Y. (B.Tech.) (Electronics Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026
Cyber Security (BTN04804)

Day & Date: Monday, 18-05-2026 Max. Marks: 50
Time: 03:00 PM To 05:00 PM

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

MCQ/Objective Type Questions

Duration: 20 Minutes Marks: 10

Q.1 Choose the correct alternative from the options and rewrite the sentence. **10**

1) What is "salting" in cryptography?
a) Adding extra text to encrypt data
b) Adding random data to hashes
c) Removing encrypted data
d) Changing file permissions

2) What is one method to protect your network from attacks'?
a) Ignoring updates b) Using strong firewalls
c) Disabling antivirus d) Allowing open access

3) Which protocol is used for secure communication in cloud computing?
a) HTTPS b) HTTP
c) FTP d) DNS

4) Which wireless security protocol is the most secure?
a) WEP b) WPA
c) WPA2 d) Open network

5) What is Network Tapping?
a) Installing software updates
b) Cleaning network cables
c) Setting up a Wi-Fi router
d) Intercepting data on a network

6) How do black-hats typically find vulnerable systems?
   a) Scanning networks
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   c) Purchasing them legally
   d) Reporting them to companies

7) Which of the following is NOT a type of malware?
   a) Worm
   b) Trojan Horse
   c) Firewall
   d) Ransomware

8) What type of malware encrypts a user's files and demands payment for a decryption key?
   a) Spyware
   b) Ransomware
   c) Adware
   d) Worm

9) What is a common cloud attack?
   a) DNS hijacking
   b) Data exfiltration
   c) Overclocking
   d) Data compression

10) What is Cryptography used for?
   a) Encrypting and decrypting data
   b) Defragmenting disks
   c) Installing software
   d) Sending emails

Seat No.	

Set **Q**

Fourth Y. (B.Tech.) (Electronics Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026
Cyber Security (BTN04804)

Day & Date: Monday, 18-05-2026 Max. Marks: 40
Time: 03:00 PM To 05:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

Section – I

Q.2 Attempt the following. (Any Five) **20**

a) Describe the basic steps in the Black-hat attack methodology.

b) Explain how Black-hats find vulnerable networks.

c) Explain the different types of malware.

d) Explain common methods of password theft.

e) Describe how malware can be deployed and methods to defend against it.

f) Discuss multi-factor authentication and its benefits.

Section – II

Q.3 Attempt the following. (Any Five) **20**

a) What are the key steps to set up a firewall for network protection?

b) Explain how a firewall defends against network attacks.

c) Explain the differences between WEP, WPA, and WPA2.

d) Describe the process of setting up a secure wireless network.

e) Discuss the importance of key protection in cryptography.

f) Explain how "salting" enhances password security.

Seat No.	

Set **R**

Fourth Y. (B.Tech.) (Electronics Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026
Cyber Security (BTN04804)

Day & Date: Monday, 18-05-2026 Max. Marks: 50
Time: 03:00 PM To 05:00 PM

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

MCQ/Objective Type Questions

Duration: 20 Minutes Marks: 10

Q.1 Choose the correct alternative from the options and rewrite the sentence. **10**

1) Which wireless security protocol is the most secure?
a) WEP b) WPA
c) WPA2 d) Open network

2) What is Network Tapping?
a) Installing software updates
b) Cleaning network cables
c) Setting up a Wi-Fi router
d) Intercepting data on a network

3) How do black-hats typically find vulnerable systems?
a) Scanning networks
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4) Which of the following is NOT a type of malware?
a) Worm b) Trojan Horse
c) Firewall d) Ransomware

5) What type of malware encrypts a user's files and demands payment for a decryption key?
a) Spyware b) Ransomware
c) Adware d) Worm

6) What is a common cloud attack?
   a) DNS hijacking
   b) Data exfiltration
   c) Overclocking
   d) Data compression

7) What is Cryptography used for?
   a) Encrypting and decrypting data
   b) Defragmenting disks
   c) Installing software
   d) Sending emails

8) What is "salting” in cryptography?
   a) Adding extra text to encrypt data
   b) Adding random data to hashes
   c) Removing encrypted data
   d) Changing file permissions

9) What is one method to protect your network from attacks'?
   a) Ignoring updates
   b) Using strong firewalls
   c) Disabling antivirus
   d) Allowing open access

10) Which protocol is used for secure communication in cloud computing?
   a) HTTPS
   b) HTTP
   c) FTP
   d) DNS

Seat No.	

Set R

Fourth Y. (B.Tech.) (Electronics Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026
Cyber Security (BTN04804)

Day & Date: Monday, 18-05-2026 Max. Marks: 40
Time: 03:00 PM To 05:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

Section – I

Q.2 Attempt the following. (Any Five) **20**

a) Describe the basic steps in the Black-hat attack methodology.

b) Explain how Black-hats find vulnerable networks.

c) Explain the different types of malware.

d) Explain common methods of password theft.

e) Describe how malware can be deployed and methods to defend against it.

f) Discuss multi-factor authentication and its benefits.

Section – II

Q.3 Attempt the following. (Any Five) **20**

a) What are the key steps to set up a firewall for network protection?

b) Explain how a firewall defends against network attacks.

c) Explain the differences between WEP, WPA, and WPA2.

d) Describe the process of setting up a secure wireless network.

e) Discuss the importance of key protection in cryptography.

f) Explain how "salting" enhances password security.

SLR-QH-429

Seat No.		Set	S

Fourth Y. (B.Tech.) (Electronics Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026
Cyber Security (BTN04804)

Day & Date: Monday, 18-05-2026 Max. Marks: 50
Time: 03:00 PM To 05:00 PM

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

MCQ/Objective Type Questions

Duration: 20 Minutes Marks: 10

Q.1 Choose the correct alternative from the options and rewrite the sentence. **10**

1) What type of malware encrypts a user's files and demands payment for a decryption key?
a) Spyware b) Ransomware
c) Adware d) Worm

2) What is a common cloud attack?
a) DNS hijacking b) Data exfiltration
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3) What is Cryptography used for?
a) Encrypting and decrypting data
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a) Adding extra text to encrypt data
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d) Changing file permissions

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6) Which protocol is used for secure communication in cloud computing?

a) HTTPS
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d) DNS

7) Which wireless security protocol is the most secure?

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8) What is Network Tapping?

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9) How do black-hats typically find vulnerable systems?

a) Scanning networks
b) Watching YouTube
c) Purchasing them legally
d) Reporting them to companies

10) Which of the following is NOT a type of malware?

a) Worm
b) Trojan Horse
c) Firewall
d) Ransomware

Seat No.	

Set **S**

Fourth Y. (B.Tech.) (Electronics Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026
Cyber Security (BTN04804)

Day & Date: Monday, 18-05-2026 Max. Marks: 40
Time: 03:00 PM To 05:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

Section – I

Q.2 Attempt the following. (Any Five) **20**

a) Describe the basic steps in the Black-hat attack methodology.

b) Explain how Black-hats find vulnerable networks.

c) Explain the different types of malware.

d) Explain common methods of password theft.

e) Describe how malware can be deployed and methods to defend against it.

f) Discuss multi-factor authentication and its benefits.

Section – II

Q.3 Attempt the following. (Any Five) **20**

a) What are the key steps to set up a firewall for network protection?

b) Explain how a firewall defends against network attacks.

c) Explain the differences between WEP, WPA, and WPA2.

d) Describe the process of setting up a secure wireless network.

e) Discuss the importance of key protection in cryptography.

f) Explain how "salting" enhances password security.

SLR-QH-431

Seat No.		Set	P

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Design And Analysis of Algorithms (CSEPCC-07)

Day & Date: Saturday, 02-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Choose the correct option. **14**

1) Problems that cannot be solved by any algorithm are called?
a) tractable problems b) intractable problems
c) undecidable problems d) decidable problem

2) Halting problem is an example for?
a) decidable problem b) undecidable problem
c) complete problem d) trackable problem

3) Which of the problems cannot be solved by a backtracking method?
a) n-queen problem b) subset sum problem
c) Hamiltonian circuit problem d) travelling salesman problem

4) Prim's algorithm is based on _____ method.
a) Divide and conquer method b) Dynamic Programming
c) Greedy method d) Branch and bound

5) An algorithm is _____.
a) A piece of code to be execute
b) A loosely written code to make final code
c) A step by step procedure to solve problem
d) All of the above

6) An algorithm that calls itself directly or indirectly is known as _____.
a) Sub algorithm b) Recursion
c) Polish notation d) Traversal algorithm

7) The complexity of Binary search algorithm is _____.

a) O (n)
b) O (log n)
c) O (n^2)
d) O (log n^2)

8) The traveling salesman problem involves visiting each city how many times?

a) 0
b) 1
c) 2
d) 3

9) What is the time complexity for following pseudocode?

```
Algorithm Sum(n, A[])
{
        S:=0;
        For i:1 to n do
        S:S+A[i];
        return (S);
}
```

a) 2n+3
b) 2n+2
c) 2n+1
d) None

10) Which of the following statements is true regarding the P and NP class of decision problems?

a) $P = NP$
b) $P \subseteq NP$
c) $NP \subseteq P$
d) None of these

11) The Optimal Storage on Tapes Patterns problem fits the _____ paradigm.

a) subset
b) ordering
c) Both of these
d) None of these

12) What is the objective of the knapsack problem?

a) To get maximum total value in the knapsack
b) To get minimum total value in the knapsack
c) To get maximum weight in the knapsack
d) To get minimum weight in the knapsack

13) The divide-and-conquer algorithm for recursively finding the maximum and minimum of a list of n numbers requires _____ number of comparisons.

a) $2n$
b) $(3n/2) - 2$
c) $3n$
d) $4n$

14) Which of the following sorting algorithms is the fastest?

a) Merge sort
b) Quick sort
c) Insertion sort
d) Shell sort

Seat No.	

Set **P**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Design And Analysis of Algorithms (CSEPCC-07)

Day & Date: Saturday, 02-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data whenever necessary.

Section – I

Q.2 Solve Any Three of the followings. **12**

a) Define and explain asymptotic notations with examples.

b) Prove that, time complexity of merge sort algorithm is O (n.log n).

c) Sort the following sequence using merge sort

$$38, 27, 43, 3, 9, 82, 10, 15, 21, 7$$

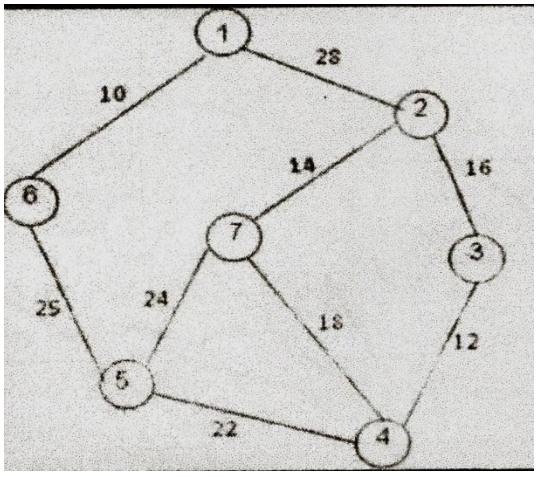
d) Explain optimal storage on tape. Find optimal storage sequence on 3 tapes t_0, t_1, t_2 for program of lengths.

$$12, 5, 8, 32, 7, 5, 18, 26, 4$$

Q.3 Solve Any One of the followings. **08**

a) Explain time and space complexity of an algorithm with examples in detail.

b) Define spanning tree. Derive minimum cost spanning tree of following graph by prim's algorithm.



Q.4 Solve the followings. **08**

Obtain a set of optimal Huffman codes for message $(m_1, m_2, m_3, \ldots, m_7)$ with relative frequencies $(a_1, a_2, a_3, \ldots, a_7) = (4, 5, 7, 8, 10, 12, 20)$.
Draw the decode tree for this set of codes.

Section – II

Q.5 Solve Any Three of the followings. **12**

a) Differentiate between tractable and intractable problem.

b) Write note on P, NP, NP-Complete and NP-Hard.

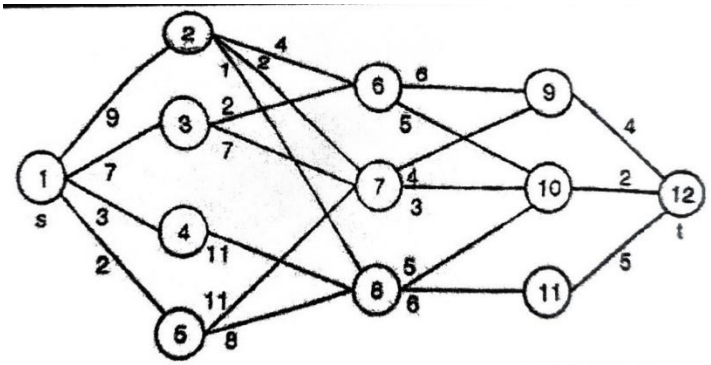
c) Define Backtracking? Explain graph coloring problem in detail.

d) Generate the set S_i, $0 <= i <= 3$, for following knapsack instance with $n = 3, (p_1, p_2, p_3) = (1, 2, 5)$ and $(w_1, w_2, w_3) = (2, 3, 4)$ and $m = 6$. Find optimal solution using dynamic programming.

Q.6 Solve Any One of the followings. **08**

a) Apply the Sum of Subset algorithm to the instance $w = \{5, 10, 12, 13, 15, 18\}, m = 30$ and generate all valid subsets. Draw a portion of the generated state space tree.

b) Find the minimum path cost between vertex s and t for following multistage graph using dynamic programming.



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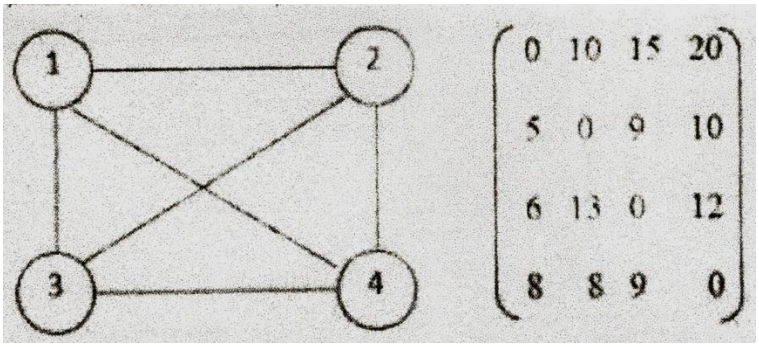
Consider the following directed graph. Find optimal tour length of travelling sales person problem.



Seat No.	

Set **Q**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Design And Analysis of Algorithms (CSEPCC-07)

Day & Date: Saturday, 02-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Choose the correct option. **14**

1) The traveling salesman problem involves visiting each city how many times?
a) 0 b) 1
c) 2 d) 3

2) What is the time complexity for following pseudocode?

```
Algorithm Sum(n, A[])
{
        S:=0;
        For i:1 to n do
        S:S+A[i];
        return (S);
}
```

a) 2n+3 b) 2n+2
c) 2n+1 d) None

3) Which of the following statements is true regarding the P and NP class of decision problems?
a) $P = NP$ b) $P \subseteq NP$
c) $NP \subseteq P$ d) None of these

4) The Optimal Storage on Tapes Patterns problem fits the _____ paradigm.
a) subset b) ordering
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5) What is the objective of the knapsack problem?
   a) To get maximum total value in the knapsack
   b) To get minimum total value in the knapsack
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   d) To get minimum weight in the knapsack

6) The divide-and-conquer algorithm for recursively finding the maximum and minimum of a list of n numbers requires _____ number of comparisons.
   a) $2n$ b) $(3n/2) - 2$
   c) $3n$ d) $4n$

7) Which of the following sorting algorithms is the fastest?
   a) Merge sort b) Quick sort
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8) Problems that cannot be solved by any algorithm are called?
   a) tractable problems b) intractable problems
   c) undecidable problems d) decidable problem

9) Halting problem is an example for?
   a) decidable problem b) undecidable problem
   c) complete problem d) trackable problem

10) Which of the problems cannot be solved by a backtracking method?
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11) Prim's algorithm is based on _____ method.
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   c) Greedy method d) Branch and bound

12) An algorithm is _____.
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   c) A step by step procedure to solve problem
   d) All of the above

13) An algorithm that calls itself directly or indirectly is known as _____.
   a) Sub algorithm b) Recursion
   c) Polish notation d) Traversal algorithm

14) The complexity of Binary search algorithm is _____.
   a) O (n) b) O (log n)
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Seat No.	

Set **Q**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Design And Analysis of Algorithms (CSEPCC-07)

Day & Date: Saturday, 02-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
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Section – I

Q.2 Solve Any Three of the followings. **12**

a) Define and explain asymptotic notations with examples.

b) Prove that, time complexity of merge sort algorithm is O (n.log n).

c) Sort the following sequence using merge sort

$$38, 27, 43, 3, 9, 82, 10, 15, 21, 7$$

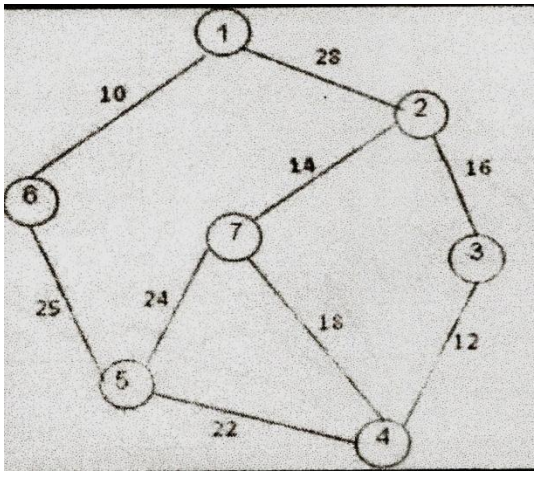
d) Explain optimal storage on tape. Find optimal storage sequence on 3 tapes t_0, t_1, t_2 for program of lengths.

$$12, 5, 8, 32, 7, 5, 18, 26, 4$$

Q.3 Solve Any One of the followings. **08**

a) Explain time and space complexity of an algorithm with examples in detail.

b) Define spanning tree. Derive minimum cost spanning tree of following graph by prim's algorithm.



Q.4 Solve the followings. **08**

Obtain a set of optimal Huffman codes for message $(m_1, m_2, m_3, \ldots, m_7)$ with relative frequencies $(a_1, a_2, a_3, \ldots, a_7) = (4, 5, 7, 8, 10, 12, 20)$.
Draw the decode tree for this set of codes.

Section – II

Q.5 Solve Any Three of the followings. **12**

a) Differentiate between tractable and intractable problem.

b) Write note on P, NP, NP-Complete and NP-Hard.

c) Define Backtracking? Explain graph coloring problem in detail.

d) Generate the set S_i, $0 <= i <= 3$, for following knapsack instance with $n = 3, (p_1, p_2, p_3) = (1, 2, 5)$ and $(w_1, w_2, w_3) = (2, 3, 4)$ and $m = 6$. Find optimal solution using dynamic programming.

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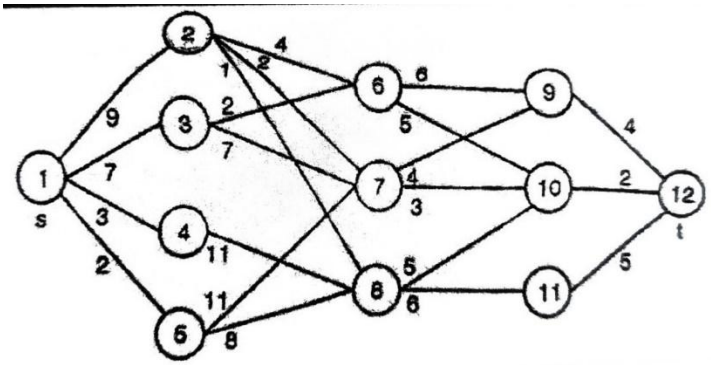

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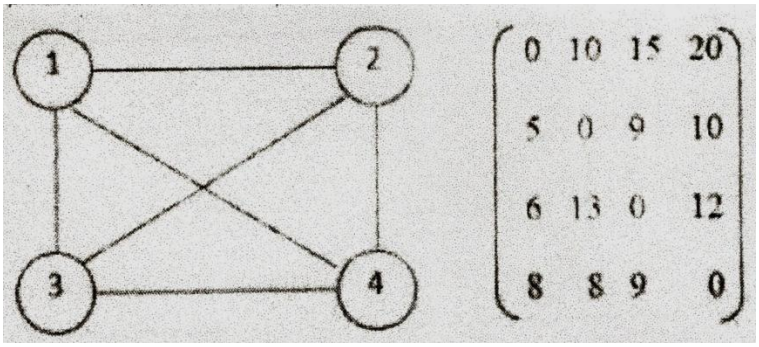
Consider the following directed graph. Find optimal tour length of travelling sales person problem.



Seat No.	

Set R

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Design And Analysis of Algorithms (CSEPCC-07)

Day & Date: Saturday, 02-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

Duration: 30 Minutes Marks: 14

Q.1 Choose the correct option. 14

1) The Optimal Storage on Tapes Patterns problem fits the _____ paradigm.
a) subset b) ordering
c) Both of these d) None of these

2) What is the objective of the knapsack problem?
a) To get maximum total value in the knapsack
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3) The divide-and-conquer algorithm for recursively finding the maximum and minimum of a list of n numbers requires _____ number of comparisons.
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a) 2n+3
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14) Which of the following statements is true regarding the P and NP class of decision problems?
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Seat No.	

Set **R**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Design And Analysis of Algorithms (CSEPCC-07)

Day & Date: Saturday, 02-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
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Section – I

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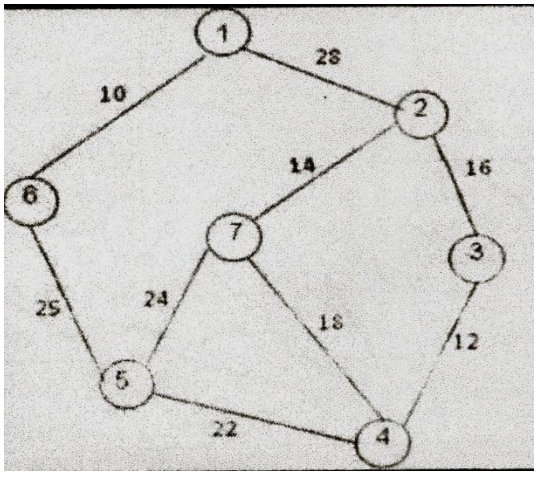

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Obtain a set of optimal Huffman codes for message $(m_1, m_2, m_3, \ldots, m_7)$ with relative frequencies $(a_1, a_2, a_3, \ldots, a_7) = (4, 5, 7, 8, 10, 12, 20)$.
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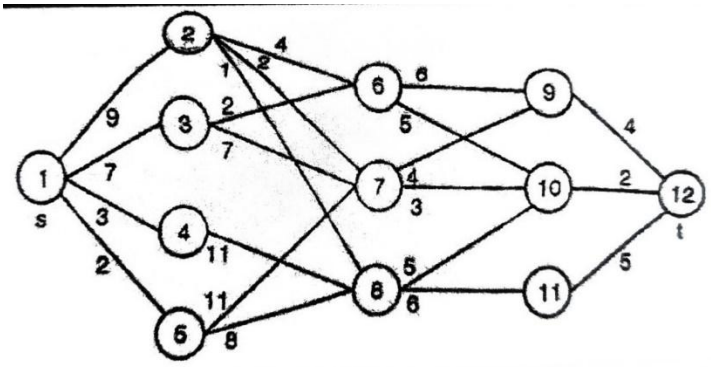

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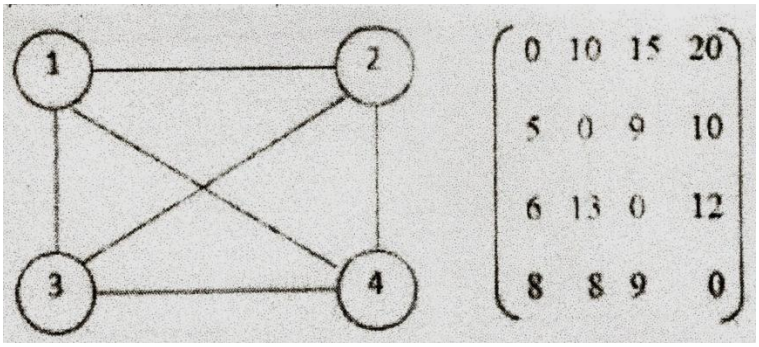

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Seat No.		Set	S

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Design And Analysis of Algorithms (CSEPCC-07)

Day & Date: Saturday, 02-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

Duration: 30 Minutes Marks: 14

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Seat No.	

Set **S**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Design And Analysis of Algorithms (CSEPCC-07)

Day & Date: Saturday, 02-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
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Section – I

Q.2 Solve Any Three of the followings. **12**

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Q.3 Solve Any One of the followings. **08**

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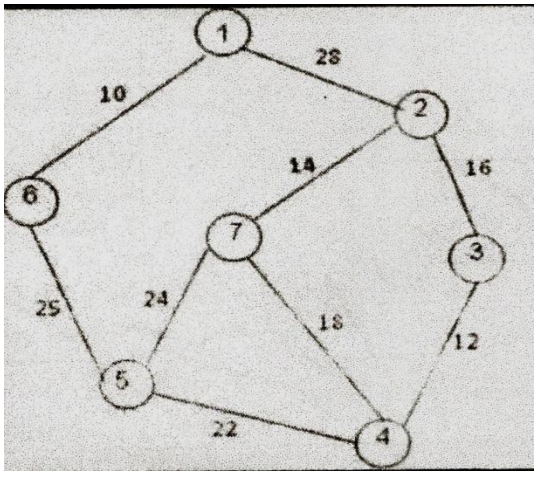

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Section – II

Q.5 Solve Any Three of the followings. **12**

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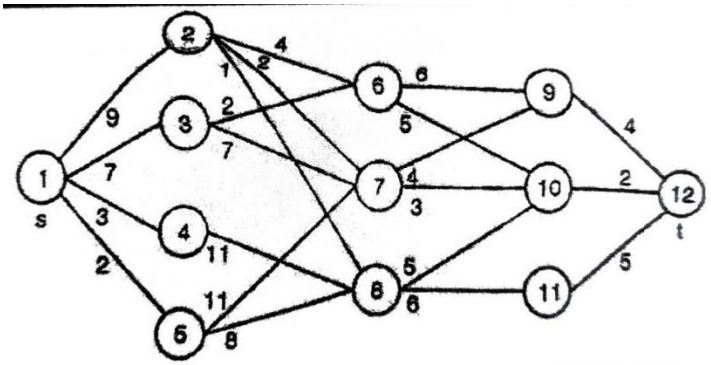

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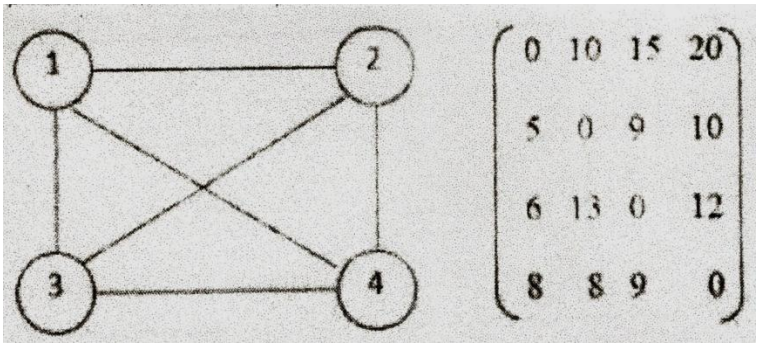

SLR-QH-432

Seat No.	

Set P

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Operating System (CSEPCC-08)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct option: 14

1) Which of the following system calls is used to create a new process?
a) exec() b) fork()
c) wait() d) exit()

2) Which of the following scheduling algorithms can cause starvation?
a) Round Robin b) SJF
c) FCFS d) None of the mentioned

3) The main objective of the CPU scheduling algorithm is to _____.
a) maximize throughput b) minimize CPU utilization
c) minimize turnaround time d) both (a) and (c)

4) The portion of the process that is waiting for CPU is found in the _____ queue.
a) Ready b) Job
c) Waiting d) Device

5) The Critical Section refers to _____.
a) code that must be executed by all processes together
b) code that accesses shared resources
c) code independent of synchronization
d) None of these

6) Binary semaphores are also called _____.
a) mutex locks b) monitors
c) counting semaphores d) signals

7) Deadlock prevention ensures that _____.
   a) at least one of the necessary conditions for deadlock cannot hold
   b) system periodically detects and recovers
   c) resources are forcibly taken from processes
   d) deadlock never occurs by ignoring processes

8) Which of the following is true about paging?
   a) Pages are of variable size
   b) It leads to external fragmentation
   c) Page size is fixed
   d) None

9) Which page replacement algorithm suffers from Belady's anomaly?
   a) FIFO
   b) LRU
   c) Optimal
   d) None

10) The time required to move the disk arm to the required cylinder is known as _____.
   a) Rotational latency
   b) Seek time
   c) Transfer time
   d) Access time

11) In Banker's algorithm, a system is in a safe state if _____.
   a) there exists a sequence of processes that can be executed safely
   b) deadlock occurs
   c) all processes are waiting
   d) None of these

12) Virtual memory is implemented using _____.
   a) cache memory
   b) main memory
   c) secondary memory
   d) ROM

13) Which of the following is not a type of operating system?
   a) Batch
   b) Time-sharing
   c) Spooling
   d) Real-time

14) Disk scheduling algorithm that services requests in the order they arrive is _____.
   a) SSTF
   b) FCFS
   c) LOOK
   d) C-SCAN

Seat No.	

Set **P**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Operating System (CSEPCC-08)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
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3) Make suitable assumptions if necessary and state them clearly.

Section – I

Q.2 Solve the following. (Any Three) **12**

a) Define an operating system. Explain its main functions.

b) Explain different states of a process with neat diagram.

c) Explain the process control block (PCB).

d) Explain threads concept in detail.

Q.3 Solve Any Two. **16**

a) Explain in detail long-term, short-term, and medium-term schedulers.

b) Explain classical problems of Synchronization in terms of Dining Philosopher Problem.

c) Consider the following set of processes, with the length of the CPU burst time given in milliseconds

Process	Burst Time
P1	24
P2	3
P3	3

The processes are assumed to have arrived in the order P1, P2, P3 all at time 0. Answer the following:

i) Draw Gantt charts that illustrate the execution of these processes using FCFS and RR scheduling with time quantum of 4 milliseconds.
ii) What is average waiting time for both the scheduling algorithms in part (i)?
iii) What is average turnaround time for both the scheduling algorithms in part (i)?
iv) Which scheduling algorithm results in minimal average waiting time (over all process)?

Section – II

Q.4 Solve the following. (Any Three) **12**

a) List and explain the necessary conditions for deadlock.

b) What is Demand paging? Define logical and physical addresses.

c) Explain the concept of virtual memory and its advantages.

d) List different disk scheduling algorithms and explain anyone scheduling algorithm.

Q.5 Solve Any Two. **16**

a) Consider the page reference string: 1, 2, 3, 2, 4, 1, 5, 2, 1, 3, 4.
Calculate the number of page faults using FIFO algorithm for 3 frames.

b) Explain segmentation with neat diagram. Mention its advantages.

c) Explain Bankers Algorithm with example.

SLR-QH-432

Seat No.	

Set Q

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Operating System (CSEPCC-08)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct option: 14

1) Which of the following is true about paging?
a) Pages are of variable size
b) It leads to external fragmentation
c) Page size is fixed
d) None

2) Which page replacement algorithm suffers from Belady's anomaly?
a) FIFO b) LRU
c) Optimal d) None

3) The time required to move the disk arm to the required cylinder is known as _____.
a) Rotational latency b) Seek time
c) Transfer time d) Access time

4) In Banker's algorithm, a system is in a safe state if _____.
a) there exists a sequence of processes that can be executed safely
b) deadlock occurs
c) all processes are waiting
d) None of these

5) Virtual memory is implemented using _____.
a) cache memory b) main memory
c) secondary memory d) ROM

6) Which of the following is not a type of operating system?
a) Batch b) Time-sharing
c) Spooling d) Real-time

7) Disk scheduling algorithm that services requests in the order they arrive is _____.
   a) SSTF
   b) FCFS
   c) LOOK
   d) C-SCAN

8) Which of the following system calls is used to create a new process?
   a) exec()
   b) fork()
   c) wait()
   d) exit()

9) Which of the following scheduling algorithms can cause starvation?
   a) Round Robin
   b) SJF
   c) FCFS
   d) None of the mentioned

10) The main objective of the CPU scheduling algorithm is to _____.
   a) maximize throughput
   b) minimize CPU utilization
   c) minimize turnaround time
   d) both (a) and (c)

11) The portion of the process that is waiting for CPU is found in the _____ queue.
   a) Ready
   b) Job
   c) Waiting
   d) Device

12) The Critical Section refers to _____.
   a) code that must be executed by all processes together
   b) code that accesses shared resources
   c) code independent of synchronization
   d) None of these

13) Binary semaphores are also called _____.
   a) mutex locks
   b) monitors
   c) counting semaphores
   d) signals

14) Deadlock prevention ensures that _____.
   a) at least one of the necessary conditions for deadlock cannot hold
   b) system periodically detects and recovers
   c) resources are forcibly taken from processes
   d) deadlock never occurs by ignoring processes

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Operating System (CSEPCC-08)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Make suitable assumptions if necessary and state them clearly.

Section – I

Q.2 Solve the following. (Any Three) **12**

a) Define an operating system. Explain its main functions.

b) Explain different states of a process with neat diagram.

c) Explain the process control block (PCB).

d) Explain threads concept in detail.

Q.3 Solve Any Two. **16**

a) Explain in detail long-term, short-term, and medium-term schedulers.

b) Explain classical problems of Synchronization in terms of Dining Philosopher Problem.

c) Consider the following set of processes, with the length of the CPU burst time given in milliseconds

Process	Burst Time
P1	24
P2	3
P3	3

The processes are assumed to have arrived in the order P1, P2, P3 all at time 0. Answer the following:

i) Draw Gantt charts that illustrate the execution of these processes using FCFS and RR scheduling with time quantum of 4 milliseconds.
ii) What is average waiting time for both the scheduling algorithms in part (i)?
iii) What is average turnaround time for both the scheduling algorithms in part (i)?
iv) Which scheduling algorithm results in minimal average waiting time (over all process)?

Section – II

Q.4 Solve the following. (Any Three) **12**

a) List and explain the necessary conditions for deadlock.

b) What is Demand paging? Define logical and physical addresses.

c) Explain the concept of virtual memory and its advantages.

d) List different disk scheduling algorithms and explain anyone scheduling algorithm.

Q.5 Solve Any Two. **16**

a) Consider the page reference string: 1, 2, 3, 2, 4, 1, 5, 2, 1, 3, 4.
Calculate the number of page faults using FIFO algorithm for 3 frames.

b) Explain segmentation with neat diagram. Mention its advantages.

c) Explain Bankers Algorithm with example.

Seat No.	

Set **R**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Operating System (CSEPCC-08)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct option: **14**

1) In Banker's algorithm, a system is in a safe state if _____.
a) there exists a sequence of processes that can be executed safely
b) deadlock occurs
c) all processes are waiting
d) None of these

2) Virtual memory is implemented using _____.
a) cache memory b) main memory
c) secondary memory d) ROM

3) Which of the following is not a type of operating system?
a) Batch b) Time-sharing
c) Spooling d) Real-time

4) Disk scheduling algorithm that services requests in the order they arrive is _____.
a) SSTF b) FCFS
c) LOOK d) C-SCAN

5) Which of the following system calls is used to create a new process?
a) exec() b) fork()
c) wait() d) exit()

6) Which of the following scheduling algorithms can cause starvation?
a) Round Robin b) SJF
c) FCFS d) None of the mentioned

7) The main objective of the CPU scheduling algorithm is to _____.
   a) maximize throughput
   b) minimize CPU utilization
   c) minimize turnaround time
   d) both (a) and (c)

8) The portion of the process that is waiting for CPU is found in the _____ queue.
   a) Ready
   b) Job
   c) Waiting
   d) Device

9) The Critical Section refers to _____.
   a) code that must be executed by all processes together
   b) code that accesses shared resources
   c) code independent of synchronization
   d) None of these

10) Binary semaphores are also called _____.
   a) mutex locks
   b) monitors
   c) counting semaphores
   d) signals

11) Deadlock prevention ensures that _____.
   a) at least one of the necessary conditions for deadlock cannot hold
   b) system periodically detects and recovers
   c) resources are forcibly taken from processes
   d) deadlock never occurs by ignoring processes

12) Which of the following is true about paging?
   a) Pages are of variable size
   b) It leads to external fragmentation
   c) Page size is fixed
   d) None

13) Which page replacement algorithm suffers from Belady's anomaly?
   a) FIFO
   b) LRU
   c) Optimal
   d) None

14) The time required to move the disk arm to the required cylinder is known as _____.
   a) Rotational latency
   b) Seek time
   c) Transfer time
   d) Access time

Seat No.	

Set **R**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Operating System (CSEPCC-08)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Make suitable assumptions if necessary and state them clearly.

Section – I

Q.2 Solve the following. (Any Three) **12**

a) Define an operating system. Explain its main functions.

b) Explain different states of a process with neat diagram.

c) Explain the process control block (PCB).

d) Explain threads concept in detail.

Q.3 Solve Any Two. **16**

a) Explain in detail long-term, short-term, and medium-term schedulers.

b) Explain classical problems of Synchronization in terms of Dining Philosopher Problem.

c) Consider the following set of processes, with the length of the CPU burst time given in milliseconds

Process	Burst Time
P1	24
P2	3
P3	3

The processes are assumed to have arrived in the order P1, P2, P3 all at time 0. Answer the following:

i) Draw Gantt charts that illustrate the execution of these processes using FCFS and RR scheduling with time quantum of 4 milliseconds.
ii) What is average waiting time for both the scheduling algorithms in part (i)?
iii) What is average turnaround time for both the scheduling algorithms in part (i)?
iv) Which scheduling algorithm results in minimal average waiting time (over all process)?

Section – II

Q.4 Solve the following. (Any Three) **12**

a) List and explain the necessary conditions for deadlock.

b) What is Demand paging? Define logical and physical addresses.

c) Explain the concept of virtual memory and its advantages.

d) List different disk scheduling algorithms and explain anyone scheduling algorithm.

Q.5 Solve Any Two. **16**

a) Consider the page reference string: 1, 2, 3, 2, 4, 1, 5, 2, 1, 3, 4.
Calculate the number of page faults using FIFO algorithm for 3 frames.

b) Explain segmentation with neat diagram. Mention its advantages.

c) Explain Bankers Algorithm with example.

Seat No.	

Set **S**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Operating System (CSEPCC-08)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct option: **14**

1) Binary semaphores are also called _____.
a) mutex locks b) monitors
c) counting semaphores d) signals

2) Deadlock prevention ensures that _____.
a) at least one of the necessary conditions for deadlock cannot hold
b) system periodically detects and recovers
c) resources are forcibly taken from processes
d) deadlock never occurs by ignoring processes

3) Which of the following is true about paging?
a) Pages are of variable size
b) It leads to external fragmentation
c) Page size is fixed
d) None

4) Which page replacement algorithm suffers from Belady's anomaly?
a) FIFO b) LRU
c) Optimal d) None

5) The time required to move the disk arm to the required cylinder is known as _____.
a) Rotational latency b) Seek time
c) Transfer time d) Access time

6) In Banker's algorithm, a system is in a safe state if _____.
   a) there exists a sequence of processes that can be executed safely
   b) deadlock occurs
   c) all processes are waiting
   d) None of these

7) Virtual memory is implemented using _____.
   a) cache memory
   b) main memory
   c) secondary memory
   d) ROM

8) Which of the following is not a type of operating system?
   a) Batch
   b) Time-sharing
   c) Spooling
   d) Real-time

9) Disk scheduling algorithm that services requests in the order they arrive is _____.
   a) SSTF
   b) FCFS
   c) LOOK
   d) C-SCAN

10) Which of the following system calls is used to create a new process?
   a) exec()
   b) fork()
   c) wait()
   d) exit()

11) Which of the following scheduling algorithms can cause starvation?
   a) Round Robin
   b) SJF
   c) FCFS
   d) None of the mentioned

12) The main objective of the CPU scheduling algorithm is to _____.
   a) maximize throughput
   b) minimize CPU utilization
   c) minimize turnaround time
   d) both (a) and (c)

13) The portion of the process that is waiting for CPU is found in the _____ queue.
   a) Ready
   b) Job
   c) Waiting
   d) Device

14) The Critical Section refers to _____.
   a) code that must be executed by all processes together
   b) code that accesses shared resources
   c) code independent of synchronization
   d) None of these

Seat No.	

Set **S**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Operating System (CSEPCC-08)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Make suitable assumptions if necessary and state them clearly.

Section – I

Q.2 Solve the following. (Any Three) **12**

a) Define an operating system. Explain its main functions.

b) Explain different states of a process with neat diagram.

c) Explain the process control block (PCB).

d) Explain threads concept in detail.

Q.3 Solve Any Two. **16**

a) Explain in detail long-term, short-term, and medium-term schedulers.

b) Explain classical problems of Synchronization in terms of Dining Philosopher Problem.

c) Consider the following set of processes, with the length of the CPU burst time given in milliseconds

Process	Burst Time
P1	24
P2	3
P3	3

The processes are assumed to have arrived in the order P1, P2, P3 all at time 0. Answer the following:

i) Draw Gantt charts that illustrate the execution of these processes using FCFS and RR scheduling with time quantum of 4 milliseconds.
ii) What is average waiting time for both the scheduling algorithms in part (i)?
iii) What is average turnaround time for both the scheduling algorithms in part (i)?
iv) Which scheduling algorithm results in minimal average waiting time (over all process)?

Section – II

Q.4 Solve the following. (Any Three) **12**

a) List and explain the necessary conditions for deadlock.

b) What is Demand paging? Define logical and physical addresses.

c) Explain the concept of virtual memory and its advantages.

d) List different disk scheduling algorithms and explain anyone scheduling algorithm.

Q.5 Solve Any Two. **16**

a) Consider the page reference string: 1, 2, 3, 2, 4, 1, 5, 2, 1, 3, 4.
Calculate the number of page faults using FIFO algorithm for 3 frames.

b) Explain segmentation with neat diagram. Mention its advantages.

c) Explain Bankers Algorithm with example.

SLR-QH-433

Seat No.	

Set P

T. Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Database Engineering (CSEPCC-09)

Day & Date: Thursday, 07-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Select Correct Option. **14**

1) For each attribute of a relation, there is a set of permitted values, called the _____ of that attribute.
a) Domain b) Relation
c) Set d) Schema

2) Database _____ which is the logical design of the database, and the database _____ which is a snapshot of the data in the database at a given instant in time.
a) Instance, Schema b) Relation, Schema
c) Relation, Domain d) Schema, Instance

3) Which one of the following is a procedural language?
a) Domain relational calculus b) Tuple relational calculus
c) Relational algebra d) Query language

4) The _____ clause is used to list the attributes desired in the result of a query.
a) Where b) Select
c) From d) Distinct

5) In the _____ normal form, a composite attribute is converted to individual attributes.
a) First b) Second
c) Third d) Fourth

6) Which-one of the following statements about normal forms is FALSE?
   a) BCNF is stricter than 3 NF
   b) Lossless, dependency - preserving decomposition into 3 NF is always possible
   c) Loss less, dependency - preserving decomposition into BCNF is always possible
   d) Any relation with two attributes is BCNF

7) In B+ tree the node which points to another node is called _____.
   a) Leaf node
   b) External node
   c) Final node
   d) Internal node

8) A transaction may not always complete its execution successfully. Such a transaction is termed _____.
   a) Aborted
   b) Terminated
   c) Closed
   d) All of the mentioned

9) DBMS periodically suspends all processing and synchronizes its files and journals through the use of _____.
   a) Checkpoint facility
   b) Backup facility
   c) Recovery manager
   d) Database change log

10) When the transaction finishes the final statement the transaction enters into?
   a) Active state
   b) Committed state
   c) Partially committed state
   d) Abort state

11) The recovery scheme must also provide _____.
   a) High availability
   b) Low availability
   c) High reliability
   d) High durability

12) Which of the following belongs to transaction failure _____.
   a) Read error
   b) Boot error
   c) Logical error
   d) All of the mentioned

13) The assumption that hardware errors and bugs in the software bring the system to a halt, but do not corrupt the nonvolatile storage contents, is known as the _____.
   a) Stop assumption
   b) Fail assumption
   c) Halt assumption
   d) Fail-stop assumption

14) _____ means that data used during the execution of a transaction cannot be used by a second transaction until the first one is completed.
   a) Serializability
   b) Atomicity
   c) Isolation
   d) Time stamping

Seat No.	

Set **P**

T. Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Database Engineering (CSEPCC-09)

Day & Date: Thursday, 07-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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

Section – I

Q.2 Solve the following: (Any Three) **12**

a) Explain with example various attributes types in ER model.

b) Explain with examples Generalization and Specialization.

c) Explain with example dependency preservation.

d) Explain with example Third Normal Form (3NF).

e) Explain cardinality constraints and participating constraints.

Q.3 Solve the following: (Any Two) **16**

a) What is functional dependency? Explain the way to find closure of a set of functional dependency.

b) Explain fundamental relational algebra operations with examples.

c) List and explain drawbacks of file processing system.

Section – II

Q.4 Solve the following: (Any Three) **12**

a) Explain transaction model with example.

b) Explain the concept of Shadow Paging.

c) Explain deferred database modifications with example.

d) Explain Dense and Sparse indexing with suitable diagram.

e) Give difference between Ordered indices and Hashing with one example. Which is better to use?

Q.5 Solve the following: (Any Two) **16**

a) Explain two-phase locking protocol in detail.

b) List the ACID properties and explain each property in detail with a suitable example.

c) Explain in detail the concept of check points in recovery systems.

Seat No.	

Set **Q**

T. Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Database Engineering (CSEPCC-09)

Day & Date: Thursday, 07-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Select Correct Option. **14**

1) A transaction may not always complete its execution successfully. Such a transaction is termed _____.
a) Aborted b) Terminated
c) Closed d) All of the mentioned

2) DBMS periodically suspends all processing and synchronizes its files and journals through the use of _____.
a) Checkpoint facility b) Backup facility
c) Recovery manager d) Database change log

3) When the transaction finishes the final statement the transaction enters into?
a) Active state b) Committed state
c) Partially committed state d) Abort state

4) The recovery scheme must also provide _____.
a) High availability b) Low availability
c) High reliability d) High durability

5) Which of the following belongs to transaction failure _____.
a) Read error b) Boot error
c) Logical error d) All of the mentioned

6) The assumption that hardware errors and bugs in the software bring the system to a halt, but do not corrupt the nonvolatile storage contents, is known as the _____.
a) Stop assumption b) Fail assumption
c) Halt assumption d) Fail-stop assumption

7) _____ means that data used during the execution of a transaction cannot be used by a second transaction until the first one is completed.
a) Serializability b) Atomicity
c) Isolation d) Time stamping

8) For each attribute of a relation, there is a set of permitted values, called the _____ of that attribute.
a) Domain b) Relation
c) Set d) Schema

9) Database _____ which is the logical design of the database, and the database _____ which is a snapshot of the data in the database at a given instant in time.
a) Instance, Schema b) Relation, Schema
c) Relation, Domain d) Schema, Instance

10) Which one of the following is a procedural language?
a) Domain relational calculus b) Tuple relational calculus
c) Relational algebra d) Query language

11) The _____ clause is used to list the attributes desired in the result of a query.
a) Where b) Select
c) From d) Distinct

12) In the _____ normal form, a composite attribute is converted to individual attributes.
a) First b) Second
c) Third d) Fourth

13) Which-one of the following statements about normal forms is FALSE?
a) BCNF is stricter than 3 NF
b) Lossless, dependency - preserving decomposition into 3 NF is always possible
c) Loss less, dependency - preserving decomposition into BCNF is always possible
d) Any relation with two attributes is BCNF

14) In B+ tree the node which points to another node is called _____.
a) Leaf node b) External node
c) Final node d) Internal node

Seat No.	

Set **Q**

T. Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Database Engineering (CSEPCC-09)

Day & Date: Thursday, 07-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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

Section – I

Q.2 Solve the following: (Any Three) **12**

a) Explain with example various attributes types in ER model.

b) Explain with examples Generalization and Specialization.

c) Explain with example dependency preservation.

d) Explain with example Third Normal Form (3NF).

e) Explain cardinality constraints and participating constraints.

Q.3 Solve the following: (Any Two) **16**

a) What is functional dependency? Explain the way to find closure of a set of functional dependency.

b) Explain fundamental relational algebra operations with examples.

c) List and explain drawbacks of file processing system.

Section – II

Q.4 Solve the following: (Any Three) **12**

a) Explain transaction model with example.

b) Explain the concept of Shadow Paging.

c) Explain deferred database modifications with example.

d) Explain Dense and Sparse indexing with suitable diagram.

e) Give difference between Ordered indices and Hashing with one example. Which is better to use?

Q.5 Solve the following: (Any Two) **16**

a) Explain two-phase locking protocol in detail.

b) List the ACID properties and explain each property in detail with a suitable example.

c) Explain in detail the concept of check points in recovery systems.

SLR-QH-433

Seat No.	

Set R

T. Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Database Engineering (CSEPCC-09)

Day & Date: Thursday, 07-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Select Correct Option. **14**

1) The recovery scheme must also provide _____.
a) High availability b) Low availability
c) High reliability d) High durability

2) Which of the following belongs to transaction failure _____.
a) Read error b) Boot error
c) Logical error d) All of the mentioned

3) The assumption that hardware errors and bugs in the software bring the system to a halt, but do not corrupt the nonvolatile storage contents, is known as the _____.
a) Stop assumption b) Fail assumption
c) Halt assumption d) Fail-stop assumption

4) _____ means that data used during the execution of a transaction cannot be used by a second transaction until the first one is completed.
a) Serializability b) Atomicity
c) Isolation d) Time stamping

5) For each attribute of a relation, there is a set of permitted values, called the _____ of that attribute.
a) Domain b) Relation
c) Set d) Schema

6) Database _____ which is the logical design of the database, and the database _____ which is a snapshot of the data in the database at a given instant in time.
a) Instance, Schema b) Relation, Schema
c) Relation, Domain d) Schema, Instance

7) Which one of the following is a procedural language?
a) Domain relational calculus b) Tuple relational calculus
c) Relational algebra d) Query language

8) The _____ clause is used to list the attributes desired in the result of a query.
a) Where b) Select
c) From d) Distinct

9) In the _____ normal form, a composite attribute is converted to individual attributes.
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c) Third d) Fourth

10) Which-one of the following statements about normal forms is FALSE?
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a) Aborted b) Terminated
c) Closed d) All of the mentioned

13) DBMS periodically suspends all processing and synchronizes its files and journals through the use of _____.
a) Checkpoint facility b) Backup facility
c) Recovery manager d) Database change log

14) When the transaction finishes the final statement the transaction enters into?
a) Active state b) Committed state
c) Partially committed state d) Abort state

Seat No.	

Set **R**

T. Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Database Engineering (CSEPCC-09)

Day & Date: Thursday, 07-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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

Section – I

Q.2 Solve the following: (Any Three) **12**

a) Explain with example various attributes types in ER model.

b) Explain with examples Generalization and Specialization.

c) Explain with example dependency preservation.

d) Explain with example Third Normal Form (3NF).

e) Explain cardinality constraints and participating constraints.

Q.3 Solve the following: (Any Two) **16**

a) What is functional dependency? Explain the way to find closure of a set of functional dependency.

b) Explain fundamental relational algebra operations with examples.

c) List and explain drawbacks of file processing system.

Section – II

Q.4 Solve the following: (Any Three) **12**

a) Explain transaction model with example.

b) Explain the concept of Shadow Paging.

c) Explain deferred database modifications with example.

d) Explain Dense and Sparse indexing with suitable diagram.

e) Give difference between Ordered indices and Hashing with one example. Which is better to use?

Q.5 Solve the following: (Any Two) **16**

a) Explain two-phase locking protocol in detail.

b) List the ACID properties and explain each property in detail with a suitable example.

c) Explain in detail the concept of check points in recovery systems.

Seat No.	

Set **S**

T. Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Database Engineering (CSEPCC-09)

Day & Date: Thursday, 07-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Select Correct Option. **14**

1) Which-one of the following statements about normal forms is FALSE?
a) BCNF is stricter than 3 NF
b) Lossless, dependency - preserving decomposition into 3 NF is always possible
c) Loss less, dependency - preserving decomposition into BCNF is always possible
d) Any relation with two attributes is BCNF

2) In B+ tree the node which points to another node is called _____.
a) Leaf node b) External node
c) Final node d) Internal node

3) A transaction may not always complete its execution successfully. Such a transaction is termed _____.
a) Aborted b) Terminated
c) Closed d) All of the mentioned

4) DBMS periodically suspends all processing and synchronizes its files and journals through the use of _____.
a) Checkpoint facility b) Backup facility
c) Recovery manager d) Database change log

5) When the transaction finishes the final statement the transaction enters into?
a) Active state b) Committed state
c) Partially committed state d) Abort state

6) The recovery scheme must also provide _____.
a) High availability b) Low availability
c) High reliability d) High durability

7) Which of the following belongs to transaction failure _____.
a) Read error
b) Boot error
c) Logical error
d) All of the mentioned

8) The assumption that hardware errors and bugs in the software bring the system to a halt, but do not corrupt the nonvolatile storage contents, is known as the _____.
a) Stop assumption
b) Fail assumption
c) Halt assumption
d) Fail-stop assumption

9) _____ means that data used during the execution of a transaction cannot be used by a second transaction until the first one is completed.
a) Serializability
b) Atomicity
c) Isolation
d) Time stamping

10) For each attribute of a relation, there is a set of permitted values, called the _____ of that attribute.
a) Domain
b) Relation
c) Set
d) Schema

11) Database _____ which is the logical design of the database, and the database _____ which is a snapshot of the data in the database at a given instant in time.
a) Instance, Schema
b) Relation, Schema
c) Relation, Domain
d) Schema, Instance

12) Which one of the following is a procedural language?
a) Domain relational calculus
b) Tuple relational calculus
c) Relational algebra
d) Query language

13) The _____ clause is used to list the attributes desired in the result of a query.
a) Where
b) Select
c) From
d) Distinct

14) In the _____ normal form, a composite attribute is converted to individual attributes.
a) First
b) Second
c) Third
d) Fourth

SLR-QH-433

Seat No.		Set	S

T. Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Database Engineering (CSEPCC-09)

Day & Date: Thursday, 07-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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

Section – I

Q.2 Solve the following: (Any Three) **12**

a) Explain with example various attributes types in ER model.

b) Explain with examples Generalization and Specialization.

c) Explain with example dependency preservation.

d) Explain with example Third Normal Form (3NF).

e) Explain cardinality constraints and participating constraints.

Q.3 Solve the following: (Any Two) **16**

a) What is functional dependency? Explain the way to find closure of a set of functional dependency.

b) Explain fundamental relational algebra operations with examples.

c) List and explain drawbacks of file processing system.

Section – II

Q.4 Solve the following: (Any Three) **12**

a) Explain transaction model with example.

b) Explain the concept of Shadow Paging.

c) Explain deferred database modifications with example.

d) Explain Dense and Sparse indexing with suitable diagram.

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Q.5 Solve the following: (Any Two) **16**

a) Explain two-phase locking protocol in detail.

b) List the ACID properties and explain each property in detail with a suitable example.

c) Explain in detail the concept of check points in recovery systems.

Seat No.	

Set **P**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Software Testing and Quality Assurance (CSEPEC–01A)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) TQM represents _____.
a) Tool Quality Management b) Test Quality Manager
c) Total Quality Management d) All above

2) This is a cost incurred by the organization during development, in the form of first-time review/testing which gets returned in future.
a) Green Money b) White Money
c) Red Money d) Blue Money

3) _____ is the process of methodically reducing the huge set of possible test cases into a much smaller, but still equally effective set.
a) Test Planning b) Test Strategy
c) Test Design d) Equivalence Partitioning

4) Verification is also termed as _____.
a) Static Testing b) Dynamic Testing
c) Both a & b d) None of the above

5) Alpha testing is done at _____.
a) Customers site b) Developers site
c) Both a & b d) None of the above

6) _____ coverage involves tracking a piece of data completely through the software.
a) Data flow b) Process flow
c) Information flow d) None of the above

7) _____ is intended to determine whether the changed components have introduced any error in unchanged components of the system.
a) Regression Testing b) Stress Testing
c) Usability Testing d) Installation Testing

8) Bug can be described as _____.
a) Minimal b) Singular
c) Reproducible d) All of the above

9) Goals of test case planning are _____.
a) Organization b) Repeatability
c) Tracking d) All of the above

10) Cost of quality depends on _____.
a) Prevention b) Appraisals
c) Failure d) All of the above

11) For random testing a _____ automated testing tool with its continuous repetition and use, can expose bugs such as memory leaks that might not occur until many hours or days of normal use of a newly developed software product.
a) Selenium named
b) Visual Test named
c) Dumb Monkey Technique Based
d) Macro Magic named

12) This is a software quality assurance activity that focuses on the identification and assessment of potential hazards that may affect software negatively and causes an entire system to fail.
a) Software Reliability b) Software Availability
c) Software Safety d) All of the above

13) A _____ analyser is an example of a viewing tool.
a) Code coverage b) Data flow
c) Information flow d) All of the above

14) _____ are tools used to control and operate the software being tested.
a) Viewers and Monitors b) Drivers
c) Stubs d) Stress and Load Tools

Seat No.	

Set **P**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Software Testing and Quality Assurance (CSEPEC–01A)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

SECTION – I

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

a) What are the different skills required by tester?

b) Write note on Graphical User Interface Testing.

c) Write short note on equivalence partitioning technique.

d) Explain differences between static and dynamic testing.

e) Explain Integration Testing.

Q.3 Attempt the following. (Any Two) **12**

a) Explain Defect Management Process.

b) Explain White Box and Black box testing techniques in detail.

c) Write a short note Acceptance Testing on Alpha, Beta and Gamma testing.

SECTION – II

Q.4 Attempt the following. (Any Four) **16**

a) Write and explain the test schedule of test planning topics.

b) Explain Bug Life Cycle.

c) Explain elements of Software Quality Assurance.

d) Explain Random testing in automation.

e) Write note on Software Quality Assurance Tasks & Goals.

Q.5 Attempt the following. (Any Two) **12**

a) Explain Test case planning in detail with diagram.

b) Explain ISO 9000 and CMM Quality Standard.

c) Explain the various testing tools of software testing.

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Software Testing and Quality Assurance (CSEPEC–01A)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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4) Assume suitable data if required.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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d) Macro Magic named

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7) _____ are tools used to control and operate the software being tested.
a) Viewers and Monitors b) Drivers
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8) TQM represents _____.
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c) Both a & b d) None of the above

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Seat No.	

Set **Q**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Software Testing and Quality Assurance (CSEPEC–01A)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
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3) Assume suitable data if necessary.

SECTION – I

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

a) What are the different skills required by tester?

b) Write note on Graphical User Interface Testing.

c) Write short note on equivalence partitioning technique.

d) Explain differences between static and dynamic testing.

e) Explain Integration Testing.

Q.3 Attempt the following. (Any Two) **12**

a) Explain Defect Management Process.

b) Explain White Box and Black box testing techniques in detail.

c) Write a short note Acceptance Testing on Alpha, Beta and Gamma testing.

SECTION – II

Q.4 Attempt the following. (Any Four) **16**

a) Write and explain the test schedule of test planning topics.

b) Explain Bug Life Cycle.

c) Explain elements of Software Quality Assurance.

d) Explain Random testing in automation.

e) Write note on Software Quality Assurance Tasks & Goals.

Q.5 Attempt the following. (Any Two) **12**

a) Explain Test case planning in detail with diagram.

b) Explain ISO 9000 and CMM Quality Standard.

c) Explain the various testing tools of software testing.

Seat No.	

Set **R**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Software Testing and Quality Assurance (CSEPEC–01A)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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3) Figures to the right indicates full marks.
4) Assume suitable data if required.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

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c) Dumb Monkey Technique Based
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13) Goals of test case planning are _____.
a) Organization b) Repeatability
c) Tracking d) All of the above

14) Cost of quality depends on _____.
a) Prevention b) Appraisals
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Seat No.	

Set **R**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Software Testing and Quality Assurance (CSEPEC–01A)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

SECTION – I

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

a) What are the different skills required by tester?

b) Write note on Graphical User Interface Testing.

c) Write short note on equivalence partitioning technique.

d) Explain differences between static and dynamic testing.

e) Explain Integration Testing.

Q.3 Attempt the following. (Any Two) **12**

a) Explain Defect Management Process.

b) Explain White Box and Black box testing techniques in detail.

c) Write a short note Acceptance Testing on Alpha, Beta and Gamma testing.

SECTION – II

Q.4 Attempt the following. (Any Four) **16**

a) Write and explain the test schedule of test planning topics.

b) Explain Bug Life Cycle.

c) Explain elements of Software Quality Assurance.

d) Explain Random testing in automation.

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Q.5 Attempt the following. (Any Two) **12**

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Seat No.	

Set | S

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Software Testing and Quality Assurance (CSEPEC–01A)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

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2) _____ is intended to determine whether the changed components have introduced any error in unchanged components of the system.
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Seat No.	

Set **S**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Software Testing and Quality Assurance (CSEPEC–01A)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

SECTION – I

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

a) What are the different skills required by tester?

b) Write note on Graphical User Interface Testing.

c) Write short note on equivalence partitioning technique.

d) Explain differences between static and dynamic testing.

e) Explain Integration Testing.

Q.3 Attempt the following. (Any Two) **12**

a) Explain Defect Management Process.

b) Explain White Box and Black box testing techniques in detail.

c) Write a short note Acceptance Testing on Alpha, Beta and Gamma testing.

SECTION – II

Q.4 Attempt the following. (Any Four) **16**

a) Write and explain the test schedule of test planning topics.

b) Explain Bug Life Cycle.

c) Explain elements of Software Quality Assurance.

d) Explain Random testing in automation.

e) Write note on Software Quality Assurance Tasks & Goals.

Q.5 Attempt the following. (Any Two) **12**

a) Explain Test case planning in detail with diagram.

b) Explain ISO 9000 and CMM Quality Standard.

c) Explain the various testing tools of software testing.

SLR-QH-437

Seat No.	

Set P

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Object Oriented Modeling and Design (CSEPEC–01D)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct option from the following. **14**

1) Which of the following best defines a *class?*
a) A real-world entity
b) A collection of similar objects
c) A blueprint for objects
d) A data member

2) Which of the following is NOT a grouping construct?
a) Package
b) Subsystem
c) Object
d) Module

3) Generalization as extension means _____.
a) Adding new attributes and methods
b) Restricting access to subclasses
c) Overriding methods
d) Removing inherited attributes

4) Nested state diagrams are used to _____.
a) Represent simple transitions
b) Represent hierarchical or composite states
c) Simplify DFDs
d) Show object inheritance

5) In DFD, circles represent _____.
a) Data stores
b) Processes
c) Data flows
d) External entities

6) OMT stands for: _____.
a) Object Modeling Technique
b) Object Management Tool
c) Object Model Transformation
d) Object Mapping Theory

7) The database system in OMT implementation is used to_____.
   a) Store classes and objects permanently
   b) Draw diagrams
   c) Handle event transitions
   d) Create GUIs

8) A *type* in UML is defined as _____.
   a) The implementation of a class
   b) The interface or behavior a class exhibit
   c) A data field
   d) A method's return value

9) Interaction diagrams are used to _____.
   a) Model the flow of control between objects
   b) Represent physical architecture
   c) Show static relationships
   d) Design database schemas

10) Events and signals in UML refer to _____.
   a) Triggers that cause state transitions
   b) Database attributes
   c) Class relationships
   d) System components

11) In UML, time and space modeling is mainly used to _____.
   a) Represent system timing and distribution aspects
   b) Define inheritance hierarchy
   c) Manage database performance
   d) Model internal loops

12) Architectural modeling in UML is primarily concerned with _____.
   a) System behavior
   b) Physical and logical structure of the system
   c) Data flow
   d) Algorithm design

13) Components in UML represent _____.
   a) Software modules with specific functionality
   b) Hardware devices
   c) User roles
   d) Database schemas

14) Which of the following represents a collaboration?
   a) Multiple objects working together to perform a behavior
   b) One object calling itself recursively
   c) Two classes inheriting the same parent
   d) A single method execution

Seat No.	

Set **P**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Object Oriented Modeling and Design (CSEPEC–01D)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if required.

SECTION – I

Q.2 Attempt any Three. **12**

a) Write a short note on *Generalization and Inheritance.*

b) Define and explain DFD with its basic symbols.

c) Explain dynamic modeling with a suitable example and state diagram.

d) Explain the *object-oriented style* of programming with an example.

Q.3 Attempt for any One. **08**

a) Explain the main themes of Object-Oriented Development.

b) Discuss the features of object-oriented languages and their role in OMT implementation.

Q.4 Compulsory Question. **08**

Draw Data flow Diagram for Hotel reservation System (Level 0, Level 1, Level 2)?

SECTION – II

Q.5 Attempt any Three. **12**

a) What are *types* and *roles* in UML?

b) Describe *instances and object diagrams* with suitable examples.

c) What is an *activity diagram?* Explain its basic notations.

d) Explain how *patterns* and *frameworks* support architectural modeling.

Q.6 Attempt for any One. **08**

a) Develop a State Chart Diagram for a Printer showing states such as *Idle, Printing, Out of Paper, Error*.

b) How do *component and deployment diagrams* together represent system architecture? Illustrate with a diagram.

Q.7 Compulsory Question. **08**

Draw a Class Diagram for an Online Shopping System depicting *Product, Cart, Order, Customer,* and *Payment.*

SLR-QH-437

Seat No.	

Set Q

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Object Oriented Modeling and Design (CSEPEC–01D)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct option from the following. **14**

1) A *type* in UML is defined as _____.
a) The implementation of a class
b) The interface or behavior a class exhibit
c) A data field
d) A method's return value

2) Interaction diagrams are used to _____.
a) Model the flow of control between objects
b) Represent physical architecture
c) Show static relationships
d) Design database schemas

3) Events and signals in UML refer to _____.
a) Triggers that cause state transitions
b) Database attributes
c) Class relationships
d) System components

4) In UML, time and space modeling is mainly used to _____.
a) Represent system timing and distribution aspects
b) Define inheritance hierarchy
c) Manage database performance
d) Model internal loops

5) Architectural modeling in UML is primarily concerned with _____.
a) System behavior
b) Physical and logical structure of the system
c) Data flow
d) Algorithm design

6) Components in UML represent _____.
   a) Software modules with specific functionality
   b) Hardware devices
   c) User roles
   d) Database schemas

7) Which of the following represents a collaboration?
   a) Multiple objects working together to perform a behavior
   b) One object calling itself recursively
   c) Two classes inheriting the same parent
   d) A single method execution

8) Which of the following best defines a *class?*
   a) A real-world entity
   b) A collection of similar objects
   c) A blueprint for objects
   d) A data member

9) Which of the following is NOT a grouping construct?
   a) Package
   b) Subsystem
   c) Object
   d) Module

10) Generalization as extension means _____.
   a) Adding new attributes and methods
   b) Restricting access to subclasses
   c) Overriding methods
   d) Removing inherited attributes

11) Nested state diagrams are used to _____.
   a) Represent simple transitions
   b) Represent hierarchical or composite states
   c) Simplify DFDs
   d) Show object inheritance

12) In DFD, circles represent _____.
   a) Data stores
   b) Processes
   c) Data flows
   d) External entities

13) OMT stands for: _____.
   a) Object Modeling Technique
   b) Object Management Tool
   c) Object Model Transformation
   d) Object Mapping Theory

14) The database system in OMT implementation is used to_____.
   a) Store classes and objects permanently
   b) Draw diagrams
   c) Handle event transitions
   d) Create GUIs

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Object Oriented Modeling and Design (CSEPEC–01D)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if required.

SECTION – I

Q.2 Attempt any Three. **12**

a) Write a short note on *Generalization and Inheritance.*

b) Define and explain DFD with its basic symbols.

c) Explain dynamic modeling with a suitable example and state diagram.

d) Explain the *object-oriented style* of programming with an example.

Q.3 Attempt for any One. **08**

a) Explain the main themes of Object-Oriented Development.

b) Discuss the features of object-oriented languages and their role in OMT implementation.

Q.4 Compulsory Question. **08**

Draw Data flow Diagram for Hotel reservation System (Level 0, Level 1, Level 2)?

SECTION – II

Q.5 Attempt any Three. **12**

a) What are *types* and *roles* in UML?

b) Describe *instances and object diagrams* with suitable examples.

c) What is an *activity diagram?* Explain its basic notations.

d) Explain how *patterns* and *frameworks* support architectural modeling.

Q.6 Attempt for any One. **08**

a) Develop a State Chart Diagram for a Printer showing states such as *Idle, Printing, Out of Paper, Error*.

b) How do *component and deployment diagrams* together represent system architecture? Illustrate with a diagram.

Q.7 Compulsory Question. **08**

Draw a Class Diagram for an Online Shopping System depicting *Product, Cart, Order, Customer,* and *Payment.*

Seat No.	

Set **R**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Object Oriented Modeling and Design (CSEPEC–01D)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct option from the following. **14**

1) In UML, time and space modeling is mainly used to _____.
a) Represent system timing and distribution aspects
b) Define inheritance hierarchy
c) Manage database performance
d) Model internal loops

2) Architectural modeling in UML is primarily concerned with _____.
a) System behavior
b) Physical and logical structure of the system
c) Data flow
d) Algorithm design

3) Components in UML represent _____.
a) Software modules with specific functionality
b) Hardware devices
c) User roles
d) Database schemas

4) Which of the following represents a collaboration?
a) Multiple objects working together to perform a behavior
b) One object calling itself recursively
c) Two classes inheriting the same parent
d) A single method execution

5) Which of the following best defines a *class?*
a) A real-world entity
b) A collection of similar objects
c) A blueprint for objects
d) A data member

6) Which of the following is NOT a grouping construct?
a) Package b) Subsystem
c) Object d) Module

7) Generalization as extension means _____.
a) Adding new attributes and methods
b) Restricting access to subclasses
c) Overriding methods
d) Removing inherited attributes

8) Nested state diagrams are used to _____.
a) Represent simple transitions
b) Represent hierarchical or composite states
c) Simplify DFDs
d) Show object inheritance

9) In DFD, circles represent _____.
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10) OMT stands for: _____.
a) Object Modeling Technique
b) Object Management Tool
c) Object Model Transformation
d) Object Mapping Theory

11) The database system in OMT implementation is used to_____.
a) Store classes and objects permanently
b) Draw diagrams
c) Handle event transitions
d) Create GUIs

12) A *type* in UML is defined as _____.
a) The implementation of a class
b) The interface or behavior a class exhibit
c) A data field
d) A method's return value

13) Interaction diagrams are used to _____.
a) Model the flow of control between objects
b) Represent physical architecture
c) Show static relationships
d) Design database schemas

14) Events and signals in UML refer to _____.
a) Triggers that cause state transitions
b) Database attributes
c) Class relationships
d) System components

SLR-QH-437

Seat No.	

Set R

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Object Oriented Modeling and Design (CSEPEC–01D)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if required.

SECTION – I

Q.2 Attempt any Three. **12**

a) Write a short note on *Generalization and Inheritance.*

b) Define and explain DFD with its basic symbols.

c) Explain dynamic modeling with a suitable example and state diagram.

d) Explain the *object-oriented style* of programming with an example.

Q.3 Attempt for any One. **08**

a) Explain the main themes of Object-Oriented Development.

b) Discuss the features of object-oriented languages and their role in OMT implementation.

Q.4 Compulsory Question. **08**

Draw Data flow Diagram for Hotel reservation System (Level 0, Level 1, Level 2)?

SECTION – II

Q.5 Attempt any Three. **12**

a) What are *types* and *roles* in UML?

b) Describe *instances and object diagrams* with suitable examples.

c) What is an *activity diagram?* Explain its basic notations.

d) Explain how *patterns* and *frameworks* support architectural modeling.

Q.6 Attempt for any One. **08**

a) Develop a State Chart Diagram for a Printer showing states such as *Idle, Printing, Out of Paper, Error*.

b) How do *component and deployment diagrams* together represent system architecture? Illustrate with a diagram.

Q.7 Compulsory Question. **08**

Draw a Class Diagram for an Online Shopping System depicting *Product, Cart, Order, Customer,* and *Payment.*

Seat No.	

Set | S

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Object Oriented Modeling and Design (CSEPEC–01D)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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3) Figures to the right indicate full marks.
4) Assume suitable data if required.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct option from the following. **14**

1) OMT stands for: _____.
a) Object Modeling Technique
b) Object Management Tool
c) Object Model Transformation
d) Object Mapping Theory

2) The database system in OMT implementation is used to_____.
a) Store classes and objects permanently
b) Draw diagrams
c) Handle event transitions
d) Create GUIs

3) A *type* in UML is defined as _____.
a) The implementation of a class
b) The interface or behavior a class exhibit
c) A data field
d) A method's return value

4) Interaction diagrams are used to _____.
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b) Represent physical architecture
c) Show static relationships
d) Design database schemas

5) Events and signals in UML refer to _____.
a) Triggers that cause state transitions
b) Database attributes
c) Class relationships
d) System components

6) In UML, time and space modeling is mainly used to _____.
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   b) Define inheritance hierarchy
   c) Manage database performance
   d) Model internal loops

7) Architectural modeling in UML is primarily concerned with _____.
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   b) Physical and logical structure of the system
   c) Data flow
   d) Algorithm design

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   c) User roles
   d) Database schemas

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   b) One object calling itself recursively
   c) Two classes inheriting the same parent
   d) A single method execution

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   c) A blueprint for objects
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   b) Subsystem
   c) Object
   d) Module

12) Generalization as extension means _____.
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13) Nested state diagrams are used to _____.
   a) Represent simple transitions
   b) Represent hierarchical or composite states
   c) Simplify DFDs
   d) Show object inheritance

14) In DFD, circles represent _____.
   a) Data stores
   b) Processes
   c) Data flows
   d) External entities

SLR-QH-437

Seat No.	

Set S

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Object Oriented Modeling and Design (CSEPEC–01D)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if required.

SECTION – I

Q.2 Attempt any Three. **12**

a) Write a short note on *Generalization and Inheritance.*

b) Define and explain DFD with its basic symbols.

c) Explain dynamic modeling with a suitable example and state diagram.

d) Explain the *object-oriented style* of programming with an example.

Q.3 Attempt for any One. **08**

a) Explain the main themes of Object-Oriented Development.

b) Discuss the features of object-oriented languages and their role in OMT implementation.

Q.4 Compulsory Question. **08**

Draw Data flow Diagram for Hotel reservation System (Level 0, Level 1, Level 2)?

SECTION – II

Q.5 Attempt any Three. **12**

a) What are *types* and *roles* in UML?

b) Describe *instances and object diagrams* with suitable examples.

c) What is an *activity diagram?* Explain its basic notations.

d) Explain how *patterns* and *frameworks* support architectural modeling.

Q.6 Attempt for any One. **08**

a) Develop a State Chart Diagram for a Printer showing states such as *Idle, Printing, Out of Paper, Error*.

b) How do *component and deployment diagrams* together represent system architecture? Illustrate with a diagram.

Q.7 Compulsory Question. **08**

Draw a Class Diagram for an Online Shopping System depicting *Product, Cart, Order, Customer,* and *Payment.*

SLR-QH-438

Seat No.		Set	P

Marks Obtained		Signature of Examiner		Signature of Junior Supervisor	

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Creativity and Design Thinking (AEC-02)

Day & Date: Tuesday, 12-05-2026 Max. Marks: 50
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Mention Question Paper Set (P/Q/R/S) on Top of Page.
4) Use of non-programmable calculators is allowed.

Answer

Q.1 Multiple Choice Questions.

1) Innovation mainly focuses on _____.
a) Generating ideas only b) Implementing creative ideas
c) Copying others d) Marketing

2) Creativity and Innovation together lead to _____.
a) Routine performance b) Problem discovery
c) Practical novelty d) Mechanical repetition

3) A characteristic of a creative person is _____.
a) Rigidity b) Curiosity
c) Fearfulness d) Passivity

4) Which of the following represents a major *barrier* to creativity?
a) Time pressure b) Risk-taking
c) Playfulness d) Flexibility

5) The “Ideate” stage in design thinking focuses on _____.
a) Understanding users b) Generating solutions
c) Testing ideas d) Building prototypes

6) Design thinking is fundamentally _____.
a) User-centered b) Manager-centered
c) Engineer-centered d) Cost-centered

7) Which of these helps to *overcome* creative blocks?
a) Collaboration b) Fear of mistakes
c) Over-planning d) Isolation

8) A design thinker empathizes to _____.
a) Know customer feelings and needs
b) Find product cost
c) Estimate profit
d) Collect market data

9) The *Define* phase results in _____.
a) Problem statement b) Prototype
c) Survey d) Marketing plan

10) Barriers to creativity can be removed through _____.
a) Open communication b) Discouragement
c) Repetition d) Judgmental thinking

11) The last phase of design thinking is _____.
a) Prototype b) Test
c) Ideate d) Define

12) Which term best describes the ability to see connections between unrelated ideas?
a) Fluency b) Flexibility
c) Originality d) Association

13) One of the benefits of design thinking is _____.
a) Focusing on user-friendly solutions
b) Ignoring customers
c) Cost reduction only
d) Quick fixes

14) Divergent and convergent thinking together ensure _____.
a) Balance between idea generation and selection
b) Faster production
c) Market analysis
d) Less creativity

15) In brainstorming, criticism should be ____.
a) Encouraged b) Postponed
c) Ignored d) Repeated

16) SCAMPER is mainly used for _____.
a) Modifying existing ideas b) Market study
c) Testing materials d) Estimating cost

17) In mind mapping, central themes are _____.
a) Placed at center with branches outward
b) At the edges
c) Hidden
d) Random

18) TRIZ encourages _____.
a) Systematic innovation through contradictions
b) Copying existing patents
c) Brainstorm blocking
d) Linear analysis

19) Which is a creative ideation technique?
a) Storyboarding b) Checklist creation
c) Prototype testing d) Quality audit

20) Concept sketching helps _____.
a) Express ideas visually b) Replace written reports
c) Perform tests d) Manage finance

21) In SCAMPER, “C” stands for _____.
a) Combine b) Copy
c) Create d) Classify

22) The purpose of divergent thinking is to _____.
a) Explore many possibilities b) Select one answer
c) Limit imagination d) Finalize design

23) Which of the following tools is best suited for *organizing ideas?*
a) Mind map b) Pie chart
c) Spreadsheet d) Histogram

24) “Storytelling” in concept development helps designers _____.
a) Communicate user experiences effectively
b) Draw detailed schematics
c) Analyze budget
d) Fix prototypes

25) The last step of concept development is _____.
a) Visualization of ideas b) Brainstorming
c) TRIZ analysis d) Market feedback

26) Prototyping in design helps _____.
a) Convert abstract ideas into tangible models
b) Replace manufacturing
c) Finalize budgets
d) Avoid testing

27) Which prototype type is *cheapest* and fastest?
a) Low-fidelity b) High-fidelity
c) Final d) Medium

28) High-fidelity prototypes allow _____.
a) User interaction and realism
b) Concept only
c) Paper sketching
d) Cost saving only

29) The iterative approach focuses on _____.
a) Refining design through repeated feedback
b) Making single model
c) Reducing creativity
d) Avoiding testing

30) The first step in rapid prototyping is _____.
a) 3D CAD modeling b) Final assembly
c) Testing d) Polishing

31) Which tool is commonly used in rapid prototyping?
a) 3D printer b) Spreadsheet
c) CNC lathe d) Mind map

32) User testing is most crucial in which stage?
a) Prototype evaluation b) Ideation
c) Definition d) Empathize

33) A real-life application of creative design is _____.
a) Smart wearable devices b) Paper waste
c) Redundant designs d) Manual data entry

34) Brainstorming during prototype improvement helps _____.
a) Generate alternative solutions
b) Restrict ideas
c) Delay work
d) Stop iteration

35) Which of the following prototypes allows early visualization?
a) Sketch model b) CAD simulation
c) Clay model d) Flowchart

36) Customer-driven design ensures _____.
a) Meeting user needs b) Reducing quality
c) Ignoring testing d) Increasing cost

37) The final output of iterative design is _____.
a) Optimized product meeting specifications
b) Initial draft
c) Prototype sketch
d) Raw material

38) The goal of sustainable design is _____.
a) Minimize negative environmental impact
b) Increase short-term gain
c) Use non-renewable resources
d) Ignore life cycle

39) Which phase is crucial for sustainability decisions?
a) Design stage b) Disposal
c) Marketing d) Sales

40) Product life-cycle assessment includes _____.
a) Raw material to end-of-life impact
b) Only production cost
c) Marketing only
d) Storage cost

41) A product designed for durability supports _____.
a) Longevity principle b) Obsolescence
c) Short-term use d) High waste

42) Eco-friendly design considers _____.
a) Material selection and energy efficiency
b) Only packaging
c) Advertisement
d) Color

43) "Design for reuse" aims to _____.
a) Extend product life b) Destroy waste
c) Limit recycling d) Increase cost

44) Agile development in design allows _____.
a) Rapid response to change b) Strict stepwise control
c) No feedback d) Delayed iterations

45) Spiral model combines _____.
a) Prototyping and risk management
b) Linear and agile stages
c) Testing and marketing
d) Sales and production

46) The staged (waterfall) model is _____.
a) Sequential b) Iterative
c) Flexible d) Rapid

47) Case studies in sustainable design show _____.
a) Application of eco-friendly materials
b) Ignoring user needs
c) Over-production
d) Energy waste

48) The most important sustainability factor in manufacturing is _____.
a) Resource efficiency
b) Advertisement
c) Branding
d) Design color

49) Which practice promotes a circular economy?
a) Recycling and remanufacturing
b) Landfilling
c) Burning waste
d) Exporting scrap

50) Sustainable engineering mainly targets _____.
a) Balance between economy, society, and environment
b) Maximizing output only
c) Technological monopoly
d) Short-term gains

Seat No.		Set	Q

Marks Obtained		Signature of Examiner		Signature of Junior Supervisor	

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Creativity and Design Thinking (AEC-02)

Day & Date: Tuesday, 12-05-2026 Max. Marks: 50
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
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Answer

Q.1 Multiple Choice Questions.

1) In SCAMPER, "C" stands for _____.
a) Combine b) Copy
c) Create d) Classify

2) The purpose of divergent thinking is to _____.
a) Explore many possibilities b) Select one answer
c) Limit imagination d) Finalize design

3) Which of the following tools is best suited for *organizing ideas?*
a) Mind map b) Pie chart
c) Spreadsheet d) Histogram

4) "Storytelling" in concept development helps designers _____.
a) Communicate user experiences effectively
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d) Fix prototypes

5) The last step of concept development is _____.
a) Visualization of ideas b) Brainstorming
c) TRIZ analysis d) Market feedback

6) Prototyping in design helps _____.
a) Convert abstract ideas into tangible models
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c) Finalize budgets
d) Avoid testing

7) Which prototype type is *cheapest* and fastest?
a) Low-fidelity b) High-fidelity
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8) High-fidelity prototypes allow _____.
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9) The iterative approach focuses on _____.
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c) Reducing creativity
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10) The first step in rapid prototyping is _____.
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c) Testing d) Polishing

11) Which tool is commonly used in rapid prototyping?
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12) User testing is most crucial in which stage?
a) Prototype evaluation b) Ideation
c) Definition d) Empathize

13) A real-life application of creative design is _____.
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14) Brainstorming during prototype improvement helps _____.
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15) Which of the following prototypes allows early visualization?
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26) The staged (waterfall) model is _____.
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33) A characteristic of a creative person is _____.
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c) Survey d) Marketing plan

40) Barriers to creativity can be removed through _____.
a) Open communication b) Discouragement
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41) The last phase of design thinking is _____.
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c) Ideate d) Define

42) Which term best describes the ability to see connections between unrelated ideas?
a) Fluency b) Flexibility
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44) Divergent and convergent thinking together ensure _____.
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45) In brainstorming, criticism should be ____.
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b) At the edges
c) Hidden
d) Random

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a) Systematic innovation through contradictions
b) Copying existing patents
c) Brainstorm blocking
d) Linear analysis

49) Which is a creative ideation technique?

a) Storyboarding
b) Checklist creation
c) Prototype testing
d) Quality audit

50) Concept sketching helps _____.

a) Express ideas visually
b) Replace written reports
c) Perform tests
d) Manage finance

SLR-QH-438

Seat No.		Set	R

Marks Obtained		Signature of Examiner		Signature of Junior Supervisor	

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Creativity and Design Thinking (AEC-02)

Day & Date: Tuesday, 12-05-2026 Max. Marks: 50
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Mention Question Paper Set (P/Q/R/S) on Top of Page.
4) Use of non-programmable calculators is allowed.

Answer

Q.1 Multiple Choice Questions.

1) A product designed for durability supports _____.
a) Longevity principle b) Obsolescence
c) Short-term use d) High waste

2) Eco-friendly design considers _____.
a) Material selection and energy efficiency
b) Only packaging
c) Advertisement
d) Color

3) "Design for reuse" aims to _____.
a) Extend product life b) Destroy waste
c) Limit recycling d) Increase cost

4) Agile development in design allows _____.
a) Rapid response to change b) Strict stepwise control
c) No feedback d) Delayed iterations

5) Spiral model combines _____.
a) Prototyping and risk management
b) Linear and agile stages
c) Testing and marketing
d) Sales and production

6) The staged (waterfall) model is _____.
a) Sequential b) Iterative
c) Flexible d) Rapid

7) Case studies in sustainable design show _____.
a) Application of eco-friendly materials
b) Ignoring user needs
c) Over-production
d) Energy waste

8) The most important sustainability factor in manufacturing is _____.
a) Resource efficiency b) Advertisement
c) Branding d) Design color

9) Which practice promotes a circular economy?
a) Recycling and remanufacturing
b) Landfilling
c) Burning waste
d) Exporting scrap

10) Sustainable engineering mainly targets _____.
a) Balance between economy, society, and environment
b) Maximizing output only
c) Technological monopoly
d) Short-term gains

11) Innovation mainly focuses on _____.
a) Generating ideas only b) Implementing creative ideas
c) Copying others d) Marketing

12) Creativity and Innovation together lead to _____.
a) Routine performance b) Problem discovery
c) Practical novelty d) Mechanical repetition

13) A characteristic of a creative person is _____.
a) Rigidity b) Curiosity
c) Fearfulness d) Passivity

14) Which of the following represents a major *barrier* to creativity?
a) Time pressure b) Risk-taking
c) Playfulness d) Flexibility

15) The “Ideate” stage in design thinking focuses on _____.
a) Understanding users b) Generating solutions
c) Testing ideas d) Building prototypes

16) Design thinking is fundamentally _____.
a) User-centered b) Manager-centered
c) Engineer-centered d) Cost-centered

17) Which of these helps to *overcome* creative blocks?
a) Collaboration b) Fear of mistakes
c) Over-planning d) Isolation

18) A design thinker empathizes to _____.
a) Know customer feelings and needs
b) Find product cost
c) Estimate profit
d) Collect market data

19) The *Define* phase results in _____.
a) Problem statement b) Prototype
c) Survey d) Marketing plan

20) Barriers to creativity can be removed through _____.
a) Open communication b) Discouragement
c) Repetition d) Judgmental thinking

21) The last phase of design thinking is _____.
a) Prototype b) Test
c) Ideate d) Define

22) Which term best describes the ability to see connections between unrelated ideas?
a) Fluency b) Flexibility
c) Originality d) Association

23) One of the benefits of design thinking is _____.
a) Focusing on user-friendly solutions
b) Ignoring customers
c) Cost reduction only
d) Quick fixes

24) Divergent and convergent thinking together ensure _____.
a) Balance between idea generation and selection
b) Faster production
c) Market analysis
d) Less creativity

25) In brainstorming, criticism should be ____.
a) Encouraged b) Postponed
c) Ignored d) Repeated

26) SCAMPER is mainly used for _____.
a) Modifying existing ideas b) Market study
c) Testing materials d) Estimating cost

27) In mind mapping, central themes are _____.
a) Placed at center with branches outward
b) At the edges
c) Hidden
d) Random

28) TRIZ encourages _____.
a) Systematic innovation through contradictions
b) Copying existing patents
c) Brainstorm blocking
d) Linear analysis

29) Which is a creative ideation technique?
a) Storyboarding b) Checklist creation
c) Prototype testing d) Quality audit

30) Concept sketching helps _____.
a) Express ideas visually b) Replace written reports
c) Perform tests d) Manage finance

31) In SCAMPER, "C" stands for _____.
a) Combine b) Copy
c) Create d) Classify

32) The purpose of divergent thinking is to _____.
a) Explore many possibilities b) Select one answer
c) Limit imagination d) Finalize design

33) Which of the following tools is best suited for *organizing ideas?*
a) Mind map b) Pie chart
c) Spreadsheet d) Histogram

34) "Storytelling" in concept development helps designers _____.
a) Communicate user experiences effectively
b) Draw detailed schematics
c) Analyze budget
d) Fix prototypes

35) The last step of concept development is _____.
a) Visualization of ideas b) Brainstorming
c) TRIZ analysis d) Market feedback

36) Prototyping in design helps _____.
a) Convert abstract ideas into tangible models
b) Replace manufacturing
c) Finalize budgets
d) Avoid testing

37) Which prototype type is *cheapest* and fastest?
a) Low-fidelity b) High-fidelity
c) Final d) Medium

38) High-fidelity prototypes allow _____.
a) User interaction and realism
b) Concept only
c) Paper sketching
d) Cost saving only

39) The iterative approach focuses on _____.
a) Refining design through repeated feedback
b) Making single model
c) Reducing creativity
d) Avoiding testing

40) The first step in rapid prototyping is _____.
a) 3D CAD modeling b) Final assembly
c) Testing d) Polishing

41) Which tool is commonly used in rapid prototyping?
a) 3D printer b) Spreadsheet
c) CNC lathe d) Mind map

42) User testing is most crucial in which stage?
a) Prototype evaluation b) Ideation
c) Definition d) Empathize

43) A real-life application of creative design is _____.
a) Smart wearable devices b) Paper waste
c) Redundant designs d) Manual data entry

44) Brainstorming during prototype improvement helps _____.
a) Generate alternative solutions
b) Restrict ideas
c) Delay work
d) Stop iteration

45) Which of the following prototypes allows early visualization?
a) Sketch model b) CAD simulation
c) Clay model d) Flowchart

46) Customer-driven design ensures _____.
a) Meeting user needs b) Reducing quality
c) Ignoring testing d) Increasing cost

47) The final output of iterative design is _____.
a) Optimized product meeting specifications
b) Initial draft
c) Prototype sketch
d) Raw material

48) The goal of sustainable design is _____.

a) Minimize negative environmental impact
b) Increase short-term gain
c) Use non-renewable resources
d) Ignore life cycle

49) Which phase is crucial for sustainability decisions?

a) Design stage b) Disposal
c) Marketing d) Sales

50) Product life-cycle assessment includes _____.

a) Raw material to end-of-life impact
b) Only production cost
c) Marketing only
d) Storage cost

SLR-QH-438

Seat No.		Set	S

Marks Obtained		Signature of Examiner		Signature of Junior Supervisor	

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Creativity and Design Thinking (AEC-02)

Day & Date: Tuesday, 12-05-2026 Max. Marks: 50
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Mention Question Paper Set (P/Q/R/S) on Top of Page.
4) Use of non-programmable calculators is allowed.

Answer

Q.1 Multiple Choice Questions.

1) The last phase of design thinking is _____.
a) Prototype b) Test
c) Ideate d) Define

2) Which term best describes the ability to see connections between unrelated ideas?
a) Fluency b) Flexibility
c) Originality d) Association

3) One of the benefits of design thinking is _____.
a) Focusing on user-friendly solutions
b) Ignoring customers
c) Cost reduction only
d) Quick fixes

4) Divergent and convergent thinking together ensure _____.
a) Balance between idea generation and selection
b) Faster production
c) Market analysis
d) Less creativity

5) In brainstorming, criticism should be ____.
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c) Hidden
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8) TRIZ encourages _____.
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10) Concept sketching helps _____.
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a) Explore many possibilities b) Select one answer
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c) Marketing only
d) Storage cost

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c) Short-term use d) High waste

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b) Only packaging
c) Advertisement
d) Color

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c) Testing and marketing
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37) Case studies in sustainable design show _____.
a) Application of eco-friendly materials
b) Ignoring user needs
c) Over-production
d) Energy waste

38) The most important sustainability factor in manufacturing is _____.
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c) Branding d) Design color

39) Which practice promotes a circular economy?
a) Recycling and remanufacturing
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c) Burning waste
d) Exporting scrap

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c) Over-planning d) Isolation

48) A design thinker empathizes to _____.

a) Know customer feelings and needs
b) Find product cost
c) Estimate profit
d) Collect market data

49) The *Define* phase results in _____.

a) Problem statement
b) Prototype
c) Survey
d) Marketing plan

50) Barriers to creativity can be removed through _____.

a) Open communication
b) Discouragement
c) Repetition
d) Judgmental thinking

SLR-QH-439

Seat No.		Set	P

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Honors in Artificial Intelligence and Machine Learning
Natural Language Processing (CSEHON-03A)

Day & Date: Thursday, 14-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions (if necessary and state them clearly).

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) WordNet is used in NLP for _____.
a) Statistical modeling
b) Lexical database and word relationships
c) Speech-to-text conversion
d) Machine translation

2) Which algorithm is commonly used for sequence labeling in NLP?
a) K-Means b) Hidden Markov Model
c) Decision Tree d) Random Forest

3) The Bag of Words (BoW) model ignores _____.
a) Word frequency b) Word order
c) Word presence d) Word occurrence

4) The cosine similarity between two word vectors measures, _____.
a) The angle between them
b) The sum of their values
c) The difference in magnitude
d) The total frequency of words

5) Morphological Segmentation means _____.
a) Does Discourse Analysis
b) Separate words into individual morphemes and identify the class of the morphemes
c) Is an extension of propositional logic
d) None of the mentioned

6) What is the main challenge/s of NLP?
   a) Handling Ambiguity of Sentences
   b) Handling Tokenization
   c) Handling POS-Tagging
   d) All of the mentioned

7) Parsing in NLP is the process of _____.
   a) Analyzing grammatical structure of a sentence
   b) Tokenizing text
   c) Removing punctuation
   d) Translating words

8) Bag-of-Words approach _____.
   a) keeps word order, keeps word multiplicity
   b) keeps word order, disregards word multiplicity
   c) disregards word order, disregards word multiplicity
   d) disregards word order, keeps word multiplicity

9) Which of these tools is often used for NLP tasks in Python?
   a) TensorFlow b) NLTK
   c) OpenCV d) Matplotlib

10) Which function would you use to retrieve the list of unique words?
   a) fit_tranform() b) CountVectorizer()
   c) get_feature_names() d) download()

11) What is the name of the computer program that simulates the thought processes of human beings?
   a) Human logic b) Expert reason
   c) Expert system d) Personal information

12) Ambiguity in NLP refers to _____.
   a) Words or sentences having multiple meanings
   b) Incorrect tokenization
   c) Data sparsity
   d) Lack of vocabulary

13) In NLP, removing common words like is, the, and is called _____.
   a) Lemmatization b) Stopword removal
   c) Tokenization d) Parsing

14) A sentence is divided into words during _____.
   a) Chunking b) Parsing
   c) Tokenization d) Tagging

Seat No.	

Set **P**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Honors in Artificial Intelligence and Machine Learning
Natural Language Processing (CSEHON-03A)

Day & Date: Thursday, 14-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever necessary and mention it clearly.

SECTION – I

Q.2 Attempt (Any Four). **16**

a) Discuss Natural Language Understanding (NLU) with example.

b) Explain importance of NLP.

c) Describe the role of Machine Learning in Natural Language Processing.

d) Compare Machine Learning and NLP.

e) Discuss Word-net Application in Query Expansion.

Q.3 Attempt (Any Two). **12**

a) Write a short note on top-down and bottom-up parsing techniques used in NLP.

b) Explain Word Sense Disambiguation (WSD) in detail.

c) Explain Semantic Roles with example.

SECTION - II

Q.4 Attempt (Any Four). **16**

a) Explain the working of Named Entity Recognition (NER) in NLP. What are its challenges and applications?

b) Explain Sentiment Analysis in NLP. Describe the methods used and real-life applications.

c) What is Machine Translation? Explain its working with reference to Google Translate or similar systems.

d) Explain Random Fields, Maximum Entropy model.

e) Explain Shallow parsing (Chunk parsing).

Q.5 Attempt (Any Two). **12**

a) Explain HMM in detail.

b) Explain Text Entailment with various triggers.

c) Explain Baum Welch algorithm.

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Honors in Artificial Intelligence and Machine Learning
Natural Language Processing (CSEHON-03A)

Day & Date: Thursday, 14-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions (if necessary and state them clearly).

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) Bag-of-Words approach _____.
a) keeps word order, keeps word multiplicity
b) keeps word order, disregards word multiplicity
c) disregards word order, disregards word multiplicity
d) disregards word order, keeps word multiplicity

2) Which of these tools is often used for NLP tasks in Python?
a) TensorFlow b) NLTK
c) OpenCV d) Matplotlib

3) Which function would you use to retrieve the list of unique words?
a) fit_tranform() b) CountVectorizer()
c) get_feature_names() d) download()

4) What is the name of the computer program that simulates the thought processes of human beings?
a) Human logic b) Expert reason
c) Expert system d) Personal information

5) Ambiguity in NLP refers to _____.
a) Words or sentences having multiple meanings
b) Incorrect tokenization
c) Data sparsity
d) Lack of vocabulary

6) In NLP, removing common words like is, the, and is called _____.
a) Lemmatization b) Stopword removal
c) Tokenization d) Parsing

7) A sentence is divided into words during _____.
   a) Chunking
   b) Parsing
   c) Tokenization
   d) Tagging

8) WordNet is used in NLP for _____.
   a) Statistical modeling
   b) Lexical database and word relationships
   c) Speech-to-text conversion
   d) Machine translation

9) Which algorithm is commonly used for sequence labeling in NLP?
   a) K-Means
   b) Hidden Markov Model
   c) Decision Tree
   d) Random Forest

10) The Bag of Words (BoW) model ignores _____.
   a) Word frequency
   b) Word order
   c) Word presence
   d) Word occurrence

11) The cosine similarity between two word vectors measures, _____.
   a) The angle between them
   b) The sum of their values
   c) The difference in magnitude
   d) The total frequency of words

12) Morphological Segmentation means _____.
   a) Does Discourse Analysis
   b) Separate words into individual morphemes and identify the class of the morphemes
   c) Is an extension of propositional logic
   d) None of the mentioned

13) What is the main challenge/s of NLP?
   a) Handling Ambiguity of Sentences
   b) Handling Tokenization
   c) Handling POS-Tagging
   d) All of the mentioned

14) Parsing in NLP is the process of _____.
   a) Analyzing grammatical structure of a sentence
   b) Tokenizing text
   c) Removing punctuation
   d) Translating words

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Honors in Artificial Intelligence and Machine Learning
Natural Language Processing (CSEHON-03A)

Day & Date: Thursday, 14-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever necessary and mention it clearly.

SECTION – I

Q.2 Attempt (Any Four). **16**

a) Discuss Natural Language Understanding (NLU) with example.

b) Explain importance of NLP.

c) Describe the role of Machine Learning in Natural Language Processing.

d) Compare Machine Learning and NLP.

e) Discuss Word-net Application in Query Expansion.

Q.3 Attempt (Any Two). **12**

a) Write a short note on top-down and bottom-up parsing techniques used in NLP.

b) Explain Word Sense Disambiguation (WSD) in detail.

c) Explain Semantic Roles with example.

SECTION - II

Q.4 Attempt (Any Four). **16**

a) Explain the working of Named Entity Recognition (NER) in NLP. What are its challenges and applications?

b) Explain Sentiment Analysis in NLP. Describe the methods used and real-life applications.

c) What is Machine Translation? Explain its working with reference to Google Translate or similar systems.

d) Explain Random Fields, Maximum Entropy model.

e) Explain Shallow parsing (Chunk parsing).

Q.5 Attempt (Any Two). **12**

a) Explain HMM in detail.

b) Explain Text Entailment with various triggers.

c) Explain Baum Welch algorithm.

SLR-QH-439

Seat No.		Set	R

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Honors in Artificial Intelligence and Machine Learning
Natural Language Processing (CSEHON-03A)

Day & Date: Thursday, 14-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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4) Make suitable assumptions (if necessary and state them clearly).

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) What is the name of the computer program that simulates the thought processes of human beings?
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2) Ambiguity in NLP refers to _____.
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Honors in Artificial Intelligence and Machine Learning
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3) Assume suitable data wherever necessary and mention it clearly.

SECTION – I

Q.2 Attempt (Any Four). **16**

a) Discuss Natural Language Understanding (NLU) with example.

b) Explain importance of NLP.

c) Describe the role of Machine Learning in Natural Language Processing.

d) Compare Machine Learning and NLP.

e) Discuss Word-net Application in Query Expansion.

Q.3 Attempt (Any Two). **12**

a) Write a short note on top-down and bottom-up parsing techniques used in NLP.

b) Explain Word Sense Disambiguation (WSD) in detail.

c) Explain Semantic Roles with example.

SECTION - II

Q.4 Attempt (Any Four). **16**

a) Explain the working of Named Entity Recognition (NER) in NLP. What are its challenges and applications?

b) Explain Sentiment Analysis in NLP. Describe the methods used and real-life applications.

c) What is Machine Translation? Explain its working with reference to Google Translate or similar systems.

d) Explain Random Fields, Maximum Entropy model.

e) Explain Shallow parsing (Chunk parsing).

Q.5 Attempt (Any Two). **12**

a) Explain HMM in detail.

b) Explain Text Entailment with various triggers.

c) Explain Baum Welch algorithm.

Seat No.		Set	S

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Honors in Artificial Intelligence and Machine Learning
Natural Language Processing (CSEHON-03A)

Day & Date: Thursday, 14-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions (if necessary and state them clearly).

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) What is the main challenge/s of NLP?
a) Handling Ambiguity of Sentences
b) Handling Tokenization
c) Handling POS-Tagging
d) All of the mentioned

2) Parsing in NLP is the process of _____.
a) Analyzing grammatical structure of a sentence
b) Tokenizing text
c) Removing punctuation
d) Translating words

3) Bag-of-Words approach _____.
a) keeps word order, keeps word multiplicity
b) keeps word order, disregards word multiplicity
c) disregards word order, disregards word multiplicity
d) disregards word order, keeps word multiplicity

4) Which of these tools is often used for NLP tasks in Python?
a) TensorFlow b) NLTK
c) OpenCV d) Matplotlib

5) Which function would you use to retrieve the list of unique words?
a) fit_tranform() b) CountVectorizer()
c) get_feature_names() d) download()

6) What is the name of the computer program that simulates the thought processes of human beings?
a) Human logic
b) Expert reason
c) Expert system
d) Personal information

7) Ambiguity in NLP refers to _____.
a) Words or sentences having multiple meanings
b) Incorrect tokenization
c) Data sparsity
d) Lack of vocabulary

8) In NLP, removing common words like is, the, and is called _____.
a) Lemmatization
b) Stopword removal
c) Tokenization
d) Parsing

9) A sentence is divided into words during _____.
a) Chunking
b) Parsing
c) Tokenization
d) Tagging

10) WordNet is used in NLP for _____.
a) Statistical modeling
b) Lexical database and word relationships
c) Speech-to-text conversion
d) Machine translation

11) Which algorithm is commonly used for sequence labeling in NLP?
a) K-Means
b) Hidden Markov Model
c) Decision Tree
d) Random Forest

12) The Bag of Words (BoW) model ignores _____.
a) Word frequency
b) Word order
c) Word presence
d) Word occurrence

13) The cosine similarity between two word vectors measures, _____.
a) The angle between them
b) The sum of their values
c) The difference in magnitude
d) The total frequency of words

14) Morphological Segmentation means _____.
a) Does Discourse Analysis
b) Separate words into individual morphemes and identify the class of the morphemes
c) Is an extension of propositional logic
d) None of the mentioned

Seat No.	

Set **S**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Honors in Artificial Intelligence and Machine Learning
Natural Language Processing (CSEHON-03A)

Day & Date: Thursday, 14-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever necessary and mention it clearly.

SECTION – I

Q.2 Attempt (Any Four). **16**

a) Discuss Natural Language Understanding (NLU) with example.

b) Explain importance of NLP.

c) Describe the role of Machine Learning in Natural Language Processing.

d) Compare Machine Learning and NLP.

e) Discuss Word-net Application in Query Expansion.

Q.3 Attempt (Any Two). **12**

a) Write a short note on top-down and bottom-up parsing techniques used in NLP.

b) Explain Word Sense Disambiguation (WSD) in detail.

c) Explain Semantic Roles with example.

SECTION - II

Q.4 Attempt (Any Four). **16**

a) Explain the working of Named Entity Recognition (NER) in NLP. What are its challenges and applications?

b) Explain Sentiment Analysis in NLP. Describe the methods used and real-life applications.

c) What is Machine Translation? Explain its working with reference to Google Translate or similar systems.

d) Explain Random Fields, Maximum Entropy model.

e) Explain Shallow parsing (Chunk parsing).

Q.5 Attempt (Any Two). **12**

a) Explain HMM in detail.

b) Explain Text Entailment with various triggers.

c) Explain Baum Welch algorithm.

SLR-QH-440

Seat No.		Set	P

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Honors in Cyber Security-Cyber Forensic (CSEHON-03B)

Day & Date: Thursday, 14-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) Cybercrime can be best defined as _____.
a) Crime involving physical harm
b) Illegal acts committed using computers or networks
c) Social media usage
d) Government surveillance

2) Which of the following is not a key element of information security?
a) Confidentiality b) Integrity
c) Availability d) Profitability

3) Which of the following is not a category of cybercrime?
a) Cybercrime against persons
b) Cybercrime against property
c) Cybercrime against wildlife
d) Cybercrime against government

4) Which type of malware replicates itself to spread across systems?
a) Virus b) Worm
c) Trojan d) Rootkit

5) What is the key difference between a virus and a worm?
a) Virus spreads without user interaction
b) Worm needs a host program
c) Worm spreads without needing a host
d) Virus cannot cause damage

6) Which of the following can be a consequence of a buffer overflow attack?
a) Performance improvement
b) Arbitrary code execution
c) Firewall bypass
d) Hardware damage

7) Digital signatures in India are governed under which section of the IT Act?
a) Section 43
b) Section 66
c) Section 3
d) Section 7

8) Which section of the IT Act deals with hacking?
a) Section 43
b) Section 65
c) Section 66
d) Section 72

9) In the context of cyber law, which international convention aims to combat cybercrime globally?
a) Kyoto Protocol
b) Hague Convention
c) Budapest Convention
d) Geneva Convention

10) What is the first step in any network forensic investigation?
a) Evidence analysis
b) Reporting
c) Preparation and authorization
d) Reconstructing the attack

11) Why is documentation important in network forensics?
a) For billing purposes
b) For future reference
c) For legal presentation and validation
d) To improve system performance

12) Which technique is used to preserve integrity of captured network evidence?
a) Using hash functions
b) Encrypting logs
c) Creating backups
d) Using firewalls

13) Which of the following data types can be extracted during mobile forensic analysis?
a) Call logs
b) SMS
c) GPS data
d) All of the above

14) What is the role of a write blocker in forensics?
a) Block spam messages
b) Prevent data modification during extraction
c) Enhance image resolution
d) Enable internet connection

SLR-QH-440

Seat No.	

Set P

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Honors in Cyber Security-Cyber Forensic (CSEHON-03B)

Day & Date: Thursday, 14-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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

SECTION – I

Q.2 Attempt (Any Three) **12**

a) What are the 3 elements of CIA triad in cybersecurity?

b) Define proxy servers and explain their role in concealing cybercriminal identities.

c) What is SQL injection? Provide a simple example of its use in cybercrime.

d) List any two differences between digital signatures and electronic signatures.

Q.3 Attempt (Any Two) **16**

a) How do cybercriminals plan the attack? List the key steps.

b) What is phishing? Explain any four common techniques used in phishing attacks with examples.

c) Why is there a need for cyber law in India? Mention any four reasons.

SECTION – II

Q.4 Attempt (Any Three) **12**

a) What is the need for computer forensics in today's digital world?

b) Define techno-legal challenges in the context of digital evidence from mobile phones.

c) What is meant by filtering and data reduction in network forensics?

d) Define network technology with two examples relevant to forensic investigation.

Q.5 Attempt (Any Two) **16**

a) Explain the digital forensic life cycle.

b) Mention the key challenges faced in computer forensics investigations.

c) Write a short note on reporting results in a network forensic investigation.

SLR-QH-440

Seat No.	

Set Q

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Honors in Cyber Security-Cyber Forensic (CSEHON-03B)

Day & Date: Thursday, 14-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

Duration: 30 Minutes Marks: 14

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

1) Which section of the IT Act deals with hacking?
a) Section 43 b) Section 65
c) Section 66 d) Section 72

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   b) Prevent data modification during extraction
   c) Enhance image resolution
   d) Enable internet connection

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   b) Illegal acts committed using computers or networks
   c) Social media usage
   d) Government surveillance

9) Which of the following is not a key element of information security?
   a) Confidentiality
   b) Integrity
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   b) Cybercrime against property
   c) Cybercrime against wildlife
   d) Cybercrime against government

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   b) Worm
   c) Trojan
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SLR-QH-440

Seat No.	

Set Q

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Honors in Cyber Security-Cyber Forensic (CSEHON-03B)

Day & Date: Thursday, 14-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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

SECTION – I

Q.2 Attempt (Any Three) **12**

a) What are the 3 elements of CIA triad in cybersecurity?

b) Define proxy servers and explain their role in concealing cybercriminal identities.

c) What is SQL injection? Provide a simple example of its use in cybercrime.

d) List any two differences between digital signatures and electronic signatures.

Q.3 Attempt (Any Two) **16**

a) How do cybercriminals plan the attack? List the key steps.

b) What is phishing? Explain any four common techniques used in phishing attacks with examples.

c) Why is there a need for cyber law in India? Mention any four reasons.

SECTION – II

Q.4 Attempt (Any Three) **12**

a) What is the need for computer forensics in today's digital world?

b) Define techno-legal challenges in the context of digital evidence from mobile phones.

c) What is meant by filtering and data reduction in network forensics?

d) Define network technology with two examples relevant to forensic investigation.

Q.5 Attempt (Any Two) **16**

a) Explain the digital forensic life cycle.

b) Mention the key challenges faced in computer forensics investigations.

c) Write a short note on reporting results in a network forensic investigation.

SLR-QH-440

Seat No.		Set	R

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Honors in Cyber Security-Cyber Forensic (CSEHON-03B)

Day & Date: Thursday, 14-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) Why is documentation important in network forensics?
a) For billing purposes
b) For future reference
c) For legal presentation and validation
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a) Evidence analysis b) Reporting
c) Preparation and authorization d) Reconstructing the attack

SLR-QH-440

Seat No.	

Set R

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Honors in Cyber Security-Cyber Forensic (CSEHON-03B)

Day & Date: Thursday, 14-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
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SECTION – I

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a) Explain the digital forensic life cycle.

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SLR-QH-440

Seat No.		Set	S

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Honors in Cyber Security-Cyber Forensic (CSEHON-03B)

Day & Date: Thursday, 14-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

Duration: 30 Minutes Marks: 14

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

1) Which of the following can be a consequence of a buffer overflow attack?
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b) Worm needs a host program
c) Worm spreads without needing a host
d) Virus cannot cause damage

SLR-QH-440

Seat No.	

Set S

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Honors in Cyber Security-Cyber Forensic (CSEHON-03B)

Day & Date: Thursday, 14-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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

SECTION – I

Q.2 Attempt (Any Three) **12**

a) What are the 3 elements of CIA triad in cybersecurity?

b) Define proxy servers and explain their role in concealing cybercriminal identities.

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d) List any two differences between digital signatures and electronic signatures.

Q.3 Attempt (Any Two) **16**

a) How do cybercriminals plan the attack? List the key steps.

b) What is phishing? Explain any four common techniques used in phishing attacks with examples.

c) Why is there a need for cyber law in India? Mention any four reasons.

SECTION – II

Q.4 Attempt (Any Three) **12**

a) What is the need for computer forensics in today's digital world?

b) Define techno-legal challenges in the context of digital evidence from mobile phones.

c) What is meant by filtering and data reduction in network forensics?

d) Define network technology with two examples relevant to forensic investigation.

Q.5 Attempt (Any Two) **16**

a) Explain the digital forensic life cycle.

b) Mention the key challenges faced in computer forensics investigations.

c) Write a short note on reporting results in a network forensic investigation.

SLR-QH-442

Seat No.		Set	P

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (Old) (CBCS) Examination: March/April – 2026
Artificial Intelligence (BTN03501)

Day & Date: Saturday, 02-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) Which of the following is NOT a common approach in AI development?
a) Machine learning
b) Rule-based systems
c) Intuition-based decision-making
d) Natural language processing

2) Which type of agent makes decisions based on maximizing expected utility?
a) Reactive Agent
b) Goal-Driven Agent
c) Utility-Driven Agent
d) Learning Agent

3) What is the main difference between forward and backward search?
a) Forward search begins from the goal and moves toward the start.
b) Backward search begins from the start and moves toward the goal.
c) Forward search begins from the start and moves toward the goal, while backward search starts at the goal and works backward to the initial state.
d) Both approaches are identical in their direction.

4) Which search algorithm works well with problems that can be broken into subproblems and solved recursively?
a) A* Algorithm
b) AO* Algorithm
c) Breadth-First Search
d) Hill-Climbing Algorithm

5) What is the primary purpose of an ontology in knowledge representation?
a) To define and organize the structure of knowledge in a domain.
b) To perform arithmetic computations.
c) To encode procedural rules for solving optimization problems.
d) To randomly generate knowledge.

6) What is "situation calculus" used for?
   a) To model situations and changes caused by actions over time.
   b) To calculate probabilities in a stochastic environment.
   c) To analyze neural network performance.
   d) To generate ontologies for domain knowledge.

7) How is probability connected to logic in reasoning with uncertain knowledge?
   a) By assigning probabilities to logical statements to represent uncertainty.
   b) By using logical operators to eliminate uncertainty.
   c) By converting all probabilities into deterministic values.
   d) By ignoring logic in probabilistic reasoning.

8) What is a Bayesian network?
   a) A deterministic decision-making system.
   b) A graphical model that represents probabilistic relationships among variables.
   c) A network that always provides the exact solution.
   d) A type of neural network for image recognition.

9) What is the main goal of utility theory in decision-making?
   a) To maximize the total profit.
   b) To represent preferences over a set of outcomes and make rational choices.
   c) To minimize risk at all costs.
   d) To calculate the exact probability of an event

10) What is the primary objective of decision theory?
   a) To optimize decision-making by considering risks and rewards.
   b) To eliminate all uncertainty in decision-making.
   c) To determine the most likely outcome of an event.
   d) To create deterministic models for all decisions.

11) What is supervised learning?
   a) A learning process where the model learns from data without labeled outputs.
   b) A learning process where the model is provided with labeled input-output pairs to make predictions.
   c) A method of learning by observing others' actions.
   d) A learning process based solely on unstructured data.

12) In statistical learning, what is the purpose of regression models?
   a) To classify data into different categories.
   b) To predict the continuous values based on input variables.
   c) To create random data points.
   d) To optimize decision-making processes.

13) What is the primary goal of Al in its current stage of development?
a) To fully replace human labor in all industries.
b) To assist humans by automating specific tasks and solving complex problems.
c) To develop machines capable of human-like emotions.
d) To ensure all Al systems operate autonomously.

14) In the context of Al development, what does the term "general Al" refer to?
a) Al that specializes in specific tasks.
b) Al that is capable of performing any intellectual task a human can do.
c) Al that only focuses on decision-making in business.
d) Al that cannot learn from experience.

Seat No.	

Set **P**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (Old) (CBCS) Examination: March/April - 2026
Artificial Intelligence (BTN03501)

Day & Date: Saturday, 02-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

Section – I

Q.2 Attempt any four. **16**

a) What are the primary foundations of Artificial Intelligence.

b) Differentiate between forward and backward search techniques.

c) What are ontologies in the context of Al, and how do they contribute to knowledge representation?

d) Explain Goal Driven agent with neat labelled diagram.

e) Explain the minimax algorithm and its use in decision-making for two-player games.

Q.3 Attempt any two. **12**

a) Describe the role of first-order logic in knowledge representation with example.

b) Discuss the scope of Artificial Intelligence and its impact on various industries with example.

c) Explain different types of heuristic search.

Section – II

Q.4 Attempt any four. **16**

a) What is probability, and how is it connected to logic in Al?

b) What is utility theory? How does it aid in decision-making processes?

c) Differentiate between supervised and unsupervised learning with examples.

d) What are the philosophical foundations of Al? Discuss the key philosophical issues associated with Al development.

e) Explain semi-supervised learning and its advantages over supervised and unsupervised learning.

Q.5 Attempt any two. **12**

a) Explain Al Present and future and explain one example of Al Application.

b) Explain Reinforcement learning with examples.

c) Explain Bayesian Network in detail with example.

SLR-QH-442

Seat No.		Set	Q

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (Old) (CBCS) Examination: March/April – 2026
Artificial Intelligence (BTN03501)

Day & Date: Saturday, 02-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) What is a Bayesian network?
a) A deterministic decision-making system.
b) A graphical model that represents probabilistic relationships among variables.
c) A network that always provides the exact solution.
d) A type of neural network for image recognition.

2) What is the main goal of utility theory in decision-making?
a) To maximize the total profit.
b) To represent preferences over a set of outcomes and make rational choices.
c) To minimize risk at all costs.
d) To calculate the exact probability of an event

3) What is the primary objective of decision theory?
a) To optimize decision-making by considering risks and rewards.
b) To eliminate all uncertainty in decision-making.
c) To determine the most likely outcome of an event.
d) To create deterministic models for all decisions.

4) What is supervised learning?
a) A learning process where the model learns from data without labeled outputs.
b) A learning process where the model is provided with labeled input-output pairs to make predictions.
c) A method of learning by observing others' actions.
d) A learning process based solely on unstructured data.

5) In statistical learning, what is the purpose of regression models?
   a) To classify data into different categories.
   b) To predict the continuous values based on input variables.
   c) To create random data points.
   d) To optimize decision-making processes.

6) What is the primary goal of Al in its current stage of development?
   a) To fully replace human labor in all industries.
   b) To assist humans by automating specific tasks and solving complex problems.
   c) To develop machines capable of human-like emotions.
   d) To ensure all Al systems operate autonomously.

7) In the context of Al development, what does the term "general Al" refer to?
   a) Al that specializes in specific tasks.
   b) Al that is capable of performing any intellectual task a human can do.
   c) Al that only focuses on decision-making in business.
   d) Al that cannot learn from experience.

8) Which of the following is NOT a common approach in Al development?
   a) Machine learning
   b) Rule-based systems
   c) Intuition-based decision-making
   d) Natural language processing

9) Which type of agent makes decisions based on maximizing expected utility?
   a) Reactive Agent
   b) Goal-Driven Agent
   c) Utility-Driven Agent
   d) Learning Agent

10) What is the main difference between forward and backward search?
   a) Forward search begins from the goal and moves toward the start.
   b) Backward search begins from the start and moves toward the goal.
   c) Forward search begins from the start and moves toward the goal, while backward search starts at the goal and works backward to the initial state.
   d) Both approaches are identical in their direction.

11) Which search algorithm works well with problems that can be broken into subproblems and solved recursively?
   a) A* Algorithm
   b) AO* Algorithm
   c) Breadth-First Search
   d) Hill-Climbing Algorithm

12) What is the primary purpose of an ontology in knowledge representation?
   a) To define and organize the structure of knowledge in a domain.
   b) To perform arithmetic computations.
   c) To encode procedural rules for solving optimization problems.
   d) To randomly generate knowledge.

13) What is "situation calculus" used for?

a) To model situations and changes caused by actions over time.
b) To calculate probabilities in a stochastic environment.
c) To analyze neural network performance.
d) To generate ontologies for domain knowledge.

14) How is probability connected to logic in reasoning with uncertain knowledge?

a) By assigning probabilities to logical statements to represent uncertainty.
b) By using logical operators to eliminate uncertainty.
c) By converting all probabilities into deterministic values.
d) By ignoring logic in probabilistic reasoning.

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (Old) (CBCS) Examination: March/April - 2026
Artificial Intelligence (BTN03501)

Day & Date: Saturday, 02-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

Section – I

Q.2 Attempt any four. **16**

a) What are the primary foundations of Artificial Intelligence.

b) Differentiate between forward and backward search techniques.

c) What are ontologies in the context of Al, and how do they contribute to knowledge representation?

d) Explain Goal Driven agent with neat labelled diagram.

e) Explain the minimax algorithm and its use in decision-making for two-player games.

Q.3 Attempt any two. **12**

a) Describe the role of first-order logic in knowledge representation with example.

b) Discuss the scope of Artificial Intelligence and its impact on various industries with example.

c) Explain different types of heuristic search.

Section – II

Q.4 Attempt any four. **16**

a) What is probability, and how is it connected to logic in Al?

b) What is utility theory? How does it aid in decision-making processes?

c) Differentiate between supervised and unsupervised learning with examples.

d) What are the philosophical foundations of Al? Discuss the key philosophical issues associated with Al development.

e) Explain semi-supervised learning and its advantages over supervised and unsupervised learning.

Q.5 Attempt any two. **12**

a) Explain Al Present and future and explain one example of Al Application.

b) Explain Reinforcement learning with examples.

c) Explain Bayesian Network in detail with example.

Seat No.		Set	R

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (Old) (CBCS) Examination: March/April – 2026
Artificial Intelligence (BTN03501)

Day & Date: Saturday, 02-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no. 03 (Starting page of the Answer Book). Each question carries one mark.
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3) Figures to the right indicates full marks.
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MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) What is supervised learning?
a) A learning process where the model learns from data without labeled outputs.
b) A learning process where the model is provided with labeled input-output pairs to make predictions.
c) A method of learning by observing others' actions.
d) A learning process based solely on unstructured data.

2) In statistical learning, what is the purpose of regression models?
a) To classify data into different categories.
b) To predict the continuous values based on input variables.
c) To create random data points.
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3) What is the primary goal of Al in its current stage of development?
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d) To ensure all Al systems operate autonomously.

4) In the context of Al development, what does the term "general Al" refer to?
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9) What is the primary purpose of an ontology in knowledge representation?
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10) What is "situation calculus" used for?
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Seat No.	

Set **R**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (Old) (CBCS) Examination: March/April - 2026
Artificial Intelligence (BTN03501)

Day & Date: Saturday, 02-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

Section – I

Q.2 Attempt any four. **16**

a) What are the primary foundations of Artificial Intelligence.

b) Differentiate between forward and backward search techniques.

c) What are ontologies in the context of Al, and how do they contribute to knowledge representation?

d) Explain Goal Driven agent with neat labelled diagram.

e) Explain the minimax algorithm and its use in decision-making for two-player games.

Q.3 Attempt any two. **12**

a) Describe the role of first-order logic in knowledge representation with example.

b) Discuss the scope of Artificial Intelligence and its impact on various industries with example.

c) Explain different types of heuristic search.

Section – II

Q.4 Attempt any four. **16**

a) What is probability, and how is it connected to logic in Al?

b) What is utility theory? How does it aid in decision-making processes?

c) Differentiate between supervised and unsupervised learning with examples.

d) What are the philosophical foundations of Al? Discuss the key philosophical issues associated with Al development.

e) Explain semi-supervised learning and its advantages over supervised and unsupervised learning.

Q.5 Attempt any two. **12**

a) Explain Al Present and future and explain one example of Al Application.

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c) Explain Bayesian Network in detail with example.

Seat No.		Set	S

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (Old) (CBCS) Examination: March/April – 2026
Artificial Intelligence (BTN03501)

Day & Date: Saturday, 02-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

Duration: 30 Minutes Marks:14

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

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c) To encode procedural rules for solving optimization problems.
d) To randomly generate knowledge.

Seat No.	

Set **S**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (Old) (CBCS) Examination: March/April - 2026
Artificial Intelligence (BTN03501)

Day & Date: Saturday, 02-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

Section – I

Q.2 Attempt any four. **16**

a) What are the primary foundations of Artificial Intelligence.

b) Differentiate between forward and backward search techniques.

c) What are ontologies in the context of Al, and how do they contribute to knowledge representation?

d) Explain Goal Driven agent with neat labelled diagram.

e) Explain the minimax algorithm and its use in decision-making for two-player games.

Q.3 Attempt any two. **12**

a) Describe the role of first-order logic in knowledge representation with example.

b) Discuss the scope of Artificial Intelligence and its impact on various industries with example.

c) Explain different types of heuristic search.

Section – II

Q.4 Attempt any four. **16**

a) What is probability, and how is it connected to logic in Al?

b) What is utility theory? How does it aid in decision-making processes?

c) Differentiate between supervised and unsupervised learning with examples.

d) What are the philosophical foundations of Al? Discuss the key philosophical issues associated with Al development.

e) Explain semi-supervised learning and its advantages over supervised and unsupervised learning.

Q.5 Attempt any two. **12**

a) Explain Al Present and future and explain one example of Al Application.

b) Explain Reinforcement learning with examples.

c) Explain Bayesian Network in detail with example.

SLR-QH-443

Seat No.	

Set P

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (Old) (CBCS) Examination: March/April – 2026
Operating Systems (BTN03502)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Multiple choice questions: **14**

1) SPOOLING stands for _____.
a) Spontaneous primary operation online
b) Simultaneous peripheral operation on line
c) Small peripheral operation online
d) None of these

2) _____ is a program that acts as an intermediary between a user of a computer and the computer hardware.
a) A Computer Graphics b) An Overview System
c) A Computer Organization d) An operating system

3) _____ systems were developed to provide interactive use of a computer system at a reasonable cost.
a) Time-sharing b) Multiprogramming
c) Object Oriented d) Batch

4) Dispatch Latency is _____.
a) The time taken by the dispatcher to stop one process and start another
b) The time taken by processor to write a file on disk
c) The Time taken by the dispatcher to bring a process from Swap Space
d) None of the above

5) Aging is _____.
a) Keeping track of cache contents
b) keeping track of what pages are currently residing in memory
c) keeping track of how many times a given page is referenced
d) Increasing the priority of jobs to ensure termination in finite time

6) The segment of code in which the process may change common variables, update tables, write into files is known as _____.
a) Entry Section
b) Remainder Section
c) Critical section
d) Exit section

7) The requirements for the solution to critical section problem are _____.
a) Mutual Exclusion
b) Progress
c) Bounded Waiting
d) All of the above

8) The content of need matrix is _____.
a) Allocation - Available
b) Max - Available
c) Allocation - Max
d) Max - Allocation

9) A system is in a safe state only if there exists a _____.
a) safe allocation
b) safe resource
c) safe sequence
d) All of these

10) Thrashing _____.
a) is a natural consequence of virtual memory systems
b) is a high paging activity
c) always occurs on large computers
d) can always be avoided by swapping

11) The _____ algorithm selects the request with the least seek time from the current head position.
a) SSTF Disk Scheduling
b) FCFS Disk Scheduling
c) SCAN Scheduling
d) C-SCAN Scheduling

12) The _____ is the time for the disk arm to move the heads to the cylinder containing the desired sector.
a) Rotational Latency
b) Seek Time
c) Bandwidth
d) None of these

13) Suppose that a disk drive has 200 cylinders numbered 0 to 199. Consider a disk queue with I/O requests on the following cylinders in their arriving order: 54, 95, 73, 130, 25, 48, 110, 30, 45, 180, and 190. The disk head is assumed to be at cylinder 24. Starting from the current head position, what is the total distance (in cylinders) the disk arm moves to satisfy all the pending requests for the FCFS disk-scheduling algorithm?
a) 580 cylinders
b) 589 cylinders
c) 643 cylinders
d) 570 cylinders

14) A problem encountered in multitasking when a process is perpetually denied necessary resources is called _____.
a) aging
b) starvation
c) inversion
d) deadlock

SLR-QH-443

Seat No.	

Set P

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I)
(Old) (CBCS) Examination: March/April – 2026
Operating Systems (BTN03502)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data whenever necessary.

Section – I

Q.2 Solve any three. **12**

a) Differentiate between Multiprogramming and Multitasking Operating Systems

b) Explain Process Control bock with diagram.

c) Explain CPU I/O burst Cycle.

d) Explain Multilevel Queue Scheduling in Detail.

Q.3 Solve any One. **08**

a) Explain concept of Thread & Differentiate user level thread and kernel level thread.

b) Apply Priority scheduling and SJF Scheduling algorithm on following example.

Process	Burst Time	Priority
P0	8	2
P1	5	4
P2	7	3
P3	10	1
P4	6	5

i) Draw Gant Chart for both algorithms.
ii) Calculate total Waiting time & average Waiting time for both algorithms.
iii) Calculate total turnaround time & average total turnaround time for both algorithms.
iv) State which algorithm is best along with reason.

Q.4 Attempt the following. **08**

a) Explain Petersons algorithm of critical section along with producer consumer problem.

Section – II

Q.5 Attempt any Three. **12**

a) Explain Segmentation as non-contiguous memory management scheme.

b) Explain Deadlock Characterization in detail.

c) Explain steps involved in page fault handling with diagram.

d) Suppose that a disk drive has 500 cylinders numbered 0 to 499. The drive currently serves a request at cylinder 143; the previous request was at cylinder 125. The queue of pending requests, in FIFO order, is 86, 170, 213, 474, 148, 109, 222, 450, and 330. Starting from the current head position, what is the total distance (in cylinders) the disk arm moves to satisfy all the pending requests for the SSTF disk-scheduling algorithm.

Q.6 Attempt any One. **08**

a) Explain Methods for Handing deadlock in detail.

b) Consider following page reference string

5, 0, 2, 1, 0, 3, 0, 2, 4, 3, 0, 3, 2, 1, 3

Apply FIFO, LRU and Optimal and solve example with 3 frames

i) Calculate total no. of page faults for each algorithm

ii) Calculate page faults rate for each algorithm

iii) Which algorithm gives minimum page fault?

Q.7 Attempt the following **08**

Consider a system with five processes P0 through P4 and three resource types A, B, C. Resource type A has 10 instances, resource type B has 5 instances, and resource type C has 7 instances. Suppose that, at time to, the following snapshot of the system has been taken:

Process	Allocation			Max			Available		
P0	A	B	C	A	B	C	A	B	C
P1	0	1	0	7	5	3	3	3	2
P2	2	0	0	3	2	2			
P3	3	0	2	9	0	2			
P4	2	1	1	2	2	2			
P5	0	0	2	4	3	3			

i) Find content of need matrix

ii) Find whether system in safe state or not

iii) Find all possible safe sequence

iv) If process P2 arrives with request (1, 0, 2) Will it granted?

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (Old) (CBCS) Examination: March/April – 2026
Operating Systems (BTN03502)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

Duration: 30 Minutes Marks: 14

Q.1 Multiple choice questions: **14**

1) The content of need matrix is _____.
a) Allocation - Available b) Max - Available
c) Allocation - Max d) Max - Allocation

2) A system is in a safe state only if there exists a _____.
a) safe allocation b) safe resource
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3) Thrashing _____.
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10) _____ systems were developed to provide interactive use of a computer system at a reasonable cost.

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c) Critical section
d) Exit section

14) The requirements for the solution to critical section problem are _____.

a) Mutual Exclusion
b) Progress
c) Bounded Waiting
d) All of the above

SLR-QH-443

Seat No.	

Set Q

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I)
(Old) (CBCS) Examination: March/April – 2026
Operating Systems (BTN03502)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data whenever necessary.

Section – I

Q.2 Solve any three. **12**

a) Differentiate between Multiprogramming and Multitasking Operating Systems

b) Explain Process Control bock with diagram.

c) Explain CPU I/O burst Cycle.

d) Explain Multilevel Queue Scheduling in Detail.

Q.3 Solve any One. **08**

a) Explain concept of Thread & Differentiate user level thread and kernel level thread.

b) Apply Priority scheduling and SJF Scheduling algorithm on following example.

Process	Burst Time	Priority
P0	8	2
P1	5	4
P2	7	3
P3	10	1
P4	6	5

i) Draw Gant Chart for both algorithms.
ii) Calculate total Waiting time & average Waiting time for both algorithms.
iii) Calculate total turnaround time & average total turnaround time for both algorithms.
iv) State which algorithm is best along with reason.

Q.4 Attempt the following. **08**

a) Explain Petersons algorithm of critical section along with producer consumer problem.

Section – II

Q.5 Attempt any Three. **12**

a) Explain Segmentation as non-contiguous memory management scheme.

b) Explain Deadlock Characterization in detail.

c) Explain steps involved in page fault handling with diagram.

d) Suppose that a disk drive has 500 cylinders numbered 0 to 499. The drive currently serves a request at cylinder 143; the previous request was at cylinder 125. The queue of pending requests, in FIFO order, is 86, 170, 213, 474, 148, 109, 222, 450, and 330. Starting from the current head position, what is the total distance (in cylinders) the disk arm moves to satisfy all the pending requests for the SSTF disk-scheduling algorithm.

Q.6 Attempt any One. **08**

a) Explain Methods for Handing deadlock in detail.

b) Consider following page reference string

5, 0, 2, 1, 0, 3, 0, 2, 4, 3, 0, 3, 2, 1, 3

Apply FIFO, LRU and Optimal and solve example with 3 frames

i) Calculate total no. of page faults for each algorithm

ii) Calculate page faults rate for each algorithm

iii) Which algorithm gives minimum page fault?

Q.7 Attempt the following **08**

Consider a system with five processes P0 through P4 and three resource types A, B, C. Resource type A has 10 instances, resource type B has 5 instances, and resource type C has 7 instances. Suppose that, at time to, the following snapshot of the system has been taken:

Process	Allocation			Max			Available		
P0	A	B	C	A	B	C	A	B	C
P1	0	1	0	7	5	3	3	3	2
P2	2	0	0	3	2	2			
P3	3	0	2	9	0	2			
P4	2	1	1	2	2	2			
P5	0	0	2	4	3	3			

i) Find content of need matrix

ii) Find whether system in safe state or not

iii) Find all possible safe sequence

iv) If process P2 arrives with request (1, 0, 2) Will it granted?

Seat No.	

Set **R**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (Old) (CBCS) Examination: March/April – 2026
Operating Systems (BTN03502)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Multiple choice questions: **14**

1) The _____ algorithm selects the request with the least seek time from the current head position.
a) SSTF Disk Scheduling b) FCFS Disk Scheduling
c) SCAN Scheduling d) C-SCAN Scheduling

2) The _____ is the time for the disk arm to move the heads to the cylinder containing the desired sector.
a) Rotational Latency b) Seek Time
c) Bandwidth d) None of these

3) Suppose that a disk drive has 200 cylinders numbered 0 to 199. Consider a disk queue with I/O requests on the following cylinders in their arriving order: 54, 95, 73, 130, 25, 48, 110, 30, 45, 180, and 190. The disk head is assumed to be at cylinder 24. Starting from the current head position, what is the total distance (in cylinders) the disk arm moves to satisfy all the pending requests for the FCFS disk-scheduling algorithm?
a) 580 cylinders b) 589 cylinders
c) 643 cylinders d) 570 cylinders

4) A problem encountered in multitasking when a process is perpetually denied necessary resources is called _____.
a) aging b) starvation
c) inversion d) deadlock

5) SPOOLING stands for _____.
a) Spontaneous primary operation online
b) Simultaneous peripheral operation on line
c) Small peripheral operation online
d) None of these

6) _____ is a program that acts as an intermediary between a user of a computer and the computer hardware.
a) A Computer Graphics
b) An Overview System
c) A Computer Organization
d) An operating system

7) _____ systems were developed to provide interactive use of a computer system at a reasonable cost.
a) Time-sharing
b) Multiprogramming
c) Object Oriented
d) Batch

8) Dispatch Latency is _____.
a) The time taken by the dispatcher to stop one process and start another
b) The time taken by processor to write a file on disk
c) The Time taken by the dispatcher to bring a process from Swap Space
d) None of the above

9) Aging is _____.
a) Keeping track of cache contents
b) keeping track of what pages are currently residing in memory
c) keeping track of how many times a given page is referenced
d) Increasing the priority of jobs to ensure termination in finite time

10) The segment of code in which the process may change common variables, update tables, write into files is known as _____.
a) Entry Section
b) Remainder Section
c) Critical section
d) Exit section

11) The requirements for the solution to critical section problem are _____.
a) Mutual Exclusion
b) Progress
c) Bounded Waiting
d) All of the above

12) The content of need matrix is _____.
a) Allocation - Available
b) Max - Available
c) Allocation - Max
d) Max - Allocation

13) A system is in a safe state only if there exists a _____.
a) safe allocation
b) safe resource
c) safe sequence
d) All of these

14) Thrashing _____.

a) is a natural consequence of virtual memory systems
b) is a high paging activity
c) always occurs on large computers
d) can always be avoided by swapping

SLR-QH-443

Seat No.	

Set R

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (Old) (CBCS) Examination: March/April – 2026
Operating Systems (BTN03502)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data whenever necessary.

Section – I

Q.2 Solve any three. **12**

a) Differentiate between Multiprogramming and Multitasking Operating Systems

b) Explain Process Control bock with diagram.

c) Explain CPU I/O burst Cycle.

d) Explain Multilevel Queue Scheduling in Detail.

Q.3 Solve any One. **08**

a) Explain concept of Thread & Differentiate user level thread and kernel level thread.

b) Apply Priority scheduling and SJF Scheduling algorithm on following example.

Process	Burst Time	Priority
P0	8	2
P1	5	4
P2	7	3
P3	10	1
P4	6	5

i) Draw Gant Chart for both algorithms.
ii) Calculate total Waiting time & average Waiting time for both algorithms.
iii) Calculate total turnaround time & average total turnaround time for both algorithms.
iv) State which algorithm is best along with reason.

Q.4 Attempt the following. **08**

a) Explain Petersons algorithm of critical section along with producer consumer problem.

Section – II

Q.5 Attempt any Three. **12**

a) Explain Segmentation as non-contiguous memory management scheme.

b) Explain Deadlock Characterization in detail.

c) Explain steps involved in page fault handling with diagram.

d) Suppose that a disk drive has 500 cylinders numbered 0 to 499. The drive currently serves a request at cylinder 143; the previous request was at cylinder 125. The queue of pending requests, in FIFO order, is 86, 170, 213, 474, 148, 109, 222, 450, and 330. Starting from the current head position, what is the total distance (in cylinders) the disk arm moves to satisfy all the pending requests for the SSTF disk-scheduling algorithm.

Q.6 Attempt any One. **08**

a) Explain Methods for Handing deadlock in detail.

b) Consider following page reference string

5, 0, 2, 1, 0, 3, 0, 2, 4, 3, 0, 3, 2, 1, 3

Apply FIFO, LRU and Optimal and solve example with 3 frames

i) Calculate total no. of page faults for each algorithm

ii) Calculate page faults rate for each algorithm

iii) Which algorithm gives minimum page fault?

Q.7 Attempt the following **08**

Consider a system with five processes P0 through P4 and three resource types A, B, C. Resource type A has 10 instances, resource type B has 5 instances, and resource type C has 7 instances. Suppose that, at time to, the following snapshot of the system has been taken:

Process	Allocation			Max			Available		
P0	A	B	C	A	B	C	A	B	C
P1	0	1	0	7	5	3	3	3	2
P2	2	0	0	3	2	2			
P3	3	0	2	9	0	2			
P4	2	1	1	2	2	2			
P5	0	0	2	4	3	3			

i) Find content of need matrix

ii) Find whether system in safe state or not

iii) Find all possible safe sequence

iv) If process P2 arrives with request (1, 0, 2) Will it granted?

Seat No.	

Set **S**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (Old) (CBCS) Examination: March/April – 2026
Operating Systems (BTN03502)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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4) Assume suitable data whenever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Multiple choice questions: **14**

1) The segment of code in which the process may change common variables, update tables, write into files is known as _____.
a) Entry Section b) Remainder Section
c) Critical section d) Exit section

2) The requirements for the solution to critical section problem are _____.
a) Mutual Exclusion b) Progress
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3) The content of need matrix is _____.
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4) A system is in a safe state only if there exists a _____.
a) safe allocation b) safe resource
c) safe sequence d) All of these

5) Thrashing _____.
a) is a natural consequence of virtual memory systems
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c) always occurs on large computers
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6) The _____ algorithm selects the request with the least seek time from the current head position.
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7) The _____ is the time for the disk arm to move the heads to the cylinder containing the desired sector.

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8) Suppose that a disk drive has 200 cylinders numbered 0 to 199. Consider a disk queue with I/O requests on the following cylinders in their arriving order: 54, 95, 73, 130, 25, 48, 110, 30, 45, 180, and 190. The disk head is assumed to be at cylinder 24. Starting from the current head position, what is the total distance (in cylinders) the disk arm moves to satisfy all the pending requests for the FCFS disk-scheduling algorithm?

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c) The Time taken by the dispatcher to bring a process from Swap Space
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14) Aging is _____.

a) Keeping track of cache contents
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SLR-QH-443

Seat No.	

Set S

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I)
(Old) (CBCS) Examination: March/April – 2026
Operating Systems (BTN03502)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
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Section – I

Q.2 Solve any three. **12**

a) Differentiate between Multiprogramming and Multitasking Operating Systems

b) Explain Process Control bock with diagram.

c) Explain CPU I/O burst Cycle.

d) Explain Multilevel Queue Scheduling in Detail.

Q.3 Solve any One. **08**

a) Explain concept of Thread & Differentiate user level thread and kernel level thread.

b) Apply Priority scheduling and SJF Scheduling algorithm on following example.

Process	Burst Time	Priority
P0	8	2
P1	5	4
P2	7	3
P3	10	1
P4	6	5

i) Draw Gant Chart for both algorithms.
ii) Calculate total Waiting time & average Waiting time for both algorithms.
iii) Calculate total turnaround time & average total turnaround time for both algorithms.
iv) State which algorithm is best along with reason.

Q.4 Attempt the following. **08**

a) Explain Petersons algorithm of critical section along with producer consumer problem.

Section – II

Q.5 Attempt any Three. **12**

a) Explain Segmentation as non-contiguous memory management scheme.

b) Explain Deadlock Characterization in detail.

c) Explain steps involved in page fault handling with diagram.

d) Suppose that a disk drive has 500 cylinders numbered 0 to 499. The drive currently serves a request at cylinder 143; the previous request was at cylinder 125. The queue of pending requests, in FIFO order, is 86, 170, 213, 474, 148, 109, 222, 450, and 330. Starting from the current head position, what is the total distance (in cylinders) the disk arm moves to satisfy all the pending requests for the SSTF disk-scheduling algorithm.

Q.6 Attempt any One. **08**

a) Explain Methods for Handing deadlock in detail.

b) Consider following page reference string

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Apply FIFO, LRU and Optimal and solve example with 3 frames

i) Calculate total no. of page faults for each algorithm

ii) Calculate page faults rate for each algorithm

iii) Which algorithm gives minimum page fault?

Q.7 Attempt the following **08**

Consider a system with five processes P0 through P4 and three resource types A, B, C. Resource type A has 10 instances, resource type B has 5 instances, and resource type C has 7 instances. Suppose that, at time to, the following snapshot of the system has been taken:

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P2	2	0	0	3	2	2			
P3	3	0	2	9	0	2			
P4	2	1	1	2	2	2			
P5	0	0	2	4	3	3			

i) Find content of need matrix

ii) Find whether system in safe state or not

iii) Find all possible safe sequence

iv) If process P2 arrives with request (1, 0, 2) Will it granted?

SLR-QH-444

Seat No.	

Set P

T. Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (Old) (CBCS) Examination: March/April – 2026
Database Engineering (BTN03503)

Day & Date: Thursday, 07-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No.1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

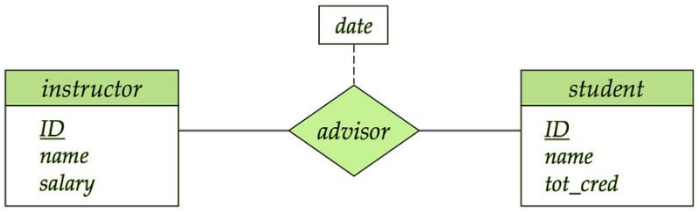
Duration: 30 Minutes Marks: 14

Q.1 Choose the correct option. **14**

1) The ability to modify the physical schema without changing the logical schema is called _____.
a) Subschemas
b) Logical Schema
c) Physical Schema
d) Physical Data Independence

2) A null value for the *apartment-number attribute* could mean "not applicable" _____.
a) The address does not include an apartment number
b) That an apartment number exists but we do not know what it is
c) We do not know whether or not an apartment number is part of the customer's address
d) None

3) In following E-R diagram, which attribute is descriptive attribute?



a) name
b) salary
c) tot_cred
d) date

4) Identify the correct relational algebra query for the following output.

Input

A	B	C	D
α	α	**1**	**7**
α	β	**5**	**7**
β	β	**12**	**3**
β	β	**23**	**10**

Output

A	B	C	D
α	α	**1**	**7**
β	β	**23**	**10**

a) $\sigma_{C=D \wedge D>5}(r)$
b) $\sigma_{A=B \wedge D<5}(r)$
c) $\sigma_{A=B \wedge D>5}(r)$
d) None

5) For the class (class_name, age) table, find the names and average age of all classes where the average age of students is greater than 10. Identify the correct, SQL Query for this statement.

a)
```
SELECT class_name, age
FROM class
GROUP BY class_name
HAVING AVG(age) > 10;
```

b)
```
SELECT class_name, age
FROM class
HAVING AVG(age) > 10
GROUP BY class_name;
```

c)
```
SELECT class_name, AVG (age)
FROM class
GROUP BY class_name
HAVING AVG(age) > 10;
```

d)
```
SELECT class_name, AVG (age)
FROM class
HAVING AVG(age) > 10
GROUP BY class_name;
```

6) Consider the following relation

A	B	C
α	1	A
β	2	B

Which of the following indicate the lossless decomposition?

a) R1 = (A, B) and R2 = (B, C)
b) R1 = (A, C) and R2 = (B, C)
c) R1 = (C, A) and R2 = (B, C)
d) R1 = (C, A) and R2 = (C, B)

7) Consider the relation R, on this instance _____.

A	B	C	D
A1	B1	C1	D1
A1	B2	C1	D2
A2	B2	C2	D2
A2	B2	C2	D3
A3	B3	C2	D4

a) C → A does hold, but A → C does not hold
b) C → A does not hold, but A → C does hold
c) C → A and A → C does hold
d) C → A and A → C does not hold

8) In B+ tree, each node that is not a root or a leaf has between _____.
a) $\lceil n/2 \rceil$ and n children
b) $\lfloor n/2 \rfloor$ and n children
c) $n/2$ and n children
d) None

9) While performing the operation deletion on B+-tree, if the node has too few entries due to the removal, then _____.
a) Redistribute pointers
b) Merge siblings
c) Delete node
d) None

10) Consider following transactions

T1	T2
read(A) A := A − 50 write(A)	
	read(A) temp := A * 0.1 A := A − temp write(A)
read(B) B := B + 50 write(B) commit	
	read(B) B := B + temp write(B) commit

What will be the values of A, B and A+B after T1 write A if the initial values of A=100, B=200?
a) A=50, B=200 and A+B=250
b) A=45, B=210 and A+B=245
c) A=45, B=250 and A+B=295
d) A=45, B=255 and A+B=300

11) A transaction may obtain locks, but may not release any lock in _____.
a) Growing phase
b) Shrinking phase
c) Both
d) None

12) The property of transaction - “Either all operations of the transaction are reflected properly in the database, or none are”, is the _____.

a) Atomicity
b) Consistency
c) Isolation
d) Durability

13) When a transaction Ti issues a read(Q) operation, the system issues a _____ instruction followed by the _____ instruction.

a) lock-S(Q), read(Q)
b) read(Q), lock-S(Q)
c) read(Q), lock-X(Q)
d) None

14) Non-volatile storage contents are assumed to not be corrupted by system crash in case of _____.

a) Logical error
b) System error
c) Fail-stop assumption
d) Disk failure

Seat No.	

Set **P**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (Old) (CBCS) Examination: March/April - 2026
Database Engineering (BTN03503)

Day & Date: Thursday, 07-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Make suitable assumptions if necessary and state them clearly.

SECTION – I

Q.2 Attempt any Three **12**

a) List and explain the components of storage manager.

b) Consider the following database schema. Write the queries using relational algebra.

branch (branch_name, branch_city, assets)
customer (customer_name, customer_street, customer_city)
loan (loan_number, branch_name, amount)
borrower (customer_name, loan_number)
account (account_number, branch_name, balance)
depositor (customer_name, account_number)

i) Find all customers who have a loan at a bank.
ii) Find all customers who have both a loan and an account
iii) Find all customers who have a loan or an account or both
iv) Find all customers who have a loan but not an account

c) Explain Generalization and Specialization with example.

d) Find if a given functional dependency is implied from a set of Functional Dependencies for:
AB → CD, AF → D, DE → F, C → G, F → E, G → A
i) Check: CF → DF
ii) Check: BG → E

Q.3 What is Prime Attributes and non-prime attribute? Find Prime Attributes and non-prime attributes using Functional Dependencies: **08**

i) R(ABCDEF) having FDs {AB → C, C → D, D → E, F → B, E → F}
ii) R(ABDLPT) having FDs {B → PT, A → D, T → L}
iii) R(ABCDEFGHIJ) having FDs {AB → C, A → DE, B → F, F → GH, D → IJ}

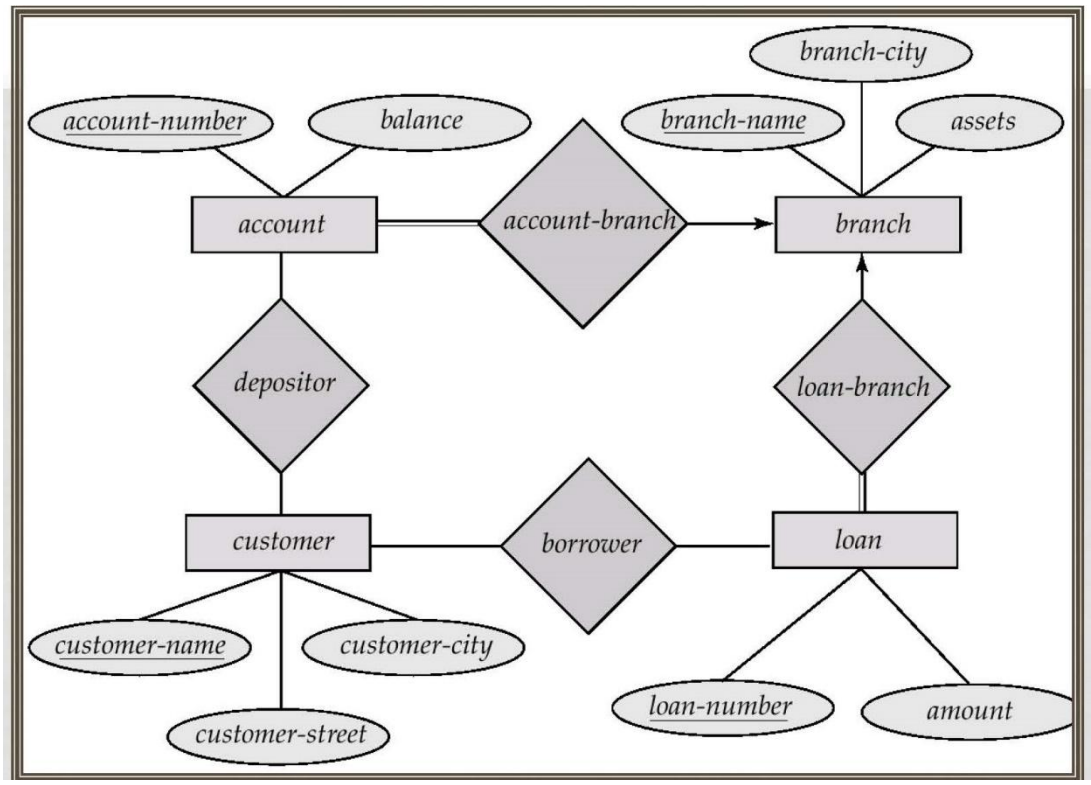
OR

Consider the E-R diagram in given Figure,

i) List the entity sets along with attributes and their primary keys.

ii) List Relationship along with attributes and their primary keys.

iii) Reduce this ER model to relational model



Q.4 Explain the following joins with example in SQL. **08**

a) Inner join

b) Right outer join

c) Left outer join

d) Full outer join

SECTION – II

Q.5 Attempt any Three. **12**

a) Explain primary, clustering, secondary indexing and multilevel indexing.

b) Explain the conflict serializability. Check whether the following schedules are conflict serializable.

T_1	T_2
read (A)	
write (A)	
	read (A)
	write (A)
read (B)	
write (B)	
	read (B)
	write (B)

Schedule 1

T_1	T_2
read(A)	
write(A)	
	read(A)
read(B)	
	write(A)
write(B)	
	read(B)
	write(B)

Schedule 2

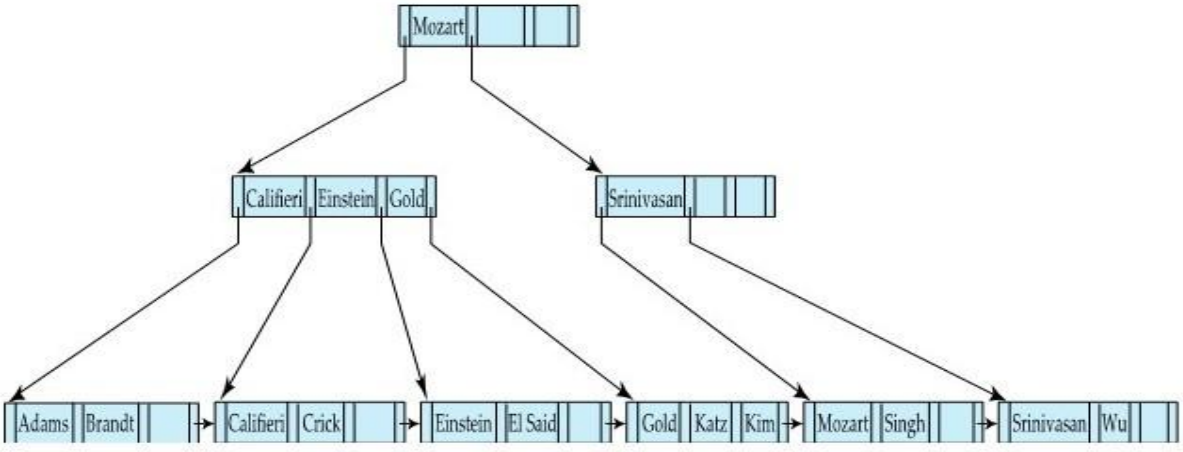
c) Explain various types of failure that may occur in the system.

d) Explain the concept of lock granularity concurrency control mechanism.

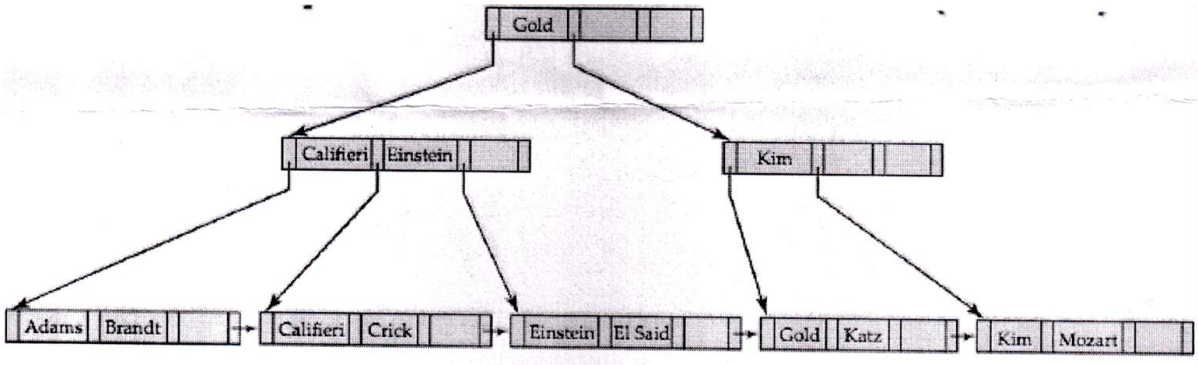
Q.6 Explain log based recovery. Also explain with example immediate database modification and deferred modification scheme. **08**

OR

Explain B+ tree with an example and how insertion works. Draw the B+ tree after inserting “Lamport” in this tree



Draw the B+ tree after deleting “Gold” from this tree



Q.7 What do you mean by concurrency control? Explain two phase locking protocol along with the strict and rigorous two-phase locking protocol with example. **08**

Seat No.		Set	Q

T. Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (Old) (CBCS) Examination: March/April – 2026
Database Engineering (BTN03503)

Day & Date: Thursday, 07-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Choose the correct option. **14**

1) In B+ tree, each node that is not a root or a leaf has between _____.
a) $\lceil n/2 \rceil$ and n children b) $\lfloor n/2 \rfloor$ and n children
c) $n/2$ and n children d) None

2) While performing the operation deletion on B+-tree, if the node has too few entries due to the removal, then _____.
a) Redistribute pointers b) Merge siblings
c) Delete node d) None

3) Consider following transactions

T1	T2
read(A) A := A − 50 write(A)	
	read(A) temp := A * 0.1 A := A − temp write(A)
read(B) B := B + 50 write(B) commit	
	read(B) B := B + temp write(B) commit

What will be the values of A, B and A+B after T1 write A if the initial values of A=100, B=200?
a) A=50, B=200 and A+B=250 b) A=45, B=210 and A+B=245
c) A=45, B=250 and A+B=295 d) A=45, B=255 and A+B=300

4) A transaction may obtain locks, but may not release any lock in _____.
a) Growing phase
b) Shrinking phase
c) Both
d) None

5) The property of transaction - “Either all operations of the transaction are reflected properly in the database, or none are”, is the _____.
a) Atomicity
b) Consistency
c) Isolation
d) Durability

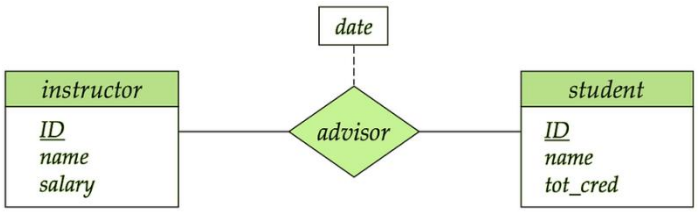
6) When a transaction Ti issues a read(Q) operation, the system issues a _____ instruction followed by the _____ instruction.
a) lock-S(Q), read(Q)
b) read(Q), lock-S(Q)
c) read(Q), lock-X(Q)
d) None

7) Non-volatile storage contents are assumed to not be corrupted by system crash in case of _____.
a) Logical error
b) System error
c) Fail-stop assumption
d) Disk failure

8) The ability to modify the physical schema without changing the logical schema is called _____.
a) Subschemas
b) Logical Schema
c) Physical Schema
d) Physical Data Independence

9) A null value for the *apartment-number attribute* could mean “not applicable” _____.
a) The address does not include an apartment number
b) That an apartment number exists but we do not know what it is
c) We do not know whether or not an apartment number is part of the customer’s address
d) None

10) In following E-R diagram, which attribute is descriptive attribute?



a) name
b) salary
c) tot_cred
d) date

11) Identify the correct relational algebra query for the following output.

Input

A	B	C	D
α	α	**1**	**7**
α	β	**5**	**7**
β	β	**12**	**3**
β	β	**23**	**10**

Output

A	B	C	D
α	α	**1**	**7**
β	β	**23**	**10**

a) $\sigma_{C=D \wedge D>5}(r)$
b) $\sigma_{A=B \wedge D<5}(r)$
c) $\sigma_{A=B \wedge D>5}(r)$
d) None

12) For the class (class_name, age) table, find the names and average age of all classes where the average age of students is greater than 10. Identify the correct, SQL Query for this statement.

a)
```
SELECT class_name, age
FROM class
GROUP BY class_name
HAVING AVG(age) > 10;
```

b)
```
SELECT class_name, age
FROM class
HAVING AVG(age) > 10
GROUP BY class_name;
```

c)
```
SELECT class_name, AVG (age)
FROM class
GROUP BY class_name
HAVING AVG(age) > 10;
```

d)
```
SELECT class_name, AVG (age)
FROM class
HAVING AVG(age) > 10
GROUP BY class_name;
```

13) Consider the following relation

A	B	C
α	1	A
β	2	B

Which of the following indicate the lossless decomposition?

a) R1 = (A, B) and R2 = (B, C)
b) R1 = (A, C) and R2 = (B, C)
c) R1 = (C, A) and R2 = (B, C)
d) R1 = (C, A) and R2 = (C, B)

14) Consider the relation R, on this instance _____.

A	B	C	D
A1	B1	C1	D1
A1	B2	C1	D2
A2	B2	C2	D2
A2	B2	C2	D3
A3	B3	C2	D4

a) C → A does hold, but A → C does not hold
b) C → A does not hold, but A → C does hold
c) C → A and A → C does hold
d) C → A and A → C does not hold

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (Old) (CBCS) Examination: March/April - 2026
Database Engineering (BTN03503)

Day & Date: Thursday, 07-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Make suitable assumptions if necessary and state them clearly.

SECTION – I

Q.2 Attempt any Three **12**

a) List and explain the components of storage manager.

b) Consider the following database schema. Write the queries using relational algebra.

branch (branch_name, branch_city, assets)
customer (customer_name, customer_street, customer_city)
loan (loan_number, branch_name, amount)
borrower (customer_name, loan_number)
account (account_number, branch_name, balance)
depositor (customer_name, account_number)

i) Find all customers who have a loan at a bank.
ii) Find all customers who have both a loan and an account
iii) Find all customers who have a loan or an account or both
iv) Find all customers who have a loan but not an account

c) Explain Generalization and Specialization with example.

d) Find if a given functional dependency is implied from a set of Functional Dependencies for:
AB → CD, AF → D, DE → F, C → G, F → E, G → A
i) Check: CF → DF
ii) Check: BG → E

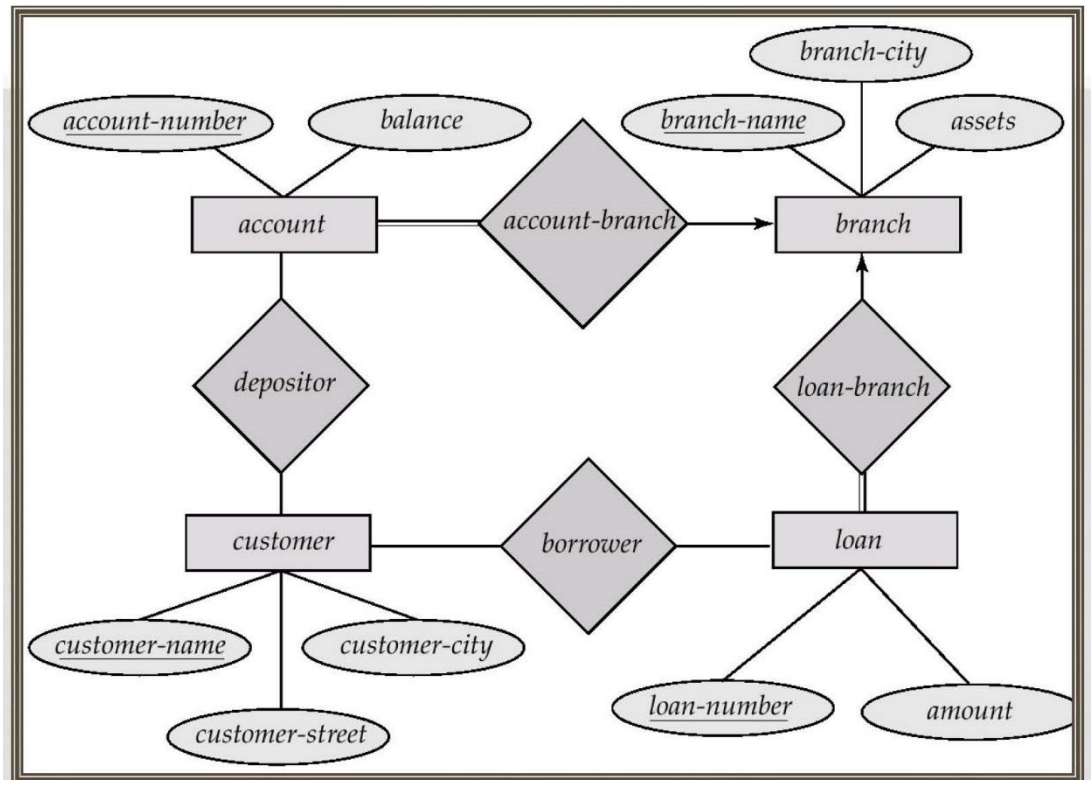
Q.3 What is Prime Attributes and non-prime attribute? Find Prime Attributes and non-prime attributes using Functional Dependencies: **08**

i) R(ABCDEF) having FDs {AB → C, C → D, D → E, F → B, E → F}
ii) R(ABDLPT) having FDs {B → PT, A → D, T → L}
iii) R(ABCDEFGHIJ) having FDs {AB → C, A → DE, B → F, F → GH, D → IJ}

OR

Consider the E-R diagram in given Figure,

i) List the entity sets along with attributes and their primary keys.
ii) List Relationship along with attributes and their primary keys.
iii) Reduce this ER model to relational model



Q.4 Explain the following joins with example in SQL. **08**

a) Inner join
b) Right outer join
c) Left outer join
d) Full outer join

SECTION – II

Q.5 Attempt any Three. **12**

a) Explain primary, clustering, secondary indexing and multilevel indexing.

b) Explain the conflict serializability. Check whether the following schedules are conflict serializable.

T_1	T_2
read (A)	
write (A)	
	read (A)
	write (A)
read (B)	
write (B)	
	read (B)
	write (B)

Schedule 1

T_1	T_2
read(A)	
write(A)	
	read(A)
read(B)	
	write(A)
write(B)	
	read(B)
	write(B)

Schedule 2

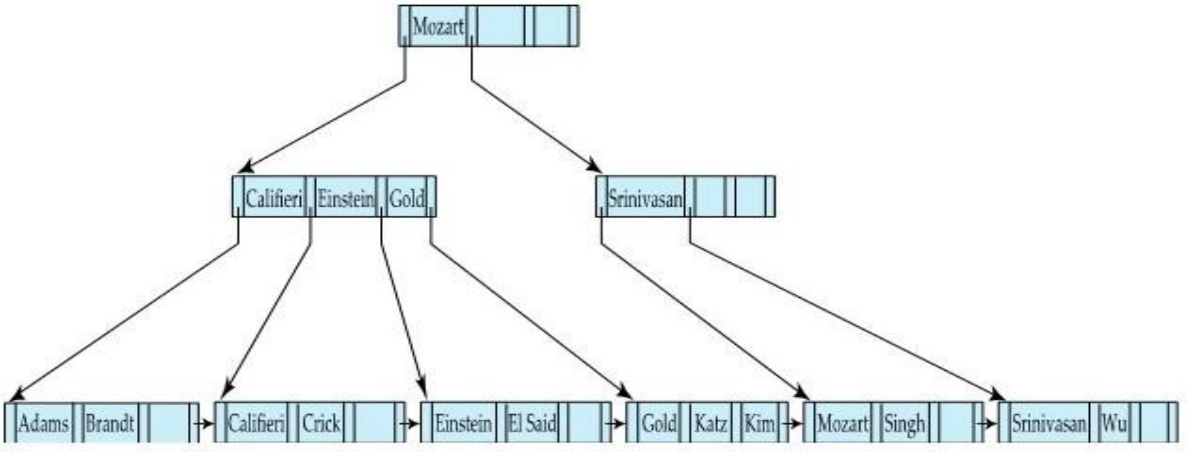
c) Explain various types of failure that may occur in the system.

d) Explain the concept of lock granularity concurrency control mechanism.

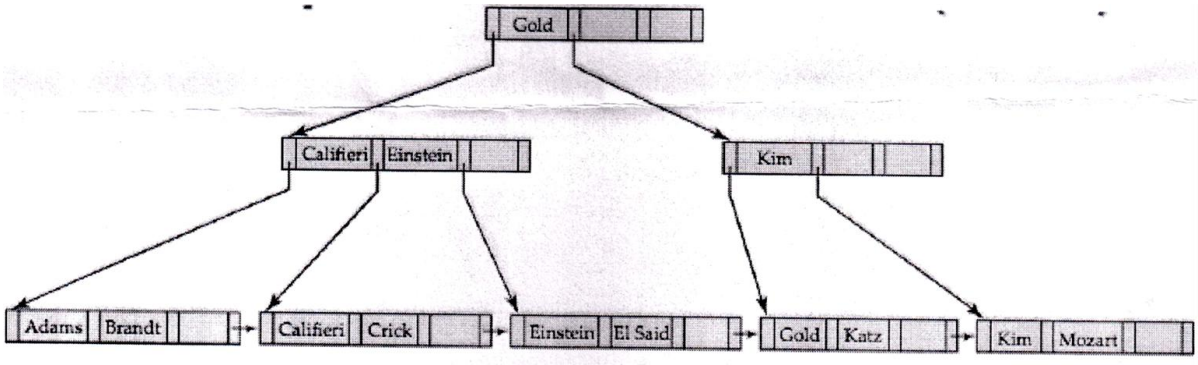
Q.6 Explain log based recovery. Also explain with example immediate database modification and deferred modification scheme. **08**

OR

Explain B+ tree with an example and how insertion works. Draw the B+ tree after inserting “Lamport” in this tree



Draw the B+ tree after deleting “Gold” from this tree



Q.7 What do you mean by concurrency control? Explain two phase locking protocol along with the strict and rigorous two-phase locking protocol with example. **08**

Seat No.	

Set R

T. Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (Old) (CBCS) Examination: March/April – 2026
Database Engineering (BTN03503)

Day & Date: Thursday, 07-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No.1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Choose the correct option. **14**

1) A transaction may obtain locks, but may not release any lock in _____.
a) Growing phase b) Shrinking phase
c) Both d) None

2) The property of transaction - "Either all operations of the transaction are reflected properly in the database, or none are", is the _____.
a) Atomicity b) Consistency
c) Isolation d) Durability

3) When a transaction Ti issues a read(Q) operation, the system issues a _____ instruction followed by the _____ instruction.
a) lock-S(Q), read(Q) b) read(Q), lock-S(Q)
c) read(Q), lock-X(Q) d) None

4) Non-volatile storage contents are assumed to not be corrupted by system crash in case of _____.
a) Logical error b) System error
c) Fail-stop assumption d) Disk failure

5) The ability to modify the physical schema without changing the logical schema is called _____.
a) Subschemas
b) Logical Schema
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6) A null value for the *apartment-number attribute* could mean "not applicable" _____.

a) The address does not include an apartment number
b) That an apartment number exists but we do not know what it is
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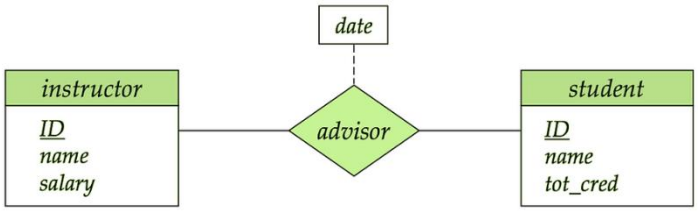
d) None

7) In following E-R diagram, which attribute is descriptive attribute?



a) name
b) salary
c) tot_cred
d) date

8) Identify the correct relational algebra query for the following output.

Input

A	B	C	D
α	α	**1**	**7**
α	β	**5**	**7**
β	β	**12**	**3**
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Output

A	B	C	D
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a)
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FROM class
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HAVING AVG(age) > 10;
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b)
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SELECT class_name, age
FROM class
HAVING AVG(age) > 10
GROUP BY class_name;
```

c)
```
SELECT class_name, AVG (age)
FROM class
GROUP BY class_name
HAVING AVG(age) > 10;
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d)
```
SELECT class_name, AVG (age)
FROM class
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```

10) Consider the following relation

A	B	C
α	1	A
β	2	B

Which of the following indicate the lossless decomposition?

a) R1 = (A, B) and R2 = (B, C)
b) R1 = (A, C) and R2 = (B, C)
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d) R1 = (C, A) and R2 = (C, B)

11) Consider the relation R, on this instance _____.

A	B	C	D
A1	B1	C1	D1
A1	B2	C1	D2
A2	B2	C2	D2
A2	B2	C2	D3
A3	B3	C2	D4

a) C → A does hold, but A → C does not hold
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c) C → A and A → C does hold
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12) In B+ tree, each node that is not a root or a leaf has between _____.

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b) $\lfloor n/2 \rfloor$ and n children
c) $n/2$ and n children
d) None

13) While performing the operation deletion on B+-tree, if the node has too few entries due to the removal, then _____.

a) Redistribute pointers
b) Merge siblings
c) Delete node
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14) Consider following transactions

T1	T2
read(A) A := A − 50 write(A)	
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What will be the values of A, B and A+B after T1 write A if the initial values of A=100, B=200?

a) A=50, B=200 and A+B=250
b) A=45, B=210 and A+B=245
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Seat No.	

Set **R**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (Old) (CBCS) Examination: March/April - 2026
Database Engineering (BTN03503)

Day & Date: Thursday, 07-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
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3) Make suitable assumptions if necessary and state them clearly.

SECTION – I

Q.2 Attempt any Three **12**

a) List and explain the components of storage manager.

b) Consider the following database schema. Write the queries using relational algebra.

branch (branch_name, branch_city, assets)
customer (customer_name, customer_street, customer_city)
loan (loan_number, branch_name, amount)
borrower (customer_name, loan_number)
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i) Find all customers who have a loan at a bank.
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iii) Find all customers who have a loan or an account or both
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c) Explain Generalization and Specialization with example.

d) Find if a given functional dependency is implied from a set of Functional Dependencies for:
AB → CD, AF → D, DE → F, C → G, F → E, G → A
i) Check: CF → DF
ii) Check: BG → E

Q.3 What is Prime Attributes and non-prime attribute? Find Prime Attributes and non-prime attributes using Functional Dependencies: **08**

i) R(ABCDEF) having FDs {AB → C, C → D, D → E, F → B, E → F}
ii) R(ABDLPT) having FDs {B → PT, A → D, T → L}
iii) R(ABCDEFGHIJ) having FDs {AB → C, A → DE, B → F, F → GH, D → IJ}

OR

Consider the E-R diagram in given Figure,

i) List the entity sets along with attributes and their primary keys.
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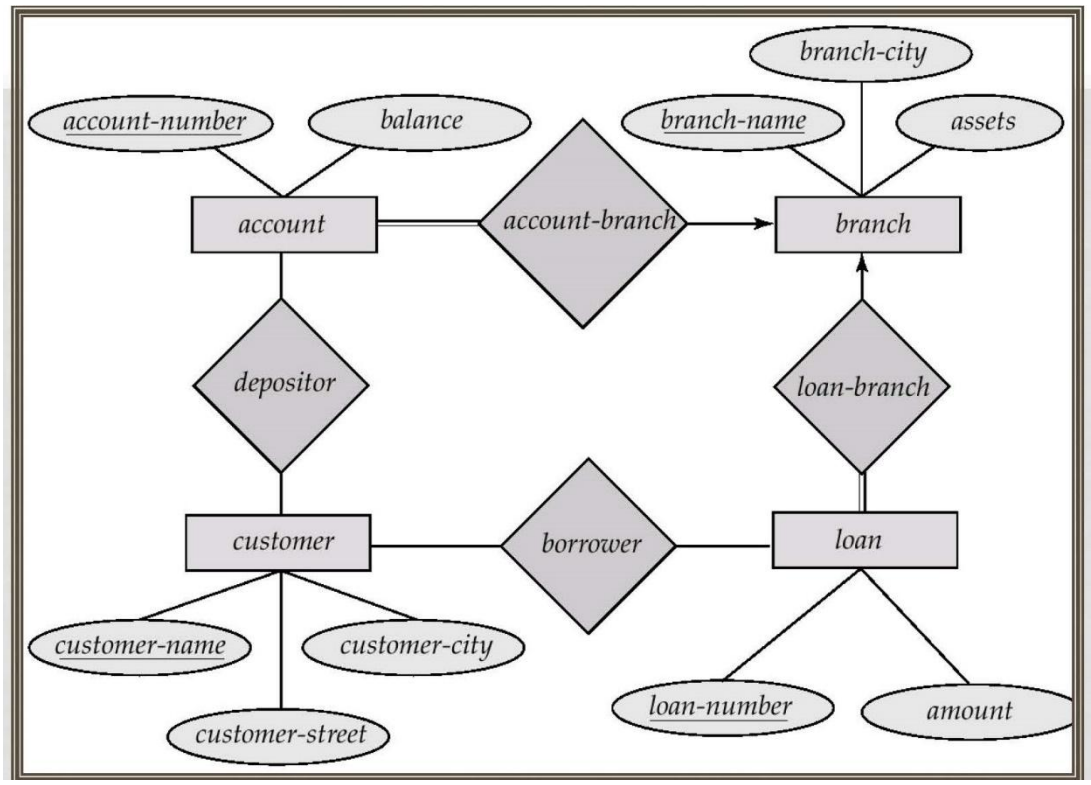

Q.4 Explain the following joins with example in SQL. **08**

a) Inner join
b) Right outer join
c) Left outer join
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SECTION – II

Q.5 Attempt any Three. **12**

a) Explain primary, clustering, secondary indexing and multilevel indexing.

b) Explain the conflict serializability. Check whether the following schedules are conflict serializable.

T_1	T_2
read (A)	
write (A)	
	read (A)
	write (A)
read (B)	
write (B)	
	read (B)
	write (B)

Schedule 1

T_1	T_2
read(A)	
write(A)	
	read(A)
read(B)	
	write(A)
write(B)	
	read(B)
	write(B)

Schedule 2

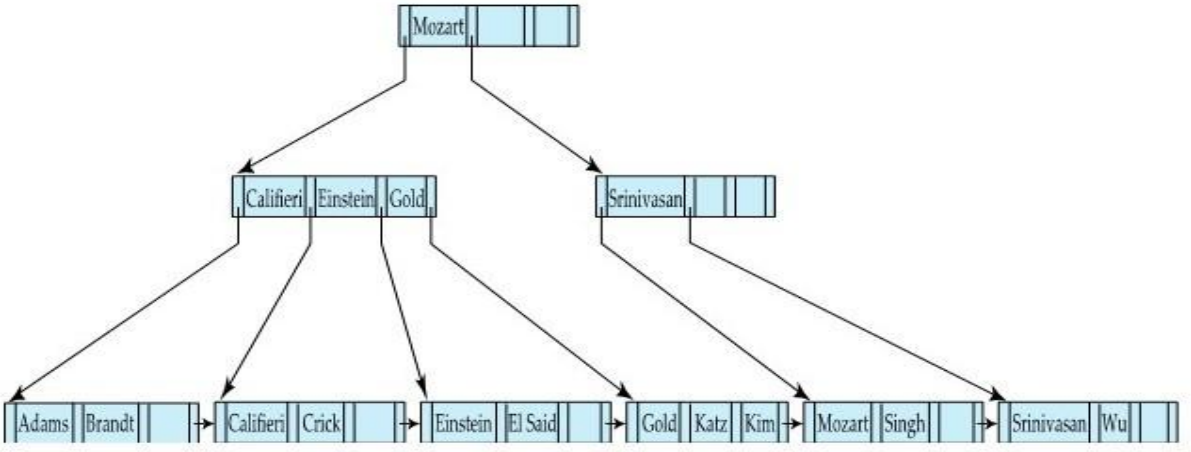
c) Explain various types of failure that may occur in the system.

d) Explain the concept of lock granularity concurrency control mechanism.

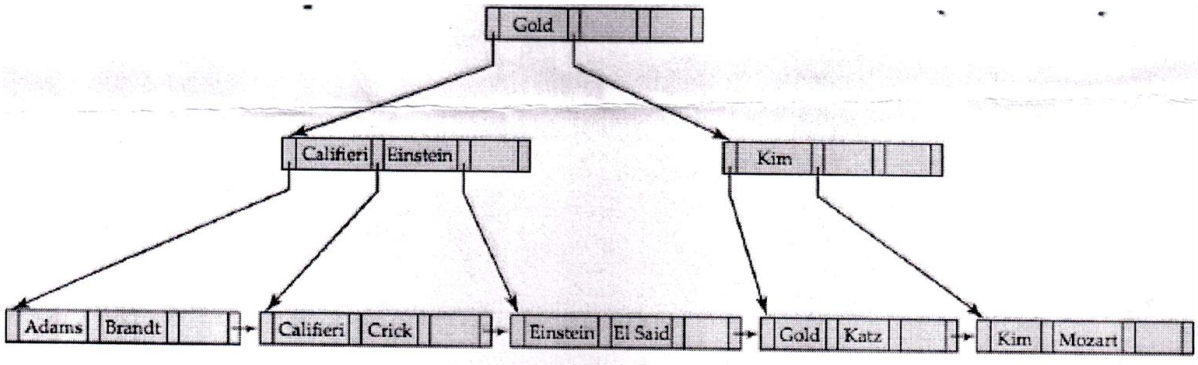
Q.6 Explain log based recovery. Also explain with example immediate database modification and deferred modification scheme. **08**

OR

Explain B+ tree with an example and how insertion works. Draw the B+ tree after inserting “Lamport” in this tree



Draw the B+ tree after deleting “Gold” from this tree



Q.7 What do you mean by concurrency control? Explain two phase locking protocol along with the strict and rigorous two-phase locking protocol with example. **08**

Seat No.	

Set **S**

T. Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (Old) (CBCS) Examination: March/April – 2026
Database Engineering (BTN03503)

Day & Date: Thursday, 07-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

Duration: 30 Minutes Marks: 14

Q.1 Choose the correct option. **14**

1) Consider the following relation

A	B	C
α	1	A
β	2	B

Which of the following indicate the lossless decomposition?
a) R1 = (A, B) and R2 = (B, C)
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c) R1 = (C, A) and R2 = (B, C)
d) R1 = (C, A) and R2 = (C, B)

2) Consider the relation R, on this instance _____.

A	B	C	D
A1	B1	C1	D1
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a) C → A does hold, but A → C does not hold
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What will be the values of A, B and A+B after T1 write A if the initial values of A=100, B=200?

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6) A transaction may obtain locks, but may not release any lock in _____.

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7) The property of transaction - “Either all operations of the transaction are reflected properly in the database, or none are”, is the _____.

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8) When a transaction Ti issues a read(Q) operation, the system issues a _____ instruction followed by the _____ instruction.

a) lock-S(Q), read(Q)
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c) read(Q), lock-X(Q)
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9) Non-volatile storage contents are assumed to not be corrupted by system crash in case of _____.

a) Logical error
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a) Subschemas
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11) A null value for the *apartment-number attribute* could mean "not applicable" _____.

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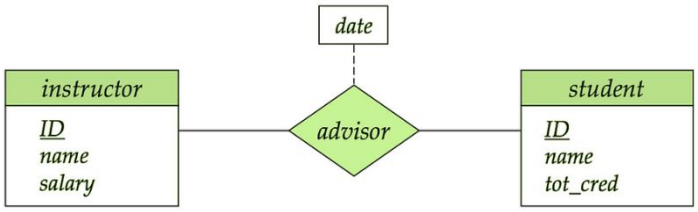

a) name
b) salary
c) tot_cred
d) date

13) Identify the correct relational algebra query for the following output.

Input

A	B	C	D
α	α	**1**	**7**
α	β	**5**	**7**
β	β	**12**	**3**
β	β	**23**	**10**

Output

A	B	C	D
α	α	**1**	**7**
β	β	**23**	**10**

a) $\sigma_{C=D \wedge D>5}(r)$
b) $\sigma_{A=B \wedge D<5}(r)$
c) $\sigma_{A=B \wedge D>5}(r)$
d) None

14) For the class (class_name, age) table, find the names and average age of all classes where the average age of students is greater than 10. Identify the correct, SQL Query for this statement.

a) SELECT class_name, age
FROM class
GROUP BY class_name
HAVING AVG(age) > 10;

b) SELECT class_name, age
FROM class
HAVING AVG(age) > 10
GROUP BY class_name;

c) SELECT class_name, AVG (age)
FROM class
GROUP BY class_name
HAVING AVG(age) > 10;

d) SELECT class_name, AVG (age)
FROM class
HAVING AVG(age) > 10
GROUP BY class_name;

Seat No.	

Set **S**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (Old) (CBCS) Examination: March/April - 2026
Database Engineering (BTN03503)

Day & Date: Thursday, 07-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
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3) Make suitable assumptions if necessary and state them clearly.

SECTION – I

Q.2 Attempt any Three **12**

a) List and explain the components of storage manager.

b) Consider the following database schema. Write the queries using relational algebra.

branch (branch_name, branch_city, assets)
customer (customer_name, customer_street, customer_city)
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depositor (customer_name, account_number)

i) Find all customers who have a loan at a bank.
ii) Find all customers who have both a loan and an account
iii) Find all customers who have a loan or an account or both
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c) Explain Generalization and Specialization with example.

d) Find if a given functional dependency is implied from a set of Functional Dependencies for:
AB → CD, AF → D, DE → F, C → G, F → E, G → A
i) Check: CF → DF
ii) Check: BG → E

Q.3 What is Prime Attributes and non-prime attribute? Find Prime Attributes and non-prime attributes using Functional Dependencies: **08**

i) R(ABCDEF) having FDs {AB → C, C → D, D → E, F → B, E → F}
ii) R(ABDLPT) having FDs {B → PT, A → D, T → L}
iii) R(ABCDEFGHIJ) having FDs {AB → C, A → DE, B → F, F → GH, D → IJ}

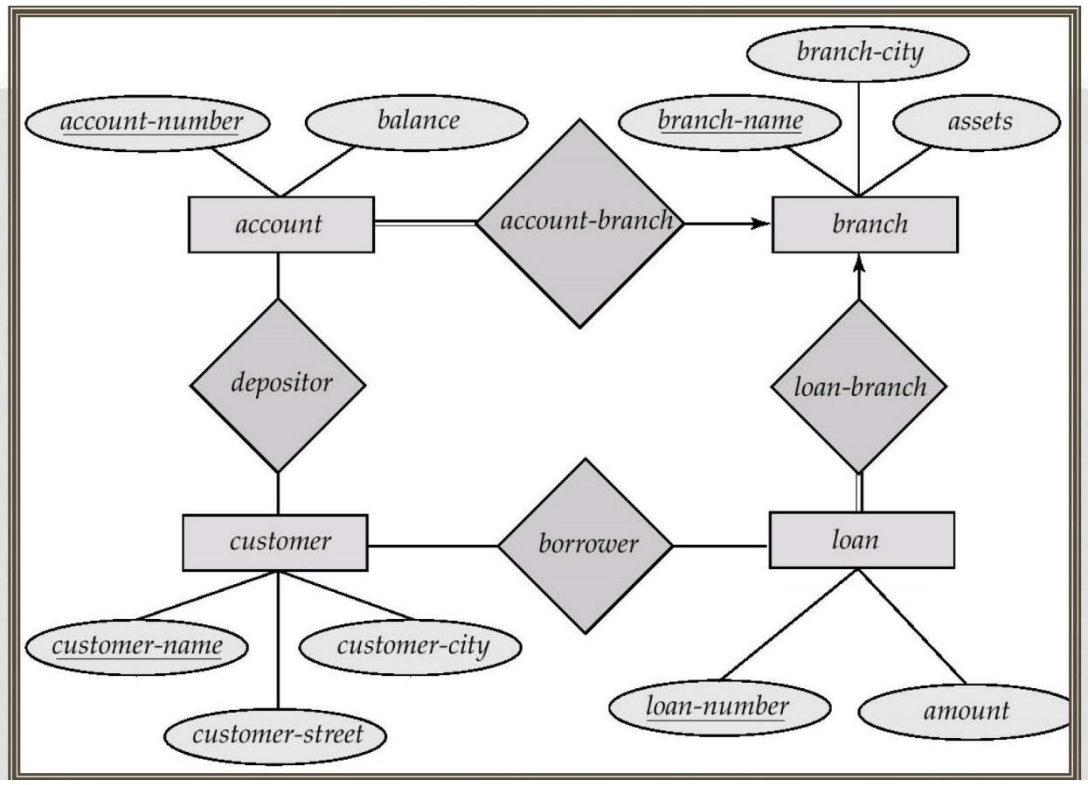
OR

Consider the E-R diagram in given Figure,

i) List the entity sets along with attributes and their primary keys.

ii) List Relationship along with attributes and their primary keys.

iii) Reduce this ER model to relational model



Q.4 Explain the following joins with example in SQL. **08**

a) Inner join

b) Right outer join

c) Left outer join

d) Full outer join

SECTION – II

Q.5 Attempt any Three. **12**

a) Explain primary, clustering, secondary indexing and multilevel indexing.

b) Explain the conflict serializability. Check whether the following schedules are conflict serializable.

T_1	T_2
read (A)	
write (A)	
	read (A)
	write (A)
read (B)	
write (B)	
	read (B)
	write (B)

Schedule 1

T_1	T_2
read(A)	
write(A)	
	read(A)
read(B)	
	write(A)
write(B)	
	read(B)
	write(B)

Schedule 2

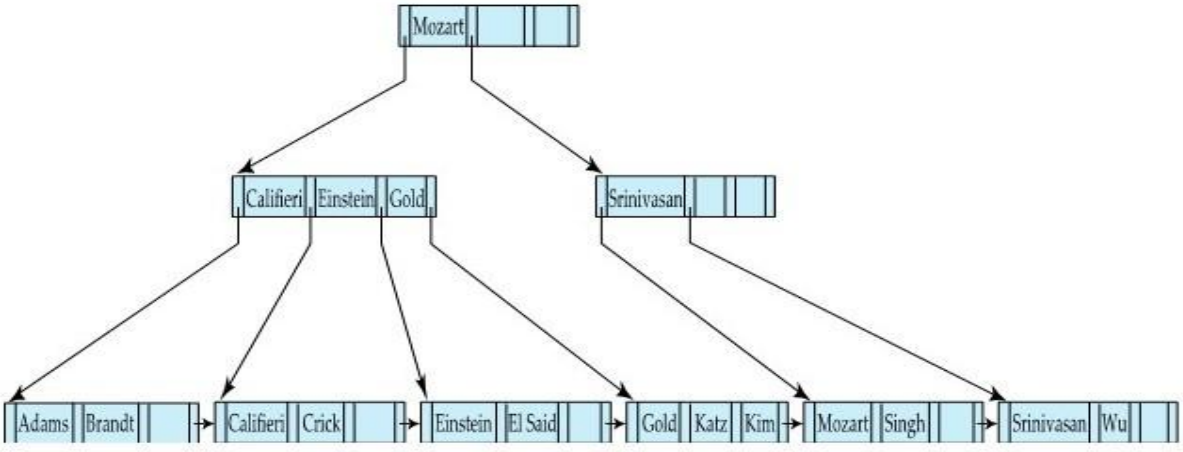
c) Explain various types of failure that may occur in the system.

d) Explain the concept of lock granularity concurrency control mechanism.

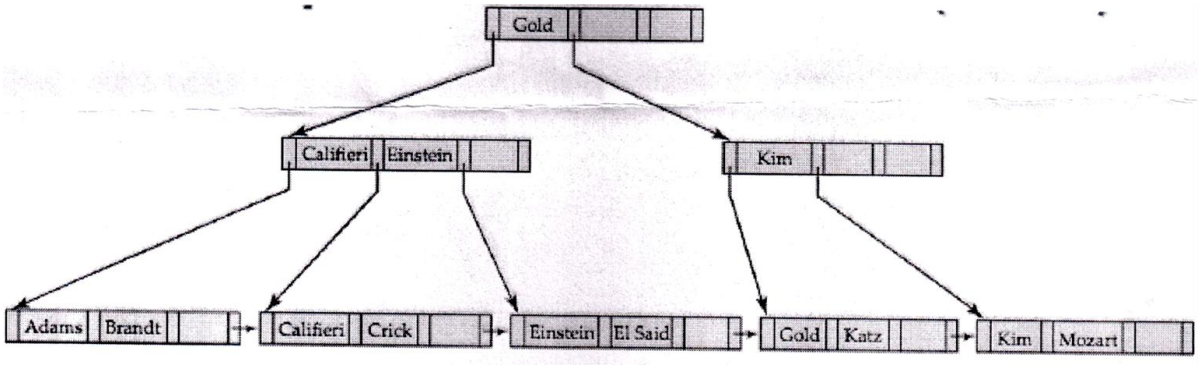
Q.6 Explain log based recovery. Also explain with example immediate database modification and deferred modification scheme. **08**

OR

Explain B+ tree with an example and how insertion works. Draw the B+ tree after inserting “Lamport” in this tree



Draw the B+ tree after deleting “Gold” from this tree



Q.7 What do you mean by concurrency control? Explain two phase locking protocol along with the strict and rigorous two-phase locking protocol with example. **08**

SLR-QH-445

Seat No.	

Set P

T. Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (Old) (CBCS) Examination: March/April – 2026
Design and Analysis of Algorithm (BTN03504)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Choose the correct alternative from the options. 14

1) The key elements of recursion are _____.
a) Base case and recursive case
b) Loops and conditions
c) Variables and constants
d) None of the above

2) The notation O(n) represents _____.
a) Best case
b) Worst case upper bound
c) Average case only
d) Constant complexity

3) The main purpose of an algorithm is _____.
a) To provide syntax rules
b) To describe steps to solve a problem
c) To translate into assembly code
d) To specify hardware

4) The time complexity of binary search is _____.
a) $O(n)$
b) $O(1)$
c) $O(n^2)$
d) $O(\log n)$

5) Worst case time complexity of Quick Sort is _____.
a) $O(n \log n)$
b) $O(n^2)$
c) $O(\log n)$
d) $O(n)$

6) The greedy method always guarantees _____.
a) Optimal solution
b) Random solution
c) Locally optimal solution
d) Partial solution

7) Job sequencing with deadlines aims to _____.
a) Maximize profit
b) Minimize time
c) Minimize cost
d) Minimize deadline

8) The general method of DP consists of _____.
a) Breaking problem recursively and reusing results
b) Random trials
c) Brute force
d) Backtracking

9) The goal of the Multistage Graph problem is to _____.
a) Find minimum cost path
b) Find maximum spanning tree
c) Detect cycles
d) Balance edges

10) In 8-Queen problem, each queen must be placed _____.
a) In same row
b) In different rows and columns
c) Adjacent diagonally
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11) The Hamiltonian Cycle problem checks _____.
a) Existence of a path visiting each vertex once and returning to start
b) Minimum spanning tree
c) Shortest path
d) Connected components

12) The NP class consists of _____.
a) Problems verifiable in polynomial time
b) Non-polynomial solvable
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13) For a nested loop, both running from 1 to n, time complexity is _____.
a) $O(n)$
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d) $O(2n)$

14) The All Pairs Shortest Path algorithm runs in _____.
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b) $O(n^3)$
c) $O(n \log\ n)$
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Seat No.	

Set **P**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (Old) (CBCS) Examination: March/April – 2026
Design and Analysis of Algorithm (BTN03504)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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

Q.2 Solve any Three. **12**

a) Find optimal placement for 3 tapes T0, T1, T2 where the Program are of lengths.
12, 5, 8, 32, 7, 5, 18, 26, 4, 3, 11, 10, 6

b) Define algorithm and explain its specification.

c) Differentiate between Kruskal and Prims algorithm.

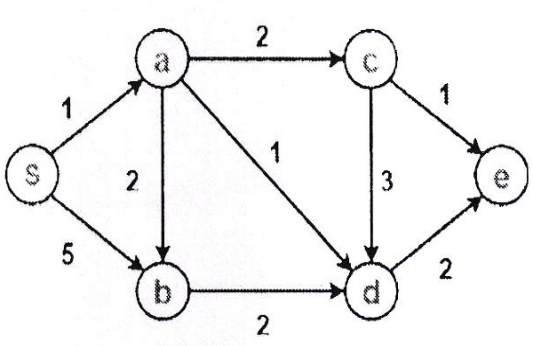
d) Explain general method of divide & conquer. Write an algorithm for binary search.

Q.3 Solve any Two. **16**

a) Sort following elements using Quick sort (Show each iteration).
65, 70, 75, 80, 85, 60, 55, 50, 45.

b) What is the solution generated by the function job scheduling when $n = 7$?
$(P1, P2, \ldots\ldots, P7) = (3, 5, 20, 18, 1, 6, 30)$
$(d1, d2, \ldots\ldots, d7) = (1, 3, 4, 3, 2, 1, 2)$

c) Find the single source shortest path of following graph. Consider vertex S as initial vertex.



SECTION – II

Q.4 Solve any Three. **12**

a) Give the problem statement of n-queens problem. Explain the solution for 4-queens problem using state space tree.

b) Explain the following with examples.
i) Class NP Problems
ii) NP complete problem

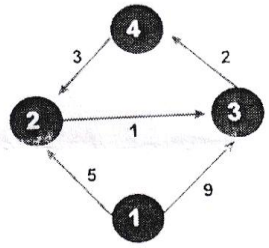
c) Solve 0/1 Knapsack problem using dynamic programming.
M = 8, n = 4 profit = {1, 2, 5, 6} and weight = {2, 3, 4, 5}

d) Draw the portion of the state space tree for m - colorings of a graph when n = 4 and m = 3.

Q.5 Solve any Two. **16**

a) Explain flow shop scheduling with example.

b) Find all pair shortest path using dynamic programming for following graph.



c) Given W [1:6] = {5, 10, 12, 13, 15, 18), m = 30 and n = 6. Find all possible subsets of w that sum to m. Draw the portion of the state space tree that is generated.

SLR-QH-445

Seat No.	

Set Q

T. Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (Old) (CBCS) Examination: March/April – 2026
Design and Analysis of Algorithm (BTN03504)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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4) Assume suitable data whenever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Choose the correct alternative from the options. 14

1) The general method of DP consists of _____.
a) Breaking problem recursively and reusing results
b) Random trials
c) Brute force
d) Backtracking

2) The goal of the Multistage Graph problem is to _____.
a) Find minimum cost path b) Find maximum spanning tree
c) Detect cycles d) Balance edges

3) In 8-Queen problem, each queen must be placed _____.
a) In same row b) In different rows and columns
c) Adjacent diagonally d) Randomly

4) The Hamiltonian Cycle problem checks _____.
a) Existence of a path visiting each vertex once and returning to start
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5) The NP class consists of _____.
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6) For a nested loop, both running from 1 to n, time complexity is _____.
a) $O(n)$ b) $O(n \log n)$
c) $O(n^2)$ d) $O(2n)$

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14) Job sequencing with deadlines aims to _____.
a) Maximize profit b) Minimize time
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Seat No.	

Set **Q**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (Old) (CBCS) Examination: March/April – 2026
Design and Analysis of Algorithm (BTN03504)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
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SECTION – I

Q.2 Solve any Three. **12**

a) Find optimal placement for 3 tapes T0, T1, T2 where the Program are of lengths.
12, 5, 8, 32, 7, 5, 18, 26, 4, 3, 11, 10, 6

b) Define algorithm and explain its specification.

c) Differentiate between Kruskal and Prims algorithm.

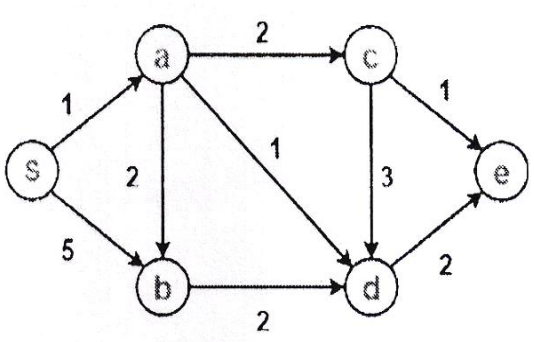
d) Explain general method of divide & conquer. Write an algorithm for binary search.

Q.3 Solve any Two. **16**

a) Sort following elements using Quick sort (Show each iteration).
65, 70, 75, 80, 85, 60, 55, 50, 45.

b) What is the solution generated by the function job scheduling when $n = 7$?
$(P1, P2, \ldots\ldots, P7) = (3, 5, 20, 18, 1, 6, 30)$
$(d1, d2, \ldots\ldots, d7) = (1, 3, 4, 3, 2, 1, 2)$

c) Find the single source shortest path of following graph. Consider vertex S as initial vertex.



SECTION – II

Q.4 Solve any Three. **12**

a) Give the problem statement of n-queens problem. Explain the solution for 4-queens problem using state space tree.

b) Explain the following with examples.
i) Class NP Problems
ii) NP complete problem

c) Solve 0/1 Knapsack problem using dynamic programming.
M = 8, n = 4 profit = {1, 2, 5, 6} and weight = {2, 3, 4, 5}

d) Draw the portion of the state space tree for m - colorings of a graph when n = 4 and m = 3.

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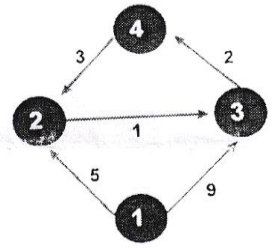
a) Explain flow shop scheduling with example.

b) Find all pair shortest path using dynamic programming for following graph.



c) Given W [1:6] = {5, 10, 12, 13, 15, 18), m = 30 and n = 6. Find all possible subsets of w that sum to m. Draw the portion of the state space tree that is generated.

Seat No.	

Set **R**

T. Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (Old) (CBCS) Examination: March/April – 2026
Design and Analysis of Algorithm (BTN03504)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

Duration: 30 Minutes Marks: 14

Q.1 Choose the correct alternative from the options. 14

1) The Hamiltonian Cycle problem checks _____.
a) Existence of a path visiting each vertex once and returning to start
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c) Shortest path
d) Connected components

2) The NP class consists of _____.
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3) For a nested loop, both running from 1 to n, time complexity is _____.
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Seat No.	

Set **R**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (Old) (CBCS) Examination: March/April – 2026
Design and Analysis of Algorithm (BTN03504)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
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SECTION – I

Q.2 Solve any Three. **12**

a) Find optimal placement for 3 tapes T0, T1, T2 where the Program are of lengths.
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b) Define algorithm and explain its specification.

c) Differentiate between Kruskal and Prims algorithm.

d) Explain general method of divide & conquer. Write an algorithm for binary search.

Q.3 Solve any Two. **16**

a) Sort following elements using Quick sort (Show each iteration).
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b) What is the solution generated by the function job scheduling when $n = 7$?
$(P1, P2, \ldots\ldots, P7) = (3, 5, 20, 18, 1, 6, 30)$
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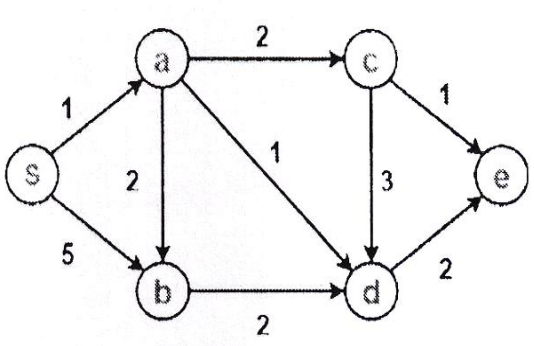
c) Find the single source shortest path of following graph. Consider vertex S as initial vertex.



SECTION – II

Q.4 Solve any Three. **12**

a) Give the problem statement of n-queens problem. Explain the solution for 4-queens problem using state space tree.

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i) Class NP Problems
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c) Solve 0/1 Knapsack problem using dynamic programming.
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Q.5 Solve any Two. **16**

a) Explain flow shop scheduling with example.

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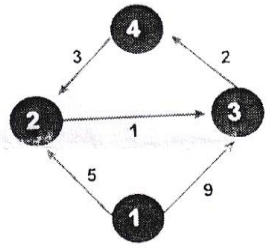

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Seat No.	

Set **S**

T. Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (Old) (CBCS) Examination: March/April – 2026
Design and Analysis of Algorithm (BTN03504)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

Duration: 30 Minutes Marks: 14

Q.1 Choose the correct alternative from the options. 14

1) The greedy method always guarantees _____.
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Seat No.	

Set **S**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (Old) (CBCS) Examination: March/April – 2026
Design and Analysis of Algorithm (BTN03504)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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SECTION – I

Q.2 Solve any Three. **12**

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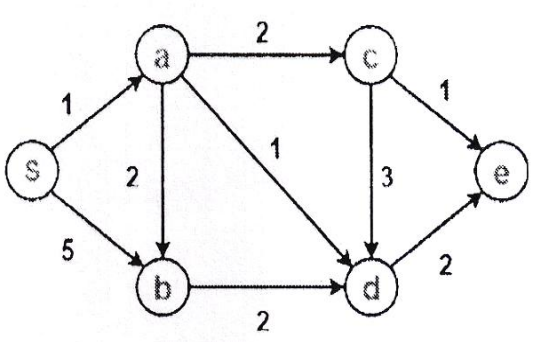

SECTION – II

Q.4 Solve any Three. **12**

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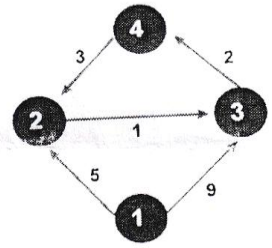
a) Explain flow shop scheduling with example.

b) Find all pair shortest path using dynamic programming for following graph.



c) Given W [1:6] = {5, 10, 12, 13, 15, 18), m = 30 and n = 6. Find all possible subsets of w that sum to m. Draw the portion of the state space tree that is generated.

SLR-QH-446

Seat No.	

Set P

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (Old) (CBCS) Examination: March/April – 2026
Reinforcement Learning (BTN03512)

Day & Date: Tuesday, 12-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions (if necessary and state them clearly).

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) In Reinforcement Learning, the agent's goal is to maximize the _____.
a) Immediate reward
b) Total expected cumulative reward
c) Number of episodes
d) Number of states visited

2) The component responsible for selecting actions in an environment is called _____.
a) Reward signal b) Agent
c) Policy d) Environment

3) The concept of trial-and-error learning was first studied by _____.
a) Edward Thorndike b) Alan Turing
c) Richard Sutton d) Andrew Ng

4) Early inspiration for Reinforcement Learning algorithms came from _____.
a) Behavioral psychology b) Symbolic reasoning
c) Fuzzy logic d) Game theory

5) In the 10-armed testbed experiment, each arm represents _____.
a) A different action with its own reward distribution
b) A fixed policy
c) A separate learning episode
d) A set of terminal states

6) In episodic tasks, learning is divided into ____.
   a) Sequences that end in terminal states
   b) Continuous steps without termination
   c) Randomly timed actions
   d) Cycles that have no ending

7) The concept of delayed reward helps an agent to _____.
   a) Focus only on current rewards
   b) Avoid exploration
   c) Plan actions for long-term benefits
   d) Minimize rewards

8) Policy evaluation in reinforcement learning aims at _____.
   a) Estimating the value function for a given policy
   b) Selecting random actions to explore
   c) Maximizing immediate rewards only
   d) Ignoring state transitions

9) Policy iteration is formed by repeating the steps of _____.
   a) Monte Carlo sampling only
   b) Value initialization and random selection
   c) Exploration and exploitation
   d) Policy evaluation and policy improvement

10) The efficiency of dynamic programming can be improved through ___.
   a) Eliminating the discount factor
   b) Increasing the size of the state space
   c) Focusing updates on frequently visited or relevant states
   d) Using random initialization only

11) A key advantage of TD prediction methods is _____.
   a) Requirement of complete knowledge of the environment
   b) Learning directly from incomplete episodes
   c) Dependence only on Monte Carlo sampling
   d) Ignoring intermediate rewards

12) A major strength of TD methods such as SARSA and Q-learning lies in _____.
   a) Ignoring delayed rewards
   b) Requiring exact knowledge of transition probabilities
   c) Avoiding real-time updates
   d) Learning directly from experience without a model of the environment

13) The Dyna architecture integrates _____.
   a) Policy evaluation with static updates only
   b) Exploration with random guessing
   c) Learning from real experience with simulated planning
   d) Reward functions with constant values

14) Expected updates use _____.

a) Averaged outcomes over possible next states and rewards
b) Only one sample transition per update
c) Random action selection
d) Ignored value predictions

SLR-QH-446

Seat No.	

Set P

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (Old) (CBCS) Examination: March/April – 2026
Reinforcement Learning (BTN03512)

Day & Date: Tuesday, 12-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Make suitable assumptions (if necessary and state them clearly).

SECTION – I

Q.2 Attempt Any Four **16**

a) Explain the Multi armed bandit problem. List its applications.

b) What is the Markov property? Explain concept of MDP with its elements.

c) List and explain Elements of Reinforcement Learning.

d) Describe the significance of reward signals in the RL process.

e) Differentiate between Greedy Policy VS ε- Greedy Policy.

Q.3 Attempt Any One **06**

a) Illustrate with diagram and equation the unified notation for episodic tasks and continuous task.

b) Compare supervised learning, unsupervised learning, and reinforcement learning in terms of their goals, data requirements, and typical applications.

Q.4 List and explain Applications of Reinforcement Learning. **06**

SECTION – II

Q.5 Attempt Any Four **16**

a) Differentiate between model based and model free learning.

b) Illustrate the working of SARSA (On-Policy TD control) method.

c) Define Policy Improvement in Reinforcement Learning. Provide an example to illustrate the concept.

d) Explain the working mechanism of Samuel's Checkers Player with it’s board.

e) Write short note on Model and Planning concept.

Q.6 Attempt Any One **06**

a) Write short notes on:
   i) Dyna-Q
   ii) Monte Carlo method

b) Explain Value Function with it's types.

Q.7 Outline Prioritized Sweeping and explain its necessity. **06**

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (Old) (CBCS) Examination: March/April – 2026
Reinforcement Learning (BTN03512)

Day & Date: Tuesday, 12-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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4) Make suitable assumptions (if necessary and state them clearly).

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) Policy evaluation in reinforcement learning aims at _____.
a) Estimating the value function for a given policy
b) Selecting random actions to explore
c) Maximizing immediate rewards only
d) Ignoring state transitions

2) Policy iteration is formed by repeating the steps of _____.
a) Monte Carlo sampling only
b) Value initialization and random selection
c) Exploration and exploitation
d) Policy evaluation and policy improvement

3) The efficiency of dynamic programming can be improved through ___.
a) Eliminating the discount factor
b) Increasing the size of the state space
c) Focusing updates on frequently visited or relevant states
d) Using random initialization only

4) A key advantage of TD prediction methods is _____.
a) Requirement of complete knowledge of the environment
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c) Dependence only on Monte Carlo sampling
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5) A major strength of TD methods such as SARSA and Q-learning lies in _____.
   a) Ignoring delayed rewards
   b) Requiring exact knowledge of transition probabilities
   c) Avoiding real-time updates
   d) Learning directly from experience without a model of the environment

6) The Dyna architecture integrates _____.
   a) Policy evaluation with static updates only
   b) Exploration with random guessing
   c) Learning from real experience with simulated planning
   d) Reward functions with constant values

7) Expected updates use _____.
   a) Averaged outcomes over possible next states and rewards
   b) Only one sample transition per update
   c) Random action selection
   d) Ignored value predictions

8) In Reinforcement Learning, the agent's goal is to maximize the _____.
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   b) Total expected cumulative reward
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   d) Number of states visited

9) The component responsible for selecting actions in an environment is called _____.
   a) Reward signal
   b) Agent
   c) Policy
   d) Environment

10) The concept of trial-and-error learning was first studied by _____.
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   b) Alan Turing
   c) Richard Sutton
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11) Early inspiration for Reinforcement Learning algorithms came from _____.
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   b) Symbolic reasoning
   c) Fuzzy logic
   d) Game theory

12) In the 10-armed testbed experiment, each arm represents _____.
   a) A different action with its own reward distribution
   b) A fixed policy
   c) A separate learning episode
   d) A set of terminal states

13) In episodic tasks, learning is divided into ____.
   a) Sequences that end in terminal states
   b) Continuous steps without termination
   c) Randomly timed actions
   d) Cycles that have no ending

14) The concept of delayed reward helps an agent to _____.
   a) Focus only on current rewards
   b) Avoid exploration
   c) Plan actions for long-term benefits
   d) Minimize rewards

SLR-QH-446

Seat No.	

Set Q

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (Old) (CBCS) Examination: March/April – 2026
Reinforcement Learning (BTN03512)

Day & Date: Tuesday, 12-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Make suitable assumptions (if necessary and state them clearly).

SECTION – I

Q.2 Attempt Any Four **16**

a) Explain the Multi armed bandit problem. List its applications.

b) What is the Markov property? Explain concept of MDP with its elements.

c) List and explain Elements of Reinforcement Learning.

d) Describe the significance of reward signals in the RL process.

e) Differentiate between Greedy Policy VS ε- Greedy Policy.

Q.3 Attempt Any One **06**

a) Illustrate with diagram and equation the unified notation for episodic tasks and continuous task.

b) Compare supervised learning, unsupervised learning, and reinforcement learning in terms of their goals, data requirements, and typical applications.

Q.4 List and explain Applications of Reinforcement Learning. **06**

SECTION – II

Q.5 Attempt Any Four **16**

a) Differentiate between model based and model free learning.

b) Illustrate the working of SARSA (On-Policy TD control) method.

c) Define Policy Improvement in Reinforcement Learning. Provide an example to illustrate the concept.

d) Explain the working mechanism of Samuel's Checkers Player with it’s board.

e) Write short note on Model and Planning concept.

Q.6 Attempt Any One **06**

a) Write short notes on:
   i) Dyna-Q
   ii) Monte Carlo method

b) Explain Value Function with it's types.

Q.7 Outline Prioritized Sweeping and explain its necessity. **06**

Seat No.	

Set **R**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (Old) (CBCS) Examination: March/April – 2026
Reinforcement Learning (BTN03512)

Day & Date: Tuesday, 12-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions (if necessary and state them clearly).

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) A key advantage of TD prediction methods is _____.
a) Requirement of complete knowledge of the environment
b) Learning directly from incomplete episodes
c) Dependence only on Monte Carlo sampling
d) Ignoring intermediate rewards

2) A major strength of TD methods such as SARSA and Q-learning lies in _____.
a) Ignoring delayed rewards
b) Requiring exact knowledge of transition probabilities
c) Avoiding real-time updates
d) Learning directly from experience without a model of the environment

3) The Dyna architecture integrates _____.
a) Policy evaluation with static updates only
b) Exploration with random guessing
c) Learning from real experience with simulated planning
d) Reward functions with constant values

4) Expected updates use _____.
a) Averaged outcomes over possible next states and rewards
b) Only one sample transition per update
c) Random action selection
d) Ignored value predictions

5) In Reinforcement Learning, the agent's goal is to maximize the _____.
   a) Immediate reward
   b) Total expected cumulative reward
   c) Number of episodes
   d) Number of states visited

6) The component responsible for selecting actions in an environment is called _____.
   a) Reward signal
   b) Agent
   c) Policy
   d) Environment

7) The concept of trial-and-error learning was first studied by _____.
   a) Edward Thorndike
   b) Alan Turing
   c) Richard Sutton
   d) Andrew Ng

8) Early inspiration for Reinforcement Learning algorithms came from _____.
   a) Behavioral psychology
   b) Symbolic reasoning
   c) Fuzzy logic
   d) Game theory

9) In the 10-armed testbed experiment, each arm represents _____.
   a) A different action with its own reward distribution
   b) A fixed policy
   c) A separate learning episode
   d) A set of terminal states

10) In episodic tasks, learning is divided into ____.
   a) Sequences that end in terminal states
   b) Continuous steps without termination
   c) Randomly timed actions
   d) Cycles that have no ending

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   a) Focus only on current rewards
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   c) Plan actions for long-term benefits
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12) Policy evaluation in reinforcement learning aims at _____.
   a) Estimating the value function for a given policy
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   d) Ignoring state transitions

13) Policy iteration is formed by repeating the steps of _____.
   a) Monte Carlo sampling only
   b) Value initialization and random selection
   c) Exploration and exploitation
   d) Policy evaluation and policy improvement

14) The efficiency of dynamic programming can be improved through ___.

a) Eliminating the discount factor
b) Increasing the size of the state space
c) Focusing updates on frequently visited or relevant states
d) Using random initialization only

Seat No.	

Set R

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (Old) (CBCS) Examination: March/April – 2026
Reinforcement Learning (BTN03512)

Day & Date: Tuesday, 12-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Make suitable assumptions (if necessary and state them clearly).

SECTION – I

Q.2 Attempt Any Four **16**

a) Explain the Multi armed bandit problem. List its applications.

b) What is the Markov property? Explain concept of MDP with its elements.

c) List and explain Elements of Reinforcement Learning.

d) Describe the significance of reward signals in the RL process.

e) Differentiate between Greedy Policy VS ε- Greedy Policy.

Q.3 Attempt Any One **06**

a) Illustrate with diagram and equation the unified notation for episodic tasks and continuous task.

b) Compare supervised learning, unsupervised learning, and reinforcement learning in terms of their goals, data requirements, and typical applications.

Q.4 List and explain Applications of Reinforcement Learning. **06**

SECTION – II

Q.5 Attempt Any Four **16**

a) Differentiate between model based and model free learning.

b) Illustrate the working of SARSA (On-Policy TD control) method.

c) Define Policy Improvement in Reinforcement Learning. Provide an example to illustrate the concept.

d) Explain the working mechanism of Samuel's Checkers Player with it’s board.

e) Write short note on Model and Planning concept.

Q.6 Attempt Any One **06**

a) Write short notes on:
   i) Dyna-Q
   ii) Monte Carlo method

b) Explain Value Function with it's types.

Q.7 Outline Prioritized Sweeping and explain its necessity. **06**

Seat No.		Set	S

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (Old) (CBCS) Examination: March/April – 2026
Reinforcement Learning (BTN03512)

Day & Date: Tuesday, 12-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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3) Figures to the right indicates full marks.
4) Make suitable assumptions (if necessary and state them clearly).

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) In episodic tasks, learning is divided into ____.
a) Sequences that end in terminal states
b) Continuous steps without termination
c) Randomly timed actions
d) Cycles that have no ending

2) The concept of delayed reward helps an agent to _____.
a) Focus only on current rewards
b) Avoid exploration
c) Plan actions for long-term benefits
d) Minimize rewards

3) Policy evaluation in reinforcement learning aims at _____.
a) Estimating the value function for a given policy
b) Selecting random actions to explore
c) Maximizing immediate rewards only
d) Ignoring state transitions

4) Policy iteration is formed by repeating the steps of _____.
a) Monte Carlo sampling only
b) Value initialization and random selection
c) Exploration and exploitation
d) Policy evaluation and policy improvement

5) The efficiency of dynamic programming can be improved through ___.
a) Eliminating the discount factor
b) Increasing the size of the state space
c) Focusing updates on frequently visited or relevant states
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6) A key advantage of TD prediction methods is _____.
   a) Requirement of complete knowledge of the environment
   b) Learning directly from incomplete episodes
   c) Dependence only on Monte Carlo sampling
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7) A major strength of TD methods such as SARSA and Q-learning lies in _____.
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   d) Learning directly from experience without a model of the environment

8) The Dyna architecture integrates _____.
   a) Policy evaluation with static updates only
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   d) Reward functions with constant values

9) Expected updates use _____.
   a) Averaged outcomes over possible next states and rewards
   b) Only one sample transition per update
   c) Random action selection
   d) Ignored value predictions

10) In Reinforcement Learning, the agent's goal is to maximize the _____.
   a) Immediate reward
   b) Total expected cumulative reward
   c) Number of episodes
   d) Number of states visited

11) The component responsible for selecting actions in an environment is called _____.
   a) Reward signal
   b) Agent
   c) Policy
   d) Environment

12) The concept of trial-and-error learning was first studied by _____.
   a) Edward Thorndike
   b) Alan Turing
   c) Richard Sutton
   d) Andrew Ng

13) Early inspiration for Reinforcement Learning algorithms came from _____.
   a) Behavioral psychology
   b) Symbolic reasoning
   c) Fuzzy logic
   d) Game theory

14) In the 10-armed testbed experiment, each arm represents _____.

a) A different action with its own reward distribution
b) A fixed policy
c) A separate learning episode
d) A set of terminal states

SLR-QH-446

Seat No.	

Set S

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (Old) (CBCS) Examination: March/April – 2026
Reinforcement Learning (BTN03512)

Day & Date: Tuesday, 12-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Make suitable assumptions (if necessary and state them clearly).

SECTION – I

Q.2 Attempt Any Four **16**

a) Explain the Multi armed bandit problem. List its applications.

b) What is the Markov property? Explain concept of MDP with its elements.

c) List and explain Elements of Reinforcement Learning.

d) Describe the significance of reward signals in the RL process.

e) Differentiate between Greedy Policy VS ε- Greedy Policy.

Q.3 Attempt Any One **06**

a) Illustrate with diagram and equation the unified notation for episodic tasks and continuous task.

b) Compare supervised learning, unsupervised learning, and reinforcement learning in terms of their goals, data requirements, and typical applications.

Q.4 List and explain Applications of Reinforcement Learning. **06**

SECTION – II

Q.5 Attempt Any Four **16**

a) Differentiate between model based and model free learning.

b) Illustrate the working of SARSA (On-Policy TD control) method.

c) Define Policy Improvement in Reinforcement Learning. Provide an example to illustrate the concept.

d) Explain the working mechanism of Samuel's Checkers Player with it’s board.

e) Write short note on Model and Planning concept.

Q.6 Attempt Any One **06**

a) Write short notes on:
   i) Dyna-Q
   ii) Monte Carlo method

b) Explain Value Function with it's types.

Q.7 Outline Prioritized Sweeping and explain its necessity. **06**

SLR-QH-447

Seat No.		Set	P

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (Old) (CBCS) Examination: March/April – 2026
Data Preprocessing and Visualization (BTN03513)

Day & Date: Tuesday, 12-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) In classification, the data are arranged according to _____.
a) Similarities b) Differences
c) Percentages d) Ratios

2) A distribution in which the observations are concentrated at one end of the distribution is called a _____.
a) Symmetric distribution b) Normal distribution
c) Skewed distribution d) Uniform distribution

3) What are the different types of variables?
a) Nominal b) Ordinal
c) Quantitative d) All of above

4) Data that summarize all observations in a category are called _____ data.
a) frequency b) summarized
c) raw d) None of these

5) What is the meaning of Mean?
a) Average b) Sum
c) Difference d) None of these

6) Metrics to measure Central Tendency _____.
a) Mean b) Mode
c) Median d) All of above

7) What does NumPy stand for?
a) Numerical Python b) Natural Python
c) Numeric Program d) Nonlinear Python

8) Which of the following is used to find the indices of the maximum and minimum elements in a NumPy array?

a) argmax() and argmin()
b) max() and min()
c) amax() and amin()
d) None

9) import NumPy as np
a =np.array([[1,2], [3,4]])
print(a)ndim)

a) 0
b) 1
c) 2
d) 3

10) Dataframe object is value mutable.

a) True
b) False

11) Amongst which of the following is / are not correct to access individual item from dataframe 'df'?

a) df.iat[2,2]
b) df.loc[2,2]
c) df.at[2,2]
d) df[0,0]

12) Which of the following library is used to plot the graph in python?

a) NumPy
b) Pandas
c) Matplotlib
d) All of above

13) Which is the correct command to install Matplotlib?

a) pip install matplotlib
b) pip install matplotlib.pz
c) pip install matplotlib.*
d) All of the above

14) Which function is used to create a histogram in Seaborn?

a) sns.lineplot()
b) sns.scatterplot()
c) sns.histplot()
d) sns.barplot()

Seat No.	

Set **P**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I)
(Old) (CBCS) Examination: March/April – 2026
Data Preprocessing and Visualization (BTN03513)

Day & Date: Tuesday, 12-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
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3) Assume suitable data whenever necessary.

SECTION – I

Q.2 Attempt Any Three. **12**

a) What are the different types of Variable.

b) Explain the types of Hypothesis with example.

c) What is Scatter plot? Draw the Positive and Negative relationship.

d) Define the terms ndim, shape, size, dtype with syntax.

Q.3 Attempt Any Two. **16**

a) What are the Metrics of Central Tendency with example.

b) How to convert text to numbers and numbers to text with example.

c) From the given array: array$([0,1,2,3,4,5,6,7,8,9])$ Write a Python code for

i) Display first five element
ii) Element after index 5
iii) Middle subarray
iv) Display last 2 element
v) Display only even element
vi) Display only odd elements

SECTION – II

Q.4 Attempt Any Three. **12**

a) Explain the operations on data in pandas in detail.

b) How to handle missing values in Pandas, explain with example.

c) What is Data Visualization, identify the design principles of data visualization.

d) Define Matplotlib and List out the libraries for plotting the graph, explain any one in detail with syntax.

Q.5 Attempt Any Two. **16**

a) What are the steps to combine dataset using append, concat & Merge, join in pandas.

b) Explain different types of operations on string in pandas.

c) Write the Python code to draw the Bar Chart, Histogram using Matplotlib and Seaborn.

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (Old) (CBCS) Examination: March/April – 2026
Data Preprocessing and Visualization (BTN03513)

Day & Date: Tuesday, 12-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) Which of the following is used to find the indices of the maximum and minimum elements in a NumPy array?
a) argmax() and argmin() b) max() and min()
c) amax() and amin() d) None

2) import NumPy as np
a =np.array([[1,2], [3,4]])
print(a)ndim)
a) 0 b) 1
c) 2 d) 3

3) Dataframe object is value mutable.
a) True b) False

4) Amongst which of the following is / are not correct to access individual item from dataframe 'df'?
a) df.iat[2,2] b) df.loc[2,2]
c) df.at[2,2] d) df[0,0]

5) Which of the following library is used to plot the graph in python?
a) NumPy b) Pandas
c) Matplotlib d) All of above

6) Which is the correct command to install Matplotlib?
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13) Metrics to measure Central Tendency _____.
a) Mean b) Mode
c) Median d) All of above

14) What does NumPy stand for?
a) Numerical Python b) Natural Python
c) Numeric Program d) Nonlinear Python

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I)
(Old) (CBCS) Examination: March/April – 2026
Data Preprocessing and Visualization (BTN03513)

Day & Date: Tuesday, 12-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data whenever necessary.

SECTION – I

Q.2 Attempt Any Three. **12**

a) What are the different types of Variable.

b) Explain the types of Hypothesis with example.

c) What is Scatter plot? Draw the Positive and Negative relationship.

d) Define the terms ndim, shape, size, dtype with syntax.

Q.3 Attempt Any Two. **16**

a) What are the Metrics of Central Tendency with example.

b) How to convert text to numbers and numbers to text with example.

c) From the given array: array$([0,1,2,3,4,5,6,7,8,9])$ Write a Python code for

i) Display first five element
ii) Element after index 5
iii) Middle subarray
iv) Display last 2 element
v) Display only even element
vi) Display only odd elements

SECTION – II

Q.4 Attempt Any Three. **12**

a) Explain the operations on data in pandas in detail.

b) How to handle missing values in Pandas, explain with example.

c) What is Data Visualization, identify the design principles of data visualization.

d) Define Matplotlib and List out the libraries for plotting the graph, explain any one in detail with syntax.

Q.5 Attempt Any Two. **16**

a) What are the steps to combine dataset using append, concat & Merge, join in pandas.

b) Explain different types of operations on string in pandas.

c) Write the Python code to draw the Bar Chart, Histogram using Matplotlib and Seaborn.

Seat No.	

Set R

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (Old) (CBCS) Examination: March/April – 2026
Data Preprocessing and Visualization (BTN03513)

Day & Date: Tuesday, 12-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) Amongst which of the following is / are not correct to access individual item from dataframe 'df'?
a) df.iat[2,2] b) df.loc[2,2]
c) df.at[2,2] d) df[0,0]

2) Which of the following library is used to plot the graph in python?
a) NumPy b) Pandas
c) Matplotlib d) All of above

3) Which is the correct command to install Matplotlib?
a) pip install matplotlib b) pip install matplotlib.pz
c) pip install matplotlib.* d) All of the above

4) Which function is used to create a histogram in Seaborn?
a) sns.lineplot() b) sns.scatterplot()
c) sns.histplot() d) sns.barplot()

5) In classification, the data are arranged according to _____.
a) Similarities b) Differences
c) Percentages d) Ratios

6) A distribution in which the observations are concentrated at one end of the distribution is called a _____.
a) Symmetric distribution b) Normal distribution
c) Skewed distribution d) Uniform distribution

7) What are the different types of variables?
a) Nominal b) Ordinal
c) Quantitative d) All of above

8) Data that summarize all observations in a category are called _____ data.

a) frequency b) summarized
c) raw d) None of these

9) What is the meaning of Mean?

a) Average b) Sum
c) Difference d) None of these

10) Metrics to measure Central Tendency _____.

a) Mean b) Mode
c) Median d) All of above

11) What does NumPy stand for?

a) Numerical Python b) Natural Python
c) Numeric Program d) Nonlinear Python

12) Which of the following is used to find the indices of the maximum and minimum elements in a NumPy array?

a) argmax() and argmin() b) max() and min()
c) amax() and amin() d) None

13) import NumPy as np
a =np.array([[1,2], [3,4]])
print(a)ndim)

a) 0 b) 1
c) 2 d) 3

14) Dataframe object is value mutable.

a) True b) False

SLR-QH-447

Seat No.	

Set R

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I)
(Old) (CBCS) Examination: March/April – 2026
Data Preprocessing and Visualization (BTN03513)

Day & Date: Tuesday, 12-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data whenever necessary.

SECTION – I

Q.2 Attempt Any Three. **12**

a) What are the different types of Variable.

b) Explain the types of Hypothesis with example.

c) What is Scatter plot? Draw the Positive and Negative relationship.

d) Define the terms ndim, shape, size, dtype with syntax.

Q.3 Attempt Any Two. **16**

a) What are the Metrics of Central Tendency with example.

b) How to convert text to numbers and numbers to text with example.

c) From the given array: array$([0,1,2,3,4,5,6,7,8,9])$ Write a Python code for

i) Display first five element
ii) Element after index 5
iii) Middle subarray
iv) Display last 2 element
v) Display only even element
vi) Display only odd elements

SECTION – II

Q.4 Attempt Any Three. **12**

a) Explain the operations on data in pandas in detail.

b) How to handle missing values in Pandas, explain with example.

c) What is Data Visualization, identify the design principles of data visualization.

d) Define Matplotlib and List out the libraries for plotting the graph, explain any one in detail with syntax.

Q.5 Attempt Any Two. **16**

a) What are the steps to combine dataset using append, concat & Merge, join in pandas.

b) Explain different types of operations on string in pandas.

c) Write the Python code to draw the Bar Chart, Histogram using Matplotlib and Seaborn.

Seat No.		Set	S

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (Old) (CBCS) Examination: March/April – 2026
Data Preprocessing and Visualization (BTN03513)

Day & Date: Tuesday, 12-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) Metrics to measure Central Tendency _____.
a) Mean b) Mode
c) Median d) All of above

2) What does NumPy stand for?
a) Numerical Python b) Natural Python
c) Numeric Program d) Nonlinear Python

3) Which of the following is used to find the indices of the maximum and minimum elements in a NumPy array?
a) argmax() and argmin() b) max() and min()
c) amax() and amin() d) None

4) import NumPy as np
a =np.array([[1,2], [3,4]])
print(a)ndim)
a) 0 b) 1
c) 2 d) 3

5) Dataframe object is value mutable.
a) True b) False

6) Amongst which of the following is / are not correct to access individual item from dataframe 'df'?
a) df.iat[2,2] b) df.loc[2,2]
c) df.at[2,2] d) df[0,0]

7) Which of the following library is used to plot the graph in python?
a) NumPy b) Pandas
c) Matplotlib d) All of above

8) Which is the correct command to install Matplotlib?
a) pip install matplotlib b) pip install matplotlib.pz
c) pip install matplotlib.* d) All of the above

9) Which function is used to create a histogram in Seaborn?
a) sns.lineplot() b) sns.scatterplot()
c) sns.histplot() d) sns.barplot()

10) In classification, the data are arranged according to _____.
a) Similarities b) Differences
c) Percentages d) Ratios

11) A distribution in which the observations are concentrated at one end of the distribution is called a _____.
a) Symmetric distribution b) Normal distribution
c) Skewed distribution d) Uniform distribution

12) What are the different types of variables?
a) Nominal b) Ordinal
c) Quantitative d) All of above

13) Data that summarize all observations in a category are called _____ data.
a) frequency b) summarized
c) raw d) None of these

14) What is the meaning of Mean?
a) Average b) Sum
c) Difference d) None of these

Seat No.		Set	S

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I)
(Old) (CBCS) Examination: March/April – 2026
Data Preprocessing and Visualization (BTN03513)

Day & Date: Tuesday, 12-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data whenever necessary.

SECTION – I

Q.2 Attempt Any Three. **12**

a) What are the different types of Variable.

b) Explain the types of Hypothesis with example.

c) What is Scatter plot? Draw the Positive and Negative relationship.

d) Define the terms ndim, shape, size, dtype with syntax.

Q.3 Attempt Any Two. **16**

a) What are the Metrics of Central Tendency with example.

b) How to convert text to numbers and numbers to text with example.

c) From the given array: array$([0,1,2,3,4,5,6,7,8,9])$ Write a Python code for

i) Display first five element
ii) Element after index 5
iii) Middle subarray
iv) Display last 2 element
v) Display only even element
vi) Display only odd elements

SECTION – II

Q.4 Attempt Any Three. **12**

a) Explain the operations on data in pandas in detail.

b) How to handle missing values in Pandas, explain with example.

c) What is Data Visualization, identify the design principles of data visualization.

d) Define Matplotlib and List out the libraries for plotting the graph, explain any one in detail with syntax.

Q.5 Attempt Any Two. **16**

a) What are the steps to combine dataset using append, concat & Merge, join in pandas.

b) Explain different types of operations on string in pandas.

c) Write the Python code to draw the Bar Chart, Histogram using Matplotlib and Seaborn.

SLR-QH-448

Seat No.		Set	P

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (Old) (CBCS) Examination: March/April – 2026
Network Security and Secure Coding (BTN03514)

Day & Date: Tuesday, 12-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) Which of the following is NOT a security service?
a) Confidentiality b) Integrity
c) Replication d) Non-repudiation

2) What type of attack involves intercepting and altering communication between two parties without their knowledge?
a) Denial of Service b) Man-in-the-Middle
c) ARP Spoofing d) Buffer Overflow

3) The primary purpose of access control is to _____.
a) Ensure data integrity
b) Maintain data availability
c) Prevent unauthorized access to resources
d) Provide data confidentiality

4) In TCP session hijacking, an attacker typically takes advantage of _____.
a) DNS vulnerabilities b) Network congestion
c) Unencrypted session tokens d) Buffer overflow

5) ARP attacks can lead to which of the following security issues?
a) Data encryption b) Session fixation
c) Man-in-the-Middle attacks d) SQL injection

6) Which of the following type of security attacks _____.
a) Modification b) Interception
c) None of above d) All of these

7) What is the main purpose of a cipher block mode of operation?
a) To generate keys
b) To enhance the security of block ciphers
c) To extend the size of the plaintext
d) To provide a random number generator

8) Which of the following is a primary use of S/MIME?
a) Encrypting web traffic
b) Securing email communications
c) Protecting file storage
d) Authenticating users in a network

9) RFC Stand for _____.
a) Request For Computer
b) Request For Commencement
c) Request For Copy
d) None of these

10) When a hash function is used to provide message authentication, the hash function value is referred to as _____.
a) Message Field
b) Message Digest
c) Message Score
d) Message Leap

11) The Interruption is the occurs when _____.
a) Integrity
b) Availability
c) Confidentiality
d) All of these

12) What is the purpose of the Encapsulating Security Payload (ESP) in IPsec?
a) To provide user authentication
b) To encrypt and authenticate data
c) To manage keys
d) To route packets

13) In IP Security (IPsec), what does the Authentication Header (AH) provide?
a) Confidentiality
b) Integrity and authentication
c) Non-repudiation
d) Compression

14) Which of the following algorithms is commonly used in PGP for encryption?
a) RSA
b) DES
c) AES
d) Blowfish

Seat No.	

Set **P**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I)
(Old) (CBCS) Examination: March/April – 2026
Network Security and Secure Coding (BTN03514)

Day & Date: Tuesday, 12-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data whenever necessary.

SECTION – I

Q.2 Attempt Any Four. **16**

a) Explain the security attack.
b) Explain the UDP Hijacking in detail
c) Write a short note on: Kerberos
d) Write a short note on ARP attack
e) Explain the man -in -the -middle attacks.

Q.3 Attempt Any Two. **12**

a) Explain the type of attacks.
b) Describe the digital signature and digital certificates.
c) Write a short on HMAC.

SECTION – II

Q.4 Attempt Any Four. **16**

a) Explain the pretty good privacy.
b) Explain the IP security architecture.
c) Write a short on: Fuzzing.
d) Explain the firewall design principle.
e) Explain the Intrusion Detection System.

Q.5 Attempt Any Two. **12**

a) Write notes on: S/MIME
b) Write a difference between attacks and defence in details.
c) Write notes on following.
i) Authentication header
ii) ESP (Encapsulating Security Payload)

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (Old) (CBCS) Examination: March/April – 2026
Network Security and Secure Coding (BTN03514)

Day & Date: Tuesday, 12-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) Which of the following is a primary use of S/MIME?
a) Encrypting web traffic
b) Securing email communications
c) Protecting file storage
d) Authenticating users in a network

2) RFC Stand for _____.
a) Request For Computer
b) Request For Commencement
c) Request For Copy
d) None of these

3) When a hash function is used to provide message authentication, the hash function value is referred to as _____.
a) Message Field b) Message Digest
c) Message Score d) Message Leap

4) The Interruption is the occurs when _____.
a) Integrity b) Availability
c) Confidentiality d) All of these

5) What is the purpose of the Encapsulating Security Payload (ESP) in IPsec?
a) To provide user authentication
b) To encrypt and authenticate data
c) To manage keys
d) To route packets

6) In IP Security (IPsec), what does the Authentication Header (AH) provide?
a) Confidentiality
b) Integrity and authentication
c) Non-repudiation
d) Compression

7) Which of the following algorithms is commonly used in PGP for encryption?
a) RSA
b) DES
c) AES
d) Blowfish

8) Which of the following is NOT a security service?
a) Confidentiality
b) Integrity
c) Replication
d) Non-repudiation

9) What type of attack involves intercepting and altering communication between two parties without their knowledge?
a) Denial of Service
b) Man-in-the-Middle
c) ARP Spoofing
d) Buffer Overflow

10) The primary purpose of access control is to _____.
a) Ensure data integrity
b) Maintain data availability
c) Prevent unauthorized access to resources
d) Provide data confidentiality

11) In TCP session hijacking, an attacker typically takes advantage of _____.
a) DNS vulnerabilities
b) Network congestion
c) Unencrypted session tokens
d) Buffer overflow

12) ARP attacks can lead to which of the following security issues?
a) Data encryption
b) Session fixation
c) Man-in-the-Middle attacks
d) SQL injection

13) Which of the following type of security attacks _____.
a) Modification
b) Interception
c) None of above
d) All of these

14) What is the main purpose of a cipher block mode of operation?
a) To generate keys
b) To enhance the security of block ciphers
c) To extend the size of the plaintext
d) To provide a random number generator

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I)
(Old) (CBCS) Examination: March/April – 2026
Network Security and Secure Coding (BTN03514)

Day & Date: Tuesday, 12-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data whenever necessary.

SECTION – I

Q.2 Attempt Any Four. **16**

a) Explain the security attack.
b) Explain the UDP Hijacking in detail
c) Write a short note on: Kerberos
d) Write a short note on ARP attack
e) Explain the man -in -the -middle attacks.

Q.3 Attempt Any Two. **12**

a) Explain the type of attacks.
b) Describe the digital signature and digital certificates.
c) Write a short on HMAC.

SECTION – II

Q.4 Attempt Any Four. **16**

a) Explain the pretty good privacy.
b) Explain the IP security architecture.
c) Write a short on: Fuzzing.
d) Explain the firewall design principle.
e) Explain the Intrusion Detection System.

Q.5 Attempt Any Two. **12**

a) Write notes on: S/MIME
b) Write a difference between attacks and defence in details.
c) Write notes on following.
i) Authentication header
ii) ESP (Encapsulating Security Payload)

Seat No.		Set	R

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (Old) (CBCS) Examination: March/April – 2026
Network Security and Secure Coding (BTN03514)

Day & Date: Tuesday, 12-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) The Interruption is the occurs when _____.
a) Integrity b) Availability
c) Confidentiality d) All of these

2) What is the purpose of the Encapsulating Security Payload (ESP) in IPsec?
a) To provide user authentication
b) To encrypt and authenticate data
c) To manage keys
d) To route packets

3) In IP Security (IPsec), what does the Authentication Header (AH) provide?
a) Confidentiality b) Integrity and authentication
c) Non-repudiation d) Compression

4) Which of the following algorithms is commonly used in PGP for encryption?
a) RSA b) DES
c) AES d) Blowfish

5) Which of the following is NOT a security service?
a) Confidentiality b) Integrity
c) Replication d) Non-repudiation

6) What type of attack involves intercepting and altering communication between two parties without their knowledge?
a) Denial of Service b) Man-in-the-Middle
c) ARP Spoofing d) Buffer Overflow

7) The primary purpose of access control is to _____.
   a) Ensure data integrity
   b) Maintain data availability
   c) Prevent unauthorized access to resources
   d) Provide data confidentiality

8) In TCP session hijacking, an attacker typically takes advantage of _____.
   a) DNS vulnerabilities
   b) Network congestion
   c) Unencrypted session tokens
   d) Buffer overflow

9) ARP attacks can lead to which of the following security issues?
   a) Data encryption
   b) Session fixation
   c) Man-in-the-Middle attacks
   d) SQL injection

10) Which of the following type of security attacks _____.
   a) Modification
   b) Interception
   c) None of above
   d) All of these

11) What is the main purpose of a cipher block mode of operation?
   a) To generate keys
   b) To enhance the security of block ciphers
   c) To extend the size of the plaintext
   d) To provide a random number generator

12) Which of the following is a primary use of S/MIME?
   a) Encrypting web traffic
   b) Securing email communications
   c) Protecting file storage
   d) Authenticating users in a network

13) RFC Stand for _____.
   a) Request For Computer
   b) Request For Commencement
   c) Request For Copy
   d) None of these

14) When a hash function is used to provide message authentication, the hash function value is referred to as _____.
   a) Message Field
   b) Message Digest
   c) Message Score
   d) Message Leap

Seat No.	

Set **R**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I)
(Old) (CBCS) Examination: March/April – 2026
Network Security and Secure Coding (BTN03514)

Day & Date: Tuesday, 12-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data whenever necessary.

SECTION – I

Q.2 Attempt Any Four. **16**

a) Explain the security attack.
b) Explain the UDP Hijacking in detail
c) Write a short note on: Kerberos
d) Write a short note on ARP attack
e) Explain the man -in -the -middle attacks.

Q.3 Attempt Any Two. **12**

a) Explain the type of attacks.
b) Describe the digital signature and digital certificates.
c) Write a short on HMAC.

SECTION – II

Q.4 Attempt Any Four. **16**

a) Explain the pretty good privacy.
b) Explain the IP security architecture.
c) Write a short on: Fuzzing.
d) Explain the firewall design principle.
e) Explain the Intrusion Detection System.

Q.5 Attempt Any Two. **12**

a) Write notes on: S/MIME
b) Write a difference between attacks and defence in details.
c) Write notes on following.
i) Authentication header
ii) ESP (Encapsulating Security Payload)

Seat No.	

Set | S

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (Old) (CBCS) Examination: March/April – 2026
Network Security and Secure Coding (BTN03514)

Day & Date: Tuesday, 12-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) Which of the following type of security attacks _____.
a) Modification b) Interception
c) None of above d) All of these

2) What is the main purpose of a cipher block mode of operation?
a) To generate keys
b) To enhance the security of block ciphers
c) To extend the size of the plaintext
d) To provide a random number generator

3) Which of the following is a primary use of S/MIME?
a) Encrypting web traffic
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c) Protecting file storage
d) Authenticating users in a network

4) RFC Stand for _____.
a) Request For Computer
b) Request For Commencement
c) Request For Copy
d) None of these

5) When a hash function is used to provide message authentication, the hash function value is referred to as _____.
a) Message Field b) Message Digest
c) Message Score d) Message Leap

6) The Interruption is the occurs when _____.
a) Integrity b) Availability
c) Confidentiality d) All of these

7) What is the purpose of the Encapsulating Security Payload (ESP) in IPsec?
a) To provide user authentication
b) To encrypt and authenticate data
c) To manage keys
d) To route packets

8) In IP Security (IPsec), what does the Authentication Header (AH) provide?
a) Confidentiality b) Integrity and authentication
c) Non-repudiation d) Compression

9) Which of the following algorithms is commonly used in PGP for encryption?
a) RSA b) DES
c) AES d) Blowfish

10) Which of the following is NOT a security service?
a) Confidentiality b) Integrity
c) Replication d) Non-repudiation

11) What type of attack involves intercepting and altering communication between two parties without their knowledge?
a) Denial of Service b) Man-in-the-Middle
c) ARP Spoofing d) Buffer Overflow

12) The primary purpose of access control is to _____.
a) Ensure data integrity
b) Maintain data availability
c) Prevent unauthorized access to resources
d) Provide data confidentiality

13) In TCP session hijacking, an attacker typically takes advantage of _____.
a) DNS vulnerabilities b) Network congestion
c) Unencrypted session tokens d) Buffer overflow

14) ARP attacks can lead to which of the following security issues?
a) Data encryption b) Session fixation
c) Man-in-the-Middle attacks d) SQL injection

SLR-QH-448

Seat No.		Set	S

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I)
(Old) (CBCS) Examination: March/April – 2026
Network Security and Secure Coding (BTN03514)

Day & Date: Tuesday, 12-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data whenever necessary.

SECTION – I

Q.2 Attempt Any Four. **16**

a) Explain the security attack.
b) Explain the UDP Hijacking in detail
c) Write a short note on: Kerberos
d) Write a short note on ARP attack
e) Explain the man -in -the -middle attacks.

Q.3 Attempt Any Two. **12**

a) Explain the type of attacks.
b) Describe the digital signature and digital certificates.
c) Write a short on HMAC.

SECTION – II

Q.4 Attempt Any Four. **16**

a) Explain the pretty good privacy.
b) Explain the IP security architecture.
c) Write a short on: Fuzzing.
d) Explain the firewall design principle.
e) Explain the Intrusion Detection System.

Q.5 Attempt Any Two. **12**

a) Write notes on: S/MIME
b) Write a difference between attacks and defence in details.
c) Write notes on following.
i) Authentication header
ii) ESP (Encapsulating Security Payload)

SLR-QH-454

Seat No.		Set	P

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Software Engineering (CSEPCC-10)

Day & Date: Friday, 15-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 MCQ Section: **14**

1) Consistent SRS means _____.
a) Structure allows easy change
b) Every requirement stated shall be met
c) Every requirement is verifiable
d) No conflicts between requirements

2) How set of interacting components can share data?
a) Model-view-controller b) Architecture pattern
c) Repository pattern d) None

3) Internal software quality from given below _____.
a) Scalability b) Usability
c) Reusability d) Reliability

4) Most important stakeholder?
a) Entry level personnel b) Middle level
c) Managers d) Users

5) SDLC stands for _____.
a) System Development Life Cycle
b) Software Development Life Cycle
c) Software Design Life Cycle
d) System Design Life Cycle

6) _____ defines auditing & reporting.
a) Quality Control b) Quality Assurance
c) Quality Assessment d) None

7) _____ analysis helps improve future.
a) Project closure b) Functional closure
c) Quality closure d) Risk

8) SRS provides reference for _____.
a) Verification b) Implementation
c) Validation d) Justification

9) Worst type of coupling _____.
a) Control b) Data
c) Content d) None

10) Property allowing adaptation to changes _____.
a) Maintainability b) Flexibility
c) Testability d) Portability

11) Model depicting system structure _____.
a) Data b) Structural
c) Context d) Behavioral

12) In what type of coupling, the complete data structure is passed from one module to another?
a) Control Coupling b) Stamp Coupling
c) External Coupling d) Content Coupling

13) Engineering design activities consists of which of the following?
a) Studying the SRS
b) Producing new models of the problem
c) Product design models
d) All of the mentioned

14) The "Time Boxing" of a scrum process is called _____.
a) Process Event b) Sprint
c) Cycle d) None of the mentioned

Seat No.	

Set **P**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Software Engineering (CSEPCC-10)

Day & Date: Friday, 15-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data whenever necessary.

SECTION – I

Q.2 Attempt (Any Three). **12**

a) Explain the role of Software Architecture.

b) What are the characteristics of a software process?

c) Explain the prototyping model. Give its strengths and weaknesses.

d) Explain the requirement process.

Q.3 Attempt (Any Two). **16**

a) Describe the Spiral Model of software development in detail.

b) Explain SRS components in detail.

c) What is cohesion? Describe all types of cohesion used in design.

SECTION – II

Q.4 Attempt (Any Three). **12**

a) Write a short note on CMM.

b) Write a short note on iterative project management life cycle.

c) Explain adaptive project management life cycle.

d) Explain quality concepts and quality planning.

Q.5 Attempt (Any Two). **16**

a) Explain software configuration management process in detail.

b) Explain unit testing.

c) Compare Agile and Scrum.

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Software Engineering (CSEPCC-10)

Day & Date: Friday, 15-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 MCQ Section: **14**

1) SRS provides reference for _____.
a) Verification b) Implementation
c) Validation d) Justification

2) Worst type of coupling _____.
a) Control b) Data
c) Content d) None

3) Property allowing adaptation to changes _____.
a) Maintainability b) Flexibility
c) Testability d) Portability

4) Model depicting system structure _____.
a) Data b) Structural
c) Context d) Behavioral

5) In what type of coupling, the complete data structure is passed from one module to another?
a) Control Coupling b) Stamp Coupling
c) External Coupling d) Content Coupling

6) Engineering design activities consists of which of the following?
a) Studying the SRS
b) Producing new models of the problem
c) Product design models
d) All of the mentioned

7) The "Time Boxing" of a scrum process is called _____.
a) Process Event b) Sprint
c) Cycle d) None of the mentioned

8) Consistent SRS means _____.
a) Structure allows easy change
b) Every requirement stated shall be met
c) Every requirement is verifiable
d) No conflicts between requirements

9) How set of interacting components can share data?
a) Model-view-controller b) Architecture pattern
c) Repository pattern d) None

10) Internal software quality from given below _____.
a) Scalability b) Usability
c) Reusability d) Reliability

11) Most important stakeholder?
a) Entry level personnel b) Middle level
c) Managers d) Users

12) SDLC stands for _____.
a) System Development Life Cycle
b) Software Development Life Cycle
c) Software Design Life Cycle
d) System Design Life Cycle

13) _____ defines auditing & reporting.
a) Quality Control b) Quality Assurance
c) Quality Assessment d) None

14) _____ analysis helps improve future.
a) Project closure b) Functional closure
c) Quality closure d) Risk

SLR-QH-454

Seat No.	

Set Q

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Software Engineering (CSEPCC-10)

Day & Date: Friday, 15-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data whenever necessary.

SECTION – I

Q.2 Attempt (Any Three). **12**

a) Explain the role of Software Architecture.

b) What are the characteristics of a software process?

c) Explain the prototyping model. Give its strengths and weaknesses.

d) Explain the requirement process.

Q.3 Attempt (Any Two). **16**

a) Describe the Spiral Model of software development in detail.

b) Explain SRS components in detail.

c) What is cohesion? Describe all types of cohesion used in design.

SECTION – II

Q.4 Attempt (Any Three). **12**

a) Write a short note on CMM.

b) Write a short note on iterative project management life cycle.

c) Explain adaptive project management life cycle.

d) Explain quality concepts and quality planning.

Q.5 Attempt (Any Two). **16**

a) Explain software configuration management process in detail.

b) Explain unit testing.

c) Compare Agile and Scrum.

Seat No.	

Set **R**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Software Engineering (CSEPCC-10)

Day & Date: Friday, 15-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 MCQ Section: **14**

1) Model depicting system structure _____.
a) Data b) Structural
c) Context d) Behavioral

2) In what type of coupling, the complete data structure is passed from one module to another?
a) Control Coupling b) Stamp Coupling
c) External Coupling d) Content Coupling

3) Engineering design activities consists of which of the following?
a) Studying the SRS
b) Producing new models of the problem
c) Product design models
d) All of the mentioned

4) The "Time Boxing" of a scrum process is called _____.
a) Process Event b) Sprint
c) Cycle d) None of the mentioned

5) Consistent SRS means _____.
a) Structure allows easy change
b) Every requirement stated shall be met
c) Every requirement is verifiable
d) No conflicts between requirements

6) How set of interacting components can share data?
a) Model-view-controller b) Architecture pattern
c) Repository pattern d) None

7) Internal software quality from given below _____.
a) Scalability b) Usability
c) Reusability d) Reliability

8) Most important stakeholder?
a) Entry level personnel b) Middle level
c) Managers d) Users

9) SDLC stands for _____.
a) System Development Life Cycle
b) Software Development Life Cycle
c) Software Design Life Cycle
d) System Design Life Cycle

10) _____ defines auditing & reporting.
a) Quality Control b) Quality Assurance
c) Quality Assessment d) None

11) _____ analysis helps improve future.
a) Project closure b) Functional closure
c) Quality closure d) Risk

12) SRS provides reference for _____.
a) Verification b) Implementation
c) Validation d) Justification

13) Worst type of coupling _____.
a) Control b) Data
c) Content d) None

14) Property allowing adaptation to changes _____.
a) Maintainability b) Flexibility
c) Testability d) Portability

Seat No.	

Set **R**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Software Engineering (CSEPCC-10)

Day & Date: Friday, 15-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data whenever necessary.

SECTION – I

Q.2 Attempt (Any Three). **12**

a) Explain the role of Software Architecture.

b) What are the characteristics of a software process?

c) Explain the prototyping model. Give its strengths and weaknesses.

d) Explain the requirement process.

Q.3 Attempt (Any Two). **16**

a) Describe the Spiral Model of software development in detail.

b) Explain SRS components in detail.

c) What is cohesion? Describe all types of cohesion used in design.

SECTION – II

Q.4 Attempt (Any Three). **12**

a) Write a short note on CMM.

b) Write a short note on iterative project management life cycle.

c) Explain adaptive project management life cycle.

d) Explain quality concepts and quality planning.

Q.5 Attempt (Any Two). **16**

a) Explain software configuration management process in detail.

b) Explain unit testing.

c) Compare Agile and Scrum.

SLR-QH-454

Seat No.		Set	S

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Software Engineering (CSEPCC-10)

Day & Date: Friday, 15-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 MCQ Section: **14**

1) _____ defines auditing & reporting.
a) Quality Control b) Quality Assurance
c) Quality Assessment d) None

2) _____ analysis helps improve future.
a) Project closure b) Functional closure
c) Quality closure d) Risk

3) SRS provides reference for _____.
a) Verification b) Implementation
c) Validation d) Justification

4) Worst type of coupling _____.
a) Control b) Data
c) Content d) None

5) Property allowing adaptation to changes _____.
a) Maintainability b) Flexibility
c) Testability d) Portability

6) Model depicting system structure _____.
a) Data b) Structural
c) Context d) Behavioral

7) In what type of coupling, the complete data structure is passed from one module to another?
a) Control Coupling b) Stamp Coupling
c) External Coupling d) Content Coupling

8) Engineering design activities consists of which of the following?
   a) Studying the SRS
   b) Producing new models of the problem
   c) Product design models
   d) All of the mentioned

9) The "Time Boxing" of a scrum process is called _____.
   a) Process Event
   b) Sprint
   c) Cycle
   d) None of the mentioned

10) Consistent SRS means _____.
   a) Structure allows easy change
   b) Every requirement stated shall be met
   c) Every requirement is verifiable
   d) No conflicts between requirements

11) How set of interacting components can share data?
   a) Model-view-controller
   b) Architecture pattern
   c) Repository pattern
   d) None

12) Internal software quality from given below _____.
   a) Scalability
   b) Usability
   c) Reusability
   d) Reliability

13) Most important stakeholder?
   a) Entry level personnel
   b) Middle level
   c) Managers
   d) Users

14) SDLC stands for _____.
   a) System Development Life Cycle
   b) Software Development Life Cycle
   c) Software Design Life Cycle
   d) System Design Life Cycle

SLR-QH-454

Seat No.	

Set S

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Software Engineering (CSEPCC-10)

Day & Date: Friday, 15-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data whenever necessary.

SECTION – I

Q.2 Attempt (Any Three). **12**

a) Explain the role of Software Architecture.

b) What are the characteristics of a software process?

c) Explain the prototyping model. Give its strengths and weaknesses.

d) Explain the requirement process.

Q.3 Attempt (Any Two). **16**

a) Describe the Spiral Model of software development in detail.

b) Explain SRS components in detail.

c) What is cohesion? Describe all types of cohesion used in design.

SECTION – II

Q.4 Attempt (Any Three). **12**

a) Write a short note on CMM.

b) Write a short note on iterative project management life cycle.

c) Explain adaptive project management life cycle.

d) Explain quality concepts and quality planning.

Q.5 Attempt (Any Two). **16**

a) Explain software configuration management process in detail.

b) Explain unit testing.

c) Compare Agile and Scrum.

SLR-QH-455

Seat No.		Set	P

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Cloud Computing (CSEPCC-11)

Day & Date: Monday, 18-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Multiple Choice Questions. **14**

1) In the Seven-Step Model of Migration, which step involves identifying the applications to be moved?
a) Cloud Assessment b) Optimization
c) Testing d) Migration

2) Which cloud service model provides a platform for software development and deployment without managing underlying infrastructure?
a) IaaS b) PaaS
c) SaaS d) CaaS

3) Which AWS service is primarily used for scalable block storage for EC2 instances?
a) S3 b) EBS
c) Glacier d) RDS

4) The ability of a cloud system to handle growing amounts of work by adding resources is called _____.
a) Multi-tenancy b) Scalability
c) Virtualization d) Encapsulation

5) Which risk from Gartner's Seven Cloud Security Risks refers to not knowing where your data is physically stored?
a) Privileged user access b) Regulatory compliance
c) Data location d) Data recovery

6) What is the main purpose of a Hypervisor?
a) To manage network traffic
b) To run multiple OS on a single hardware
c) To encrypt data
d) To backup files

7) In a Hybrid Cloud, the organization usually uses _____.
a) Only AWS
b) Only Azure
c) Combination of Private and Public clouds
d) Local servers only

8) Which of these is a popular Open Source cloud infrastructure management tool?
a) Microsoft Azure
b) OpenStack
c) Google App Engine
d) Salesforce

9) CaaS in cloud computing stands for _____.
a) Containers as a Service
b) Compliance as a Service
c) Communication as a Service
d) Both a) and b)

10) Which legal issue is raised specifically by the physical location of data, in different countries?
a) Data Privacy
b) Jurisdictional Issues
c) Intellectual Property
d) SaaS lockout

11) To host a static website with high availability on AWS, which service is most cost-effective?
a) AWS EC2
b) AWS Lambda
c) AWS S3
d) AWS RDS

12) What defines an Identity in Cloud Identity Management?
a) A set of attributes related to an entity
b) A password
c) An IP address
d) A digital signature

13) ROI in the context of Cloud Business Perspective stands for _____.
a) Rate of Interest
b) Return on Investment
c) Risk of Integration
d) Resource on Internet

14) Which of the following is a core component of OpenStack responsible for providing compute instances (Virtual Machines)?
a) Swift
b) Neutron
c) Nova
d) Cinder

Seat No.	

Set **P**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Cloud Computing (CSEPCC-11)

Day & Date: Monday, 18-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data whenever necessary.

SECTION – I

Q.2 Attempt Any Three. **12**

a) Explain the different layers of cloud computing (IaaS, PaaS, SaaS) with a suitable real- world example for each.

b) What are the desired features of a cloud computing environment?

c) Differentiate between Private Cloud and Public Cloud deployment models based on their characteristics, management, and target users.

d) List and briefly explain the six steps of the Seven-Step Model of Migration into a Cloud (Explain any six).

e) Defining Compliance as a Service (CaaS) with example.

Q.3 Attempt Any Two. **16**

a) Define Identity as a Service (IDaaS) and Compliance as a Service (CaaS) with examples.

b) Discuss the criteria for when to opt for Public Cloud services versus Private Cloud.

c) Explain Virtual Machine Migration Services.

SECTION – II

Q.4 Attempt Any Three. **12**

a) List and briefly describe any four of Gartner’s Seven Cloud Computing Security Risks.

b) Explain the concept of the "Security Boundary" and "Security Service Boundary" in cloud computing.

c) Discuss the key considerations a business must evaluate when "Establishing a Cloud Vision" and "Buying Cloud Services."

d) Explain the "Jurisdictional Issues” raised by virtualization and data location. How does the physical location of data center impact data privacy and security?

e) What is meant by Building ROI from Cloud Computing"? Discuss the major challenges businesses face when trying to calculate the financial benefits of migrating to the cloud.

Q.5 Attempt Any Two. **16**

a) Discuss the various techniques for securing data in cloud computing with special reference to brokered cloud storage access and encryption.

b) Discuss the challenges in cloud computing adoption and real-world use cases of cloud computing in business.

c) Explain the business perspective of cloud adoption. Why should organizations move to the cloud? Discuss the process of establishing cloud vision.

SLR-QH-455

Seat No.	

Set Q

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Cloud Computing (CSEPCC-11)

Day & Date: Monday, 18-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Multiple Choice Questions. **14**

1) Which of these is a popular Open Source cloud infrastructure management tool?
a) Microsoft Azure b) OpenStack
c) Google App Engine d) Salesforce

2) CaaS in cloud computing stands for _____.
a) Containers as a Service b) Compliance as a Service
c) Communication as a Service d) Both a) and b)

3) Which legal issue is raised specifically by the physical location of data, in different countries?
a) Data Privacy b) Jurisdictional Issues
c) Intellectual Property d) SaaS lockout

4) To host a static website with high availability on AWS, which service is most cost-effective?
a) AWS EC2 b) AWS Lambda
c) AWS S3 d) AWS RDS

5) What defines an Identity in Cloud Identity Management?
a) A set of attributes related to an entity
b) A password
c) An IP address
d) A digital signature

6) ROI in the context of Cloud Business Perspective stands for _____.
a) Rate of Interest b) Return on Investment
c) Risk of Integration d) Resource on Internet

7) Which of the following is a core component of OpenStack responsible for providing compute instances (Virtual Machines)?
a) Swift
b) Neutron
c) Nova
d) Cinder

8) In the Seven-Step Model of Migration, which step involves identifying the applications to be moved?
a) Cloud Assessment
b) Optimization
c) Testing
d) Migration

9) Which cloud service model provides a platform for software development and deployment without managing underlying infrastructure?
a) IaaS
b) PaaS
c) SaaS
d) CaaS

10) Which AWS service is primarily used for scalable block storage for EC2 instances?
a) S3
b) EBS
c) Glacier
d) RDS

11) The ability of a cloud system to handle growing amounts of work by adding resources is called _____.
a) Multi-tenancy
b) Scalability
c) Virtualization
d) Encapsulation

12) Which risk from Gartner's Seven Cloud Security Risks refers to not knowing where your data is physically stored?
a) Privileged user access
b) Regulatory compliance
c) Data location
d) Data recovery

13) What is the main purpose of a Hypervisor?
a) To manage network traffic
b) To run multiple OS on a single hardware
c) To encrypt data
d) To backup files

14) In a Hybrid Cloud, the organization usually uses _____.
a) Only AWS
b) Only Azure
c) Combination of Private and Public clouds
d) Local servers only

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Cloud Computing (CSEPCC-11)

Day & Date: Monday, 18-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data whenever necessary.

SECTION – I

Q.2 Attempt Any Three. **12**

a) Explain the different layers of cloud computing (IaaS, PaaS, SaaS) with a suitable real- world example for each.

b) What are the desired features of a cloud computing environment?

c) Differentiate between Private Cloud and Public Cloud deployment models based on their characteristics, management, and target users.

d) List and briefly explain the six steps of the Seven-Step Model of Migration into a Cloud (Explain any six).

e) Defining Compliance as a Service (CaaS) with example.

Q.3 Attempt Any Two. **16**

a) Define Identity as a Service (IDaaS) and Compliance as a Service (CaaS) with examples.

b) Discuss the criteria for when to opt for Public Cloud services versus Private Cloud.

c) Explain Virtual Machine Migration Services.

SECTION – II

Q.4 Attempt Any Three. **12**

a) List and briefly describe any four of Gartner’s Seven Cloud Computing Security Risks.

b) Explain the concept of the "Security Boundary" and "Security Service Boundary" in cloud computing.

c) Discuss the key considerations a business must evaluate when "Establishing a Cloud Vision" and "Buying Cloud Services."

d) Explain the "Jurisdictional Issues” raised by virtualization and data location. How does the physical location of data center impact data privacy and security?

e) What is meant by Building ROI from Cloud Computing"? Discuss the major challenges businesses face when trying to calculate the financial benefits of migrating to the cloud.

Q.5 Attempt Any Two. **16**

a) Discuss the various techniques for securing data in cloud computing with special reference to brokered cloud storage access and encryption.

b) Discuss the challenges in cloud computing adoption and real-world use cases of cloud computing in business.

c) Explain the business perspective of cloud adoption. Why should organizations move to the cloud? Discuss the process of establishing cloud vision.

Seat No.	

Set **R**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Cloud Computing (CSEPCC-11)

Day & Date: Monday, 18-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Multiple Choice Questions. **14**

1) To host a static website with high availability on AWS, which service is most cost-effective?
a) AWS EC2 b) AWS Lambda
c) AWS S3 d) AWS RDS

2) What defines an Identity in Cloud Identity Management?
a) A set of attributes related to an entity
b) A password
c) An IP address
d) A digital signature

3) ROI in the context of Cloud Business Perspective stands for _____.
a) Rate of Interest b) Return on Investment
c) Risk of Integration d) Resource on Internet

4) Which of the following is a core component of OpenStack responsible for providing compute instances (Virtual Machines)?
a) Swift b) Neutron
c) Nova d) Cinder

5) In the Seven-Step Model of Migration, which step involves identifying the applications to be moved?
a) Cloud Assessment b) Optimization
c) Testing d) Migration

6) Which cloud service model provides a platform for software development and deployment without managing underlying infrastructure?
a) IaaS b) PaaS
c) SaaS d) CaaS

7) Which AWS service is primarily used for scalable block storage for EC2 instances?
a) S3 b) EBS
c) Glacier d) RDS

8) The ability of a cloud system to handle growing amounts of work by adding resources is called _____.
a) Multi-tenancy b) Scalability
c) Virtualization d) Encapsulation

9) Which risk from Gartner's Seven Cloud Security Risks refers to not knowing where your data is physically stored?
a) Privileged user access b) Regulatory compliance
c) Data location d) Data recovery

10) What is the main purpose of a Hypervisor?
a) To manage network traffic
b) To run multiple OS on a single hardware
c) To encrypt data
d) To backup files

11) In a Hybrid Cloud, the organization usually uses _____.
a) Only AWS
b) Only Azure
c) Combination of Private and Public clouds
d) Local servers only

12) Which of these is a popular Open Source cloud infrastructure management tool?
a) Microsoft Azure b) OpenStack
c) Google App Engine d) Salesforce

13) CaaS in cloud computing stands for _____.
a) Containers as a Service b) Compliance as a Service
c) Communication as a Service d) Both a) and b)

14) Which legal issue is raised specifically by the physical location of data, in different countries?
a) Data Privacy b) Jurisdictional Issues
c) Intellectual Property d) SaaS lockout

SLR-QH-455

Seat No.	

Set R

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Cloud Computing (CSEPCC-11)

Day & Date: Monday, 18-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data whenever necessary.

SECTION – I

Q.2 Attempt Any Three. **12**

a) Explain the different layers of cloud computing (IaaS, PaaS, SaaS) with a suitable real- world example for each.

b) What are the desired features of a cloud computing environment?

c) Differentiate between Private Cloud and Public Cloud deployment models based on their characteristics, management, and target users.

d) List and briefly explain the six steps of the Seven-Step Model of Migration into a Cloud (Explain any six).

e) Defining Compliance as a Service (CaaS) with example.

Q.3 Attempt Any Two. **16**

a) Define Identity as a Service (IDaaS) and Compliance as a Service (CaaS) with examples.

b) Discuss the criteria for when to opt for Public Cloud services versus Private Cloud.

c) Explain Virtual Machine Migration Services.

SECTION – II

Q.4 Attempt Any Three. **12**

a) List and briefly describe any four of Gartner’s Seven Cloud Computing Security Risks.

b) Explain the concept of the "Security Boundary" and "Security Service Boundary" in cloud computing.

c) Discuss the key considerations a business must evaluate when "Establishing a Cloud Vision" and "Buying Cloud Services."

d) Explain the "Jurisdictional Issues” raised by virtualization and data location. How does the physical location of data center impact data privacy and security?

e) What is meant by Building ROI from Cloud Computing"? Discuss the major challenges businesses face when trying to calculate the financial benefits of migrating to the cloud.

Q.5 Attempt Any Two. **16**

a) Discuss the various techniques for securing data in cloud computing with special reference to brokered cloud storage access and encryption.

b) Discuss the challenges in cloud computing adoption and real-world use cases of cloud computing in business.

c) Explain the business perspective of cloud adoption. Why should organizations move to the cloud? Discuss the process of establishing cloud vision.

Seat No.		Set	S

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Cloud Computing (CSEPCC-11)

Day & Date: Monday, 18-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Multiple Choice Questions. **14**

1) What is the main purpose of a Hypervisor?
a) To manage network traffic
b) To run multiple OS on a single hardware
c) To encrypt data
d) To backup files

2) In a Hybrid Cloud, the organization usually uses _____.
a) Only AWS
b) Only Azure
c) Combination of Private and Public clouds
d) Local servers only

3) Which of these is a popular Open Source cloud infrastructure management tool?
a) Microsoft Azure b) OpenStack
c) Google App Engine d) Salesforce

4) CaaS in cloud computing stands for _____.
a) Containers as a Service b) Compliance as a Service
c) Communication as a Service d) Both a) and b)

5) Which legal issue is raised specifically by the physical location of data, in different countries?
a) Data Privacy b) Jurisdictional Issues
c) Intellectual Property d) SaaS lockout

6) To host a static website with high availability on AWS, which service is most cost-effective?
a) AWS EC2 b) AWS Lambda
c) AWS S3 d) AWS RDS

7) What defines an Identity in Cloud Identity Management?
a) A set of attributes related to an entity
b) A password
c) An IP address
d) A digital signature

8) ROI in the context of Cloud Business Perspective stands for _____.
a) Rate of Interest b) Return on Investment
c) Risk of Integration d) Resource on Internet

9) Which of the following is a core component of OpenStack responsible for providing compute instances (Virtual Machines)?
a) Swift b) Neutron
c) Nova d) Cinder

10) In the Seven-Step Model of Migration, which step involves identifying the applications to be moved?
a) Cloud Assessment b) Optimization
c) Testing d) Migration

11) Which cloud service model provides a platform for software development and deployment without managing underlying infrastructure?
a) IaaS b) PaaS
c) SaaS d) CaaS

12) Which AWS service is primarily used for scalable block storage for EC2 instances?
a) S3 b) EBS
c) Glacier d) RDS

13) The ability of a cloud system to handle growing amounts of work by adding resources is called _____.
a) Multi-tenancy b) Scalability
c) Virtualization d) Encapsulation

14) Which risk from Gartner's Seven Cloud Security Risks refers to not knowing where your data is physically stored?
a) Privileged user access b) Regulatory compliance
c) Data location d) Data recovery

Seat No.	

Set **S**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Cloud Computing (CSEPCC-11)

Day & Date: Monday, 18-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data whenever necessary.

SECTION – I

Q.2 Attempt Any Three. **12**

a) Explain the different layers of cloud computing (IaaS, PaaS, SaaS) with a suitable real- world example for each.

b) What are the desired features of a cloud computing environment?

c) Differentiate between Private Cloud and Public Cloud deployment models based on their characteristics, management, and target users.

d) List and briefly explain the six steps of the Seven-Step Model of Migration into a Cloud (Explain any six).

e) Defining Compliance as a Service (CaaS) with example.

Q.3 Attempt Any Two. **16**

a) Define Identity as a Service (IDaaS) and Compliance as a Service (CaaS) with examples.

b) Discuss the criteria for when to opt for Public Cloud services versus Private Cloud.

c) Explain Virtual Machine Migration Services.

SECTION – II

Q.4 Attempt Any Three. **12**

a) List and briefly describe any four of Gartner’s Seven Cloud Computing Security Risks.

b) Explain the concept of the "Security Boundary" and "Security Service Boundary" in cloud computing.

c) Discuss the key considerations a business must evaluate when "Establishing a Cloud Vision" and "Buying Cloud Services."

d) Explain the "Jurisdictional Issues” raised by virtualization and data location. How does the physical location of data center impact data privacy and security?

e) What is meant by Building ROI from Cloud Computing"? Discuss the major challenges businesses face when trying to calculate the financial benefits of migrating to the cloud.

Q.5 Attempt Any Two. **16**

a) Discuss the various techniques for securing data in cloud computing with special reference to brokered cloud storage access and encryption.

b) Discuss the challenges in cloud computing adoption and real-world use cases of cloud computing in business.

c) Explain the business perspective of cloud adoption. Why should organizations move to the cloud? Discuss the process of establishing cloud vision.

SLR-QH-456

Seat No.	

Set P

T. Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
System software (CSEPCC-12)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answers from the given options. 14

1) Syntax Directed Definition (SDD) contains _____.
a) Syntax Analysis b) Semantic Analysis
c) Code Optimization d) None of these

2) Peephole optimization is an effective technique for _____ improving the target code.
a) locally b) globally
c) both a) and b) d) processor

3) The main advantage of a two-pass assembler over a single-pass assembler is _____.
a) Faster execution time
b) Reduced memory usage
c) Ability to handle forward references easily
d) Elimination of symbol tables

4) Which table is crucial for resolving symbolic addresses during assembly?
a) Literal table b) Opcode table
c) Symbol table d) Relocation table

5) Which of the following is a common intermediate representation suitable for code generation?
a) Parse Tree b) Syntax Tree
c) Three Address Code d) Regular Expression

6) The main objective of memory management in an operating system is to _____.
   a) Maximize CPU speed
   b) Minimize disk usage
   c) Efficiently allocate and protect memory
   d) Eliminate deadlocks

7) Which of the following is advanced assembler directives?
   a) START
   b) READ
   c) EQU
   d) PRINT

8) The special type of loader that is executed when a computer is first turned on or restarted is called?
   a) Absolute loader
   b) Bootstrap loader
   c) Relative loader
   d) Link Loader

9) What is the output of Syntax Analyzer?
   a) Token Stream
   b) Parse Tree
   c) Intermediate Code
   d) Machine Code

10) _____ are generated as output of Semantic Analysis.
   a) Parse Trees
   b) Tokens
   c) Sequence of actions
   d) Intermediate Representation

11) Syntax-directed translation is based on: _____.
   a) Grammar rules
   b) Regular expressions
   c) Finite automata
   d) Tokens

12) What is the transition function mapping for a DFA?
   a) $\mathrm{E} \rightarrow \mathrm{Q} \rightarrow \mathrm{Q}$
   b) $Q^*E \rightarrow Q$
   c) $Q^*Q \rightarrow E$
   d) $E^*E \rightarrow Q$

13) Which structure helps in code generation?
   a) Symbol table
   b) Syntax tree
   c) Intermediate code
   d) All of these

14) In which type of linking are external references resolved only when the CPU executes the external call?
   a) Static Linking
   b) Dynamic Linking
   c) Pre-Linking
   d) Static Loading

SLR-QH-456

Seat No.	

Set P

T. Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
System software (CSEPCC-12)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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

SECTION – I

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

a) Describe Elements of Assembly Language.

b) What is Loader? Explain types of Loader.

c) What is symbol table and address binding in system software?

d) What is System Call? Explain its role in system software.

e) What is system software? Explain the role of system software.

Q.3 Solve the following. (Any Two) **12**

a) Compare System Software Vs Application Software.

b) Draw and explain the design and working of an assembler.

c) What is a macro? What is macro call and its definition? What is macro expansion?

SECTION – II

Q.4 Solve the following. (Any Four) **16**

a) What is Lexical Analysis? Explain Tokens and Lexical Errors in detail.

b) Compare Top down parsing Vs Bottom up parsing.

c) What is code optimization? Explain local and global optimization.

d) What is a linker? Explain the working of linker.

e) What is peephole optimization? Explain with its types.

Q.5 Solve the following. (Any Two) **12**

a) Explain in detail with Diagram Phases of compiler.

b) Explain code generation technique in design of compiler.

c) Explain two pass assembler in detail.

SLR-QH-456

Seat No.	

Set Q

T. Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
System software (CSEPCC-12)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answers from the given options. 14

1) The special type of loader that is executed when a computer is first turned on or restarted is called?
a) Absolute loader b) Bootstrap loader
c) Relative loader d) Link Loader

2) What is the output of Syntax Analyzer?
a) Token Stream b) Parse Tree
c) Intermediate Code d) Machine Code

3) _____ are generated as output of Semantic Analysis.
a) Parse Trees b) Tokens
c) Sequence of actions d) Intermediate Representation

4) Syntax-directed translation is based on: _____.
a) Grammar rules b) Regular expressions
c) Finite automata d) Tokens

5) What is the transition function mapping for a DFA?
a) $\mathrm{E} \rightarrow \mathrm{Q} \rightarrow \mathrm{Q}$ b) $Q^{*}E \rightarrow Q$
c) $Q^{*}Q \rightarrow E$ d) $E^{*}E \rightarrow Q$

6) Which structure helps in code generation?
a) Symbol table b) Syntax tree
c) Intermediate code d) All of these

7) In which type of linking are external references resolved only when the CPU executes the external call?
a) Static Linking b) Dynamic Linking
c) Pre-Linking d) Static Loading

8) Syntax Directed Definition (SDD) contains _____.
a) Syntax Analysis
b) Semantic Analysis
c) Code Optimization
d) None of these

9) Peephole optimization is an effective technique for _____ improving the target code.
a) locally
b) globally
c) both a) and b)
d) processor

10) The main advantage of a two-pass assembler over a single-pass assembler is _____.
a) Faster execution time
b) Reduced memory usage
c) Ability to handle forward references easily
d) Elimination of symbol tables

11) Which table is crucial for resolving symbolic addresses during assembly?
a) Literal table
b) Opcode table
c) Symbol table
d) Relocation table

12) Which of the following is a common intermediate representation suitable for code generation?
a) Parse Tree
b) Syntax Tree
c) Three Address Code
d) Regular Expression

13) The main objective of memory management in an operating system is to _____.
a) Maximize CPU speed
b) Minimize disk usage
c) Efficiently allocate and protect memory
d) Eliminate deadlocks

14) Which of the following is advanced assembler directives?
a) START
b) READ
c) EQU
d) PRINT

SLR-QH-456

Seat No.	

Set Q

T. Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
System software (CSEPCC-12)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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

SECTION – I

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

a) Describe Elements of Assembly Language.

b) What is Loader? Explain types of Loader.

c) What is symbol table and address binding in system software?

d) What is System Call? Explain its role in system software.

e) What is system software? Explain the role of system software.

Q.3 Solve the following. (Any Two) **12**

a) Compare System Software Vs Application Software.

b) Draw and explain the design and working of an assembler.

c) What is a macro? What is macro call and its definition? What is macro expansion?

SECTION – II

Q.4 Solve the following. (Any Four) **16**

a) What is Lexical Analysis? Explain Tokens and Lexical Errors in detail.

b) Compare Top down parsing Vs Bottom up parsing.

c) What is code optimization? Explain local and global optimization.

d) What is a linker? Explain the working of linker.

e) What is peephole optimization? Explain with its types.

Q.5 Solve the following. (Any Two) **12**

a) Explain in detail with Diagram Phases of compiler.

b) Explain code generation technique in design of compiler.

c) Explain two pass assembler in detail.

Seat No.	

Set **R**

T. Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
System software (CSEPCC-12)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) Syntax-directed translation is based on: _____.
a) Grammar rules b) Regular expressions
c) Finite automata d) Tokens

2) What is the transition function mapping for a DFA?
a) $\mathrm{E} \rightarrow \mathrm{Q} \rightarrow \mathrm{Q}$ b) $Q^*E \rightarrow Q$
c) $Q^*Q \rightarrow E$ d) $E^*E \rightarrow Q$

3) Which structure helps in code generation?
a) Symbol table b) Syntax tree
c) Intermediate code d) All of these

4) In which type of linking are external references resolved only when the CPU executes the external call?
a) Static Linking b) Dynamic Linking
c) Pre-Linking d) Static Loading

5) Syntax Directed Definition (SDD) contains _____.
a) Syntax Analysis b) Semantic Analysis
c) Code Optimization d) None of these

6) Peephole optimization is an effective technique for _____ improving the target code.
a) locally b) globally
c) both a) and b) d) processor

7) The main advantage of a two-pass assembler over a single-pass assembler is _____.
   a) Faster execution time
   b) Reduced memory usage
   c) Ability to handle forward references easily
   d) Elimination of symbol tables

8) Which table is crucial for resolving symbolic addresses during assembly?
   a) Literal table
   b) Opcode table
   c) Symbol table
   d) Relocation table

9) Which of the following is a common intermediate representation suitable for code generation?
   a) Parse Tree
   b) Syntax Tree
   c) Three Address Code
   d) Regular Expression

10) The main objective of memory management in an operating system is to _____.
   a) Maximize CPU speed
   b) Minimize disk usage
   c) Efficiently allocate and protect memory
   d) Eliminate deadlocks

11) Which of the following is advanced assembler directives?
   a) START
   b) READ
   c) EQU
   d) PRINT

12) The special type of loader that is executed when a computer is first turned on or restarted is called?
   a) Absolute loader
   b) Bootstrap loader
   c) Relative loader
   d) Link Loader

13) What is the output of Syntax Analyzer?
   a) Token Stream
   b) Parse Tree
   c) Intermediate Code
   d) Machine Code

14) _____ are generated as output of Semantic Analysis.
   a) Parse Trees
   b) Tokens
   c) Sequence of actions
   d) Intermediate Representation

SLR-QH-456

Seat No.	

Set R

T. Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
System software (CSEPCC-12)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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

SECTION – I

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

a) Describe Elements of Assembly Language.

b) What is Loader? Explain types of Loader.

c) What is symbol table and address binding in system software?

d) What is System Call? Explain its role in system software.

e) What is system software? Explain the role of system software.

Q.3 Solve the following. (Any Two) **12**

a) Compare System Software Vs Application Software.

b) Draw and explain the design and working of an assembler.

c) What is a macro? What is macro call and its definition? What is macro expansion?

SECTION – II

Q.4 Solve the following. (Any Four) **16**

a) What is Lexical Analysis? Explain Tokens and Lexical Errors in detail.

b) Compare Top down parsing Vs Bottom up parsing.

c) What is code optimization? Explain local and global optimization.

d) What is a linker? Explain the working of linker.

e) What is peephole optimization? Explain with its types.

Q.5 Solve the following. (Any Two) **12**

a) Explain in detail with Diagram Phases of compiler.

b) Explain code generation technique in design of compiler.

c) Explain two pass assembler in detail.

SLR-QH-456

Seat No.	

Set S

T. Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
System software (CSEPCC-12)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answers from the given options. 14

1) The main objective of memory management in an operating system is to _____.
a) Maximize CPU speed
b) Minimize disk usage
c) Efficiently allocate and protect memory
d) Eliminate deadlocks

2) Which of the following is advanced assembler directives?
a) START b) READ
c) EQU d) PRINT

3) The special type of loader that is executed when a computer is first turned on or restarted is called?
a) Absolute loader b) Bootstrap loader
c) Relative loader d) Link Loader

4) What is the output of Syntax Analyzer?
a) Token Stream b) Parse Tree
c) Intermediate Code d) Machine Code

5) _____ are generated as output of Semantic Analysis.
a) Parse Trees b) Tokens
c) Sequence of actions d) Intermediate Representation

6) Syntax-directed translation is based on: _____.
a) Grammar rules b) Regular expressions
c) Finite automata d) Tokens

7) What is the transition function mapping for a DFA?

a) $\mathrm{E} \rightarrow \mathrm{Q} \rightarrow \mathrm{Q}$ b) $Q^*E \rightarrow Q$

c) $Q^*Q \rightarrow E$ d) $E^*E \rightarrow Q$

8) Which structure helps in code generation?

a) Symbol table b) Syntax tree

c) Intermediate code d) All of these

9) In which type of linking are external references resolved only when the CPU executes the external call?

a) Static Linking b) Dynamic Linking

c) Pre-Linking d) Static Loading

10) Syntax Directed Definition (SDD) contains _____.

a) Syntax Analysis b) Semantic Analysis

c) Code Optimization d) None of these

11) Peephole optimization is an effective technique for _____ improving the target code.

a) locally b) globally

c) both a) and b) d) processor

12) The main advantage of a two-pass assembler over a single-pass assembler is _____.

a) Faster execution time

b) Reduced memory usage

c) Ability to handle forward references easily

d) Elimination of symbol tables

13) Which table is crucial for resolving symbolic addresses during assembly?

a) Literal table b) Opcode table

c) Symbol table d) Relocation table

14) Which of the following is a common intermediate representation suitable for code generation?

a) Parse Tree b) Syntax Tree

c) Three Address Code d) Regular Expression

SLR-QH-456

Seat No.		Set	S

T. Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
System software (CSEPCC-12)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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

SECTION – I

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

a) Describe Elements of Assembly Language.

b) What is Loader? Explain types of Loader.

c) What is symbol table and address binding in system software?

d) What is System Call? Explain its role in system software.

e) What is system software? Explain the role of system software.

Q.3 Solve the following. (Any Two) **12**

a) Compare System Software Vs Application Software.

b) Draw and explain the design and working of an assembler.

c) What is a macro? What is macro call and its definition? What is macro expansion?

SECTION – II

Q.4 Solve the following. (Any Four) **16**

a) What is Lexical Analysis? Explain Tokens and Lexical Errors in detail.

b) Compare Top down parsing Vs Bottom up parsing.

c) What is code optimization? Explain local and global optimization.

d) What is a linker? Explain the working of linker.

e) What is peephole optimization? Explain with its types.

Q.5 Solve the following. (Any Two) **12**

a) Explain in detail with Diagram Phases of compiler.

b) Explain code generation technique in design of compiler.

c) Explain two pass assembler in detail.

SLR-QH-457

Seat No.	

Set P

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Data Mining (CSEPEC-02A)

Day & Date: Friday, 22-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Data mining is a part of _____.
a) DBMS b) KDD
c) AI d) Statistics

2) Semi-structured data example _____.
a) XML b) Table
c) Image d) Audio

3) First step in data mining process _____.
a) Evaluation b) Data cleaning
c) Problem definition d) Deployment

4) Missing values handled in _____.
a) Integration b) Cleaning
c) Reduction d) Transformation

5) Apriori is used for _____.
a) Classification b) Clustering
c) Association d) Regression

6) FP-growth avoids _____.
a) Tree b) Candidate generation
c) Database d) Rules

7) ID3 uses _____.
a) Gini index b) Entropy
c) Distance d) Support

8) k-NN is _____.
a) Lazy learner b) Eager learner
c) Clustering d) Regression

9) k-means requires _____.
a) Labels
b) Distance measure
c) Rules
d) Trees

10) BIRCH is _____.
a) Classification
b) Clustering
c) Regression
d) Sampling

11) Confidence measures _____.
a) Frequency
b) Accuracy of rule
c) Distance
d) Error

12) Outliers are _____.
a) Normal points
b) Rare points
c) Frequent patterns
d) Clusters

13) Web crawler collects _____.
a) Data
b) Rules
c) Clusters
d) Noise

14) SVM is used for _____.
a) Clustering
b) Classification
c) Cleaning
d) Reduction

Seat No.	

Set **P**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Data Mining (CSEPEC-02A)

Day & Date: Friday, 22-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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

SECTION – I

Q.2 Attempt the following. (Any Three) **12**

a) Explain KDD process in detail.

b) Enlist & Explain Types of Data with suitable examples.

c) Explain the Data Cleaning of data preprocessing.

d) Explain the Decision Tree in detail.

Q.3 Attempt the following. (Any Two) **16**

a) Explain Apriori Algorithm with example.

b) Compare Data Mining and Machine Learning.

c) Explain classification techniques: Naive Bayes, k-NN, SVM.

SECTION – II

Q.4 Attempt the following. (Any Three) **12**

a) Explain cluster concept and its requirements.

b) Explain k-means algorithm.

c) State the difference Between Data Mining and Web Mining.

d) Explain types of web mining.

Q.5 Attempt the following. (Any Two) **16**

a) Explain hierarchical clustering (agglomerative and divisive).

b) Explain outlier detection clustering based approaches.

c) Explain FP-Growth algorithm.

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Data Mining (CSEPEC-02A)

Day & Date: Friday, 22-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) k-NN is _____.
a) Lazy learner b) Eager learner
c) Clustering d) Regression

2) k-means requires _____.
a) Labels b) Distance measure
c) Rules d) Trees

3) BIRCH is _____.
a) Classification b) Clustering
c) Regression d) Sampling

4) Confidence measures _____.
a) Frequency b) Accuracy of rule
c) Distance d) Error

5) Outliers are _____.
a) Normal points b) Rare points
c) Frequent patterns d) Clusters

6) Web crawler collects _____.
a) Data b) Rules
c) Clusters d) Noise

7) SVM is used for _____.
a) Clustering b) Classification
c) Cleaning d) Reduction

8) Data mining is a part of _____.
a) DBMS b) KDD
c) Al d) Statistics

9) Semi-structured data example _____.
a) XML b) Table
c) Image d) Audio

10) First step in data mining process _____.
a) Evaluation b) Data cleaning
c) Problem definition d) Deployment

11) Missing values handled in _____.
a) Integration b) Cleaning
c) Reduction d) Transformation

12) Apriori is used for _____.
a) Classification b) Clustering
c) Association d) Regression

13) FP-growth avoids _____.
a) Tree b) Candidate generation
c) Database d) Rules

14) ID3 uses _____.
a) Gini index b) Entropy
c) Distance d) Support

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Data Mining (CSEPEC-02A)

Day & Date: Friday, 22-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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

SECTION – I

Q.2 Attempt the following. (Any Three) **12**

a) Explain KDD process in detail.

b) Enlist & Explain Types of Data with suitable examples.

c) Explain the Data Cleaning of data preprocessing.

d) Explain the Decision Tree in detail.

Q.3 Attempt the following. (Any Two) **16**

a) Explain Apriori Algorithm with example.

b) Compare Data Mining and Machine Learning.

c) Explain classification techniques: Naive Bayes, k-NN, SVM.

SECTION – II

Q.4 Attempt the following. (Any Three) **12**

a) Explain cluster concept and its requirements.

b) Explain k-means algorithm.

c) State the difference Between Data Mining and Web Mining.

d) Explain types of web mining.

Q.5 Attempt the following. (Any Two) **16**

a) Explain hierarchical clustering (agglomerative and divisive).

b) Explain outlier detection clustering based approaches.

c) Explain FP-Growth algorithm.

Seat No.	

Set **R**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Data Mining (CSEPEC-02A)

Day & Date: Friday, 22-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Confidence measures _____.
a) Frequency b) Accuracy of rule
c) Distance d) Error

2) Outliers are _____.
a) Normal points b) Rare points
c) Frequent patterns d) Clusters

3) Web crawler collects _____.
a) Data b) Rules
c) Clusters d) Noise

4) SVM is used for _____.
a) Clustering b) Classification
c) Cleaning d) Reduction

5) Data mining is a part of _____.
a) DBMS b) KDD
c) Al d) Statistics

6) Semi-structured data example _____.
a) XML b) Table
c) Image d) Audio

7) First step in data mining process _____.
a) Evaluation b) Data cleaning
c) Problem definition d) Deployment

8) Missing values handled in _____.
a) Integration b) Cleaning
c) Reduction d) Transformation

9) Apriori is used for _____.
a) Classification
b) Clustering
c) Association
d) Regression

10) FP-growth avoids _____.
a) Tree
b) Candidate generation
c) Database
d) Rules

11) ID3 uses _____.
a) Gini index
b) Entropy
c) Distance
d) Support

12) k-NN is _____.
a) Lazy learner
b) Eager learner
c) Clustering
d) Regression

13) k-means requires _____.
a) Labels
b) Distance measure
c) Rules
d) Trees

14) BIRCH is _____.
a) Classification
b) Clustering
c) Regression
d) Sampling

Seat No.	

Set **R**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Data Mining (CSEPEC-02A)

Day & Date: Friday, 22-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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

SECTION – I

Q.2 Attempt the following. (Any Three) **12**

a) Explain KDD process in detail.

b) Enlist & Explain Types of Data with suitable examples.

c) Explain the Data Cleaning of data preprocessing.

d) Explain the Decision Tree in detail.

Q.3 Attempt the following. (Any Two) **16**

a) Explain Apriori Algorithm with example.

b) Compare Data Mining and Machine Learning.

c) Explain classification techniques: Naive Bayes, k-NN, SVM.

SECTION – II

Q.4 Attempt the following. (Any Three) **12**

a) Explain cluster concept and its requirements.

b) Explain k-means algorithm.

c) State the difference Between Data Mining and Web Mining.

d) Explain types of web mining.

Q.5 Attempt the following. (Any Two) **16**

a) Explain hierarchical clustering (agglomerative and divisive).

b) Explain outlier detection clustering based approaches.

c) Explain FP-Growth algorithm.

Seat No.	

Set **S**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Data Mining (CSEPEC-02A)

Day & Date: Friday, 22-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) FP-growth avoids _____.
a) Tree b) Candidate generation
c) Database d) Rules

2) ID3 uses _____.
a) Gini index b) Entropy
c) Distance d) Support

3) k-NN is _____.
a) Lazy learner b) Eager learner
c) Clustering d) Regression

4) k-means requires _____.
a) Labels b) Distance measure
c) Rules d) Trees

5) BIRCH is _____.
a) Classification b) Clustering
c) Regression d) Sampling

6) Confidence measures _____.
a) Frequency b) Accuracy of rule
c) Distance d) Error

7) Outliers are _____.
a) Normal points b) Rare points
c) Frequent patterns d) Clusters

8) Web crawler collects _____.
a) Data b) Rules
c) Clusters d) Noise

9) SVM is used for _____.
a) Clustering b) Classification
c) Cleaning d) Reduction

10) Data mining is a part of _____.
a) DBMS b) KDD
c) Al d) Statistics

11) Semi-structured data example _____.
a) XML b) Table
c) Image d) Audio

12) First step in data mining process _____.
a) Evaluation b) Data cleaning
c) Problem definition d) Deployment

13) Missing values handled in _____.
a) Integration b) Cleaning
c) Reduction d) Transformation

14) Apriori is used for _____.
a) Classification b) Clustering
c) Association d) Regression

Seat No.	

Set | S

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Data Mining (CSEPEC-02A)

Day & Date: Friday, 22-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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

SECTION – I

Q.2 Attempt the following. (Any Three) **12**

a) Explain KDD process in detail.

b) Enlist & Explain Types of Data with suitable examples.

c) Explain the Data Cleaning of data preprocessing.

d) Explain the Decision Tree in detail.

Q.3 Attempt the following. (Any Two) **16**

a) Explain Apriori Algorithm with example.

b) Compare Data Mining and Machine Learning.

c) Explain classification techniques: Naive Bayes, k-NN, SVM.

SECTION – II

Q.4 Attempt the following. (Any Three) **12**

a) Explain cluster concept and its requirements.

b) Explain k-means algorithm.

c) State the difference Between Data Mining and Web Mining.

d) Explain types of web mining.

Q.5 Attempt the following. (Any Two) **16**

a) Explain hierarchical clustering (agglomerative and divisive).

b) Explain outlier detection clustering based approaches.

c) Explain FP-Growth algorithm.

SLR-QH-458

Seat No.	

Set P

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Network Security (CSEPEC-02B)

Day & Date: Friday, 22-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) Use Caesar's Cipher to decipher the following
HQFUBSWHG WHAW
a) ABANDONED LOCK b) ENCRYPTED TEXT
c) ABANDONED TEXT d) ENCRYPTED LOCK

2) The use of a trusted third party to assure certain properties of a data exchange is known as _____.
a) Event Detection b) Trusted Functionality
c) Notarization d) Security Audit Trial

3) Traffic Analysis is _____.
a) Passive attack b) Active attack
c) Not an attack d) Security mechanism

4) Which asymmetric key cryptography algorithm is based on the discrete logarithm problem?
a) RSA
b) ECC (Elliptic Curve Cryptography)
c) Diffie-Hellman
d) ElGamal

5) If Amar wants to send an encrypted message to Rupali using a public key cryptosystem, which key does he use to encrypt the message?
a) Amar's public key b) Amar's private key
c) Rupali's public key d) Rupali's private key

6) Which algorithm produces a 160-bit hash value?
a) SHA-1 b) SHA-256
c) MD5 d) SHA-3

7) Which attack exploits hash collisions?
a) Birthday attack b) Replay attack
c) DoS attack d) Brute force attack

8) What is key characteristic of Message Authentication Code (MAC) Compared to Digital Signate _____.
a) MACs Provide non-repudiation
b) MACs can be used on public data
c) MACs are slower in processing
d) MACs are simpler to implement

9) Which is NOT a MAC application?
a) Data compression b) Message authentication
c) Integrity verification d) Secure communication

10) Encapsulating Security Payload (ESP) provides _____.
a) Confidentiality, integrity, and authentication
b) Only routing
c) Only compression
d) Only error detection

11) Which technique is used to encrypt emails in PGP?
a) Public key cryptography b) Compression
c) Routing d) Encoding

12) Access Requestor (AR) in NAC represents _____.
a) A routing device
b) A device requesting network access
c) A firewall
d) A switch

13) Endpoint security in NAC prevents _____.
a) Transmission delays
b) Packet routing errors
c) Compression failures
d) Infected devices from accessing network

14) Which attack involves fake emails from trusted source?
a) DoS b) Phishing
c) Sniffing d) Routing attack

Seat No.	

Set **P**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Network Security (CSEPEC-02B)

Day & Date: Friday, 22-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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

SECTION – I

Q.2 Attempt Any Four of the following. **16**

a) Using Caesar cipher encryption and decryption formula with $k = 3$ encrypt plaintext = "kolhapur" and decrypt the resulting ciphertext.

b) Explain the Working of S-boxes in DES algorithm.

c) Differentiate between symmetric and asymmetric encryption techniques.

d) What are the requirements of public key cryptosystem?

e) Explain how hash function used for message authentication.

Q.3 Attempt Any Two of the following. **12**

a) Explain the general Structure of AES with diagram.

b) Alice and Bob use the Diffie-Hellman key exchange technique with a common prime $q = 157$ and a primitive root $a = 5$.
i) If Alice has a private key $X_A = 15$, find her public key Y_A.
ii) If Bob has a private key $X_B = 27$, find his public key Y_B.
iii) What is the shared secret key between Alice and Bob?

c) Explain Message Digest Generation using SHA512.

SECTION – II

Q.4 Attempt Any Four of the following. **16**

a) With diagram explain internal and external error control technique to authenticate a digital medical report.

b) Explain the essential elements of digital signature process.

c) Explain various authentication methods of EAP.

d) Define IPSec. List the application of IPSec.

e) With Diagram explain Tunnel mode of ESP.

Q.5 Attempt Any Two of the following. **12**

a) Define message authentication code. Explain basic use of MAC with diagram.

b) Explain 802.1X Access Control mechanisms.

c) What is S/MIME? Explain S/MIME functionality and messages.

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Network Security (CSEPEC-02B)

Day & Date: Friday, 22-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) What is key characteristic of Message Authentication Code (MAC) Compared to Digital Signate _____.
a) MACs Provide non-repudiation
b) MACs can be used on public data
c) MACs are slower in processing
d) MACs are simpler to implement

2) Which is NOT a MAC application?
a) Data compression b) Message authentication
c) Integrity verification d) Secure communication

3) Encapsulating Security Payload (ESP) provides _____.
a) Confidentiality, integrity, and authentication
b) Only routing
c) Only compression
d) Only error detection

4) Which technique is used to encrypt emails in PGP?
a) Public key cryptography b) Compression
c) Routing d) Encoding

5) Access Requestor (AR) in NAC represents _____.
a) A routing device
b) A device requesting network access
c) A firewall
d) A switch

6) Endpoint security in NAC prevents _____.
   a) Transmission delays
   b) Packet routing errors
   c) Compression failures
   d) Infected devices from accessing network

7) Which attack involves fake emails from trusted source?
   a) DoS
   b) Phishing
   c) Sniffing
   d) Routing attack

8) Use Caesar's Cipher to decipher the following
HQFUBSWHG WHAW
   a) ABANDONED LOCK
   b) ENCRYPTED TEXT
   c) ABANDONED TEXT
   d) ENCRYPTED LOCK

9) The use of a trusted third party to assure certain properties of a data exchange is known as _____.
   a) Event Detection
   b) Trusted Functionality
   c) Notarization
   d) Security Audit Trial

10) Traffic Analysis is _____.
   a) Passive attack
   b) Active attack
   c) Not an attack
   d) Security mechanism

11) Which asymmetric key cryptography algorithm is based on the discrete logarithm problem?
   a) RSA
   b) ECC (Elliptic Curve Cryptography)
   c) Diffie-Hellman
   d) ElGamal

12) If Amar wants to send an encrypted message to Rupali using a public key cryptosystem, which key does he use to encrypt the message?
   a) Amar's public key
   b) Amar's private key
   c) Rupali's public key
   d) Rupali's private key

13) Which algorithm produces a 160-bit hash value?
   a) SHA-1
   b) SHA-256
   c) MD5
   d) SHA-3

14) Which attack exploits hash collisions?
   a) Birthday attack
   b) Replay attack
   c) DoS attack
   d) Brute force attack

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Network Security (CSEPEC-02B)

Day & Date: Friday, 22-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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

SECTION – I

Q.2 Attempt Any Four of the following. **16**

a) Using Caesar cipher encryption and decryption formula with $k = 3$ encrypt plaintext = "kolhapur" and decrypt the resulting ciphertext.

b) Explain the Working of S-boxes in DES algorithm.

c) Differentiate between symmetric and asymmetric encryption techniques.

d) What are the requirements of public key cryptosystem?

e) Explain how hash function used for message authentication.

Q.3 Attempt Any Two of the following. **12**

a) Explain the general Structure of AES with diagram.

b) Alice and Bob use the Diffie-Hellman key exchange technique with a common prime $q = 157$ and a primitive root $a = 5$.
i) If Alice has a private key $X_A = 15$, find her public key Y_A.
ii) If Bob has a private key $X_B = 27$, find his public key Y_B.
iii) What is the shared secret key between Alice and Bob?

c) Explain Message Digest Generation using SHA512.

SECTION – II

Q.4 Attempt Any Four of the following. **16**

a) With diagram explain internal and external error control technique to authenticate a digital medical report.

b) Explain the essential elements of digital signature process.

c) Explain various authentication methods of EAP.

d) Define IPSec. List the application of IPSec.

e) With Diagram explain Tunnel mode of ESP.

Q.5 Attempt Any Two of the following. **12**

a) Define message authentication code. Explain basic use of MAC with diagram.

b) Explain 802.1X Access Control mechanisms.

c) What is S/MIME? Explain S/MIME functionality and messages.

SLR-QH-458

Seat No.	

Set R

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Network Security (CSEPEC-02B)

Day & Date: Friday, 22-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) Which technique is used to encrypt emails in PGP?
a) Public key cryptography b) Compression
c) Routing d) Encoding

2) Access Requestor (AR) in NAC represents _____.
a) A routing device
b) A device requesting network access
c) A firewall
d) A switch

3) Endpoint security in NAC prevents _____.
a) Transmission delays
b) Packet routing errors
c) Compression failures
d) Infected devices from accessing network

4) Which attack involves fake emails from trusted source?
a) DoS b) Phishing
c) Sniffing d) Routing attack

5) Use Caesar's Cipher to decipher the following
HQFUBSWHG WHAW
a) ABANDONED LOCK b) ENCRYPTED TEXT
c) ABANDONED TEXT d) ENCRYPTED LOCK

6) The use of a trusted third party to assure certain properties of a data exchange is known as _____.
a) Event Detection b) Trusted Functionality
c) Notarization d) Security Audit Trial

7) Traffic Analysis is _____.
   a) Passive attack
   b) Active attack
   c) Not an attack
   d) Security mechanism

8) Which asymmetric key cryptography algorithm is based on the discrete logarithm problem?
   a) RSA
   b) ECC (Elliptic Curve Cryptography)
   c) Diffie-Hellman
   d) ElGamal

9) If Amar wants to send an encrypted message to Rupali using a public key cryptosystem, which key does he use to encrypt the message?
   a) Amar's public key
   b) Amar's private key
   c) Rupali's public key
   d) Rupali's private key

10) Which algorithm produces a 160-bit hash value?
   a) SHA-1
   b) SHA-256
   c) MD5
   d) SHA-3

11) Which attack exploits hash collisions?
   a) Birthday attack
   b) Replay attack
   c) DoS attack
   d) Brute force attack

12) What is key characteristic of Message Authentication Code (MAC) Compared to Digital Signate _____.
   a) MACs Provide non-repudiation
   b) MACs can be used on public data
   c) MACs are slower in processing
   d) MACs are simpler to implement

13) Which is NOT a MAC application?
   a) Data compression
   b) Message authentication
   c) Integrity verification
   d) Secure communication

14) Encapsulating Security Payload (ESP) provides _____.
   a) Confidentiality, integrity, and authentication
   b) Only routing
   c) Only compression
   d) Only error detection

SLR-QH-458

Seat No.	

Set R

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Network Security (CSEPEC-02B)

Day & Date: Friday, 22-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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

SECTION – I

Q.2 Attempt Any Four of the following. **16**

a) Using Caesar cipher encryption and decryption formula with $k = 3$ encrypt plaintext = "kolhapur" and decrypt the resulting ciphertext.

b) Explain the Working of S-boxes in DES algorithm.

c) Differentiate between symmetric and asymmetric encryption techniques.

d) What are the requirements of public key cryptosystem?

e) Explain how hash function used for message authentication.

Q.3 Attempt Any Two of the following. **12**

a) Explain the general Structure of AES with diagram.

b) Alice and Bob use the Diffie-Hellman key exchange technique with a common prime $q = 157$ and a primitive root $a = 5$.
i) If Alice has a private key $X_A = 15$, find her public key Y_A.
ii) If Bob has a private key $X_B = 27$, find his public key Y_B.
iii) What is the shared secret key between Alice and Bob?

c) Explain Message Digest Generation using SHA512.

SECTION – II

Q.4 Attempt Any Four of the following. **16**

a) With diagram explain internal and external error control technique to authenticate a digital medical report.

b) Explain the essential elements of digital signature process.

c) Explain various authentication methods of EAP.

d) Define IPSec. List the application of IPSec.

e) With Diagram explain Tunnel mode of ESP.

Q.5 Attempt Any Two of the following. **12**

a) Define message authentication code. Explain basic use of MAC with diagram.

b) Explain 802.1X Access Control mechanisms.

c) What is S/MIME? Explain S/MIME functionality and messages.

Seat No.	

Set **S**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Network Security (CSEPEC-02B)

Day & Date: Friday, 22-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) Which algorithm produces a 160-bit hash value?
a) SHA-1 b) SHA-256
c) MD5 d) SHA-3

2) Which attack exploits hash collisions?
a) Birthday attack b) Replay attack
c) DoS attack d) Brute force attack

3) What is key characteristic of Message Authentication Code (MAC) Compared to Digital Signate _____.
a) MACs Provide non-repudiation
b) MACs can be used on public data
c) MACs are slower in processing
d) MACs are simpler to implement

4) Which is NOT a MAC application?
a) Data compression b) Message authentication
c) Integrity verification d) Secure communication

5) Encapsulating Security Payload (ESP) provides _____.
a) Confidentiality, integrity, and authentication
b) Only routing
c) Only compression
d) Only error detection

6) Which technique is used to encrypt emails in PGP?
a) Public key cryptography b) Compression
c) Routing d) Encoding

7) Access Requestor (AR) in NAC represents _____.
   a) A routing device
   b) A device requesting network access
   c) A firewall
   d) A switch

8) Endpoint security in NAC prevents _____.
   a) Transmission delays
   b) Packet routing errors
   c) Compression failures
   d) Infected devices from accessing network

9) Which attack involves fake emails from trusted source?
   a) DoS
   b) Phishing
   c) Sniffing
   d) Routing attack

10) Use Caesar's Cipher to decipher the following
HQFUBSWHG WHAW
   a) ABANDONED LOCK
   b) ENCRYPTED TEXT
   c) ABANDONED TEXT
   d) ENCRYPTED LOCK

11) The use of a trusted third party to assure certain properties of a data exchange is known as _____.
   a) Event Detection
   b) Trusted Functionality
   c) Notarization
   d) Security Audit Trial

12) Traffic Analysis is _____.
   a) Passive attack
   b) Active attack
   c) Not an attack
   d) Security mechanism

13) Which asymmetric key cryptography algorithm is based on the discrete logarithm problem?
   a) RSA
   b) ECC (Elliptic Curve Cryptography)
   c) Diffie-Hellman
   d) ElGamal

14) If Amar wants to send an encrypted message to Rupali using a public key cryptosystem, which key does he use to encrypt the message?
   a) Amar's public key
   b) Amar's private key
   c) Rupali's public key
   d) Rupali's private key

SLR-QH-458

Seat No.	

Set S

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Network Security (CSEPEC-02B)

Day & Date: Friday, 22-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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

SECTION – I

Q.2 Attempt Any Four of the following. **16**

a) Using Caesar cipher encryption and decryption formula with $k = 3$ encrypt plaintext = "kolhapur" and decrypt the resulting ciphertext.

b) Explain the Working of S-boxes in DES algorithm.

c) Differentiate between symmetric and asymmetric encryption techniques.

d) What are the requirements of public key cryptosystem?

e) Explain how hash function used for message authentication.

Q.3 Attempt Any Two of the following. **12**

a) Explain the general Structure of AES with diagram.

b) Alice and Bob use the Diffie-Hellman key exchange technique with a common prime $q = 157$ and a primitive root $a = 5$.
i) If Alice has a private key $X_A = 15$, find her public key Y_A.
ii) If Bob has a private key $X_B = 27$, find his public key Y_B.
iii) What is the shared secret key between Alice and Bob?

c) Explain Message Digest Generation using SHA512.

SECTION – II

Q.4 Attempt Any Four of the following. **16**

a) With diagram explain internal and external error control technique to authenticate a digital medical report.

b) Explain the essential elements of digital signature process.

c) Explain various authentication methods of EAP.

d) Define IPSec. List the application of IPSec.

e) With Diagram explain Tunnel mode of ESP.

Q.5 Attempt Any Two of the following. **12**

a) Define message authentication code. Explain basic use of MAC with diagram.

b) Explain 802.1X Access Control mechanisms.

c) What is S/MIME? Explain S/MIME functionality and messages.

SLR-QH-461

Seat No.	

Set P

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Internet of Things (CSEPEC-03A)

Day & Date: Monday, 25-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which protocol is commonly used for lightweight IoT communication?
a) HTTP b) MQTT
c) FTP d) SMTP

2) The standard associated with Zigbee is _____.
a) IEEE 802.11 b) IEEE 802.15.4
c) IEEE 802.3 d) IEEE 802.15.1

3) Role of sensors in IoT physical design _____.
a) Processing b) Storage
c) Acquisition d) Security

4) RFID tags with no power source _____.
a) Active b) Semi-passive
c) Passive d) Static

5) 6LoWPAN enables IPv6 over _____.
a) Fiber b) Low-power wireless
c) Satellite d) Wired

6) Which layer provides end-to-end communication?
a) Logical b) Transport
c) Link d) Session

7) MQTT is _____ oriented.
a) Data b) Message
c) Network d) Device

8) CoAP is designed for _____.
a) Constrained devices b) High speed
c) Video d) Gaming

9) A major privacy concern in IoT _____.
a) Scalability b) Unauthorized access
c) Battery d) Latency

10) Which is NOT an IoT communication model _____.
a) Request-Response b) Exclusive Pair
c) Random-Access d) Push-Producer

11) In Value Creation, turning raw data into insight is _____.
a) Collection b) Analysis
c) Disposal d) Marketing

12) Which device acts as a bridge for Bluetooth to Internet?
a) Actuator b) IoT Gateway
c) RFID Tag d) Sensor

13) REST uses which style?
a) Stateful b) Stateless
c) Peer d) Mesh

14) Full form of LPWAN _____.
a) Low Power Wide Area Network
b) Local Power
c) Long Power
d) Low Protocol

Seat No.	

Set **P**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Internet of Things (CSEPEC-03A)

Day & Date: Monday, 25-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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

SECTION – I

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

a) Explain Characteristics of IoT with examples.

b) Define RFID and its system structure.

c) Distinguish between Sensors and Actuators.

d) Describe M2M communication block diagram.

e) Explain IoT level 2 architecture in detail.

Q.3 Attempt the following. (Any Two) **12**

a) Explain Role of Wireless Sensor Networks [WSNs].

b) What is Participatory Sensing? Explain how it is achieved?

c) Explain different communication technologies in IoT.

SECTION – II

Q.4 Attempt the following. (Any Four) **16**

a) Explain IEEE 802.15.4 in Zigbee. Explain applications also.

b) Explain layered attacker model.

c) Explain IoT privacy and vulnerabilities.

d) Explain Features of CoAP protocol.

e) What is security tomography? Explain its types in detail.

Q.5 Attempt the following. (Any Two) **12**

a) Explain Business model innovation for IoT.

b) Explain applications of IoT in Smart Cities.

c) Explain REST architecture in detail.

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Internet of Things (CSEPEC-03A)

Day & Date: Monday, 25-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) CoAP is designed for _____.
a) Constrained devices b) High speed
c) Video d) Gaming

2) A major privacy concern in IoT _____.
a) Scalability b) Unauthorized access
c) Battery d) Latency

3) Which is NOT an IoT communication model _____.
a) Request-Response b) Exclusive Pair
c) Random-Access d) Push-Producer

4) In Value Creation, turning raw data into insight is _____.
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c) Disposal d) Marketing

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c) Peer d) Mesh

7) Full form of LPWAN _____.
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b) Local Power
c) Long Power
d) Low Protocol

8) Which protocol is commonly used for lightweight IoT communication?
a) HTTP b) MQTT
c) FTP d) SMTP

9) The standard associated with Zigbee is _____.
a) IEEE 802.11 b) IEEE 802.15.4
c) IEEE 802.3 d) IEEE 802.15.1

10) Role of sensors in IoT physical design _____.
a) Processing b) Storage
c) Acquisition d) Security

11) RFID tags with no power source _____.
a) Active b) Semi-passive
c) Passive d) Static

12) 6LoWPAN enables IPv6 over _____.
a) Fiber b) Low-power wireless
c) Satellite d) Wired

13) Which layer provides end-to-end communication?
a) Logical b) Transport
c) Link d) Session

14) MQTT is _____ oriented.
a) Data b) Message
c) Network d) Device

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Internet of Things (CSEPEC-03A)

Day & Date: Monday, 25-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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

SECTION – I

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

a) Explain Characteristics of IoT with examples.

b) Define RFID and its system structure.

c) Distinguish between Sensors and Actuators.

d) Describe M2M communication block diagram.

e) Explain IoT level 2 architecture in detail.

Q.3 Attempt the following. (Any Two) **12**

a) Explain Role of Wireless Sensor Networks [WSNs].

b) What is Participatory Sensing? Explain how it is achieved?

c) Explain different communication technologies in IoT.

SECTION – II

Q.4 Attempt the following. (Any Four) **16**

a) Explain IEEE 802.15.4 in Zigbee. Explain applications also.

b) Explain layered attacker model.

c) Explain IoT privacy and vulnerabilities.

d) Explain Features of CoAP protocol.

e) What is security tomography? Explain its types in detail.

Q.5 Attempt the following. (Any Two) **12**

a) Explain Business model innovation for IoT.

b) Explain applications of IoT in Smart Cities.

c) Explain REST architecture in detail.

Seat No.	

Set **R**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Internet of Things (CSEPEC-03A)

Day & Date: Monday, 25-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) In Value Creation, turning raw data into insight is _____.
a) Collection b) Analysis
c) Disposal d) Marketing

2) Which device acts as a bridge for Bluetooth to Internet?
a) Actuator b) IoT Gateway
c) RFID Tag d) Sensor

3) REST uses which style?
a) Stateful b) Stateless
c) Peer d) Mesh

4) Full form of LPWAN _____.
a) Low Power Wide Area Network
b) Local Power
c) Long Power
d) Low Protocol

5) Which protocol is commonly used for lightweight IoT communication?
a) HTTP b) MQTT
c) FTP d) SMTP

6) The standard associated with Zigbee is _____.
a) IEEE 802.11 b) IEEE 802.15.4
c) IEEE 802.3 d) IEEE 802.15.1

7) Role of sensors in IoT physical design _____.
a) Processing b) Storage
c) Acquisition d) Security

8) RFID tags with no power source _____.
a) Active b) Semi-passive
c) Passive d) Static

9) 6LoWPAN enables IPv6 over _____.
a) Fiber b) Low-power wireless
c) Satellite d) Wired

10) Which layer provides end-to-end communication?
a) Logical b) Transport
c) Link d) Session

11) MQTT is _____ oriented.
a) Data b) Message
c) Network d) Device

12) CoAP is designed for _____.
a) Constrained devices b) High speed
c) Video d) Gaming

13) A major privacy concern in IoT _____.
a) Scalability b) Unauthorized access
c) Battery d) Latency

14) Which is NOT an IoT communication model _____.
a) Request-Response b) Exclusive Pair
c) Random-Access d) Push-Producer

Seat No.	

Set **R**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Internet of Things (CSEPEC-03A)

Day & Date: Monday, 25-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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

SECTION – I

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

a) Explain Characteristics of IoT with examples.

b) Define RFID and its system structure.

c) Distinguish between Sensors and Actuators.

d) Describe M2M communication block diagram.

e) Explain IoT level 2 architecture in detail.

Q.3 Attempt the following. (Any Two) **12**

a) Explain Role of Wireless Sensor Networks [WSNs].

b) What is Participatory Sensing? Explain how it is achieved?

c) Explain different communication technologies in IoT.

SECTION – II

Q.4 Attempt the following. (Any Four) **16**

a) Explain IEEE 802.15.4 in Zigbee. Explain applications also.

b) Explain layered attacker model.

c) Explain IoT privacy and vulnerabilities.

d) Explain Features of CoAP protocol.

e) What is security tomography? Explain its types in detail.

Q.5 Attempt the following. (Any Two) **12**

a) Explain Business model innovation for IoT.

b) Explain applications of IoT in Smart Cities.

c) Explain REST architecture in detail.

Seat No.	

Set **S**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Internet of Things (CSEPEC-03A)

Day & Date: Monday, 25-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which layer provides end-to-end communication?
a) Logical b) Transport
c) Link d) Session

2) MQTT is _____ oriented.
a) Data b) Message
c) Network d) Device

3) CoAP is designed for _____.
a) Constrained devices b) High speed
c) Video d) Gaming

4) A major privacy concern in IoT _____.
a) Scalability b) Unauthorized access
c) Battery d) Latency

5) Which is NOT an IoT communication model _____.
a) Request-Response b) Exclusive Pair
c) Random-Access d) Push-Producer

6) In Value Creation, turning raw data into insight is _____.
a) Collection b) Analysis
c) Disposal d) Marketing

7) Which device acts as a bridge for Bluetooth to Internet?
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c) RFID Tag d) Sensor

8) REST uses which style?
a) Stateful b) Stateless
c) Peer d) Mesh

9) Full form of LPWAN _____.
   a) Low Power Wide Area Network
   b) Local Power
   c) Long Power
   d) Low Protocol

10) Which protocol is commonly used for lightweight IoT communication?
   a) HTTP
   b) MQTT
   c) FTP
   d) SMTP

11) The standard associated with Zigbee is _____.
   a) IEEE 802.11
   b) IEEE 802.15.4
   c) IEEE 802.3
   d) IEEE 802.15.1

12) Role of sensors in IoT physical design _____.
   a) Processing
   b) Storage
   c) Acquisition
   d) Security

13) RFID tags with no power source _____.
   a) Active
   b) Semi-passive
   c) Passive
   d) Static

14) 6LoWPAN enables IPv6 over _____.
   a) Fiber
   b) Low-power wireless
   c) Satellite
   d) Wired

Seat No.	

Set **S**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Internet of Things (CSEPEC-03A)

Day & Date: Monday, 25-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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

SECTION – I

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

a) Explain Characteristics of IoT with examples.

b) Define RFID and its system structure.

c) Distinguish between Sensors and Actuators.

d) Describe M2M communication block diagram.

e) Explain IoT level 2 architecture in detail.

Q.3 Attempt the following. (Any Two) **12**

a) Explain Role of Wireless Sensor Networks [WSNs].

b) What is Participatory Sensing? Explain how it is achieved?

c) Explain different communication technologies in IoT.

SECTION – II

Q.4 Attempt the following. (Any Four) **16**

a) Explain IEEE 802.15.4 in Zigbee. Explain applications also.

b) Explain layered attacker model.

c) Explain IoT privacy and vulnerabilities.

d) Explain Features of CoAP protocol.

e) What is security tomography? Explain its types in detail.

Q.5 Attempt the following. (Any Two) **12**

a) Explain Business model innovation for IoT.

b) Explain applications of IoT in Smart Cities.

c) Explain REST architecture in detail.

SLR-QH-462

Seat No.	

Set P

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Big Data Analytics (CSEPEC-03B)

Day & Date: Monday, 25-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) Which of the following is an example of "unstructured data"?
a) SQL Database Table b) CSV File
c) Digital Video File d) Excel Spreadsheet

2) Which of the following is NOT a type of NoSQL database?
a) Document Store b) Key Values based
c) Column based d) Relational database

3) What is the primary goal of Data Analytics?
a) Increase website traffic
b) Extract useful insights from data
c) Manage servers
d) Design graphics

4) _____ can best be described as a programming model used to develop Hadoop-based applications that can process massive amounts of data.
a) MapReduce b) Mahout
c) Oozie d) All of the mentioned

5) What are the main components of Hadoop?
a) HDFS b) YARN
c) MapReduce d) All of Above

6) In which language is Hadoop written?
a) Java b) C++
c) Rust d) Python

7) _____ part of the MapReduce is responsible for processing one or more chunks of data and producing the output results.
a) Maptask b) Mapper
c) Task Execution d) All

8) _____ maps input key/value pairs to a set of intermediate key/value pairs.
a) Mapper b) Reducer
c) Both a) an b) d) None

9) _____ NameNode is used when the Primary NameNode goes down.
a) Rack b) Data
c) Secondary d) None

10) What is MongoDB?
a) A relational database
b) A document-oriented NoSQL database
c) A key-value store
d) A file storage system

11) In MongoDB, what is a “collection”?
a) A group of tables b) A group of documents
c) A single document d) All of Above

12) What command is used to insert a document into a collection in MongoDB?
a) db.collection.put()
b) db.collection.add()
c) db.collection.insertDocument()
d) db.collection.insertOne()

13) Which of the following is a tool to transfer data between Hadoop and relational databases?
a) Sqoop b) HBase
c) Hive d) Pig

14) HDFS stores data in distributed manner, the data can be processed in parallel on a _____ of nodes.
a) Cluster b) DataNode
c) Master Node d) None of above

SLR-QH-462

Seat No.	

Set P

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Big Data Analytics (CSEPEC-03B)

Day & Date: Monday, 25-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

Section – I

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

a) What is data? Explain classification of data.

b) Explain Challenges in Big data.

c) What is HDFS? Explain HDFS Architecture

d) Explain YARN Architecture.

e) Explain Hadoop with characteristic.

Q.3 Attempt the following. (Any Two) **12**

a) Give the difference between Hadoop 1.0 and Hadoop 2.0

b) Explain High level architecture of Hadoop.

c) What is NoSQL? Explain types of NoSQL.

Section – II

Q.4 Attempt the following. (Any Four) **16**

a) Explain different features of Cassandra in details.

b) Explain Hive Query language (HQL).

c) Explain features of Pig.

d) Explain Counter and Alter command in Cassandra.

e) Explain difference between SQL and MongoB.

Q.5 Attempt the following. (Any Two) **12**

a) What is MongoDB? Explain CRUD operations in MongoDB.

b) Explain Hive Architecture.

c) What is Pig Philosophy? Explain ETL Processing in Pig.

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Big Data Analytics (CSEPEC-03B)

Day & Date: Monday, 25-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) _____ maps input key/value pairs to a set of intermediate key/value pairs.
a) Mapper b) Reducer
c) Both a) an b) d) None

2) _____ NameNode is used when the Primary NameNode goes down.
a) Rack b) Data
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c) Master Node
d) None of above

8) Which of the following is an example of “unstructured data”?
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b) CSV File
c) Digital Video File
d) Excel Spreadsheet

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d) Relational database

10) What is the primary goal of Data Analytics?
a) Increase website traffic
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d) Design graphics

11) _____ can best be described as a programming model used to develop Hadoop-based applications that can process massive amounts of data.
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b) YARN
c) MapReduce
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13) In which language is Hadoop written?
a) Java
b) C++
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14) _____ part of the MapReduce is responsible for processing one or more chunks of data and producing the output results.
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b) Mapper
c) Task Execution
d) All

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Big Data Analytics (CSEPEC-03B)

Day & Date: Monday, 25-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

Section – I

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

a) What is data? Explain classification of data.

b) Explain Challenges in Big data.

c) What is HDFS? Explain HDFS Architecture

d) Explain YARN Architecture.

e) Explain Hadoop with characteristic.

Q.3 Attempt the following. (Any Two) **12**

a) Give the difference between Hadoop 1.0 and Hadoop 2.0

b) Explain High level architecture of Hadoop.

c) What is NoSQL? Explain types of NoSQL.

Section – II

Q.4 Attempt the following. (Any Four) **16**

a) Explain different features of Cassandra in details.

b) Explain Hive Query language (HQL).

c) Explain features of Pig.

d) Explain Counter and Alter command in Cassandra.

e) Explain difference between SQL and MongoB.

Q.5 Attempt the following. (Any Two) **12**

a) What is MongoDB? Explain CRUD operations in MongoDB.

b) Explain Hive Architecture.

c) What is Pig Philosophy? Explain ETL Processing in Pig.

Seat No.	

Set **R**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Big Data Analytics (CSEPEC-03B)

Day & Date: Monday, 25-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) In MongoDB, what is a "collection"?
a) A group of tables
b) A group of documents
c) A single document
d) All of Above

2) What command is used to insert a document into a collection in MongoDB?
a) db.collection.put()
b) db.collection.add()
c) db.collection.insertDocument()
d) db.collection.insertOne()

3) Which of the following is a tool to transfer data between Hadoop and relational databases?
a) Sqoop
b) HBase
c) Hive
d) Pig

4) HDFS stores data in distributed manner, the data can be processed in parallel on a _____ of nodes.
a) Cluster
b) DataNode
c) Master Node
d) None of above

5) Which of the following is an example of "unstructured data"?
a) SQL Database Table
b) CSV File
c) Digital Video File
d) Excel Spreadsheet

6) Which of the following is NOT a type of NoSQL database?
a) Document Store
b) Key Values based
c) Column based
d) Relational database

7) What is the primary goal of Data Analytics?
a) Increase website traffic
b) Extract useful insights from data
c) Manage servers
d) Design graphics

8) _____ can best be described as a programming model used to develop Hadoop-based applications that can process massive amounts of data.
a) MapReduce
b) Mahout
c) Oozie
d) All of the mentioned

9) What are the main components of Hadoop?
a) HDFS
b) YARN
c) MapReduce
d) All of Above

10) In which language is Hadoop written?
a) Java
b) C++
c) Rust
d) Python

11) _____ part of the MapReduce is responsible for processing one or more chunks of data and producing the output results.
a) Maptask
b) Mapper
c) Task Execution
d) All

12) _____ maps input key/value pairs to a set of intermediate key/value pairs.
a) Mapper
b) Reducer
c) Both a) an b)
d) None

13) _____ NameNode is used when the Primary NameNode goes down.
a) Rack
b) Data
c) Secondary
d) None

14) What is MongoDB?
a) A relational database
b) A document-oriented NoSQL database
c) A key-value store
d) A file storage system

Seat No.	

Set R

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Big Data Analytics (CSEPEC-03B)

Day & Date: Monday, 25-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

Section – I

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

a) What is data? Explain classification of data.

b) Explain Challenges in Big data.

c) What is HDFS? Explain HDFS Architecture

d) Explain YARN Architecture.

e) Explain Hadoop with characteristic.

Q.3 Attempt the following. (Any Two) **12**

a) Give the difference between Hadoop 1.0 and Hadoop 2.0

b) Explain High level architecture of Hadoop.

c) What is NoSQL? Explain types of NoSQL.

Section – II

Q.4 Attempt the following. (Any Four) **16**

a) Explain different features of Cassandra in details.

b) Explain Hive Query language (HQL).

c) Explain features of Pig.

d) Explain Counter and Alter command in Cassandra.

e) Explain difference between SQL and MongoB.

Q.5 Attempt the following. (Any Two) **12**

a) What is MongoDB? Explain CRUD operations in MongoDB.

b) Explain Hive Architecture.

c) What is Pig Philosophy? Explain ETL Processing in Pig.

Seat No.	

Set | S

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Big Data Analytics (CSEPEC-03B)

Day & Date: Monday, 25-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) In which language is Hadoop written?
a) Java b) C++
c) Rust d) Python

2) _____ part of the MapReduce is responsible for processing one or more chunks of data and producing the output results.
a) Maptask b) Mapper
c) Task Execution d) All

3) _____ maps input key/value pairs to a set of intermediate key/value pairs.
a) Mapper b) Reducer
c) Both a) an b) d) None

4) _____ NameNode is used when the Primary NameNode goes down.
a) Rack b) Data
c) Secondary d) None

5) What is MongoDB?
a) A relational database
b) A document-oriented NoSQL database
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b) HBase
c) Hive
d) Pig

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b) DataNode
c) Master Node
d) None of above

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11) Which of the following is NOT a type of NoSQL database?
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d) Relational database

12) What is the primary goal of Data Analytics?
a) Increase website traffic
b) Extract useful insights from data
c) Manage servers
d) Design graphics

13) _____ can best be described as a programming model used to develop Hadoop-based applications that can process massive amounts of data.
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b) Mahout
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d) All of the mentioned

14) What are the main components of Hadoop?
a) HDFS
b) YARN
c) MapReduce
d) All of Above

Seat No.	

Set **S**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Big Data Analytics (CSEPEC-03B)

Day & Date: Monday, 25-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
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Section – I

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

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b) Explain Challenges in Big data.

c) What is HDFS? Explain HDFS Architecture

d) Explain YARN Architecture.

e) Explain Hadoop with characteristic.

Q.3 Attempt the following. (Any Two) **12**

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b) Explain High level architecture of Hadoop.

c) What is NoSQL? Explain types of NoSQL.

Section – II

Q.4 Attempt the following. (Any Four) **16**

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b) Explain Hive Query language (HQL).

c) Explain features of Pig.

d) Explain Counter and Alter command in Cassandra.

e) Explain difference between SQL and MongoB.

Q.5 Attempt the following. (Any Two) **12**

a) What is MongoDB? Explain CRUD operations in MongoDB.

b) Explain Hive Architecture.

c) What is Pig Philosophy? Explain ETL Processing in Pig.

SLR-QH-464

Seat No.	

Set P

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April-2026
Honors in Artificial Intelligence and Machine Learning - Deep Learning (CSEHON-04A)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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3) Figures to the right indicates full marks.
4) Assume suitable data if necessary and mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct option from the following. **14**

1) Which algorithm is primarily used to calculate gradients in a Deep Feedforward Network?
a) K-Means
b) Backpropagation
c) Dijkstra's
d) Apriori

2) In a Feedforward Network, information flows _____.
a) In cycles
b) From output back to input only
c) From input through hidden layers to output
d) Randomly between all nodes

3) In TensorFlow, what does a "Computational Graph" represent?
a) A pie chart of data distribution
b) A description of mathematical operations and data flow
c) A bar graph of accuracy
d) A hardware map of the CPU

4) What is "Sharing Variables" useful for in TensorFlow?
a) Splitting the bill for cloud services
b) Deleting duplicate files
c) Sending data to other users
d) Reusing model parameters across different parts of a graph

5) What is the primary "Need for Regularization" in Deep Learning?
a) To speed up training
b) To prevent overfitting
c) To increase the number of parameters
d) To make the model larger

6) "Dropout" works by _____.
   a) Randomly deactivating neurons during training
   b) Deleting the entire dataset
   c) Adding more layers to the network
   d) Increasing the learning rate

7) Which CNN architecture introduced the concept of "Residual Learning"?
   a) AlexNet
   b) VGG
   c) ResNet
   d) LeNet

8) What is the primary application of the UNet architecture?
   a) Image Classification
   b) Image Segmentation (often medical)
   c) Sentiment Analysis
   d) Stock Market Prediction

9) What does "LSTM" stand for?
   a) Low-Scale Time Model
   b) Large Sample Text Machine
   c) Linear System Temporal Model
   d) Long Short-Term Memory

10) Time Series Forecasting is used for _____.
   a) Classifying cat vs. dog
   b) Predicting future values like stock prices based on past data
   c) Creating new images
   d) Deleting old files

11) An Autoencoder is primarily used for _____.
   a) Supervised classification
   b) Reinforcement learning
   c) Unsupervised learning for representation/compression
   d) Sorting data

12) Dimensionality Reduction is a common application of _____.
   a) CNNs
   b) Autoencoders
   c) LSTMs
   d) RNNs

13) RNNs are specifically designed to work with _____.
   a) Sequential data (time series, text)
   b) Static images only
   c) Fixed-size tabular data
   d) Relational databases

14) What does "Early Stopping" monitor to decide when to end training?
   a) Training Time
   b) Validation Error/Loss
   c) Number of CPUs
   d) Dataset size

Seat No.	

Set **P**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April-2026
Honors in Artificial Intelligence and Machine Learning - Deep Learning (CSEHON-04A)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicates full marks.
3) Assume suitable data if necessary and mention it clearly.

Section – I

Q.2 Attempt Any Three. **12**

a) Explain back propagation Algorithm.

b) What is Data Augmentation? List any four augmentation techniques used in TensorFlow.

c) Explain the term early stopping and Dropout.

d) Differentiate between L1 and L2 regularization techniques.

Q.3 Attempt Any One. **08**

a) Explain Gradient Descent Algorithm.

b) Assume a simple deep learning model with 3 neurons and inputs = 1, 2, 3 The weights to the input neurons are 6, 7 and 8 respectively, calculate the output?

Q.4 Explain Adam and RMSP Optimizer. **08**

Section – II

Q.5 Attempt Any Three. **12**

a) Write a short note on ImageNet.

b) Explain the concept of Bidirectional RNN with an example.

c) Explain encoder and decoder model.

d) What are the key features of the AlexNet architecture?

Q.6 Answer Any One. **08**

a) Compare LeNet, AlexNet, VGG, and GoogleNet architectures in terms of depth, parameters, and performance.

b) What is a Recurrent Neural Network (RNN)? Explain its basic structure and operation.

Q.7 What is a Variational Autoencoder (VAE)? How does it differ from a standard autoencoder? **08**

SLR-QH-464

Seat No.	

Set Q

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April-2026
Honors in Artificial Intelligence and Machine Learning - Deep Learning (CSEHON-04A)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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3) Figures to the right indicates full marks.
4) Assume suitable data if necessary and mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct option from the following. **14**

1) What is the primary application of the UNet architecture?
a) Image Classification
b) Image Segmentation (often medical)
c) Sentiment Analysis
d) Stock Market Prediction

2) What does "LSTM" stand for?
a) Low-Scale Time Model
b) Large Sample Text Machine
c) Linear System Temporal Model
d) Long Short-Term Memory

3) Time Series Forecasting is used for _____.
a) Classifying cat vs. dog
b) Predicting future values like stock prices based on past data
c) Creating new images
d) Deleting old files

4) An Autoencoder is primarily used for _____.
a) Supervised classification
b) Reinforcement learning
c) Unsupervised learning for representation/compression
d) Sorting data

5) Dimensionality Reduction is a common application of _____.
a) CNNs b) Autoencoders
c) LSTMs d) RNNs

6) RNNs are specifically designed to work with _____.
   a) Sequential data (time series, text)
   b) Static images only
   c) Fixed-size tabular data
   d) Relational databases

7) What does "Early Stopping" monitor to decide when to end training?
   a) Training Time
   b) Validation Error/Loss
   c) Number of CPUs
   d) Dataset size

8) Which algorithm is primarily used to calculate gradients in a Deep Feedforward Network?
   a) K-Means
   b) Backpropagation
   c) Dijkstra's
   d) Apriori

9) In a Feedforward Network, information flows _____.
   a) In cycles
   b) From output back to input only
   c) From input through hidden layers to output
   d) Randomly between all nodes

10) In TensorFlow, what does a "Computational Graph" represent?
   a) A pie chart of data distribution
   b) A description of mathematical operations and data flow
   c) A bar graph of accuracy
   d) A hardware map of the CPU

11) What is "Sharing Variables" useful for in TensorFlow?
   a) Splitting the bill for cloud services
   b) Deleting duplicate files
   c) Sending data to other users
   d) Reusing model parameters across different parts of a graph

12) What is the primary "Need for Regularization" in Deep Learning?
   a) To speed up training
   b) To prevent overfitting
   c) To increase the number of parameters
   d) To make the model larger

13) "Dropout" works by _____.
   a) Randomly deactivating neurons during training
   b) Deleting the entire dataset
   c) Adding more layers to the network
   d) Increasing the learning rate

14) Which CNN architecture introduced the concept of "Residual Learning"?
   a) AlexNet
   b) VGG
   c) ResNet
   d) LeNet

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April-2026
Honors in Artificial Intelligence and Machine Learning - Deep Learning (CSEHON-04A)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicates full marks.
3) Assume suitable data if necessary and mention it clearly.

Section – I

Q.2 Attempt Any Three. **12**

a) Explain back propagation Algorithm.

b) What is Data Augmentation? List any four augmentation techniques used in TensorFlow.

c) Explain the term early stopping and Dropout.

d) Differentiate between L1 and L2 regularization techniques.

Q.3 Attempt Any One. **08**

a) Explain Gradient Descent Algorithm.

b) Assume a simple deep learning model with 3 neurons and inputs = 1, 2, 3 The weights to the input neurons are 6, 7 and 8 respectively, calculate the output?

Q.4 Explain Adam and RMSP Optimizer. **08**

Section – II

Q.5 Attempt Any Three. **12**

a) Write a short note on ImageNet.

b) Explain the concept of Bidirectional RNN with an example.

c) Explain encoder and decoder model.

d) What are the key features of the AlexNet architecture?

Q.6 Answer Any One. **08**

a) Compare LeNet, AlexNet, VGG, and GoogleNet architectures in terms of depth, parameters, and performance.

b) What is a Recurrent Neural Network (RNN)? Explain its basic structure and operation.

Q.7 What is a Variational Autoencoder (VAE)? How does it differ from a standard autoencoder? **08**

SLR-QH-464

Seat No.	

Set R

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April-2026
Honors in Artificial Intelligence and Machine Learning - Deep Learning (CSEHON-04A)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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3) Figures to the right indicates full marks.
4) Assume suitable data if necessary and mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct option from the following. **14**

1) An Autoencoder is primarily used for _____.
a) Supervised classification
b) Reinforcement learning
c) Unsupervised learning for representation/compression
d) Sorting data

2) Dimensionality Reduction is a common application of _____.
a) CNNs b) Autoencoders
c) LSTMs d) RNNs

3) RNNs are specifically designed to work with _____.
a) Sequential data (time series, text)
b) Static images only
c) Fixed-size tabular data
d) Relational databases

4) What does "Early Stopping" monitor to decide when to end training?
a) Training Time b) Validation Error/Loss
c) Number of CPUs d) Dataset size

5) Which algorithm is primarily used to calculate gradients in a Deep Feedforward Network?
a) K-Means b) Backpropagation
c) Dijkstra's d) Apriori

6) In a Feedforward Network, information flows _____.
   a) In cycles
   b) From output back to input only
   c) From input through hidden layers to output
   d) Randomly between all nodes

7) In TensorFlow, what does a "Computational Graph" represent?
   a) A pie chart of data distribution
   b) A description of mathematical operations and data flow
   c) A bar graph of accuracy
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8) What is "Sharing Variables" useful for in TensorFlow?
   a) Splitting the bill for cloud services
   b) Deleting duplicate files
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9) What is the primary "Need for Regularization" in Deep Learning?
   a) To speed up training
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10) "Dropout" works by _____.
   a) Randomly deactivating neurons during training
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Seat No.	

Set **R**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April-2026
Honors in Artificial Intelligence and Machine Learning - Deep Learning (CSEHON-04A)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicates full marks.
3) Assume suitable data if necessary and mention it clearly.

Section – I

Q.2 Attempt Any Three. **12**

a) Explain back propagation Algorithm.

b) What is Data Augmentation? List any four augmentation techniques used in TensorFlow.

c) Explain the term early stopping and Dropout.

d) Differentiate between L1 and L2 regularization techniques.

Q.3 Attempt Any One. **08**

a) Explain Gradient Descent Algorithm.

b) Assume a simple deep learning model with 3 neurons and inputs = 1, 2, 3 The weights to the input neurons are 6, 7 and 8 respectively, calculate the output?

Q.4 Explain Adam and RMSP Optimizer. **08**

Section – II

Q.5 Attempt Any Three. **12**

a) Write a short note on ImageNet.

b) Explain the concept of Bidirectional RNN with an example.

c) Explain encoder and decoder model.

d) What are the key features of the AlexNet architecture?

Q.6 Answer Any One. **08**

a) Compare LeNet, AlexNet, VGG, and GoogleNet architectures in terms of depth, parameters, and performance.

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Q.7 What is a Variational Autoencoder (VAE)? How does it differ from a standard autoencoder? **08**

SLR-QH-464

Seat No.	

Set S

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April-2026
Honors in Artificial Intelligence and Machine Learning - Deep Learning (CSEHON-04A)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

Duration: 30 Minutes Marks:14

Q.1 Choose the correct option from the following. **14**

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   b) To prevent overfitting
   c) To increase the number of parameters
   d) To make the model larger

SLR-QH-464

Seat No.		Set	S

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April-2026
Honors in Artificial Intelligence and Machine Learning - Deep Learning (CSEHON-04A)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
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Section – I

Q.2 Attempt Any Three. **12**

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b) What is Data Augmentation? List any four augmentation techniques used in TensorFlow.

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b) Assume a simple deep learning model with 3 neurons and inputs = 1, 2, 3 The weights to the input neurons are 6, 7 and 8 respectively, calculate the output?

Q.4 Explain Adam and RMSP Optimizer. **08**

Section – II

Q.5 Attempt Any Three. **12**

a) Write a short note on ImageNet.

b) Explain the concept of Bidirectional RNN with an example.

c) Explain encoder and decoder model.

d) What are the key features of the AlexNet architecture?

Q.6 Answer Any One. **08**

a) Compare LeNet, AlexNet, VGG, and GoogleNet architectures in terms of depth, parameters, and performance.

b) What is a Recurrent Neural Network (RNN)? Explain its basic structure and operation.

Q.7 What is a Variational Autoencoder (VAE)? How does it differ from a standard autoencoder? **08**

SLR-QH-465

Seat No.	

Set P

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026
Honors in Cyber Security - Information Auditing and Monitoring (CSEHON-04B)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Options. **14**

1) External auditors are _____.
a) Employees b) Independent
c) Users d) Hackers

2) Reporting timeline ensures ____.
a) Delay b) Timely reports
c) Errors d) Loss

3) Audit logs track _____.
a) Files b) User activity
c) Emails d) Hardware

4) Security metrics measure _____.
a) Performance b) Security effectiveness
c) Games d) Emails

5) Security audit checks _____.
a) Systems b) Security controls
c) Emails d) Games

6) Black-box testing means _____.
a) Full knowledge b) No knowledge
c) Partial d) None

7) Trend analysis identifies _____.
a) Patterns b) Errors
c) Deletion d) Encryption

8) Pre-testing checklist ensures _____.
a) Failure b) Readiness
c) Errors d) Loss

9) Information gathering is called _____.
a) Reporting b) Reconnaissance
c) Blocking d) Encryption

10) Vulnerability analysis identifies _____.
a) Strengths b) Weaknesses
c) Logs d) Files

11) War dialing scans _____.
a) Files b) Phone numbers
c) Emails d) Logs

12) Trojan is _____.
a) Malware b) Hardware
c) Tool d) Backup

13) Log management helps in _____.
a) Deletion b) Monitoring
c) Blocking d) Ignoring

14) File integrity checking detects _____.
a) Changes b) Speed
c) Backup d) Logs

Seat No.	

Set **P**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Honors in Cyber Security - Information Auditing and Monitoring (CSEHON-04B)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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

SECTION – I

Q.2 Answer the following. (Any Three) **12**

a) Explain the purpose of a Warning Banner in system security. How does it provide legal protection?

b) What are Monitoring Tools? Explain their role in information security.

c) What is Compliance? Explain its role in maintaining organizational security.

d) Define Audit Trail. Explain its importance in auditing and security.

Q.3 Answer the following. (Any Two) **16**

a) Explain the concept of Warning Banners and their importance in legal and security aspects.

b) Explain Monitoring in Information Security. Discuss various monitoring tools and their functions.

c) Explain Security Metrics and Reporting. Discuss common issues and variances in performance metrics.

SECTION – II

Q.4 Answer the following. (Any Three) **12**

a) Explain the Pre-Penetration Testing Checklist and its significance.

b) What is Email Security? Explain common threats and protection methods.

c) What is Password Cracking? Explain different techniques used.

d) What is Data Leakage? Explain methods to prevent it.

Q.5 Answer the following. (Any Two) **16**

a) Explain Internal Network Penetration Testing and its methodologies.

b) Describe Virus and Trojan Detection, Log Management, and File Integrity Checking in.

c) Explain the complete process of Penetration Testing including planning, information gathering, vulnerability analysis, and reporting.

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026
Honors in Cyber Security - Information Auditing and Monitoring (CSEHON-04B)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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3) Figures to the right indicates full marks.
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MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Options. **14**

1) Pre-testing checklist ensures _____.
a) Failure b) Readiness
c) Errors d) Loss

2) Information gathering is called _____.
a) Reporting b) Reconnaissance
c) Blocking d) Encryption

3) Vulnerability analysis identifies _____.
a) Strengths b) Weaknesses
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4) War dialing scans _____.
a) Files b) Phone numbers
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a) Malware b) Hardware
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a) Files b) User activity
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11) Security metrics measure _____.
a) Performance b) Security effectiveness
c) Games d) Emails

12) Security audit checks _____.
a) Systems b) Security controls
c) Emails d) Games

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c) Partial d) None

14) Trend analysis identifies _____.
a) Patterns b) Errors
c) Deletion d) Encryption

SLR-QH-465

Seat No.	

Set Q

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Honors in Cyber Security - Information Auditing and Monitoring (CSEHON-04B)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Answer the following. (Any Three) **12**

a) Explain the purpose of a Warning Banner in system security. How does it provide legal protection?

b) What are Monitoring Tools? Explain their role in information security.

c) What is Compliance? Explain its role in maintaining organizational security.

d) Define Audit Trail. Explain its importance in auditing and security.

Q.3 Answer the following. (Any Two) **16**

a) Explain the concept of Warning Banners and their importance in legal and security aspects.

b) Explain Monitoring in Information Security. Discuss various monitoring tools and their functions.

c) Explain Security Metrics and Reporting. Discuss common issues and variances in performance metrics.

SECTION – II

Q.4 Answer the following. (Any Three) **12**

a) Explain the Pre-Penetration Testing Checklist and its significance.

b) What is Email Security? Explain common threats and protection methods.

c) What is Password Cracking? Explain different techniques used.

d) What is Data Leakage? Explain methods to prevent it.

Q.5 Answer the following. (Any Two) **16**

a) Explain Internal Network Penetration Testing and its methodologies.

b) Describe Virus and Trojan Detection, Log Management, and File Integrity Checking in.

c) Explain the complete process of Penetration Testing including planning, information gathering, vulnerability analysis, and reporting.

Seat No.	

Set **R**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026
Honors in Cyber Security - Information Auditing and Monitoring (CSEHON-04B)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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3) Figures to the right indicates full marks.
4) Assume suitable data if required.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Options. **14**

1) War dialing scans _____.
a) Files b) Phone numbers
c) Emails d) Logs

2) Trojan is _____.
a) Malware b) Hardware
c) Tool d) Backup

3) Log management helps in _____.
a) Deletion b) Monitoring
c) Blocking d) Ignoring

4) File integrity checking detects _____.
a) Changes b) Speed
c) Backup d) Logs

5) External auditors are _____.
a) Employees b) Independent
c) Users d) Hackers

6) Reporting timeline ensures ____.
a) Delay b) Timely reports
c) Errors d) Loss

7) Audit logs track _____.
a) Files b) User activity
c) Emails d) Hardware

8) Security metrics measure _____.
a) Performance b) Security effectiveness
c) Games d) Emails

9) Security audit checks _____.
a) Systems b) Security controls
c) Emails d) Games

10) Black-box testing means _____.
a) Full knowledge b) No knowledge
c) Partial d) None

11) Trend analysis identifies _____.
a) Patterns b) Errors
c) Deletion d) Encryption

12) Pre-testing checklist ensures _____.
a) Failure b) Readiness
c) Errors d) Loss

13) Information gathering is called _____.
a) Reporting b) Reconnaissance
c) Blocking d) Encryption

14) Vulnerability analysis identifies _____.
a) Strengths b) Weaknesses
c) Logs d) Files

Seat No.	

Set **R**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Honors in Cyber Security - Information Auditing and Monitoring (CSEHON-04B)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Answer the following. (Any Three) **12**

a) Explain the purpose of a Warning Banner in system security. How does it provide legal protection?

b) What are Monitoring Tools? Explain their role in information security.

c) What is Compliance? Explain its role in maintaining organizational security.

d) Define Audit Trail. Explain its importance in auditing and security.

Q.3 Answer the following. (Any Two) **16**

a) Explain the concept of Warning Banners and their importance in legal and security aspects.

b) Explain Monitoring in Information Security. Discuss various monitoring tools and their functions.

c) Explain Security Metrics and Reporting. Discuss common issues and variances in performance metrics.

SECTION – II

Q.4 Answer the following. (Any Three) **12**

a) Explain the Pre-Penetration Testing Checklist and its significance.

b) What is Email Security? Explain common threats and protection methods.

c) What is Password Cracking? Explain different techniques used.

d) What is Data Leakage? Explain methods to prevent it.

Q.5 Answer the following. (Any Two) **16**

a) Explain Internal Network Penetration Testing and its methodologies.

b) Describe Virus and Trojan Detection, Log Management, and File Integrity Checking in.

c) Explain the complete process of Penetration Testing including planning, information gathering, vulnerability analysis, and reporting.

Seat No.	

Set **S**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026
Honors in Cyber Security - Information Auditing and Monitoring (CSEHON-04B)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if required.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Options. **14**

1) Black-box testing means _____.
a) Full knowledge b) No knowledge
c) Partial d) None

2) Trend analysis identifies _____.
a) Patterns b) Errors
c) Deletion d) Encryption

3) Pre-testing checklist ensures _____.
a) Failure b) Readiness
c) Errors d) Loss

4) Information gathering is called _____.
a) Reporting b) Reconnaissance
c) Blocking d) Encryption

5) Vulnerability analysis identifies _____.
a) Strengths b) Weaknesses
c) Logs d) Files

6) War dialing scans _____.
a) Files b) Phone numbers
c) Emails d) Logs

7) Trojan is _____.
a) Malware b) Hardware
c) Tool d) Backup

8) Log management helps in _____.
a) Deletion b) Monitoring
c) Blocking d) Ignoring

9) File integrity checking detects _____.
a) Changes b) Speed
c) Backup d) Logs

10) External auditors are _____.
a) Employees b) Independent
c) Users d) Hackers

11) Reporting timeline ensures ____.
a) Delay b) Timely reports
c) Errors d) Loss

12) Audit logs track _____.
a) Files b) User activity
c) Emails d) Hardware

13) Security metrics measure _____.
a) Performance b) Security effectiveness
c) Games d) Emails

14) Security audit checks _____.
a) Systems b) Security controls
c) Emails d) Games

Seat No.	

Set **S**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Honors in Cyber Security - Information Auditing and Monitoring (CSEHON-04B)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Answer the following. (Any Three) **12**

a) Explain the purpose of a Warning Banner in system security. How does it provide legal protection?

b) What are Monitoring Tools? Explain their role in information security.

c) What is Compliance? Explain its role in maintaining organizational security.

d) Define Audit Trail. Explain its importance in auditing and security.

Q.3 Answer the following. (Any Two) **16**

a) Explain the concept of Warning Banners and their importance in legal and security aspects.

b) Explain Monitoring in Information Security. Discuss various monitoring tools and their functions.

c) Explain Security Metrics and Reporting. Discuss common issues and variances in performance metrics.

SECTION – II

Q.4 Answer the following. (Any Three) **12**

a) Explain the Pre-Penetration Testing Checklist and its significance.

b) What is Email Security? Explain common threats and protection methods.

c) What is Password Cracking? Explain different techniques used.

d) What is Data Leakage? Explain methods to prevent it.

Q.5 Answer the following. (Any Two) **16**

a) Explain Internal Network Penetration Testing and its methodologies.

b) Describe Virus and Trojan Detection, Log Management, and File Integrity Checking in.

c) Explain the complete process of Penetration Testing including planning, information gathering, vulnerability analysis, and reporting.

SLR-QH-467

Seat No.	

Set P

T.Y. (B.Tech.) (Computer Science and Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
System Programming (BTN03601)

Day & Date: Friday, 15-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data whenever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Multiple Choice Questions. **14**

1) Which of the following statement is TRUE?
a) Back end of language processor analyses the source program & construct IR
b) Front end of language processor analyses the source program & construct IR
c) Front end of language processor analyses source program & generate code
d) None of above

2) The macro processor must _____.
a) recognize macro definitions and macro calls
b) save the macro definitions
c) expand macro calls and substitute arguments
d) All of the above

3) Which one of the following is a operator grammar _____.
a) A ::= CD + E |a
b) A ::= CAD| C+D
c) A ::= C + D | C * D | a
d) None of above

4) _____ is a software which bridges a specification or execution gap.
a) Language Processor
b) Language migratory
c) Destructor
d) None of the above

5) A macro statement is a statement from which an _____ language statement may be generated during macro expansion.
a) Machine
b) Assembly
c) Programming
d) Object

6) The problem of forward references is tackled using a process called _____ in single pass assembler.
a) Backtracking
b) Synchronization
c) Aging
d) Back patching

7) Address assigned by the Linker to a Program is called as _____.
a) Load Origin
b) Load time address
c) Linked Origin
d) Link time address

8) In an absolute loading scheme, the four functions are accomplished as _____.
a) Allocation-by programmer, Linking-by assembler, Relocation-by assembler, loading-Loader
b) Allocation-by assembler, Linking-by linker, Relocation-by assembler, loading- Loader
c) Allocation-by programmer, Linking-by programmer, Relocation-by assembler, loading-Loader
d) Allocation-by programmer, linking-by programmer, Relocation-by programmer, loading-Loader

9) If translated origin and linked origin are different, then relocation is performed by _____.
a) Linker
b) Loader
c) Translator
d) Both a) and b)

10) In direct linking loader which is not related with object program _____.
a) ESD
b) RLD
c) BSS
d) TXT

11) lsymb = _____ + Relocation factor.
a) torigin
b) dsymb
c) tsymb
d) lorigin

12) Code to perform the relocation of the address sensitive instructions also exists as a part of the program is called _____.
a) relocating logic
b) self relocating
c) Relocatable
d) non relocatable

13) The statement which lists the public definitions of a program unit is _____.
a) EXTERN
b) PD
c) ENTRY
d) All of these

14) The output of Relocating Assembler using BSS scheme is _____.
a) Object Program
b) Information about all Other Program it References
c) Both a) & b)
d) Only a)

Seat No.		Set	P

T.Y. (B.Tech.) (Computer Science and Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
System Programming (BTN03601)

Day & Date: Friday, 15-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt Any Three questions. **12**

a) Define language processing. Generate the assembly language statement for the following source statement
Percent_profit:=(profit* 100)/cost_price

b) How forward reference problems are handled in one pass assembler? Explain with example.

c) Explain the different types of parameters in macros.

d) What is Language Processing Development Tools and explain the following LPDT tools in detail:
i) LEX
ii) YACC

Q.3 Attempt Any One question. **08**

a) What is nested macro calls and write an example of a nested macrocall. Elaborate the steps of its expansion.

OR

b) Consider the given grammar and parse the given string along with its derivation. Explain the following terms for the grammar according to the grammar specifications
i) Derivation
ii) Reduction
iii) Parse Tree

Grammar:
$< exp >::=< exp > +< term > | < term >$
$< term >::=< term >*< factor > | < factor >$
$< factor >::=< factor >\uparrow< primary > | < primary >$
$< primary >::=< id > | < const > |(< exp >)$
$< id >::= < letter > | < id > [< letter | digit >]$
$< const >::= [+| -] < digit > | < const >< digit >$
$< letter >::= a|b|...|z$
$< digit >::= 0|1|....\backslash 9$
String: $a:= b + c^*30 - d;$

Q.4 For the following assembly program: **08**

i) Show the content of symbol table at the end of pass-I.
ii) Show the intermediate code generated for the program (Variant-I).
iii) Show the target program generated for the program.

```
        START   100
A       DS      3
L1      MOVER   AREG, B
        ADD     AREG, C
        MOVEM   AREG, D
D       EQU     A+1
L2      PRINTD
        ORIGIN  A−1
C       DC      '5'
        ORIGIN  L2+1
        STOP
B       DC      '19'
        END     L1
```

SECTION – II

Q.5 Attempt Any Three questions. **12**

a) Explain Overlay Structured program with example.

b) Explain Compile and go loader scheme with its advantages and disadvantages.

c) Define loader and explain the four function performed by the loader. Explain general loading scheme with example.

d) Define the optimization transformation and explain the following with example.
i) Elimination of common sub expression.
ii) Frequency reduction
iii) Strength reduction

Q.6 Attempt Any One question. **08**

a) Write and explain "Evaluation order for operators" using RR label and Draw an expression tree and decide evaluation order of operators for the following expression.
$f + (x + y)^*((a + b)/(c - d))$

OR

b) Define Linking. Write and explain program linking algorithm with example.

Q.7 List different types of loader? Explain the Compile and go loader scheme and Absolute loader with its advantages and disadvantages. **08**

SLR-QH-467

Seat No.	

Set Q

T.Y. (B.Tech.) (Computer Science and Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
System Programming (BTN03601)

Day & Date: Friday, 15-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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3) Figures to the right indicates full marks.
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MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Multiple Choice Questions. **14**

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b) Allocation-by assembler, Linking-by linker, Relocation-by assembler, loading- Loader
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c) Aging
d) Back patching

14) Address assigned by the Linker to a Program is called as _____.

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b) Load time address
c) Linked Origin
d) Link time address

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Computer Science and Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
System Programming (BTN03601)

Day & Date: Friday, 15-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt Any Three questions. **12**

a) Define language processing. Generate the assembly language statement for the following source statement
Percent_profit:=(profit* 100)/cost_price

b) How forward reference problems are handled in one pass assembler? Explain with example.

c) Explain the different types of parameters in macros.

d) What is Language Processing Development Tools and explain the following LPDT tools in detail:
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ii) YACC

Q.3 Attempt Any One question. **08**

a) What is nested macro calls and write an example of a nested macrocall. Elaborate the steps of its expansion.

OR

b) Consider the given grammar and parse the given string along with its derivation. Explain the following terms for the grammar according to the grammar specifications
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ii) Reduction
iii) Parse Tree

Grammar:
$< exp >::=< exp > +< term > | < term >$
$< term >::=< term >*< factor > | < factor >$
$< factor >::=< factor >\uparrow< primary > | < primary >$
$< primary >::=< id > | < const > |(< exp >)$
$< id >::= < letter > | < id > [< letter | digit >]$
$< const >::= [+| -] < digit > | < const >< digit >$
$< letter >::= a|b|...|z$
$< digit >::= 0|1|....\backslash 9$
String: $a:= b + c^{*}30 - d;$

Q.4 For the following assembly program: **08**

i) Show the content of symbol table at the end of pass-I.
ii) Show the intermediate code generated for the program (Variant-I).
iii) Show the target program generated for the program.

```
        START   100
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L1      MOVER   AREG, B
        ADD     AREG, C
        MOVEM   AREG, D
D       EQU     A+1
L2      PRINTD
        ORIGIN  A−1
C       DC      '5'
        ORIGIN  L2+1
        STOP
B       DC      '19'
        END     L1
```

SECTION – II

Q.5 Attempt Any Three questions. **12**

a) Explain Overlay Structured program with example.

b) Explain Compile and go loader scheme with its advantages and disadvantages.

c) Define loader and explain the four function performed by the loader. Explain general loading scheme with example.

d) Define the optimization transformation and explain the following with example.
i) Elimination of common sub expression.
ii) Frequency reduction
iii) Strength reduction

Q.6 Attempt Any One question. **08**

a) Write and explain "Evaluation order for operators" using RR label and Draw an expression tree and decide evaluation order of operators for the following expression.
$f + (x + y)^*((a + b)/(c - d))$

OR

b) Define Linking. Write and explain program linking algorithm with example.

Q.7 List different types of loader? Explain the Compile and go loader scheme and Absolute loader with its advantages and disadvantages. **08**

Seat No.	

Set **R**

T.Y. (B.Tech.) (Computer Science and Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
System Programming (BTN03601)

Day & Date: Friday, 15-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data whenever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Multiple Choice Questions. **14**

1) lsymb = _____ + Relocation factor.
a) torigin b) dsymb
c) tsymb d) lorigin

2) Code to perform the relocation of the address sensitive instructions also exists as a part of the program is called _____.
a) relocating logic b) self relocating
c) Relocatable d) non relocatable

3) The statement which lists the public definitions of a program unit is _____.
a) EXTERN b) PD
c) ENTRY d) All of these

4) The output of Relocating Assembler using BSS scheme is _____.
a) Object Program
b) Information about all Other Program it References
c) Both a) & b)
d) Only a)

5) Which of the following statement is TRUE?
a) Back end of language processor analyses the source program & construct IR
b) Front end of language processor analyses the source program & construct IR
c) Front end of language processor analyses source program & generate code
d) None of above

6) The macro processor must _____.
a) recognize macro definitions and macro calls
b) save the macro definitions
c) expand macro calls and substitute arguments
d) All of the above

7) Which one of the following is a operator grammar _____.
a) A ::= CD + E |a
b) A ::= CAD| C+D
c) A ::= C + D | C * D | a
d) None of above

8) _____ is a software which bridges a specification or execution gap.
a) Language Processor
b) Language migratory
c) Destructor
d) None of the above

9) A macro statement is a statement from which an _____ language statement may be generated during macro expansion.
a) Machine
b) Assembly
c) Programming
d) Object

10) The problem of forward references is tackled using a process called _____ in single pass assembler.
a) Backtracking
b) Synchronization
c) Aging
d) Back patching

11) Address assigned by the Linker to a Program is called as _____.
a) Load Origin
b) Load time address
c) Linked Origin
d) Link time address

12) In an absolute loading scheme, the four functions are accomplished as _____.
a) Allocation-by programmer, Linking-by assembler, Relocation-by assembler, loading-Loader
b) Allocation-by assembler, Linking-by linker, Relocation-by assembler, loading- Loader
c) Allocation-by programmer, Linking-by programmer, Relocation-by assembler, loading-Loader
d) Allocation-by programmer, linking-by programmer, Relocation-by programmer, loading-Loader

13) If translated origin and linked origin are different, then relocation is performed by _____.
a) Linker
b) Loader
c) Translator
d) Both a) and b)

14) In direct linking loader which is not related with object program _____.
a) ESD
b) RLD
c) BSS
d) TXT

Seat No.	

Set **R**

T.Y. (B.Tech.) (Computer Science and Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
System Programming (BTN03601)

Day & Date: Friday, 15-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt Any Three questions. **12**

a) Define language processing. Generate the assembly language statement for the following source statement
Percent_profit:=(profit* 100)/cost_price

b) How forward reference problems are handled in one pass assembler? Explain with example.

c) Explain the different types of parameters in macros.

d) What is Language Processing Development Tools and explain the following LPDT tools in detail:
i) LEX
ii) YACC

Q.3 Attempt Any One question. **08**

a) What is nested macro calls and write an example of a nested macrocall. Elaborate the steps of its expansion.

OR

b) Consider the given grammar and parse the given string along with its derivation. Explain the following terms for the grammar according to the grammar specifications
i) Derivation
ii) Reduction
iii) Parse Tree

Grammar:
$< exp >::=< exp > +< term > | < term >$
$< term >::=< term >*< factor > | < factor >$
$< factor >::=< factor >\uparrow< primary > | < primary >$
$< primary >::=< id > | < const > |(< exp >)$
$< id >::= < letter > | < id > [< letter | digit >]$
$< const >::= [+| -] < digit > | < const >< digit >$
$< letter >::= a|b|...|z$
$< digit >::= 0|1|....\backslash 9$
String: $a:= b + c^{*}30 - d;$

Q.4 For the following assembly program: **08**

i) Show the content of symbol table at the end of pass-I.
ii) Show the intermediate code generated for the program (Variant-I).
iii) Show the target program generated for the program.

```
        START   100
A       DS      3
L1      MOVER   AREG, B
        ADD     AREG, C
        MOVEM   AREG, D
D       EQU     A+1
L2      PRINTD
        ORIGIN  A−1
C       DC      '5'
        ORIGIN  L2+1
        STOP
B       DC      '19'
        END     L1
```

SECTION – II

Q.5 Attempt Any Three questions. **12**

a) Explain Overlay Structured program with example.

b) Explain Compile and go loader scheme with its advantages and disadvantages.

c) Define loader and explain the four function performed by the loader. Explain general loading scheme with example.

d) Define the optimization transformation and explain the following with example.
i) Elimination of common sub expression.
ii) Frequency reduction
iii) Strength reduction

Q.6 Attempt Any One question. **08**

a) Write and explain "Evaluation order for operators" using RR label and Draw an expression tree and decide evaluation order of operators for the following expression.
$f + (x + y)^*((a + b)/(c - d))$

OR

b) Define Linking. Write and explain program linking algorithm with example.

Q.7 List different types of loader? Explain the Compile and go loader scheme and Absolute loader with its advantages and disadvantages. **08**

Seat No.	

Set **S**

T.Y. (B.Tech.) (Computer Science and Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
System Programming (BTN03601)

Day & Date: Friday, 15-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data whenever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Multiple Choice Questions. **14**

1) The problem of forward references is tackled using a process called _____ in single pass assembler.
a) Backtracking b) Synchronization
c) Aging d) Back patching

2) Address assigned by the Linker to a Program is called as _____.
a) Load Origin b) Load time address
c) Linked Origin d) Link time address

3) In an absolute loading scheme, the four functions are accomplished as _____.
a) Allocation-by programmer, Linking-by assembler, Relocation-by assembler, loading-Loader
b) Allocation-by assembler, Linking-by linker, Relocation-by assembler, loading- Loader
c) Allocation-by programmer, Linking-by programmer, Relocation-by assembler, loading-Loader
d) Allocation-by programmer, linking-by programmer, Relocation-by programmer, loading-Loader

4) If translated origin and linked origin are different, then relocation is performed by _____.
a) Linker b) Loader
c) Translator d) Both a) and b)

5) In direct linking loader which is not related with object program _____.
a) ESD b) RLD
c) BSS d) TXT

6) lsymb = _____ + Relocation factor.
a) torigin b) dsymb
c) tsymb d) lorigin

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a) EXTERN b) PD
c) ENTRY d) All of these

9) The output of Relocating Assembler using BSS scheme is _____.
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c) expand macro calls and substitute arguments
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a) A ::= CD + E |a b) A ::= CAD| C+D
c) A ::= C + D | C * D | a d) None of above

13) _____ is a software which bridges a specification or execution gap.
a) Language Processor b) Language migratory
c) Destructor d) None of the above

14) A macro statement is a statement from which an _____ language statement may be generated during macro expansion.
a) Machine b) Assembly
c) Programming d) Object

SLR-QH-467

Seat No.		Set	S

T.Y. (B.Tech.) (Computer Science and Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
System Programming (BTN03601)

Day & Date: Friday, 15-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt Any Three questions. **12**

a) Define language processing. Generate the assembly language statement for the following source statement
Percent_profit:=(profit* 100)/cost_price

b) How forward reference problems are handled in one pass assembler? Explain with example.

c) Explain the different types of parameters in macros.

d) What is Language Processing Development Tools and explain the following LPDT tools in detail:
i) LEX
ii) YACC

Q.3 Attempt Any One question. **08**

a) What is nested macro calls and write an example of a nested macrocall. Elaborate the steps of its expansion.

OR

b) Consider the given grammar and parse the given string along with its derivation. Explain the following terms for the grammar according to the grammar specifications
i) Derivation
ii) Reduction
iii) Parse Tree

Grammar:
$< exp >::=< exp > +< term > | < term >$
$< term >::=< term >*< factor > | < factor >$
$< factor >::=< factor >\uparrow< primary > | < primary >$
$< primary >::=< id > | < const > |(< exp >)$
$< id >::= < letter > | < id > [< letter | digit >]$
$< const >::= [+| -] < digit > | < const >< digit >$
$< letter >::= a|b|...|z$
$< digit >::= 0|1|....\backslash 9$
String: $a:= b + c^*30 - d;$

Q.4 For the following assembly program: **08**

i) Show the content of symbol table at the end of pass-I.
ii) Show the intermediate code generated for the program (Variant-I).
iii) Show the target program generated for the program.

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        MOVEM   AREG, D
D       EQU     A+1
L2      PRINTD
        ORIGIN  A−1
C       DC      '5'
        ORIGIN  L2+1
        STOP
B       DC      '19'
        END     L1
```

SECTION – II

Q.5 Attempt Any Three questions. **12**

a) Explain Overlay Structured program with example.

b) Explain Compile and go loader scheme with its advantages and disadvantages.

c) Define loader and explain the four function performed by the loader. Explain general loading scheme with example.

d) Define the optimization transformation and explain the following with example.
i) Elimination of common sub expression.
ii) Frequency reduction
iii) Strength reduction

Q.6 Attempt Any One question. **08**

a) Write and explain "Evaluation order for operators" using RR label and Draw an expression tree and decide evaluation order of operators for the following expression.
$f + (x + y)^*((a + b)/(c - d))$

OR

b) Define Linking. Write and explain program linking algorithm with example.

Q.7 List different types of loader? Explain the Compile and go loader scheme and Absolute loader with its advantages and disadvantages. **08**

SLR-QH-468

Seat No.	

Set P

T. Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
Internet of Things (BTN03602)

Day & Date: Monday, 18-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data whenever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Choose the correct Answer. **14**

1) What is IoT?
a) network of physical objects embedded with sensors
b) network of virtual objects
c) network of objects in the ring structure
d) network of sensors

2) Who coined the term "Internet of Things"?
a) Kevin Aston b) John Wright
c) Edward Jameson d) George Garton

3) When was the actual term "Internet of Things" coined?
a) 1998 b) 1999
c) 2000 d) 2002

4) Which of the following protocol is used to link all the devices in the IoT?
a) HTTP b) UDP
c) Network d) TCP/IP

5) What is the component of an IoT system that executes a program?
a) A sensor
b) A microcontroller
c) An actuator
d) A digital to analog converter

6) The IIOT stands for
a) Industrial Internet of Things
b) International Internet of Things
c) Internet Internetwork of Things
d) None of these

7) The core element is operated by _____.
a) PaaS
b) IoT service Provider
c) SaaS
d) laaS

8) Which devices measures gases or liquid?
a) Proximity sensor
b) Pressure sensor
c) Temperature sensor
d) Touch sensor

9) Data in network layer is transferred in the form of _____.
a) Layers
b) Packets
c) Bytes
d) Bits

10) The network layer contains which hardware device?
a) Routers, Bridges
b) Bridges only
c) Bridges and switches
d) Routers, Bridges and Switches

11) TCP Full form is _____.
a) Transmit Control Program
b) Transmission Control Protocol
c) Transaction Control Program
d) Transistor Control Module

12) Which of the following is true according to Zigbee Standard?
a) Low Power Consumption
b) Low Data Rate
c) Short-Range
d) All of the above

13) What is the protocol used in REST?
a) FTP
b) HTTP
c) JMX
d) SOAP

14) Which HTTP method do we use to make an HTTP request to update an existing resource?
a) POST
b) PUT
c) UPDATE
d) DELETE

Seat No.	

Set **P**

T. Y. (B.Tech.) (Computer Science and Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
Internet of Things (BTN03602)

Day & Date: Monday, 18-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data whenever necessary.

Section – I

Q.2 Solve Any Three. **12**

a) Write the Definition of IOT. List they are the different applications of loT? Explain any one in detail.

b) Draw the Diagram for Physical Design of IOT and Explain.

c) Draw Oracle's loT architecture. Explain.

d) Write a short note on History of IOT.

e) Explain WSN, Cloud Computing with respect to IOT enabling technologies.

Q.3 Solve Any Two. **16**

a) Draw the Diagram for Logical design of loT and Explain in Detail.

b) Write the Difference between REST based Communication API and Web Socket based Communication API.

c) Draw and Explain Any two levels from Six IOT Levels.

Section – II

Q.4 Solve Any Three. **12**

a) Write a note on constrained application protocol (CoAP).

b) Explain loT Privacy, IOT Security.

c) Explain Bluetooth and its low energy profile.

d) Write a note on applications of loT in Smart City.

e) Explain IEEE802.15, WPAN.

Q.5 Solve Any Two. **16**

a) Write a short note on ESP8266 NODE MCU, Arduino Program for Turning ON/OFF of D1 pin.

b) Write a note value creation in loT & business mode innovation for loT.

c) Write a short note on Zigbee /IEEE802.15.4 standard.

SLR-QH-468

Seat No.	

Set Q

T. Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
Internet of Things (BTN03602)

Day & Date: Monday, 18-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data whenever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Choose the correct Answer. **14**

1) Which devices measures gases or liquid?
a) Proximity sensor b) Pressure sensor
c) Temperature sensor d) Touch sensor

2) Data in network layer is transferred in the form of _____.
a) Layers b) Packets
c) Bytes d) Bits

3) The network layer contains which hardware device?
a) Routers, Bridges
b) Bridges only
c) Bridges and switches
d) Routers, Bridges and Switches

4) TCP Full form is _____.
a) Transmit Control Program
b) Transmission Control Protocol
c) Transaction Control Program
d) Transistor Control Module

5) Which of the following is true according to Zigbee Standard?
a) Low Power Consumption b) Low Data Rate
c) Short-Range d) All of the above

6) What is the protocol used in REST?
a) FTP b) HTTP
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7) Which HTTP method do we use to make an HTTP request to update an existing resource?

a) POST
b) PUT
c) UPDATE
d) DELETE

8) What is IoT?

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d) 2002

11) Which of the following protocol is used to link all the devices in the IoT?

a) HTTP
b) UDP
c) Network
d) TCP/IP

12) What is the component of an IoT system that executes a program?

a) A sensor
b) A microcontroller
c) An actuator
d) A digital to analog converter

13) The IIOT stands for

a) Industrial Internet of Things
b) International Internet of Things
c) Internet Internetwork of Things
d) None of these

14) The core element is operated by _____.

a) PaaS
b) IoT service Provider
c) SaaS
d) laaS

Seat No.	

Set **Q**

T. Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
Internet of Things (BTN03602)

Day & Date: Monday, 18-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data whenever necessary.

Section – I

Q.2 Solve Any Three. **12**

a) Write the Definition of IOT. List they are the different applications of loT? Explain any one in detail.

b) Draw the Diagram for Physical Design of IOT and Explain.

c) Draw Oracle's loT architecture. Explain.

d) Write a short note on History of IOT.

e) Explain WSN, Cloud Computing with respect to IOT enabling technologies.

Q.3 Solve Any Two. **16**

a) Draw the Diagram for Logical design of loT and Explain in Detail.

b) Write the Difference between REST based Communication API and Web Socket based Communication API.

c) Draw and Explain Any two levels from Six IOT Levels.

Section – II

Q.4 Solve Any Three. **12**

a) Write a note on constrained application protocol (CoAP).

b) Explain loT Privacy, IOT Security.

c) Explain Bluetooth and its low energy profile.

d) Write a note on applications of loT in Smart City.

e) Explain IEEE802.15, WPAN.

Q.5 Solve Any Two. **16**

a) Write a short note on ESP8266 NODE MCU, Arduino Program for Turning ON/OFF of D1 pin.

b) Write a note value creation in loT & business mode innovation for loT.

c) Write a short note on Zigbee /IEEE802.15.4 standard.

Seat No.	

Set **R**

T. Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
Internet of Things (BTN03602)

Day & Date: Monday, 18-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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3) Figures to the right indicates full marks.
4) Assume suitable data whenever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Choose the correct Answer. **14**

1) TCP Full form is _____.
a) Transmit Control Program
b) Transmission Control Protocol
c) Transaction Control Program
d) Transistor Control Module

2) Which of the following is true according to Zigbee Standard?
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Seat No.	

Set **R**

T. Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
Internet of Things (BTN03602)

Day & Date: Monday, 18-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
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Section – I

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Section – II

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Seat No.	

Set **S**

T. Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
Internet of Things (BTN03602)

Day & Date: Monday, 18-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Choose the correct Answer. **14**

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d) Transistor Control Module

7) Which of the following is true according to Zigbee Standard?
a) Low Power Consumption
b) Low Data Rate
c) Short-Range
d) All of the above

8) What is the protocol used in REST?
a) FTP
b) HTTP
c) JMX
d) SOAP

9) Which HTTP method do we use to make an HTTP request to update an existing resource?
a) POST
b) PUT
c) UPDATE
d) DELETE

10) What is IoT?
a) network of physical objects embedded with sensors
b) network of virtual objects
c) network of objects in the ring structure
d) network of sensors

11) Who coined the term “Internet of Things”?
a) Kevin Aston
b) John Wright
c) Edward Jameson
d) George Garton

12) When was the actual term “Internet of Things” coined?
a) 1998
b) 1999
c) 2000
d) 2002

13) Which of the following protocol is used to link all the devices in the IoT?
a) HTTP
b) UDP
c) Network
d) TCP/IP

14) What is the component of an IoT system that executes a program?
a) A sensor
b) A microcontroller
c) An actuator
d) A digital to analog converter

SLR-QH-468

Seat No.		Set	S

T. Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
Internet of Things (BTN03602)

Day & Date: Monday, 18-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data whenever necessary.

Section – I

Q.2 Solve Any Three. **12**

a) Write the Definition of IOT. List they are the different applications of loT? Explain any one in detail.

b) Draw the Diagram for Physical Design of IOT and Explain.

c) Draw Oracle's loT architecture. Explain.

d) Write a short note on History of IOT.

e) Explain WSN, Cloud Computing with respect to IOT enabling technologies.

Q.3 Solve Any Two. **16**

a) Draw the Diagram for Logical design of loT and Explain in Detail.

b) Write the Difference between REST based Communication API and Web Socket based Communication API.

c) Draw and Explain Any two levels from Six IOT Levels.

Section – II

Q.4 Solve Any Three. **12**

a) Write a note on constrained application protocol (CoAP).

b) Explain loT Privacy, IOT Security.

c) Explain Bluetooth and its low energy profile.

d) Write a note on applications of loT in Smart City.

e) Explain IEEE802.15, WPAN.

Q.5 Solve Any Two. **16**

a) Write a short note on ESP8266 NODE MCU, Arduino Program for Turning ON/OFF of D1 pin.

b) Write a note value creation in loT & business mode innovation for loT.

c) Write a short note on Zigbee /IEEE802.15.4 standard.

SLR-QH-469

Seat No.	

Set P

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Software Engineering (BTN03603)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No.1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Choose the correct alternatives from the given options.. 14

1) What is the first step in the software development lifecycle?
a) System Desing
b) Coding
c) System Testing
d) Preliminary Investigation and Analysis

2) Software is defined as _____.
a) set of programs, documentation & configuration of data
b) set of programs
c) documentation and configuration of data
d) None of the mentioned

3) Define Agile scrum methodology.
a) project management that emphasizes incremental progress
b) project management that emphasizes decremental progress
c) project management that emphasizes neutral progress
d) project management that emphasizes no progress

4) What does SDLC stands for?
a) System Design Life Cycle
b) Software Design Life Cycle
c) Software Development Life Cycle
d) System Development Life cycle

5) Who proposed the spiral model?
a) Barry Boehm b) Pressman
c) Royce d) IBM

6) Agile Software Development is based on which of the following type?
a) Iterative Development
b) Incremental Development
c) Both Incremental and Iterative Development
d) Linear Development

7) The SRS document is also known as _____ specification.
a) white box
b) black box
c) grey-box
d) none of the mentioned

8) Which of the following is the biggest disadvantage of using a linear sequential model?
a) It is not easy to understand
b) It takes a lot of documentation
c) It does not allow us to make the changes in later phases
d) All of the above

9) A _____ view shows the system hardware and how software components are distributed across the processors in the system.
a) Physical
b) Logical
c) Process
d) All of the mentioned

10) Software tester should be involved very early during development phase of a project.
a) True
b) False

11) Resources refers to _____.
a) Manpower
b) Machinery
c) Materials
d) All the above

12) Five dimensions that must be managed on a project _____.
a) Constraint, Quality, Cost, Schedule, Staff
b) Features, Quality, Cost, Schedule, Staff
c) Features, priority, Cost, Schedule, Staff
d) Features, Quality, Cost, Schedule, customer

13) When agile methodology was introduced?
a) 2001
b) 2002
c) 2009
d) 2004

14) In which model testers and developers work together in the project?
a) Agile model
b) Waterfall model
c) both a) and b)
d) None of these

Seat No.	

Set **P**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Software Engineering (BTN03603)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever necessary.

SECTION – I

Q.2 Attempt Any Four. **16**

a) What is SDLC? Explain software development process.

b) List and explain characteristics of Good Software.

c) Explain components of SRS.

d) Explain role of Software Architecture.

e) What is coupling and cohesion?

Q.3 Attempt Any One. **06**

a) Define DFD. Draw level 0 and Level 1 DFD for Railway Reservation System.

b) Explain in detail prototyping model.

Q.4 Explain functional specification with anyone example of use cases. **06**

SECTION – II

Q.5 Attempt Any Four. **16**

a) Define Software Testing, list & explain principles of Software Testing.

b) How to manage the Risk? Explain its planning procedure.

c) Explain Object Oriented Testing Methods.

d) Explain the process of software configuration management.

e) Which are new Management Responsibilities?

Q.6 Attempt Any One. **06**

a) Write a note on Black Box Testing.

b) What is difference between APM and Old day's system?

Q.7 Explain CMM project Management Process in detail. **06**

SLR-QH-469

Seat No.	

Set Q

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Software Engineering (BTN03603)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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c) both a) and b)
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a) System Design Life Cycle
b) Software Design Life Cycle
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a) Barry Boehm
b) Pressman
c) Royce
d) IBM

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b) Incremental Development
c) Both Incremental and Iterative Development
d) Linear Development

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c) grey-box
d) none of the mentioned

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Software Engineering (BTN03603)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever necessary.

SECTION – I

Q.2 Attempt Any Four. **16**

a) What is SDLC? Explain software development process.

b) List and explain characteristics of Good Software.

c) Explain components of SRS.

d) Explain role of Software Architecture.

e) What is coupling and cohesion?

Q.3 Attempt Any One. **06**

a) Define DFD. Draw level 0 and Level 1 DFD for Railway Reservation System.

b) Explain in detail prototyping model.

Q.4 Explain functional specification with anyone example of use cases. **06**

SECTION – II

Q.5 Attempt Any Four. **16**

a) Define Software Testing, list & explain principles of Software Testing.

b) How to manage the Risk? Explain its planning procedure.

c) Explain Object Oriented Testing Methods.

d) Explain the process of software configuration management.

e) Which are new Management Responsibilities?

Q.6 Attempt Any One. **06**

a) Write a note on Black Box Testing.

b) What is difference between APM and Old day's system?

Q.7 Explain CMM project Management Process in detail. **06**

SLR-QH-469

Seat No.	

Set R

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Software Engineering (BTN03603)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No.1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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3) Figures to the right indicates full marks.
4) Assume suitable data wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Choose the correct alternatives from the given options.. 14

1) Resources refers to _____.
a) Manpower b) Machinery
c) Materials d) All the above

2) Five dimensions that must be managed on a project _____.
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b) Features, Quality, Cost, Schedule, Staff
c) Features, priority, Cost, Schedule, Staff
d) Features, Quality, Cost, Schedule, customer

3) When agile methodology was introduced?
a) 2001 b) 2002
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4) In which model testers and developers work together in the project?
a) Agile model b) Waterfall model
c) both a) and b) d) None of these

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b) Coding
c) System Testing
d) Preliminary Investigation and Analysis

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d) Linear Development

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d) All of the above

13) A _____ view shows the system hardware and how software components are distributed across the processors in the system.
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b) Logical
c) Process
d) All of the mentioned

14) Software tester should be involved very early during development phase of a project.
a) True
b) False

Seat No.	

Set **R**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Software Engineering (BTN03603)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever necessary.

SECTION – I

Q.2 Attempt Any Four. **16**

a) What is SDLC? Explain software development process.

b) List and explain characteristics of Good Software.

c) Explain components of SRS.

d) Explain role of Software Architecture.

e) What is coupling and cohesion?

Q.3 Attempt Any One. **06**

a) Define DFD. Draw level 0 and Level 1 DFD for Railway Reservation System.

b) Explain in detail prototyping model.

Q.4 Explain functional specification with anyone example of use cases. **06**

SECTION – II

Q.5 Attempt Any Four. **16**

a) Define Software Testing, list & explain principles of Software Testing.

b) How to manage the Risk? Explain its planning procedure.

c) Explain Object Oriented Testing Methods.

d) Explain the process of software configuration management.

e) Which are new Management Responsibilities?

Q.6 Attempt Any One. **06**

a) Write a note on Black Box Testing.

b) What is difference between APM and Old day's system?

Q.7 Explain CMM project Management Process in detail. **06**

Seat No.	

Set **S**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Software Engineering (BTN03603)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No.1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Choose the correct alternatives from the given options.. 14

1) Agile Software Development is based on which of the following type?
a) Iterative Development
b) Incremental Development
c) Both Incremental and Iterative Development
d) Linear Development

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c) It does not allow us to make the changes in later phases
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c) Process d) All of the mentioned

5) Software tester should be involved very early during development phase of a project.
a) True b) False

6) Resources refers to _____.
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c) Materials d) All the above

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   c) System Testing
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   a) System Design Life Cycle
   b) Software Design Life Cycle
   c) Software Development Life Cycle
   d) System Development Life cycle

14) Who proposed the spiral model?
   a) Barry Boehm b) Pressman
   c) Royce d) IBM

Seat No.	

Set **S**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Software Engineering (BTN03603)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever necessary.

SECTION – I

Q.2 Attempt Any Four. **16**

a) What is SDLC? Explain software development process.

b) List and explain characteristics of Good Software.

c) Explain components of SRS.

d) Explain role of Software Architecture.

e) What is coupling and cohesion?

Q.3 Attempt Any One. **06**

a) Define DFD. Draw level 0 and Level 1 DFD for Railway Reservation System.

b) Explain in detail prototyping model.

Q.4 Explain functional specification with anyone example of use cases. **06**

SECTION – II

Q.5 Attempt Any Four. **16**

a) Define Software Testing, list & explain principles of Software Testing.

b) How to manage the Risk? Explain its planning procedure.

c) Explain Object Oriented Testing Methods.

d) Explain the process of software configuration management.

e) Which are new Management Responsibilities?

Q.6 Attempt Any One. **06**

a) Write a note on Black Box Testing.

b) What is difference between APM and Old day's system?

Q.7 Explain CMM project Management Process in detail. **06**

SLR-QH-470

Seat No.	

Set P

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Cloud Computing (BTN03606)

Day & Date: Friday, 22-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book).
Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Choose the correct alternatives from the given options. 14

1) Which of the following service provider provides the least amount of built in security?
a) SaaS b) PaaS
c) IaaS d) All of the mentioned

2) What is most commonly used for managing the resources for every virtual system?
a) Load balancer b) Hypervisor
c) Router d) Cloud

3) CometCloud supports policy based autonomic and _____.
a) cloud bursting b) cloud bridging
c) none d) both a) and b)

4) Which delivery model is an example of a cloud computing environment that provides users access to virtual machines?
a) Platform as a Service b) Software as a Service
c) Application as a Service d) Infrastructure as a Service

5) Aneka is based on which service model?
a) Iaas b) PaaS
c) SaaS d) BPaaS

6) Which of the is not an advantage of cloud?
   a) No worries about running out of storage
   b) Immediate access to computing resources
   c) Easier to maintain a cloud network
   d) paying only for what you use

7) Which of the following is the wrong statement about cloud computing?
   a) Private cloud doesn't employ the same level of virtualization
   b) Data center operates under average loads
   c) Private cloud doesn't pooling of resources that a cloud computing provider can achieve
   d) Abstraction enables the key benefit of cloud computing: shared, ubiquitous access

8) Which of the following is required by Cloud Computing?
   a) That the identity be authenticated
   b) That the authentication be portable
   c) That you establish an identity
   d) All of the mentioned

9) Salesforce.com is the largest _____ provider of CRM software.
   a) PaaS
   b) laaS
   c) CaaS
   d) SaaS

10) _____ authentication requires the outside use of a network security or trust service.
   a) SSO
   b) Single factor
   c) Multi Factor
   d) All of the mentioned

11) Which of the following is a man-in-the-middle type of service?
   a) CaaS
   b) IaaS
   c) AaaS
   d) All of the mentioned

12) Cloud Security protects _____.
   a) Data
   b) Applications
   c) Infrastructure
   d) All of the above

13) What legal issue in cloud computing pertains to the ownership and control of data stored on cloud servers?
   a) Data sovereignty
   b) Data encryption
   c) Data residency
   d) Data breach notification

14) What is a key consideration in cloud migration strategy?
   a) Speed of internet connection
   b) Legacy system compatibility
   c) Number of physical servers
   d) Availability of free cloud trials

SLR-QH-470

Seat No.	

Set P

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Cloud Computing (BTN03606)

Day & Date: Friday, 22-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt the following. (Any Three) **12**

a) Difference between Traditional vs. Cloud Computing.

b) What is mean by Virtual Machine? Explain Life Cycle of Virtual machine Provisioning.

c) How do you evaluate the IDaaS Application?

d) Write a note on desired features of a cloud.

Q.3 Attempt the following. (Any Two) **16**

a) Explain the concept of a seven-step model of migration into a cloud.

b) **Write a short note on:**
i) IaaS workloads
ii) Pods
iii) Aggregation
iv) Silos

c) What is need of Cloud Migration? Explain Broad Approaches to Migrating into the Cloud.

SECTION – II

Q.4 Attempt the following. (Any Three) **12**

a) Explain the concept of Aneka hybrid cloud Architecture.

b) What are the Data Privacy and Security Issues in cloud computing?

c) Describe the following autonomic behaviors of comet cloud
i) Fault-Tolerance
ii) Load-Balancing

d) Difference between On-Line Agreements versus Standard Contracts.

Q.5 Attempt the following. (Any Two) **16**

a) Explain the Comet Cloud architecture for autonomous cloudburst using a suitable diagram.

b) Explain the CSA Cloud reference model with security boundaries using suitable diagram.

c) Write a note on Commercial and Business Considerations-A Cloud User's Viewpoint.

SLR-QH-470

Seat No.	

Set Q

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Cloud Computing (BTN03606)

Day & Date: Friday, 22-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book).
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MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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SLR-QH-470

Seat No.	

Set Q

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Cloud Computing (BTN03606)

Day & Date: Friday, 22-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt the following. (Any Three) **12**

a) Difference between Traditional vs. Cloud Computing.

b) What is mean by Virtual Machine? Explain Life Cycle of Virtual machine Provisioning.

c) How do you evaluate the IDaaS Application?

d) Write a note on desired features of a cloud.

Q.3 Attempt the following. (Any Two) **16**

a) Explain the concept of a seven-step model of migration into a cloud.

b) **Write a short note on:**
i) IaaS workloads
ii) Pods
iii) Aggregation
iv) Silos

c) What is need of Cloud Migration? Explain Broad Approaches to Migrating into the Cloud.

SECTION – II

Q.4 Attempt the following. (Any Three) **12**

a) Explain the concept of Aneka hybrid cloud Architecture.

b) What are the Data Privacy and Security Issues in cloud computing?

c) Describe the following autonomic behaviors of comet cloud
i) Fault-Tolerance
ii) Load-Balancing

d) Difference between On-Line Agreements versus Standard Contracts.

Q.5 Attempt the following. (Any Two) **16**

a) Explain the Comet Cloud architecture for autonomous cloudburst using a suitable diagram.

b) Explain the CSA Cloud reference model with security boundaries using suitable diagram.

c) Write a note on Commercial and Business Considerations-A Cloud User's Viewpoint.

SLR-QH-470

Seat No.	

Set R

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Cloud Computing (BTN03606)

Day & Date: Friday, 22-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book).
Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Choose the correct alternatives from the given options. 14

1) Which of the following is a man-in-the-middle type of service?
a) CaaS b) IaaS
c) AaaS d) All of the mentioned

2) Cloud Security protects _____.
a) Data b) Applications
c) Infrastructure d) All of the above

3) What legal issue in cloud computing pertains to the ownership and control of data stored on cloud servers?
a) Data sovereignty b) Data encryption
c) Data residency d) Data breach notification

4) What is a key consideration in cloud migration strategy?
a) Speed of internet connection
b) Legacy system compatibility
c) Number of physical servers
d) Availability of free cloud trials

5) Which of the following service provider provides the least amount of built in security?
a) SaaS b) PaaS
c) IaaS d) All of the mentioned

6) What is most commonly used for managing the resources for every virtual system?
a) Load balancer b) Hypervisor
c) Router d) Cloud

7) CometCloud supports policy based autonomic and _____.
a) cloud bursting
b) cloud bridging
c) none
d) both a) and b)

8) Which delivery model is an example of a cloud computing environment that provides users access to virtual machines?
a) Platform as a Service
b) Software as a Service
c) Application as a Service
d) Infrastructure as a Service

9) Aneka is based on which service model?
a) Iaas
b) PaaS
c) SaaS
d) BPaaS

10) Which of the is not an advantage of cloud?
a) No worries about running out of storage
b) Immediate access to computing resources
c) Easier to maintain a cloud network
d) paying only for what you use

11) Which of the following is the wrong statement about cloud computing?
a) Private cloud doesn't employ the same level of virtualization
b) Data center operates under average loads
c) Private cloud doesn't pooling of resources that a cloud computing provider can achieve
d) Abstraction enables the key benefit of cloud computing: shared, ubiquitous access

12) Which of the following is required by Cloud Computing?
a) That the identity be authenticated
b) That the authentication be portable
c) That you establish an identity
d) All of the mentioned

13) Salesforce.com is the largest _____ provider of CRM software.
a) PaaS
b) laaS
c) CaaS
d) SaaS

14) _____ authentication requires the outside use of a network security or trust service.
a) SSO
b) Single factor
c) Multi Factor
d) All of the mentioned

SLR-QH-470

Seat No.	

Set R

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Cloud Computing (BTN03606)

Day & Date: Friday, 22-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt the following. (Any Three) **12**

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b) What is mean by Virtual Machine? Explain Life Cycle of Virtual machine Provisioning.

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c) What is need of Cloud Migration? Explain Broad Approaches to Migrating into the Cloud.

SECTION – II

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a) Explain the concept of Aneka hybrid cloud Architecture.

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c) Describe the following autonomic behaviors of comet cloud
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ii) Load-Balancing

d) Difference between On-Line Agreements versus Standard Contracts.

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a) Explain the Comet Cloud architecture for autonomous cloudburst using a suitable diagram.

b) Explain the CSA Cloud reference model with security boundaries using suitable diagram.

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SLR-QH-470

Seat No.	

Set S

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Cloud Computing (BTN03606)

Day & Date: Friday, 22-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book).
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MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Choose the correct alternatives from the given options. 14

1) Which of the is not an advantage of cloud?
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a) Iaas
b) PaaS
c) SaaS
d) BPaaS

SLR-QH-470

Seat No.	

Set S

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Cloud Computing (BTN03606)

Day & Date: Friday, 22-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
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SECTION – I

Q.2 Attempt the following. (Any Three) **12**

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b) What is mean by Virtual Machine? Explain Life Cycle of Virtual machine Provisioning.

c) How do you evaluate the IDaaS Application?

d) Write a note on desired features of a cloud.

Q.3 Attempt the following. (Any Two) **16**

a) Explain the concept of a seven-step model of migration into a cloud.

b) **Write a short note on:**
i) IaaS workloads
ii) Pods
iii) Aggregation
iv) Silos

c) What is need of Cloud Migration? Explain Broad Approaches to Migrating into the Cloud.

SECTION – II

Q.4 Attempt the following. (Any Three) **12**

a) Explain the concept of Aneka hybrid cloud Architecture.

b) What are the Data Privacy and Security Issues in cloud computing?

c) Describe the following autonomic behaviors of comet cloud
i) Fault-Tolerance
ii) Load-Balancing

d) Difference between On-Line Agreements versus Standard Contracts.

Q.5 Attempt the following. (Any Two) **16**

a) Explain the Comet Cloud architecture for autonomous cloudburst using a suitable diagram.

b) Explain the CSA Cloud reference model with security boundaries using suitable diagram.

c) Write a note on Commercial and Business Considerations-A Cloud User's Viewpoint.

SLR-QH-472

Seat No.	

Set P

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Network Security (BTN03608)

Day & Date: Friday, 22-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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3) Figures to the right indicates full marks.
4) Assume suitable data whenever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Choose the correct option from the following. 14

1) What is the rule for encryption in playfair cipher if the letters in a pair appear in same column?
a) they are replaced by the letter appearing immediately below them respectively
b) they are replaced by the letter appearing immediately right to them respectively
c) they are replaced by the letters at the corner of the row
d) that pair is neglected

2) Which of the following is not a vulnerability of the data-link layer?
a) MAC Address Spoofing
b) VLAN circumvention
c) Switches may be forced for flooding traffic to all VLAN ports
d) Overloading of transport-layer mechanisms

3) The DES algorithm has a key length of _____.
a) 128 Bits b) 32 Bits
c) 64 Bits d) 16 Bits

4) A _____ attack attempts to learn or make use of information from the system but does not affect system resources.
a) active b) passive
c) None of the above d) All of the above

5) In an asymmetric-key cipher, the sender uses the _____ key.
a) private b) public
c) either a) or b) d) neither a) nor b)

6) Which cryptographic algorithm is used in CMAC?
a) Triple DES and AES
b) DES
c) RC-4
d) AES

7) In _____ the hash value of a message is encrypted with a user's private key.
a) Digital Signature
b) MAC
c) One-time pad
d) All above

8) Which of the following are used to create a message digest by the network security protocols?
a) RSA
b) SHA-1
c) DES
d) MD5

9) The statement, "Information systems should be configured to require strong passwords," is an example of a/an _____.
a) Security requirement
b) Security policy
c) Security objective
d) Security control

10) One commonly used public-key cryptography method is the algorithm.
a) RSS
b) RAS
c) RSA
d) RAA

11) Which layer in the IEEE 802.11 protocol stack has the function of flow control and error control?
a) Physical Layer
b) Logic Link Control Layer
c) Medium Access Layer
d) None of the mentioned

12) _____ is the method for keeping sensitive information in email communication & accounts secure against unofficial access, loss, or compromise.
a) Email security
b) Email hacking
c) Email protection
d) Email safeguarding

13) With respect to IEEE 802.11 Wireless LAN, MSDU stands for____.
a) MAC service data unit
b) Main server data user
c) Multiframe service datagram usage
d) MAC server device usage

14) The process of verifying the identity of a user _____.
a) Authentication
b) Identification
c) Validation
d) Verification

SLR-QH-472

Seat No.	

Set P

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Network Security (BTN03608)

Day & Date: Friday, 22-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data whenever necessary.

SECTION – I

Q.2 Attempt the following. (Any Four) **16**

a) Explain Caeser Cipher with example.

b) Describe OSI Security Architecture.

c) Differentiate between Active Attack and Passive Attack.

d) Describe Diffie - Hellman key exchange algorithm.

e) Write a note on: Cryptographic Hash Functions

Q.3 Attempt the following. (Any Two) **12**

a) Explain DES encryption algorithm with diagram.

b) What is SHA? Explain in detail.

c) Elaborate RSA algorithm with example.

SECTION – II

Q.4 Attempt the following. (Any Four) **16**

a) Explain CMAC with the help of diagram.

b) Differentiate between CCM and GCM.

c) Write a note on: Network Access Control.

d) What is S/MIME? Explain in detail.

e) What is IP Security? Elaborate it.

Q.5 Attempt the following. (Any Two) **12**

a) What is HMAC? Draw HMAC structure and Write and Explain HMAC Algorithm.

b) Draw and explain ESP (Encapsulating Security Payload).

c) What is MAC? Explain Security of MAC.

SLR-QH-472

Seat No.	

Set Q

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Network Security (BTN03608)

Day & Date: Friday, 22-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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3) Figures to the right indicates full marks.
4) Assume suitable data whenever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Choose the correct option from the following. **14**

1) Which of the following are used to create a message digest by the network security protocols?
a) RSA b) SHA-1
c) DES d) MD5

2) The statement, "Information systems should be configured to require strong passwords," is an example of a/an _____.
a) Security requirement b) Security policy
c) Security objective d) Security control

3) One commonly used public-key cryptography method is the algorithm.
a) RSS b) RAS
c) RSA d) RAA

4) Which layer in the IEEE 802.11 protocol stack has the function of flow control and error control?
a) Physical Layer b) Logic Link Control Layer
c) Medium Access Layer d) None of the mentioned

5) _____ is the method for keeping sensitive information in email communication & accounts secure against unofficial access, loss, or compromise.
a) Email security b) Email hacking
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6) With respect to IEEE 802.11 Wireless LAN, MSDU stands for____.
a) MAC service data unit
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7) The process of verifying the identity of a user _____.
a) Authentication
b) Identification
c) Validation
d) Verification

8) What is the rule for encryption in playfair cipher if the letters in a pair appear in same column?
a) they are replaced by the letter appearing immediately below them respectively
b) they are replaced by the letter appearing immediately right to them respectively
c) they are replaced by the letters at the corner of the row
d) that pair is neglected

9) Which of the following is not a vulnerability of the data-link layer?
a) MAC Address Spoofing
b) VLAN circumvention
c) Switches may be forced for flooding traffic to all VLAN ports
d) Overloading of transport-layer mechanisms

10) The DES algorithm has a key length of _____.
a) 128 Bits
b) 32 Bits
c) 64 Bits
d) 16 Bits

11) A _____ attack attempts to learn or make use of information from the system but does not affect system resources.
a) active
b) passive
c) None of the above
d) All of the above

12) In an asymmetric-key cipher, the sender uses the _____ key.
a) private
b) public
c) either a) or b)
d) neither a) nor b)

13) Which cryptographic algorithm is used in CMAC?
a) Triple DES and AES
b) DES
c) RC-4
d) AES

14) In _____ the hash value of a message is encrypted with a user's private key.
a) Digital Signature
b) MAC
c) One-time pad
d) All above

SLR-QH-472

Seat No.	

Set Q

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Network Security (BTN03608)

Day & Date: Friday, 22-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
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SECTION – I

Q.2 Attempt the following. (Any Four) **16**

a) Explain Caeser Cipher with example.

b) Describe OSI Security Architecture.

c) Differentiate between Active Attack and Passive Attack.

d) Describe Diffie - Hellman key exchange algorithm.

e) Write a note on: Cryptographic Hash Functions

Q.3 Attempt the following. (Any Two) **12**

a) Explain DES encryption algorithm with diagram.

b) What is SHA? Explain in detail.

c) Elaborate RSA algorithm with example.

SECTION – II

Q.4 Attempt the following. (Any Four) **16**

a) Explain CMAC with the help of diagram.

b) Differentiate between CCM and GCM.

c) Write a note on: Network Access Control.

d) What is S/MIME? Explain in detail.

e) What is IP Security? Elaborate it.

Q.5 Attempt the following. (Any Two) **12**

a) What is HMAC? Draw HMAC structure and Write and Explain HMAC Algorithm.

b) Draw and explain ESP (Encapsulating Security Payload).

c) What is MAC? Explain Security of MAC.

SLR-QH-472

Seat No.	

Set R

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Network Security (BTN03608)

Day & Date: Friday, 22-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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4) Assume suitable data whenever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Choose the correct option from the following. 14

1) Which layer in the IEEE 802.11 protocol stack has the function of flow control and error control?
a) Physical Layer b) Logic Link Control Layer
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2) _____ is the method for keeping sensitive information in email communication & accounts secure against unofficial access, loss, or compromise.
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3) With respect to IEEE 802.11 Wireless LAN, MSDU stands for____.
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5) What is the rule for encryption in playfair cipher if the letters in a pair appear in same column?
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SLR-QH-472

Seat No.	

Set R

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Network Security (BTN03608)

Day & Date: Friday, 22-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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SLR-QH-472

Seat No.	

Set S

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Network Security (BTN03608)

Day & Date: Friday, 22-05-2026 Max. Marks: 70
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Duration: 30 Minutes Marks: 14

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c) 64 Bits
d) 16 Bits

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b) passive
c) None of the above
d) All of the above

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b) public
c) either a) or b)
d) neither a) nor b)

SLR-QH-472

Seat No.	

Set S

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Network Security (BTN03608)

Day & Date: Friday, 22-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data whenever necessary.

SECTION – I

Q.2 Attempt the following. (Any Four) **16**

a) Explain Caeser Cipher with example.

b) Describe OSI Security Architecture.

c) Differentiate between Active Attack and Passive Attack.

d) Describe Diffie - Hellman key exchange algorithm.

e) Write a note on: Cryptographic Hash Functions

Q.3 Attempt the following. (Any Two) **12**

a) Explain DES encryption algorithm with diagram.

b) What is SHA? Explain in detail.

c) Elaborate RSA algorithm with example.

SECTION – II

Q.4 Attempt the following. (Any Four) **16**

a) Explain CMAC with the help of diagram.

b) Differentiate between CCM and GCM.

c) Write a note on: Network Access Control.

d) What is S/MIME? Explain in detail.

e) What is IP Security? Elaborate it.

Q.5 Attempt the following. (Any Two) **12**

a) What is HMAC? Draw HMAC structure and Write and Explain HMAC Algorithm.

b) Draw and explain ESP (Encapsulating Security Payload).

c) What is MAC? Explain Security of MAC.

SLR-QH-473

Seat No.	

Set P

T. Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
Principles of Management: Practicing Ethics, Responsibility, Management (BTN03609)

Day & Date: Monday, 25-05-2026 Max. Marks: 50
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 20 Minutes Marks: 10

Q.1 Multiple Choice Questions. **10**

1) Attention, calmness, focus faithfulness etc are values related to _____.
a) Truth b) Love
c) Peace d) Right-conduct

2) _____ refers to the description that describes what one ought to do under a specific circumstance.
a) Normative Inquiry b) Ethics
c) Morality d) Work Ethics

3) _____ covers comprehensively all areas of practice of a particular profession.
a) Self-Assertion b) Profession
c) Professional d) Professionalism

4) An engineer should focus on the good of the clients and the public at large, which means no harm should be done intentionally is called as _____.
a) Proficiency virtues b) Team work virtues
c) Public-Spirited Virtues d) None of the above

5) _____ consists of assigned tasks at the place of employment and achieving the objectives.
a) Moral responsibility b) Job responsibility
c) Casual responsibility d) Legal responsibility

6) _____ implies consciousness which means the sense of awareness.

a) Conscientiousness
b) Informed Consent
c) Moral autonomy
d) None of the above

7) Public has a right to exposure to safe systems, not to be injured, etc. is _____.

a) Rights and duty ethics
b) Honesty
c) Courage
d) Loyalty

8) Munasinghe's Approach to Sustainable Development is based on ___.

a) Social
b) Economic
c) Environmental
d) All of the above

9) _____ is a structured system of processes by which companies and corporations are directed and controlled.

a) Sustainable development
b) Corporate governance
c) Trustworthiness
d) None of the above

10) _____ is a field that identifies resource use, measures and communicates costs of a company's or national economic impact on the environment.

a) Environment
b) Sustainability
c) Environmental accounting
d) None of the above

SLR-QH-473

Seat No.	

Set P

T. Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
Principles of Management: Practicing Ethics, Responsibility, Management (BTN03609)

Day & Date: Monday, 25-05-2026 Max. Marks: 40
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Answer the following. (Any Two) **10**

a) Define Moral Issues and its types.

b) Mention the scope and approaches of engineering ethics.

c) Explain what are Moral Dilemmas?

Q.3 Answer the following. (Any Two) **10**

a) Define following terms:
i) Team work virtue
ii) Self-governance Virtue

b) List and explain important roles of codes of ethics.

c) Explain models of professional engineers.

Section – II

Q.4 Answer the following. (Any Two) **10**

a) Explain the procedure for implementation of the Indian Water mission.

b) Why is solar energy used as an alternative source of energy in India?

c) Elaborate on Nuclear Power in India.

Q.5 Answer the following. (Any Two) **10**

a) Explain Importance of Environmental Accounting.

b) Explain the Core Principles of Good Corporate Governance.

c) Describe basis of economic sustainability.

SLR-QH-473

Seat No.	

Set Q

T. Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
Principles of Management: Practicing Ethics, Responsibility, Management (BTN03609)

Day & Date: Monday, 25-05-2026 Max. Marks: 50
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 20 Minutes Marks: 10

Q.1 Multiple Choice Questions. **10**

1) _____ implies consciousness which means the sense of awareness.
a) Conscientiousness b) Informed Consent
c) Moral autonomy d) None of the above

2) Public has a right to exposure to safe systems, not to be injured, etc. is _____.
a) Rights and duty ethics b) Honesty
c) Courage d) Loyalty

3) Munasinghe's Approach to Sustainable Development is based on ___.
a) Social b) Economic
c) Environmental d) All of the above

4) _____ is a structured system of processes by which companies and corporations are directed and controlled.
a) Sustainable development b) Corporate governance
c) Trustworthiness d) None of the above

5) _____ is a field that identifies resource use, measures and communicates costs of a company's or national economic impact on the environment.
a) Environment b) Sustainability
c) Environmental accounting d) None of the above

6) Attention, calmness, focus faithfulness etc are values related to _____.
a) Truth b) Love
c) Peace d) Right-conduct

7) _____ refers to the description that describes what one ought to do under a specific circumstance.

a) Normative Inquiry
b) Ethics
c) Morality
d) Work Ethics

8) _____ covers comprehensively all areas of practice of a particular profession.

a) Self-Assertion
b) Profession
c) Professional
d) Professionalism

9) An engineer should focus on the good of the clients and the public at large, which means no harm should be done intentionally is called as _____.

a) Proficiency virtues
b) Team work virtues
c) Public-Spirited Virtues
d) None of the above

10) _____ consists of assigned tasks at the place of employment and achieving the objectives.

a) Moral responsibility
b) Job responsibility
c) Casual responsibility
d) Legal responsibility

SLR-QH-473

Seat No.	

Set Q

T. Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
Principles of Management: Practicing Ethics, Responsibility, Management (BTN03609)

Day & Date: Monday, 25-05-2026 Max. Marks: 40
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Answer the following. (Any Two) **10**

a) Define Moral Issues and its types.

b) Mention the scope and approaches of engineering ethics.

c) Explain what are Moral Dilemmas?

Q.3 Answer the following. (Any Two) **10**

a) Define following terms:
i) Team work virtue
ii) Self-governance Virtue

b) List and explain important roles of codes of ethics.

c) Explain models of professional engineers.

Section – II

Q.4 Answer the following. (Any Two) **10**

a) Explain the procedure for implementation of the Indian Water mission.

b) Why is solar energy used as an alternative source of energy in India?

c) Elaborate on Nuclear Power in India.

Q.5 Answer the following. (Any Two) **10**

a) Explain Importance of Environmental Accounting.

b) Explain the Core Principles of Good Corporate Governance.

c) Describe basis of economic sustainability.

SLR-QH-473

Seat No.	

Set R

T. Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
Principles of Management: Practicing Ethics, Responsibility, Management (BTN03609)

Day & Date: Monday, 25-05-2026 Max. Marks: 50
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 20 Minutes Marks: 10

Q.1 Multiple Choice Questions. **10**

1) _____ is a structured system of processes by which companies and corporations are directed and controlled.
a) Sustainable development b) Corporate governance
c) Trustworthiness d) None of the above

2) _____ is a field that identifies resource use, measures and communicates costs of a company's or national economic impact on the environment.
a) Environment b) Sustainability
c) Environmental accounting d) None of the above

3) Attention, calmness, focus faithfulness etc are values related to _____.
a) Truth b) Love
c) Peace d) Right-conduct

4) _____ refers to the description that describes what one ought to do under a specific circumstance.
a) Normative Inquiry b) Ethics
c) Morality d) Work Ethics

5) _____ covers comprehensively all areas of practice of a particular profession.
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6) An engineer should focus on the good of the clients and the public at large, which means no harm should be done intentionally is called as _____.

a) Proficiency virtues
b) Team work virtues
c) Public-Spirited Virtues
d) None of the above

7) _____ consists of assigned tasks at the place of employment and achieving the objectives.

a) Moral responsibility
b) Job responsibility
c) Casual responsibility
d) Legal responsibility

8) _____ implies consciousness which means the sense of awareness.

a) Conscientiousness
b) Informed Consent
c) Moral autonomy
d) None of the above

9) Public has a right to exposure to safe systems, not to be injured, etc. is _____.

a) Rights and duty ethics
b) Honesty
c) Courage
d) Loyalty

10) Munasinghe's Approach to Sustainable Development is based on ___.

a) Social
b) Economic
c) Environmental
d) All of the above

SLR-QH-473

Seat No.	

Set R

T. Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
Principles of Management: Practicing Ethics, Responsibility, Management (BTN03609)

Day & Date: Monday, 25-05-2026 Max. Marks: 40
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Answer the following. (Any Two) **10**

a) Define Moral Issues and its types.

b) Mention the scope and approaches of engineering ethics.

c) Explain what are Moral Dilemmas?

Q.3 Answer the following. (Any Two) **10**

a) Define following terms:
i) Team work virtue
ii) Self-governance Virtue

b) List and explain important roles of codes of ethics.

c) Explain models of professional engineers.

Section – II

Q.4 Answer the following. (Any Two) **10**

a) Explain the procedure for implementation of the Indian Water mission.

b) Why is solar energy used as an alternative source of energy in India?

c) Elaborate on Nuclear Power in India.

Q.5 Answer the following. (Any Two) **10**

a) Explain Importance of Environmental Accounting.

b) Explain the Core Principles of Good Corporate Governance.

c) Describe basis of economic sustainability.

SLR-QH-473

Seat No.		Set	S

T. Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
Principles of Management: Practicing Ethics, Responsibility, Management (BTN03609)

Day & Date: Monday, 25-05-2026 Max. Marks: 50
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 20 Minutes Marks: 10

Q.1 Multiple Choice Questions. **10**

1) _____ covers comprehensively all areas of practice of a particular profession.
a) Self-Assertion b) Profession
c) Professional d) Professionalism

2) An engineer should focus on the good of the clients and the public at large, which means no harm should be done intentionally is called as _____.
a) Proficiency virtues b) Team work virtues
c) Public-Spirited Virtues d) None of the above

3) _____ consists of assigned tasks at the place of employment and achieving the objectives.
a) Moral responsibility b) Job responsibility
c) Casual responsibility d) Legal responsibility

4) _____ implies consciousness which means the sense of awareness.
a) Conscientiousness b) Informed Consent
c) Moral autonomy d) None of the above

5) Public has a right to exposure to safe systems, not to be injured, etc. is _____.
a) Rights and duty ethics b) Honesty
c) Courage d) Loyalty

6) Munasinghe's Approach to Sustainable Development is based on ___.
a) Social b) Economic
c) Environmental d) All of the above

7) _____ is a structured system of processes by which companies and corporations are directed and controlled.

a) Sustainable development
b) Corporate governance
c) Trustworthiness
d) None of the above

8) _____ is a field that identifies resource use, measures and communicates costs of a company's or national economic impact on the environment.

a) Environment
b) Sustainability
c) Environmental accounting
d) None of the above

9) Attention, calmness, focus faithfulness etc are values related to _____.

a) Truth
b) Love
c) Peace
d) Right-conduct

10) _____ refers to the description that describes what one ought to do under a specific circumstance.

a) Normative Inquiry
b) Ethics
c) Morality
d) Work Ethics

SLR-QH-473

Seat No.	

Set S

T. Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
Principles of Management: Practicing Ethics, Responsibility, Management (BTN03609)

Day & Date: Monday, 25-05-2026 Max. Marks: 40
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Answer the following. (Any Two) **10**

a) Define Moral Issues and its types.

b) Mention the scope and approaches of engineering ethics.

c) Explain what are Moral Dilemmas?

Q.3 Answer the following. (Any Two) **10**

a) Define following terms:
i) Team work virtue
ii) Self-governance Virtue

b) List and explain important roles of codes of ethics.

c) Explain models of professional engineers.

Section – II

Q.4 Answer the following. (Any Two) **10**

a) Explain the procedure for implementation of the Indian Water mission.

b) Why is solar energy used as an alternative source of energy in India?

c) Elaborate on Nuclear Power in India.

Q.5 Answer the following. (Any Two) **10**

a) Explain Importance of Environmental Accounting.

b) Explain the Core Principles of Good Corporate Governance.

c) Describe basis of economic sustainability.

SLR-QH-474

Seat No.	

Set P

T. Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
Engineering Economics and Management (BTN03610)

Day & Date: Monday, 25-05-2026 Max. Marks: 50
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page
3) Figures to right indicate full marks.

MCQ/Objective Type Questions

Duration: 20 Minutes Marks:10

Q.1 Choose the correct alternatives from the given options. 10

1) Lowest order of Maslow Hierarchy of needs theory is _____.
a) Safety needs b) Esteem needs
c) Self-Actualization d) Physiological needs

2) The marketing mix consists of: _____.
a) Product, Price, Place, Promotion
b) Planning, Production, Promotion, Profit
c) Profit, Planning, Place, Price
d) None of the above

3) Who was the first Governor of RBI?
a) David Warner b) Sir Phillip Smith
c) James Watson d) Sir Osborne Smith

4) Corporate Social Responsibility (CSR) is concerned with _____
a) Maximizing profits only
b) Fulfilling social and environmental responsibilities
c) Increasing employee salaries
d) Reducing taxation

5) Which of the following is considered a factor of production?
a) Technology b) Capital
c) Government policies d) Economic theories

6) Which is not a factor of production?
a) Land b) Labour
c) Entrepreneur d) Money

7) What is the 'Law of Demand'?
   a) Demand increases as price increases
   b) Demand decreases as price decreases
   c) Demand increases as price decreases and vice versa
   d) Demand and price are not related

8) Highest order of Maslow Hierarchy of needs theory is _____.
   a) Safety needs
   b) Esteem needs
   c) Self- Actualization needs
   d) Physiological needs

9) When the size of an organization increases, the function under production control should _____.
   a) Get more decentralized
   b) Get more centralized
   c) Stay the Same
   d) None of the above

10) A perfectly competitive market is characterized by: _____.
   a) Few sellers
   b) Homogeneous products
   c) Price-setting power for sellers
   d) Barriers to entry

SLR-QH-474

Seat No.	

Set P

T. Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
Engineering Economics and Management (BTN03610)

Day & Date: Monday, 25-05-2026 Max. Marks: 40
Time: 10:00 AM To 01:00 PM

Instructions: 1) Attempt any 4 questions from No. 2 to 7.
2) Figures to the right indicate full marks.

Q.2 Write short notes. **10**

a) Write the difference between Microeconomic and Macroeconomics.

b) Explain the law of demand with a suitable example.

Q.3 Discuss the Marketing Mix and concepts of marketing. **10**

Q.4 Define National Income, GNP, Personal income, disposal income. **10**

Q.5 Explain Maslow's hierarchy of needs theory. **10**

Q.6 Discuss the features of new economic policy in India. **10**

Q.7 Write Short Notes. **10**

a) Scope of economy

b) Departmentalization

Seat No.	

Set **Q**

T. Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
Engineering Economics and Management (BTN03610)

Day & Date: Monday, 25-05-2026 Max. Marks: 50
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page
3) Figures to right indicate full marks.

MCQ/Objective Type Questions

Duration: 20 Minutes Marks:10

Q.1 Choose the correct alternatives from the given options. 10

1) Which is not a factor of production?
a) Land b) Labour
c) Entrepreneur d) Money

2) What is the 'Law of Demand'?
a) Demand increases as price increases
b) Demand decreases as price decreases
c) Demand increases as price decreases and vice versa
d) Demand and price are not related

3) Highest order of Maslow Hierarchy of needs theory is _____.
a) Safety needs b) Esteem needs
c) Self- Actualization needs d) Physiological needs

4) When the size of an organization increases, the function under production control should _____.
a) Get more decentralized b) Get more centralized
c) Stay the Same d) None of the above

5) A perfectly competitive market is characterized by: _____.
a) Few sellers b) Homogeneous products
c) Price-setting power for sellers d) Barriers to entry

6) Lowest order of Maslow Hierarchy of needs theory is _____.
a) Safety needs b) Esteem needs
c) Self-Actualization d) Physiological needs

7) The marketing mix consists of: _____.
   a) Product, Price, Place, Promotion
   b) Planning, Production, Promotion, Profit
   c) Profit, Planning, Place, Price
   d) None of the above

8) Who was the first Governor of RBI?
   a) David Warner
   b) Sir Phillip Smith
   c) James Watson
   d) Sir Osborne Smith

9) Corporate Social Responsibility (CSR) is concerned with _____
   a) Maximizing profits only
   b) Fulfilling social and environmental responsibilities
   c) Increasing employee salaries
   d) Reducing taxation

10) Which of the following is considered a factor of production?
   a) Technology
   b) Capital
   c) Government policies
   d) Economic theories

SLR-QH-474

Seat No.	

Set Q

T. Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
Engineering Economics and Management (BTN03610)

Day & Date: Monday, 25-05-2026 Max. Marks: 40
Time: 10:00 AM To 01:00 PM

Instructions: 1) Attempt any 4 questions from No. 2 to 7.
2) Figures to the right indicate full marks.

Q.2 Write short notes. **10**

a) Write the difference between Microeconomic and Macroeconomics.

b) Explain the law of demand with a suitable example.

Q.3 Discuss the Marketing Mix and concepts of marketing. **10**

Q.4 Define National Income, GNP, Personal income, disposal income. **10**

Q.5 Explain Maslow's hierarchy of needs theory. **10**

Q.6 Discuss the features of new economic policy in India. **10**

Q.7 Write Short Notes. **10**

a) Scope of economy

b) Departmentalization

Seat No.	

Set **R**

T. Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
Engineering Economics and Management (BTN03610)

Day & Date: Monday, 25-05-2026 Max. Marks: 50
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page
3) Figures to right indicate full marks.

MCQ/Objective Type Questions

Duration: 20 Minutes Marks:10

Q.1 Choose the correct alternatives from the given options. 10

1) When the size of an organization increases, the function under production control should _____.
a) Get more decentralized b) Get more centralized
c) Stay the Same d) None of the above

2) A perfectly competitive market is characterized by: _____.
a) Few sellers b) Homogeneous products
c) Price-setting power for sellers d) Barriers to entry

3) Lowest order of Maslow Hierarchy of needs theory is _____.
a) Safety needs b) Esteem needs
c) Self-Actualization d) Physiological needs

4) The marketing mix consists of: _____.
a) Product, Price, Place, Promotion
b) Planning, Production, Promotion, Profit
c) Profit, Planning, Place, Price
d) None of the above

5) Who was the first Governor of RBI?
a) David Warner b) Sir Phillip Smith
c) James Watson d) Sir Osborne Smith

6) Corporate Social Responsibility (CSR) is concerned with _____
a) Maximizing profits only
b) Fulfilling social and environmental responsibilities
c) Increasing employee salaries
d) Reducing taxation

7) Which of the following is considered a factor of production?
   a) Technology
   b) Capital
   c) Government policies
   d) Economic theories

8) Which is not a factor of production?
   a) Land
   b) Labour
   c) Entrepreneur
   d) Money

9) What is the 'Law of Demand'?
   a) Demand increases as price increases
   b) Demand decreases as price decreases
   c) Demand increases as price decreases and vice versa
   d) Demand and price are not related

10) Highest order of Maslow Hierarchy of needs theory is _____.
   a) Safety needs
   b) Esteem needs
   c) Self- Actualization needs
   d) Physiological needs

Seat No.	

Set **R**

T. Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
Engineering Economics and Management (BTN03610)

Day & Date: Monday, 25-05-2026 Max. Marks: 40
Time: 10:00 AM To 01:00 PM

Instructions: 1) Attempt any 4 questions from No. 2 to 7.
2) Figures to the right indicate full marks.

Q.2 Write short notes. **10**

a) Write the difference between Microeconomic and Macroeconomics.

b) Explain the law of demand with a suitable example.

Q.3 Discuss the Marketing Mix and concepts of marketing. **10**

Q.4 Define National Income, GNP, Personal income, disposal income. **10**

Q.5 Explain Maslow's hierarchy of needs theory. **10**

Q.6 Discuss the features of new economic policy in India. **10**

Q.7 Write Short Notes. **10**

a) Scope of economy

b) Departmentalization

Seat No.	

Set **S**

T. Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
Engineering Economics and Management (BTN03610)

Day & Date: Monday, 25-05-2026 Max. Marks: 50
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page
3) Figures to right indicate full marks.

MCQ/Objective Type Questions

Duration: 20 Minutes Marks:10

Q.1 Choose the correct alternatives from the given options. 10

1) Who was the first Governor of RBI?
a) David Warner b) Sir Phillip Smith
c) James Watson d) Sir Osborne Smith

2) Corporate Social Responsibility (CSR) is concerned with _____
a) Maximizing profits only
b) Fulfilling social and environmental responsibilities
c) Increasing employee salaries
d) Reducing taxation

3) Which of the following is considered a factor of production?
a) Technology b) Capital
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4) Which is not a factor of production?
a) Land b) Labour
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5) What is the 'Law of Demand'?
a) Demand increases as price increases
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a) Safety needs
b) Esteem needs
c) Self-Actualization
d) Physiological needs

10) The marketing mix consists of: _____.

a) Product, Price, Place, Promotion
b) Planning, Production, Promotion, Profit
c) Profit, Planning, Place, Price
d) None of the above

SLR-QH-474

Seat No.	

Set S

T. Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
Engineering Economics and Management (BTN03610)

Day & Date: Monday, 25-05-2026 Max. Marks: 40
Time: 10:00 AM To 01:00 PM

Instructions: 1) Attempt any 4 questions from No. 2 to 7.
2) Figures to the right indicate full marks.

Q.2 Write short notes. **10**

a) Write the difference between Microeconomic and Macroeconomics.

b) Explain the law of demand with a suitable example.

Q.3 Discuss the Marketing Mix and concepts of marketing. **10**

Q.4 Define National Income, GNP, Personal income, disposal income. **10**

Q.5 Explain Maslow's hierarchy of needs theory. **10**

Q.6 Discuss the features of new economic policy in India. **10**

Q.7 Write Short Notes. **10**

a) Scope of economy

b) Departmentalization

SLR-QH-475

Seat No.	

Set P

T. Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Disaster Management (BTN03611)

Day & Date: Monday, 25-05-2026 Max. Marks: 50
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to right indicate full marks.
4) Assume suitable data wherever needed & mention it clearly.

MCQ/Objective Type Questions

Duration: 20 Minutes Marks:10

Q.1 Choose the correct alternative from the options. 10

1) Which one of the following is not a Natural Disaster?
a) Volcano eruption b) Flood
c) Blow-out d) Tsunami

2) International Day of Natural Disaster Reduction is celebrated on?
a) June 15 b) March 5
c) October 13 d) September 13

3) The primary goal of a disaster preparedness plan is: _____.
a) To protect the population
b) To protect valuable resources
c) To keep communications lines open
d) To protect environmental health personnel

4) The Disaster Management Act was made in which of the following year?
a) 2003 b) 2005
c) 2007 d) 2009

5) Among which of the following Hazards and Disasters are classified?
a) Cultural and Social b) Natural and Man-made
c) Chemical and physical d) Human and physical

6) Disaster Management includes: _____.
a) Mitigation b) Reconstruction
c) Rehabilitation d) All of the above

7) Disaster management is aimed at _____.
   a) Resettling people in the closest unaffected urban area
   b) Collection of valuable data for future management objectives
   c) Strengthening sewage and drinking water treatment facilities to resist the impact of future disaster
   d) Restoring a community's services, facilities and residences to pre-disaster levels

8) Which of the following heads the National Disaster Management Authority (NDMA)?
   a) President
   b) Prime Minister
   c) Chief Minister
   d) Governor

9) Disaster Management Team should include?
   a) Awareness generation team
   b) First aid team
   c) Search and Rescue team
   d) All of the above

10) The two atom bombs in World war II has been dropped on which of the following?
   a) Hiroshima and Nagasaki in Japan
   b) Germany
   c) Italy
   d) Great Britain

SLR-QH-475

Seat No.	

Set P

T. Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Disaster Management (BTN03611)

Day & Date: Monday, 25-05-2026 Max. Marks: 40
Time: 10:00 AM To 01:00 PM

Instructions: 1) Attempt any 4 questions from No. 2 to 7.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever needed & mention it clearly.

Q.2	**a)**	Explain the phases of Disaster Management cycle with a diagram.	**05**
	b)	Explain Sendai Framework. State its Goal and target.	**05**
Q.3	**a)**	Explain the principles and components of Disaster Management.	**05**
	b)	Describe any live man-made disasters with example.	**05**
Q.4	**a)**	Explain structural and non-structural mitigation strategies with example.	**05**
	b)	Describe the steps of Disaster Preparedness and explain contingency planning.	**05**
Q.5	**a)**	State and describe the steps taken during search and rescue operation.	**05**
	b)	What are the three A's of disaster preparedness? Explain.	**05**
Q.6	**a)**	Explain Medium term recovery aspects with examples.	**05**
	b)	Describe challenges and issues while administering First-Aid and handling of injured at Hospitals.	**05**
Q.7	**a)**	Define Disaster Management and explain aim of Disaster Management.	**05**
	b)	Explain the aspects of a disaster recovery plan.	**05**

SLR-QH-475

Seat No.	

Set Q

T. Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Disaster Management (BTN03611)

Day & Date: Monday, 25-05-2026 Max. Marks: 50
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to right indicate full marks.
4) Assume suitable data wherever needed & mention it clearly.

MCQ/Objective Type Questions

Duration: 20 Minutes Marks:10

Q.1 Choose the correct alternative from the options. 10

1) Disaster Management includes: _____.
a) Mitigation b) Reconstruction
c) Rehabilitation d) All of the above

2) Disaster management is aimed at _____.
a) Resettling people in the closest unaffected urban area
b) Collection of valuable data for future management objectives
c) Strengthening sewage and drinking water treatment facilities to resist the impact of future disaster
d) Restoring a community's services, facilities and residences to pre-disaster levels

3) Which of the following heads the National Disaster Management Authority (NDMA)?
a) President b) Prime Minister
c) Chief Minister d) Governor

4) Disaster Management Team should include?
a) Awareness generation team b) First aid team
c) Search and Rescue team d) All of the above

5) The two atom bombs in World war II has been dropped on which of the following?
a) Hiroshima and Nagasaki in Japan
b) Germany
c) Italy
d) Great Britain

6) Which one of the following is not a Natural Disaster?
a) Volcano eruption
b) Flood
c) Blow-out
d) Tsunami

7) International Day of Natural Disaster Reduction is celebrated on?
a) June 15
b) March 5
c) October 13
d) September 13

8) The primary goal of a disaster preparedness plan is: _____.
a) To protect the population
b) To protect valuable resources
c) To keep communications lines open
d) To protect environmental health personnel

9) The Disaster Management Act was made in which of the following year?
a) 2003
b) 2005
c) 2007
d) 2009

10) Among which of the following Hazards and Disasters are classified?
a) Cultural and Social
b) Natural and Man-made
c) Chemical and physical
d) Human and physical

SLR-QH-475

Seat No.	

Set Q

T. Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Disaster Management (BTN03611)

Day & Date: Monday, 25-05-2026 Max. Marks: 40
Time: 10:00 AM To 01:00 PM

Instructions: 1) Attempt any 4 questions from No. 2 to 7.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever needed & mention it clearly.

Q.2	**a)**	Explain the phases of Disaster Management cycle with a diagram.	**05**
	b)	Explain Sendai Framework. State its Goal and target.	**05**
Q.3	**a)**	Explain the principles and components of Disaster Management.	**05**
	b)	Describe any live man-made disasters with example.	**05**
Q.4	**a)**	Explain structural and non-structural mitigation strategies with example.	**05**
	b)	Describe the steps of Disaster Preparedness and explain contingency planning.	**05**
Q.5	**a)**	State and describe the steps taken during search and rescue operation.	**05**
	b)	What are the three A's of disaster preparedness? Explain.	**05**
Q.6	**a)**	Explain Medium term recovery aspects with examples.	**05**
	b)	Describe challenges and issues while administering First-Aid and handling of injured at Hospitals.	**05**
Q.7	**a)**	Define Disaster Management and explain aim of Disaster Management.	**05**
	b)	Explain the aspects of a disaster recovery plan.	**05**

SLR-QH-475

Seat No.	

Set R

T. Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Disaster Management (BTN03611)

Day & Date: Monday, 25-05-2026 Max. Marks: 50
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to right indicate full marks.
4) Assume suitable data wherever needed & mention it clearly.

MCQ/Objective Type Questions

Duration: 20 Minutes Marks:10

Q.1 Choose the correct alternative from the options. 10

1) Disaster Management Team should include?
a) Awareness generation team b) First aid team
c) Search and Rescue team d) All of the above

2) The two atom bombs in World war II has been dropped on which of the following?
a) Hiroshima and Nagasaki in Japan
b) Germany
c) Italy
d) Great Britain

3) Which one of the following is not a Natural Disaster?
a) Volcano eruption b) Flood
c) Blow-out d) Tsunami

4) International Day of Natural Disaster Reduction is celebrated on?
a) June 15 b) March 5
c) October 13 d) September 13

5) The primary goal of a disaster preparedness plan is: _____.
a) To protect the population
b) To protect valuable resources
c) To keep communications lines open
d) To protect environmental health personnel

6) The Disaster Management Act was made in which of the following year?
a) 2003 b) 2005
c) 2007 d) 2009

7) Among which of the following Hazards and Disasters are classified?
a) Cultural and Social
b) Natural and Man-made
c) Chemical and physical
d) Human and physical

8) Disaster Management includes: _____.
a) Mitigation
b) Reconstruction
c) Rehabilitation
d) All of the above

9) Disaster management is aimed at _____.
a) Resettling people in the closest unaffected urban area
b) Collection of valuable data for future management objectives
c) Strengthening sewage and drinking water treatment facilities to resist the impact of future disaster
d) Restoring a community's services, facilities and residences to pre-disaster levels

10) Which of the following heads the National Disaster Management Authority (NDMA)?
a) President
b) Prime Minister
c) Chief Minister
d) Governor

SLR-QH-475

Seat No.	

Set R

T. Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Disaster Management (BTN03611)

Day & Date: Monday, 25-05-2026 Max. Marks: 40
Time: 10:00 AM To 01:00 PM

Instructions: 1) Attempt any 4 questions from No. 2 to 7.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever needed & mention it clearly.

Q.2	**a)**	Explain the phases of Disaster Management cycle with a diagram.	**05**
	b)	Explain Sendai Framework. State its Goal and target.	**05**
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	b)	Describe the steps of Disaster Preparedness and explain contingency planning.	**05**
Q.5	**a)**	State and describe the steps taken during search and rescue operation.	**05**
	b)	What are the three A's of disaster preparedness? Explain.	**05**
Q.6	**a)**	Explain Medium term recovery aspects with examples.	**05**
	b)	Describe challenges and issues while administering First-Aid and handling of injured at Hospitals.	**05**
Q.7	**a)**	Define Disaster Management and explain aim of Disaster Management.	**05**
	b)	Explain the aspects of a disaster recovery plan.	**05**

SLR-QH-475

Seat No.		Set	S

T. Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Disaster Management (BTN03611)

Day & Date: Monday, 25-05-2026 Max. Marks: 50
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to right indicate full marks.
4) Assume suitable data wherever needed & mention it clearly.

MCQ/Objective Type Questions

Duration: 20 Minutes Marks:10

Q.1 Choose the correct alternative from the options. 10

1) The primary goal of a disaster preparedness plan is: _____.
a) To protect the population
b) To protect valuable resources
c) To keep communications lines open
d) To protect environmental health personnel

2) The Disaster Management Act was made in which of the following year?
a) 2003 b) 2005
c) 2007 d) 2009

3) Among which of the following Hazards and Disasters are classified?
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c) Rehabilitation d) All of the above

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6) Which of the following heads the National Disaster Management Authority (NDMA)?

a) President
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c) Chief Minister
d) Governor

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c) Italy
d) Great Britain

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a) Volcano eruption
b) Flood
c) Blow-out
d) Tsunami

10) International Day of Natural Disaster Reduction is celebrated on?

a) June 15
b) March 5
c) October 13
d) September 13

SLR-QH-475

Seat No.	

Set S

T. Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Disaster Management (BTN03611)

Day & Date: Monday, 25-05-2026 Max. Marks: 40
Time: 10:00 AM To 01:00 PM

Instructions: 1) Attempt any 4 questions from No. 2 to 7.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever needed & mention it clearly.

Q.2	**a)**	Explain the phases of Disaster Management cycle with a diagram.	**05**
	b)	Explain Sendai Framework. State its Goal and target.	**05**
Q.3	**a)**	Explain the principles and components of Disaster Management.	**05**
	b)	Describe any live man-made disasters with example.	**05**
Q.4	**a)**	Explain structural and non-structural mitigation strategies with example.	**05**
	b)	Describe the steps of Disaster Preparedness and explain contingency planning.	**05**
Q.5	**a)**	State and describe the steps taken during search and rescue operation.	**05**
	b)	What are the three A's of disaster preparedness? Explain.	**05**
Q.6	**a)**	Explain Medium term recovery aspects with examples.	**05**
	b)	Describe challenges and issues while administering First-Aid and handling of injured at Hospitals.	**05**
Q.7	**a)**	Define Disaster Management and explain aim of Disaster Management.	**05**
	b)	Explain the aspects of a disaster recovery plan.	**05**

SLR-QH-476

Seat No.	

Set P

T. Y. (B.Tech.) (Computer Science and Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
Natural Language Processing (BTN03612)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to right indicate full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the given options. 14

1) What is Machine Translation?
a) Converts one human language to another
b) Converts human language to machine language
c) Converts any human language to English
d) Converts Machine language to human language

2) Given a stream of text, Named Entity Recognition determines which pronoun maps to which noun.
a) False b) True
c) Can't say d) None of the mentioned

3) What is the field of Natural Language Processing (NLP)?
a) Computer Science b) Artificial Intelligence
c) Linguistics d) All of the mentioned

4) What is Morphological Segmentation?
a) Does Discourse Analysis
b) Separate words into individual morphemes and identify the class of the morphemes
c) Is an extension of propositional logic
d) None of the mentioned

5) What is Coreference Resolution?
a) Anaphora Resolution
b) Given a sentence or larger chunk of text, determine which words ("mentions") refer to the same objects ("entities")
c) All of the mentioned
d) None of the mentioned

6) Parts-of-Speech tagging determines _____.
   a) part-of-speech for each word dynamically as per meaning of the sentence
   b) part-of-speech for each word dynamically as per sentence structure
   c) all part-of-speech for a specific word given as input
   d) all of the mentioned

7) IR (information Retrieval) and IE (Information Extraction) are the two same thing.
   a) True
   b) False
   c) Can't say
   d) none of the above

8) In linguistic morphology _____ is the process for reducing inflected words to their root form.
   a) Rooting
   b) Stemming
   c) Text-Proofing
   d) Both Rooting & Stemming

9) What is full form of NLP?
   a) Natural Language Processing
   b) Nature Language Processing
   c) Natural Language Process
   d) Natural Language pages

10) Which of the following includes major tasks of NLP?
   a) Automatic Summarization
   b) Discourse Analysis
   c) Machine Translation
   d) All of the mentioned

11) NLP is concerned with the interactions between computers and human (natural) languages.
   a) True
   b) False
   c) Can't say
   d) None of these

12) What is the main challenge/s of NLP?
   a) Handling Ambiguity of Sentences
   b) Handling Tokenization
   c) Handling POS-Tagging
   d) All of the mentioned

13) Modern NLP algorithms are based on machine learning, especially statistical machine learning.
   a) True
   b) False
   c) Can't say
   d) None of above

14) Choose from the following areas where NLP can be useful.
   a) Automatic Text Summarization
   b) Automatic Question-Answering Systems
   c) Information Retrieval
   d) All of the mentioned

Seat No.	

Set **P**

T. Y. (B.Tech.) (Computer Science and Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
Natural Language Processing (BTN03612)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

SECTION – I

Q.2 Attempt Any Three. **12**

a) Explain Word-Net application in Query Expansion.

b) Explain different measures of word-net similarity.

c) Explain Lexical Knowledge Networks in detail.

d) Explain Scope Ambiguity and Attachment Ambiguity Resolution.

e) Explain Training issues in detail.

Q.3 Attempt Any Two. **16**

a) Differentiate between ML and NLP.

b) What is WSD? Explain different types of ambiguities and approaches to WSD.

c) Explain Probabilistic Parsing with example.

SECTION – II

Q.4 Attempt Any Three. **12**

a) Describe Robust and Scalable Machine Translation.

b) Explain shallow parsing in detail.

c) Explain HMM and Speech Recognition.

d) Describe Dependency Parsing in detail.

e) Explain Morphology Paradigms in detail.

Q.5 Attempt Any Two. **16**

a) Explain Morphological diversity of Indian Languages.

b) Explain Baum welch algorithm in detail.

c) Explain Sentiment Analysis in detail.

Seat No.	

Set **Q**

T. Y. (B.Tech.) (Computer Science and Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
Natural Language Processing (BTN03612)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to right indicate full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the given options. 14

1) In linguistic morphology _____ is the process for reducing inflected words to their root form.
a) Rooting b) Stemming
c) Text-Proofing d) Both Rooting & Stemming

2) What is full form of NLP?
a) Natural Language Processing
b) Nature Language Processing
c) Natural Language Process
d) Natural Language pages

3) Which of the following includes major tasks of NLP?
a) Automatic Summarization b) Discourse Analysis
c) Machine Translation d) All of the mentioned

4) NLP is concerned with the interactions between computers and human (natural) languages.
a) True b) False
c) Can't say d) None of these

5) What is the main challenge/s of NLP?
a) Handling Ambiguity of Sentences
b) Handling Tokenization
c) Handling POS-Tagging
d) All of the mentioned

6) Modern NLP algorithms are based on machine learning, especially statistical machine learning.
a) True b) False
c) Can't say d) None of above

7) Choose from the following areas where NLP can be useful.
   a) Automatic Text Summarization
   b) Automatic Question-Answering Systems
   c) Information Retrieval
   d) All of the mentioned

8) What is Machine Translation?
   a) Converts one human language to another
   b) Converts human language to machine language
   c) Converts any human language to English
   d) Converts Machine language to human language

9) Given a stream of text, Named Entity Recognition determines which pronoun maps to which noun.
   a) False
   b) True
   c) Can't say
   d) None of the mentioned

10) What is the field of Natural Language Processing (NLP)?
   a) Computer Science
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11) What is Morphological Segmentation?
   a) Does Discourse Analysis
   b) Separate words into individual morphemes and identify the class of the morphemes
   c) Is an extension of propositional logic
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12) What is Coreference Resolution?
   a) Anaphora Resolution
   b) Given a sentence or larger chunk of text, determine which words ("mentions") refer to the same objects ("entities")
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   d) None of the mentioned

13) Parts-of-Speech tagging determines _____.
   a) part-of-speech for each word dynamically as per meaning of the sentence
   b) part-of-speech for each word dynamically as per sentence structure
   c) all part-of-speech for a specific word given as input
   d) all of the mentioned

14) IR (information Retrieval) and IE (Information Extraction) are the two same thing.
   a) True
   b) False
   c) Can't say
   d) none of the above

SLR-QH-476

Seat No.	

Set Q

T. Y. (B.Tech.) (Computer Science and Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
Natural Language Processing (BTN03612)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

SECTION – I

Q.2 Attempt Any Three. **12**

a) Explain Word-Net application in Query Expansion.

b) Explain different measures of word-net similarity.

c) Explain Lexical Knowledge Networks in detail.

d) Explain Scope Ambiguity and Attachment Ambiguity Resolution.

e) Explain Training issues in detail.

Q.3 Attempt Any Two. **16**

a) Differentiate between ML and NLP.

b) What is WSD? Explain different types of ambiguities and approaches to WSD.

c) Explain Probabilistic Parsing with example.

SECTION – II

Q.4 Attempt Any Three. **12**

a) Describe Robust and Scalable Machine Translation.

b) Explain shallow parsing in detail.

c) Explain HMM and Speech Recognition.

d) Describe Dependency Parsing in detail.

e) Explain Morphology Paradigms in detail.

Q.5 Attempt Any Two. **16**

a) Explain Morphological diversity of Indian Languages.

b) Explain Baum welch algorithm in detail.

c) Explain Sentiment Analysis in detail.

SLR-QH-476

Seat No.	

Set R

T. Y. (B.Tech.) (Computer Science and Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
Natural Language Processing (BTN03612)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to right indicate full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the given options. 14

1) NLP is concerned with the interactions between computers and human (natural) languages.
a) True b) False
c) Can't say d) None of these

2) What is the main challenge/s of NLP?
a) Handling Ambiguity of Sentences
b) Handling Tokenization
c) Handling POS-Tagging
d) All of the mentioned

3) Modern NLP algorithms are based on machine learning, especially statistical machine learning.
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6) Given a stream of text, Named Entity Recognition determines which pronoun maps to which noun.
a) False
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c) Can't say
d) None of the mentioned

7) What is the field of Natural Language Processing (NLP)?
a) Computer Science
b) Artificial Intelligence
c) Linguistics
d) All of the mentioned

8) What is Morphological Segmentation?
a) Does Discourse Analysis
b) Separate words into individual morphemes and identify the class of the morphemes
c) Is an extension of propositional logic
d) None of the mentioned

9) What is Coreference Resolution?
a) Anaphora Resolution
b) Given a sentence or larger chunk of text, determine which words ("mentions") refer to the same objects ("entities")
c) All of the mentioned
d) None of the mentioned

10) Parts-of-Speech tagging determines _____.
a) part-of-speech for each word dynamically as per meaning of the sentence
b) part-of-speech for each word dynamically as per sentence structure
c) all part-of-speech for a specific word given as input
d) all of the mentioned

11) IR (information Retrieval) and IE (Information Extraction) are the two same thing.
a) True
b) False
c) Can't say
d) none of the above

12) In linguistic morphology _____ is the process for reducing inflected words to their root form.
a) Rooting
b) Stemming
c) Text-Proofing
d) Both Rooting & Stemming

13) What is full form of NLP?
a) Natural Language Processing
b) Nature Language Processing
c) Natural Language Process
d) Natural Language pages

14) Which of the following includes major tasks of NLP?
a) Automatic Summarization
b) Discourse Analysis
c) Machine Translation
d) All of the mentioned

SLR-QH-476

Seat No.	

Set R

T. Y. (B.Tech.) (Computer Science and Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
Natural Language Processing (BTN03612)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

SECTION – I

Q.2 Attempt Any Three. **12**

a) Explain Word-Net application in Query Expansion.

b) Explain different measures of word-net similarity.

c) Explain Lexical Knowledge Networks in detail.

d) Explain Scope Ambiguity and Attachment Ambiguity Resolution.

e) Explain Training issues in detail.

Q.3 Attempt Any Two. **16**

a) Differentiate between ML and NLP.

b) What is WSD? Explain different types of ambiguities and approaches to WSD.

c) Explain Probabilistic Parsing with example.

SECTION – II

Q.4 Attempt Any Three. **12**

a) Describe Robust and Scalable Machine Translation.

b) Explain shallow parsing in detail.

c) Explain HMM and Speech Recognition.

d) Describe Dependency Parsing in detail.

e) Explain Morphology Paradigms in detail.

Q.5 Attempt Any Two. **16**

a) Explain Morphological diversity of Indian Languages.

b) Explain Baum welch algorithm in detail.

c) Explain Sentiment Analysis in detail.

Seat No.	

Set | S

T. Y. (B.Tech.) (Computer Science and Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
Natural Language Processing (BTN03612)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to right indicate full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the given options. 14

1) Parts-of-Speech tagging determines _____.
a) part-of-speech for each word dynamically as per meaning of the sentence
b) part-of-speech for each word dynamically as per sentence structure
c) all part-of-speech for a specific word given as input
d) all of the mentioned

2) IR (information Retrieval) and IE (Information Extraction) are the two same thing.
a) True b) False
c) Can't say d) none of the above

3) In linguistic morphology _____ is the process for reducing inflected words to their root form.
a) Rooting b) Stemming
c) Text-Proofing d) Both Rooting & Stemming

4) What is full form of NLP?
a) Natural Language Processing
b) Nature Language Processing
c) Natural Language Process
d) Natural Language pages

5) Which of the following includes major tasks of NLP?
a) Automatic Summarization b) Discourse Analysis
c) Machine Translation d) All of the mentioned

6) NLP is concerned with the interactions between computers and human (natural) languages.
a) True b) False
c) Can't say d) None of these

7) What is the main challenge/s of NLP?
a) Handling Ambiguity of Sentences
b) Handling Tokenization
c) Handling POS-Tagging
d) All of the mentioned

8) Modern NLP algorithms are based on machine learning, especially statistical machine learning.
a) True b) False
c) Can't say d) None of above

9) Choose from the following areas where NLP can be useful.
a) Automatic Text Summarization
b) Automatic Question-Answering Systems
c) Information Retrieval
d) All of the mentioned

10) What is Machine Translation?
a) Converts one human language to another
b) Converts human language to machine language
c) Converts any human language to English
d) Converts Machine language to human language

11) Given a stream of text, Named Entity Recognition determines which pronoun maps to which noun.
a) False b) True
c) Can't say d) None of the mentioned

12) What is the field of Natural Language Processing (NLP)?
a) Computer Science b) Artificial Intelligence
c) Linguistics d) All of the mentioned

13) What is Morphological Segmentation?
a) Does Discourse Analysis
b) Separate words into individual morphemes and identify the class of the morphemes
c) Is an extension of propositional logic
d) None of the mentioned

14) What is Coreference Resolution?
a) Anaphora Resolution
b) Given a sentence or larger chunk of text, determine which words ("mentions") refer to the same objects ("entities")
c) All of the mentioned
d) None of the mentioned

SLR-QH-476

Seat No.	

Set S

T. Y. (B.Tech.) (Computer Science and Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
Natural Language Processing (BTN03612)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

SECTION – I

Q.2 Attempt Any Three. **12**

a) Explain Word-Net application in Query Expansion.

b) Explain different measures of word-net similarity.

c) Explain Lexical Knowledge Networks in detail.

d) Explain Scope Ambiguity and Attachment Ambiguity Resolution.

e) Explain Training issues in detail.

Q.3 Attempt Any Two. **16**

a) Differentiate between ML and NLP.

b) What is WSD? Explain different types of ambiguities and approaches to WSD.

c) Explain Probabilistic Parsing with example.

SECTION – II

Q.4 Attempt Any Three. **12**

a) Describe Robust and Scalable Machine Translation.

b) Explain shallow parsing in detail.

c) Explain HMM and Speech Recognition.

d) Describe Dependency Parsing in detail.

e) Explain Morphology Paradigms in detail.

Q.5 Attempt Any Two. **16**

a) Explain Morphological diversity of Indian Languages.

b) Explain Baum welch algorithm in detail.

c) Explain Sentiment Analysis in detail.

SLR-QH-478

Seat No.	

Set P

T.Y. (B.Tech.) (Computer Science and Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
Cyber Forensic (BTN03614)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct option. **14**

1) Cyber defamation involves _____.
a) Harming someone's reputation online
b) Installing antivirus
c) Encrypting files
d) Network configuration

2) Which of the following is an example of cybercrime?
a) Programming a video game
b) Unauthorized access to someone's email account
c) Writing a blog post
d) Purchasing an item online

3) Password cracking techniques include _____.
a) Dictionary and brute force attacks
b) SQL injection
c) Encrypting emails
d) Installing firewalls

4) Phishing attacks involve _____.
a) Fake emails requesting login credentials
b) Updating a web browser
c) Installing antivirus
d) Downloading PDFs

5) A proxy server primarily functions to _____.
   a) Encrypt emails
   b) Act as an intermediary for anonymity
   c) Remove malware
   d) Monitor hardware usage

6) Virus and Worms are _____.
   a) Malicious software that self-replicates
   b) Tools for data recovery
   c) Types of firewalls
   d) Password cracking techniques

7) Trojan Horses and Backdoors _____.
   a) Allow unauthorized remote access
   b) Encrypt user files
   c) Monitor network speed
   d) Act as antivirus

8) DoS and DDoS attacks _____.
   a) Overwhelm systems to make services unavailable
   b) Steal passwords
   c) Encrypt emails
   d) Scan for viruses

9) Buffer Overflow attacks _____.
   a) Exploit software bugs to crash or hijack programs
   b) Monitor network traffic
   c) Encrypt data
   d) Backup files

10) Section 66C of the IT Act deals with _____.
   a) Identity theft b) Cyber terrorism
   c) Data compression d) Digital signature

11) Digital signatures ensure _____.
   a) Integrity and authenticity of data
   b) Faster network speed
   c) Malware removal
   d) User anonymity

12) The first step in a digital forensic investigation is _____.
   a) Identification b) Reporting
   c) Analysis d) Recovery

13) Chain of custody is essential to _____.
   a) Maintain evidence authenticity
   b) Compress files
   c) Encrypt passwords
   d) Delete unwanted data

14) IP addressing helps forensic investigators to _____.

a) Track network activity
b) Encrypt emails
c) Monitor hardware
d) Recover deleted files

Seat No.	

Set **P**

T.Y. (B.Tech.) (Computer Science and Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April- 2026
Cyber Forensic (BTN03614)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever necessary.

SECTION – I

Q.2 Answer Any Four. **16**

a) Describe the classification of cybercrimes with suitable examples.

b) Explain proxy servers and anonymizers and discuss how they can be misused in cybercrimes.

c) Describe key provisions of the Indian IT Act concerning cybercrime.

d) Explain phishing attacks and preventive measures.

e) Explain SQL Injection attacks, their working, and impact on cyber security.

Q.3 Answer Any Two. **12**

a) Describe cyberstalking, its forms, and preventive measures.

b) Explain password cracking techniques and countermeasures.

c) Describe the role of the Indian IT Act in preventing and punishing cybercrimes.

SECTION – II

Q.4 Answer Any Four. **16**

a) Describe the digital forensic life cycle and its key stages.

b) Explain the major challenges faced in computer forensics.

c) Describe the role of Internet Protocols (IP) in network forensics

d) Describe types of digital evidence that can be extracted from handheld devices and their use in investigations.

e) Explain the working characteristics of mobile phones relevant to forensic investigations.

Q.5 Answer Any Two. **12**

a) Describe the process of network forensics investigation, including:
- Data collection and analysis
- Filtering and data reduction
- Class and individual characteristics and evaluation of source

b) Explain the steps involved in analysing digital evidence from handheld devices.

c) Describe the role of cyber forensics in authenticating digital evidence for use in legal proceedings.

SLR-QH-478

Seat No.	

Set Q

T.Y. (B.Tech.) (Computer Science and Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
Cyber Forensic (BTN03614)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct option. **14**

1) DoS and DDoS attacks _____.
a) Overwhelm systems to make services unavailable
b) Steal passwords
c) Encrypt emails
d) Scan for viruses

2) Buffer Overflow attacks _____.
a) Exploit software bugs to crash or hijack programs
b) Monitor network traffic
c) Encrypt data
d) Backup files

3) Section 66C of the IT Act deals with _____.
a) Identity theft b) Cyber terrorism
c) Data compression d) Digital signature

4) Digital signatures ensure _____.
a) Integrity and authenticity of data
b) Faster network speed
c) Malware removal
d) User anonymity

5) The first step in a digital forensic investigation is _____.
a) Identification b) Reporting
c) Analysis d) Recovery

6) Chain of custody is essential to _____.
   a) Maintain evidence authenticity
   b) Compress files
   c) Encrypt passwords
   d) Delete unwanted data

7) IP addressing helps forensic investigators to _____.
   a) Track network activity
   b) Encrypt emails
   c) Monitor hardware
   d) Recover deleted files

8) Cyber defamation involves _____.
   a) Harming someone's reputation online
   b) Installing antivirus
   c) Encrypting files
   d) Network configuration

9) Which of the following is an example of cybercrime?
   a) Programming a video game
   b) Unauthorized access to someone's email account
   c) Writing a blog post
   d) Purchasing an item online

10) Password cracking techniques include _____.
   a) Dictionary and brute force attacks
   b) SQL injection
   c) Encrypting emails
   d) Installing firewalls

11) Phishing attacks involve _____.
   a) Fake emails requesting login credentials
   b) Updating a web browser
   c) Installing antivirus
   d) Downloading PDFs

12) A proxy server primarily functions to _____.
   a) Encrypt emails
   b) Act as an intermediary for anonymity
   c) Remove malware
   d) Monitor hardware usage

13) Virus and Worms are _____.
   a) Malicious software that self-replicates
   b) Tools for data recovery
   c) Types of firewalls
   d) Password cracking techniques

14) Trojan Horses and Backdoors _____.

a) Allow unauthorized remote access
b) Encrypt user files
c) Monitor network speed
d) Act as antivirus

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Computer Science and Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April- 2026
Cyber Forensic (BTN03614)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever necessary.

SECTION – I

Q.2 Answer Any Four. **16**

a) Describe the classification of cybercrimes with suitable examples.

b) Explain proxy servers and anonymizers and discuss how they can be misused in cybercrimes.

c) Describe key provisions of the Indian IT Act concerning cybercrime.

d) Explain phishing attacks and preventive measures.

e) Explain SQL Injection attacks, their working, and impact on cyber security.

Q.3 Answer Any Two. **12**

a) Describe cyberstalking, its forms, and preventive measures.

b) Explain password cracking techniques and countermeasures.

c) Describe the role of the Indian IT Act in preventing and punishing cybercrimes.

SECTION – II

Q.4 Answer Any Four. **16**

a) Describe the digital forensic life cycle and its key stages.

b) Explain the major challenges faced in computer forensics.

c) Describe the role of Internet Protocols (IP) in network forensics

d) Describe types of digital evidence that can be extracted from handheld devices and their use in investigations.

e) Explain the working characteristics of mobile phones relevant to forensic investigations.

Q.5 Answer Any Two. **12**

a) Describe the process of network forensics investigation, including:
- Data collection and analysis
- Filtering and data reduction
- Class and individual characteristics and evaluation of source

b) Explain the steps involved in analysing digital evidence from handheld devices.

c) Describe the role of cyber forensics in authenticating digital evidence for use in legal proceedings.

SLR-QH-478

Seat No.	

Set R

T.Y. (B.Tech.) (Computer Science and Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
Cyber Forensic (BTN03614)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct option. **14**

1) Digital signatures ensure _____.
a) Integrity and authenticity of data
b) Faster network speed
c) Malware removal
d) User anonymity

2) The first step in a digital forensic investigation is _____.
a) Identification b) Reporting
c) Analysis d) Recovery

3) Chain of custody is essential to _____.
a) Maintain evidence authenticity
b) Compress files
c) Encrypt passwords
d) Delete unwanted data

4) IP addressing helps forensic investigators to _____.
a) Track network activity b) Encrypt emails
c) Monitor hardware d) Recover deleted files

5) Cyber defamation involves _____.
a) Harming someone's reputation online
b) Installing antivirus
c) Encrypting files
d) Network configuration

6) Which of the following is an example of cybercrime?
   a) Programming a video game
   b) Unauthorized access to someone's email account
   c) Writing a blog post
   d) Purchasing an item online

7) Password cracking techniques include _____.
   a) Dictionary and brute force attacks
   b) SQL injection
   c) Encrypting emails
   d) Installing firewalls

8) Phishing attacks involve _____.
   a) Fake emails requesting login credentials
   b) Updating a web browser
   c) Installing antivirus
   d) Downloading PDFs

9) A proxy server primarily functions to _____.
   a) Encrypt emails
   b) Act as an intermediary for anonymity
   c) Remove malware
   d) Monitor hardware usage

10) Virus and Worms are _____.
   a) Malicious software that self-replicates
   b) Tools for data recovery
   c) Types of firewalls
   d) Password cracking techniques

11) Trojan Horses and Backdoors _____.
   a) Allow unauthorized remote access
   b) Encrypt user files
   c) Monitor network speed
   d) Act as antivirus

12) DoS and DDoS attacks _____.
   a) Overwhelm systems to make services unavailable
   b) Steal passwords
   c) Encrypt emails
   d) Scan for viruses

13) Buffer Overflow attacks _____.
   a) Exploit software bugs to crash or hijack programs
   b) Monitor network traffic
   c) Encrypt data
   d) Backup files

14) Section 66C of the IT Act deals with _____.

a) Identity theft
b) Cyber terrorism
c) Data compression
d) Digital signature

SLR-QH-478

Seat No.	

Set R

T.Y. (B.Tech.) (Computer Science and Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April- 2026
Cyber Forensic (BTN03614)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever necessary.

SECTION – I

Q.2 Answer Any Four. **16**

a) Describe the classification of cybercrimes with suitable examples.

b) Explain proxy servers and anonymizers and discuss how they can be misused in cybercrimes.

c) Describe key provisions of the Indian IT Act concerning cybercrime.

d) Explain phishing attacks and preventive measures.

e) Explain SQL Injection attacks, their working, and impact on cyber security.

Q.3 Answer Any Two. **12**

a) Describe cyberstalking, its forms, and preventive measures.

b) Explain password cracking techniques and countermeasures.

c) Describe the role of the Indian IT Act in preventing and punishing cybercrimes.

SECTION – II

Q.4 Answer Any Four. **16**

a) Describe the digital forensic life cycle and its key stages.

b) Explain the major challenges faced in computer forensics.

c) Describe the role of Internet Protocols (IP) in network forensics

d) Describe types of digital evidence that can be extracted from handheld devices and their use in investigations.

e) Explain the working characteristics of mobile phones relevant to forensic investigations.

Q.5 Answer Any Two. **12**

a) Describe the process of network forensics investigation, including:

- Data collection and analysis
- Filtering and data reduction
- Class and individual characteristics and evaluation of source

b) Explain the steps involved in analysing digital evidence from handheld devices.

c) Describe the role of cyber forensics in authenticating digital evidence for use in legal proceedings.

SLR-QH-478

Seat No.	

Set S

T.Y. (B.Tech.) (Computer Science and Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
Cyber Forensic (BTN03614)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct option. **14**

1) Virus and Worms are _____.
a) Malicious software that self-replicates
b) Tools for data recovery
c) Types of firewalls
d) Password cracking techniques

2) Trojan Horses and Backdoors _____.
a) Allow unauthorized remote access
b) Encrypt user files
c) Monitor network speed
d) Act as antivirus

3) DoS and DDoS attacks _____.
a) Overwhelm systems to make services unavailable
b) Steal passwords
c) Encrypt emails
d) Scan for viruses

4) Buffer Overflow attacks _____.
a) Exploit software bugs to crash or hijack programs
b) Monitor network traffic
c) Encrypt data
d) Backup files

5) Section 66C of the IT Act deals with _____.
a) Identity theft b) Cyber terrorism
c) Data compression d) Digital signature

6) Digital signatures ensure _____.
   a) Integrity and authenticity of data
   b) Faster network speed
   c) Malware removal
   d) User anonymity

7) The first step in a digital forensic investigation is _____.
   a) Identification
   b) Reporting
   c) Analysis
   d) Recovery

8) Chain of custody is essential to _____.
   a) Maintain evidence authenticity
   b) Compress files
   c) Encrypt passwords
   d) Delete unwanted data

9) IP addressing helps forensic investigators to _____.
   a) Track network activity
   b) Encrypt emails
   c) Monitor hardware
   d) Recover deleted files

10) Cyber defamation involves _____.
   a) Harming someone's reputation online
   b) Installing antivirus
   c) Encrypting files
   d) Network configuration

11) Which of the following is an example of cybercrime?
   a) Programming a video game
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   d) Purchasing an item online

12) Password cracking techniques include _____.
   a) Dictionary and brute force attacks
   b) SQL injection
   c) Encrypting emails
   d) Installing firewalls

13) Phishing attacks involve _____.
   a) Fake emails requesting login credentials
   b) Updating a web browser
   c) Installing antivirus
   d) Downloading PDFs

14) A proxy server primarily functions to _____.
   a) Encrypt emails
   b) Act as an intermediary for anonymity
   c) Remove malware
   d) Monitor hardware usage

SLR-QH-478

Seat No.	

Set S

T.Y. (B.Tech.) (Computer Science and Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April- 2026
Cyber Forensic (BTN03614)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever necessary.

SECTION – I

Q.2 Answer Any Four. **16**

a) Describe the classification of cybercrimes with suitable examples.

b) Explain proxy servers and anonymizers and discuss how they can be misused in cybercrimes.

c) Describe key provisions of the Indian IT Act concerning cybercrime.

d) Explain phishing attacks and preventive measures.

e) Explain SQL Injection attacks, their working, and impact on cyber security.

Q.3 Answer Any Two. **12**

a) Describe cyberstalking, its forms, and preventive measures.

b) Explain password cracking techniques and countermeasures.

c) Describe the role of the Indian IT Act in preventing and punishing cybercrimes.

SECTION – II

Q.4 Answer Any Four. **16**

a) Describe the digital forensic life cycle and its key stages.

b) Explain the major challenges faced in computer forensics.

c) Describe the role of Internet Protocols (IP) in network forensics

d) Describe types of digital evidence that can be extracted from handheld devices and their use in investigations.

e) Explain the working characteristics of mobile phones relevant to forensic investigations.

Q.5 Answer Any Two. **12**

a) Describe the process of network forensics investigation, including:
- Data collection and analysis
- Filtering and data reduction
- Class and individual characteristics and evaluation of source

b) Explain the steps involved in analysing digital evidence from handheld devices.

c) Describe the role of cyber forensics in authenticating digital evidence for use in legal proceedings.

SLR-QH-479

Seat No.	

Set P

Fourth. Y. (B.Tech.) (Computer & Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Software Testing and Quality Assurance (BTN03701)

Day & Date: Saturday, 02-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top on page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct option. **14**

1) What is the main purpose of integration testing?
a) Interface errors b) Design errors
c) Procedure errors d) None of the above

2) Boundary value analysis is one of the techniques of _____ testing.
a) unit b) black box
c) white box d) acceptance

3) White Box testing techniques are called as _____ testing.
a) functional b) logical
c) structural d) physical

4) Testing of individual components by the developers are comes under which type of testing?
a) Validation testing b) Acceptance testing
c) Integration testing d) Unit testing

5) _____ testing is done at the user site and in user development by the key users.
a) Beta b) Unit
c) Alpha d) None of these

6) Following is one of the Defect Life Cycle states _____.
a) Constant b) New
c) Old d) None of these

7) _____ specification where it documents the actual values used for input along with anticipated outputs.

a) Bug b) Error
c) Test case d) defect

8) _____ tests the performance of the system by loading the database to an increased volume of data.

a) Load testing b) Stress testing
c) Performance testing d) Volume testing

9) The _____ provides a roadmap for instituting software quality assurance.

a) SQA Plan b) TQM Plan
c) SQA map d) All

10) _____ are frequently used when software needs to communicate with external devices.

a) Drivers b) Stubs
c) Monitors d) Viewers

11) _____ that offers concise descriptions of the interface objects and actions is probably most effective for intermittent knowledgeable users.

a) Online tutorial b) Online quiz
c) Online help d) Video conferencing

12) Software _____ is defined as the probability of failure free operation of computer program in specified environment for a specified time.

a) scalability b) quality
c) portability d) reliability

13) _____ is automotive testing tool used in software testing.

a) Selenium b) Solenoid
c) Rational tester d) None of these

14) _____ process through which a business seeks to ensure that product quality is maintained or improved and manufacturing errors are reduced or eliminated.

a) Quality Assurance b) Quality Control
c) Quality Planning d) None of these

SLR-QH-479

Seat No.		Set	P

Fourth. Y. (B.Tech.) (Computer & Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Software Testing and Quality Assurance (BTN03701)

Day & Date: Saturday, 02-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

Section – I

Q.2 Attempt any three. **12**

a) What are different principles of software testing?
b) Differentiate between software verification and validation.
c) Describe black box testing along with its different techniques.
d) Describe GUI testing and Security testing in detail.
e) How acceptance testing applied in software testing?

Q.3 Attempt any two. **16**

a) Describe defect life cycle used in software testing.
b) What is white box testing? Describe all techniques of white box testing.
c) How regression and sanity testing is used in software testing?

Section – II

Q.4 Attempt any three. **12**

a) What is testing case? Describe test case template used in text document.
b) What are the different software quality assurance tasks?
c) Explain software reliability used in software testing.
d) Describe bug-tracking systems used in testing.
e) What are the benefits of automation and tools used in testing?

Q.5 Attempt any two. **16**

a) Describe test case planning in software testing.
b) Describe CMM model (Capability Maturity Model) in detail.
c) What is software quality? Explain ISO 9000 quality assurance standards in detail.

Seat No.	

Set **Q**

Fourth. Y. (B.Tech.) (Computer & Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Software Testing and Quality Assurance (BTN03701)

Day & Date: Saturday, 02-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top on page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct option. **14**

1) _____ tests the performance of the system by loading the database to an increased volume of data.
a) Load testing b) Stress testing
c) Performance testing d) Volume testing

2) The _____ provides a roadmap for instituting software quality assurance.
a) SQA Plan b) TQM Plan
c) SQA map d) All

3) _____ are frequently used when software needs to communicate with external devices.
a) Drivers b) Stubs
c) Monitors d) Viewers

4) _____ that offers concise descriptions of the interface objects and actions is probably most effective for intermittent knowledgeable users.
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5) Software _____ is defined as the probability of failure free operation of computer program in specified environment for a specified time.
a) scalability b) quality
c) portability d) reliability

6) _____ is automotive testing tool used in software testing.
a) Selenium b) Solenoid
c) Rational tester d) None of these

7) _____ process through which a business seeks to ensure that product quality is maintained or improved and manufacturing errors are reduced or eliminated.

a) Quality Assurance
b) Quality Control
c) Quality Planning
d) None of these

8) What is the main purpose of integration testing?

a) Interface errors
b) Design errors
c) Procedure errors
d) None of the above

9) Boundary value analysis is one of the techniques of _____ testing.

a) unit
b) black box
c) white box
d) acceptance

10) White Box testing techniques are called as _____ testing.

a) functional
b) logical
c) structural
d) physical

11) Testing of individual components by the developers are comes under which type of testing?

a) Validation testing
b) Acceptance testing
c) Integration testing
d) Unit testing

12) _____ testing is done at the user site and in user development by the key users.

a) Beta
b) Unit
c) Alpha
d) None of these

13) Following is one of the Defect Life Cycle states _____.

a) Constant
b) New
c) Old
d) None of these

14) _____ specification where it documents the actual values used for input along with anticipated outputs.

a) Bug
b) Error
c) Test case
d) defect

SLR-QH-479

Seat No.		Set	Q

Fourth. Y. (B.Tech.) (Computer & Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Software Testing and Quality Assurance (BTN03701)

Day & Date: Saturday, 02-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

Section – I

Q.2 Attempt any three. **12**

a) What are different principles of software testing?
b) Differentiate between software verification and validation.
c) Describe black box testing along with its different techniques.
d) Describe GUI testing and Security testing in detail.
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Q.3 Attempt any two. **16**

a) Describe defect life cycle used in software testing.
b) What is white box testing? Describe all techniques of white box testing.
c) How regression and sanity testing is used in software testing?

Section – II

Q.4 Attempt any three. **12**

a) What is testing case? Describe test case template used in text document.
b) What are the different software quality assurance tasks?
c) Explain software reliability used in software testing.
d) Describe bug-tracking systems used in testing.
e) What are the benefits of automation and tools used in testing?

Q.5 Attempt any two. **16**

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b) Describe CMM model (Capability Maturity Model) in detail.
c) What is software quality? Explain ISO 9000 quality assurance standards in detail.

SLR-QH-479

Seat No.	

Set R

Fourth. Y. (B.Tech.) (Computer & Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Software Testing and Quality Assurance (BTN03701)

Day & Date: Saturday, 02-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct option. 14

1) _____ that offers concise descriptions of the interface objects and actions is probably most effective for intermittent knowledgeable users.
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c) Online help d) Video conferencing

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5) What is the main purpose of integration testing?
a) Interface errors b) Design errors
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a) unit b) black box
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c) structural d) physical

8) Testing of individual components by the developers are comes under which type of testing?
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c) Integration testing d) Unit testing

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c) Alpha d) None of these

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12) _____ tests the performance of the system by loading the database to an increased volume of data.
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13) The _____ provides a roadmap for instituting software quality assurance.
a) SQA Plan b) TQM Plan
c) SQA map d) All

14) _____ are frequently used when software needs to communicate with external devices.
a) Drivers b) Stubs
c) Monitors d) Viewers

SLR-QH-479

Seat No.		Set	R

Fourth. Y. (B.Tech.) (Computer & Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Software Testing and Quality Assurance (BTN03701)

Day & Date: Saturday, 02-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
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3) Assume suitable data if necessary.

Section – I

Q.2 Attempt any three. **12**

a) What are different principles of software testing?
b) Differentiate between software verification and validation.
c) Describe black box testing along with its different techniques.
d) Describe GUI testing and Security testing in detail.
e) How acceptance testing applied in software testing?

Q.3 Attempt any two. **16**

a) Describe defect life cycle used in software testing.
b) What is white box testing? Describe all techniques of white box testing.
c) How regression and sanity testing is used in software testing?

Section – II

Q.4 Attempt any three. **12**

a) What is testing case? Describe test case template used in text document.
b) What are the different software quality assurance tasks?
c) Explain software reliability used in software testing.
d) Describe bug-tracking systems used in testing.
e) What are the benefits of automation and tools used in testing?

Q.5 Attempt any two. **16**

a) Describe test case planning in software testing.
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c) What is software quality? Explain ISO 9000 quality assurance standards in detail.

SLR-QH-479

Seat No.		Set	S

Fourth. Y. (B.Tech.) (Computer & Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Software Testing and Quality Assurance (BTN03701)

Day & Date: Saturday, 02-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct option. **14**

1) Following is one of the Defect Life Cycle states _____.
a) Constant b) New
c) Old d) None of these

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a) Bug b) Error
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b) Quality Control
c) Quality Planning
d) None of these

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b) Design errors
c) Procedure errors
d) None of the above

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c) white box
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12) White Box testing techniques are called as _____ testing.
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b) Acceptance testing
c) Integration testing
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a) Beta
b) Unit
c) Alpha
d) None of these

SLR-QH-479

Seat No.		Set	S

Fourth. Y. (B.Tech.) (Computer & Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Software Testing and Quality Assurance (BTN03701)

Day & Date: Saturday, 02-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

Section – I

Q.2 Attempt any three. **12**

a) What are different principles of software testing?
b) Differentiate between software verification and validation.
c) Describe black box testing along with its different techniques.
d) Describe GUI testing and Security testing in detail.
e) How acceptance testing applied in software testing?

Q.3 Attempt any two. **16**

a) Describe defect life cycle used in software testing.
b) What is white box testing? Describe all techniques of white box testing.
c) How regression and sanity testing is used in software testing?

Section – II

Q.4 Attempt any three. **12**

a) What is testing case? Describe test case template used in text document.
b) What are the different software quality assurance tasks?
c) Explain software reliability used in software testing.
d) Describe bug-tracking systems used in testing.
e) What are the benefits of automation and tools used in testing?

Q.5 Attempt any two. **16**

a) Describe test case planning in software testing.
b) Describe CMM model (Capability Maturity Model) in detail.
c) What is software quality? Explain ISO 9000 quality assurance standards in detail.

SLR-QH-480

Seat No.	

Set P

Fourth. Y. (B.Tech.) (Computer & Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Compiler Construction (BTN03702)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top on page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answers from the given options. 14

1) We can optimize code by _____.
a) Dead code elimination b) Common subprograms
c) Copy intermediate loop d) Loop declaration

2) Which phase of the compiler checks the grammar of the programming?
a) Code optimization b) Semantic analysis
c) Code generation d) Syntax analysis

3) Type checking is normally done during _____.
a) Syntax directed translation (SDT)
b) Semantic analysis
c) Either a or b
d) Both option a & b

4) Which of the following expression has no 1-value?
a) a+1 b) 7
c) *a d) a+b

5) Which is considered as the sequence of characters in tokens?
a) Lexeme b) Mexeme
c) Texeme d) None of these

6) Consider the program statement x=6 where x is a variable which stage of compilation can detect this error?
a) code generation b) lexical analysis
c) syntax analysis d) semantic analysis

7) When the parser starts constructing the parse tree from the start symbol and then tries to transform the start symbol to the input, it is called?

a) Recursive descent parsing
b) Backtracking
c) Top-down Parsing
d) Bottom-up Parsing

8) Compiler is a program that translates Source Code into _____.

a) Binary Language
b) Assembly Language
c) High Level Language
d) Low Level Language

9) In activation record, Which of the following Stores the address of activation record of the caller procedure?

a) Access Link
b) Actual Parameters
c) Control Link
d) Temporaries

10) Consider the following grammar.

$S \rightarrow S^{*}E$

$S \rightarrow E$

$E \rightarrow F + E$

$E \rightarrow F$

$F \rightarrow id$

Consider the following LR (0) items corresponding to the grammar above.

i) $S \rightarrow S^{*} . E$
ii) $E \rightarrow F. + E$
iii) $E \text{ "} F + . E$

Given the items above, which two of them will appear in the same set in the canonical sets-of items for the grammar?

a) (ii)
b) (i) and (iii)
c) (iii)
d) None of the mentioned

11) Which one to the following false?

a) The code contains loop-in variant computation
b) There is scope of common sub-expression elimination in this code
c) There is scope strength reduction in this code
d) There is scope of dead code elimination in this code

12) Which of the following strings is generated by the grammar?

$S \rightarrow bA$
$S \rightarrow aB$
$A \rightarrow a$
$B \rightarrow b$
$A \rightarrow aS$
$B \rightarrow bS$
$A \rightarrow bAA$
$B \rightarrow aBB$

a) aaaabb
b) aabbbb
c) aabbab
d) abbbba

13) The following code is an example of?

```
void add_ten(int x)
{
        return x + 10;
        printf(""value of x is %d"", x);
}
```

a) Redundant instruction elimination
b) Unreachable code
c) Flow of control optimization
d) None of the above

14) Which of the following phase of the compiler is Syntax Analysis?

a) Second
b) Third
c) First
d) All of the mentioned

SLR-QH-480

Seat No.	

Set P

Fourth. Y. (B.Tech.) (Computer & Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Compiler Construction (BTN03702)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
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Section – I

Q.2 Attempt any Three. **12**

a) List Phases of Compiler and explain Code Generation.

b) List phases of compiler. Explain symbol table management. Give the translation process for statement VAR position, initial, rate : real Position : = initial + rate*60;

c) Explain Compiler Construction Tools.

d) Explain input buffering with example.

e) Write the algorithm for simulating a DFA and explain with example.

Q.3 Attempt any Two. **16**

a) Explain L-attributed definition with suitable example. Also explain bottom up evaluation of Inherited attribute.

b) What is Specification and Recognition of tokens explain with examples.

c) What are synthesized attributes? Explain S-attributed tree with example $3^{*}5 + 4\mathrm{n}$

Section – II

Q.4 Attempt any Three. **12**

a) Explain Construction of Syntax Tree with example.

b) What is the Activation Record? Elaborate with its contents.

c) What is role of flow graph in the basic block? Justify with example.

d) What is Dynamic storage allocations?

e) Elaborate Intermediate languages and explain Boolean expressions, Assignment statements

Q.5 Attempt any Two. **16**

a) What is optimization? Explain optimization of Basic blocks.

b) What is back patching? Explain back patching for Boolean expression.

c) Write a short on:

i) Peephole Optimization and basic blocks

ii) Data flow analysis and algorithms

SLR-QH-480

Seat No.	

Set Q

Fourth. Y. (B.Tech.) (Computer & Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Compiler Construction (BTN03702)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answers from the given options. **14**

1) Compiler is a program that translates Source Code into _____.
a) Binary Language b) Assembly Language
c) High Level Language d) Low Level Language

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3) Consider the following grammar.
$S \rightarrow S^{*}E$
$S \rightarrow E$
$E \rightarrow F + E$
$E \rightarrow F$
$F \rightarrow id$
Consider the following LR (0) items corresponding to the grammar above.
i) $S \rightarrow S^{*} . E$
ii) $E \rightarrow F. + E$
iii) E "$F + . E$
Given the items above, which two of them will appear in the same set in the canonical sets-of items for the grammar?
a) (ii) b) (i) and (iii)
c) (iii) d) None of the mentioned

4) Which one to the following false?

a) The code contains loop-in variant computation
b) There is scope of common sub-expression elimination in this code
c) There is scope strength reduction in this code
d) There is scope of dead code elimination in this code

5) Which of the following strings is generated by the grammar?

$S \rightarrow bA$
$S \rightarrow aB$
$A \rightarrow a$
$B \rightarrow b$
$A \rightarrow aS$
$B \rightarrow bS$
$A \rightarrow bAA$
$B \rightarrow aBB$

a) aaaabb
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c) aabbab
d) abbbba

6) The following code is an example of?

```
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7) Which of the following phase of the compiler is Syntax Analysis?

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d) Syntax analysis

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b) Semantic analysis
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SLR-QH-480

Seat No.	

Set Q

Fourth. Y. (B.Tech.) (Computer & Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Compiler Construction (BTN03702)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
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Section – I

Q.2 Attempt any Three. **12**

a) List Phases of Compiler and explain Code Generation.

b) List phases of compiler. Explain symbol table management. Give the translation process for statement VAR position, initial, rate : real Position : = initial + rate*60;

c) Explain Compiler Construction Tools.

d) Explain input buffering with example.

e) Write the algorithm for simulating a DFA and explain with example.

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a) Explain L-attributed definition with suitable example. Also explain bottom up evaluation of Inherited attribute.

b) What is Specification and Recognition of tokens explain with examples.

c) What are synthesized attributes? Explain S-attributed tree with example $3^{*}5 + 4\mathrm{n}$

Section – II

Q.4 Attempt any Three. **12**

a) Explain Construction of Syntax Tree with example.

b) What is the Activation Record? Elaborate with its contents.

c) What is role of flow graph in the basic block? Justify with example.

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Q.5 Attempt any Two. **16**

a) What is optimization? Explain optimization of Basic blocks.

b) What is back patching? Explain back patching for Boolean expression.

c) Write a short on:

i) Peephole Optimization and basic blocks

ii) Data flow analysis and algorithms

Seat No.	

Set **R**

Fourth. Y. (B.Tech.) (Computer & Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Compiler Construction (BTN03702)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answers from the given options. 14

1) Which one to the following false?
a) The code contains loop-in variant computation
b) There is scope of common sub-expression elimination in this code
c) There is scope strength reduction in this code
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2) Which of the following strings is generated by the grammar?
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$B \rightarrow b$
$A \rightarrow aS$
$B \rightarrow bS$
$A \rightarrow bAA$
$B \rightarrow aBB$

a) aaaabb b) aabbbb
c) aabbab d) abbbba

3) The following code is an example of?

```
void add_ten(int x)
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a) Redundant instruction elimination
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c) Code generation d) Syntax analysis

7) Type checking is normally done during _____.
a) Syntax directed translation (SDT)
b) Semantic analysis
c) Either a or b
d) Both option a & b

8) Which of the following expression has no 1-value?
a) a+1 b) 7
c) *a d) a+b

9) Which is considered as the sequence of characters in tokens?
a) Lexeme b) Mexeme
c) Texeme d) None of these

10) Consider the program statement x=6 where x is a variable which stage of compilation can detect this error?
a) code generation b) lexical analysis
c) syntax analysis d) semantic analysis

11) When the parser starts constructing the parse tree from the start symbol and then tries to transform the start symbol to the input, it is called?
a) Recursive descent parsing b) Backtracking
c) Top-down Parsing d) Bottom-up Parsing

12) Compiler is a program that translates Source Code into _____.
a) Binary Language b) Assembly Language
c) High Level Language d) Low Level Language

13) In activation record, Which of the following Stores the address of activation record of the caller procedure?
a) Access Link b) Actual Parameters
c) Control Link d) Temporaries

14) Consider the following grammar.

$S \rightarrow S^{*}E$

$S \rightarrow E$

$E \rightarrow F + E$

$E \rightarrow F$

$F \rightarrow id$

Consider the following LR (0) items corresponding to the grammar above.

i) $S \rightarrow S^{*} . E$

ii) $E \rightarrow F. + E$

iii) $E \text{ "}F + . E$

Given the items above, which two of them will appear in the same set in the canonical sets-of items for the grammar?

a) (ii)
b) (i) and (iii)
c) (iii)
d) None of the mentioned

SLR-QH-480

Seat No.	

Set R

Fourth. Y. (B.Tech.) (Computer & Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Compiler Construction (BTN03702)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicates full marks.
3) Assume suitable data if required.

Section – I

Q.2 Attempt any Three. **12**

a) List Phases of Compiler and explain Code Generation.

b) List phases of compiler. Explain symbol table management. Give the translation process for statement VAR position, initial, rate : real Position : = initial + rate*60;

c) Explain Compiler Construction Tools.

d) Explain input buffering with example.

e) Write the algorithm for simulating a DFA and explain with example.

Q.3 Attempt any Two. **16**

a) Explain L-attributed definition with suitable example. Also explain bottom up evaluation of Inherited attribute.

b) What is Specification and Recognition of tokens explain with examples.

c) What are synthesized attributes? Explain S-attributed tree with example $3^{*}5 + 4\mathrm{n}$

Section – II

Q.4 Attempt any Three. **12**

a) Explain Construction of Syntax Tree with example.

b) What is the Activation Record? Elaborate with its contents.

c) What is role of flow graph in the basic block? Justify with example.

d) What is Dynamic storage allocations?

e) Elaborate Intermediate languages and explain Boolean expressions, Assignment statements

Q.5 Attempt any Two. **16**

a) What is optimization? Explain optimization of Basic blocks.

b) What is back patching? Explain back patching for Boolean expression.

c) Write a short on:

i) Peephole Optimization and basic blocks

ii) Data flow analysis and algorithms

SLR-QH-480

Seat No.	

Set S

Fourth. Y. (B.Tech.) (Computer & Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Compiler Construction (BTN03702)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top on page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answers from the given options. 14

1) Consider the program statement x=6 where x is a variable which stage of compilation can detect this error?
a) code generation b) lexical analysis
c) syntax analysis d) semantic analysis

2) When the parser starts constructing the parse tree from the start symbol and then tries to transform the start symbol to the input, it is called?
a) Recursive descent parsing b) Backtracking
c) Top-down Parsing d) Bottom-up Parsing

3) Compiler is a program that translates Source Code into _____.
a) Binary Language b) Assembly Language
c) High Level Language d) Low Level Language

4) In activation record, Which of the following Stores the address of activation record of the caller procedure?
a) Access Link b) Actual Parameters
c) Control Link d) Temporaries

5) Consider the following grammar.
$S \rightarrow S^{*}E$
$S \rightarrow E$
$E \rightarrow F + E$
$E \rightarrow F$
$F \rightarrow id$
Consider the following LR (0) items corresponding to the grammar above.
i) $S \rightarrow S^{*} . E$
ii) $E \rightarrow F. + E$
iii) E "$F + . E$

Given the items above, which two of them will appear in the same set in the canonical sets-of items for the grammar?

a) (ii)
b) (i) and (iii)
c) (iii)
d) None of the mentioned

6) Which one to the following false?

a) The code contains loop-in variant computation
b) There is scope of common sub-expression elimination in this code
c) There is scope strength reduction in this code
d) There is scope of dead code elimination in this code

7) Which of the following strings is generated by the grammar?

$S \rightarrow bA$
$S \rightarrow aB$
$A \rightarrow a$
$B \rightarrow b$
$A \rightarrow aS$
$B \rightarrow bS$
$A \rightarrow bAA$
$B \rightarrow aBB$

a) aaaabb
b) aabbbb
c) aabbab
d) abbbba

8) The following code is an example of?

```
void add_ten(int x)
{
        return x + 10;
        printf(""value of x is %d"", x);
}
```

a) Redundant instruction elimination
b) Unreachable code
c) Flow of control optimization
d) None of the above

9) Which of the following phase of the compiler is Syntax Analysis?

a) Second
b) Third
c) First
d) All of the mentioned

10) We can optimize code by _____.

a) Dead code elimination
b) Common subprograms
c) Copy intermediate loop
d) Loop declaration

11) Which phase of the compiler checks the grammar of the programming?

a) Code optimization
b) Semantic analysis
c) Code generation
d) Syntax analysis

12) Type checking is normally done during _____.
a) Syntax directed translation (SDT)
b) Semantic analysis
c) Either a or b
d) Both option a & b

13) Which of the following expression has no 1-value?
a) a+1 b) 7
c) *a d) a+b

14) Which is considered as the sequence of characters in tokens?
a) Lexeme b) Mexeme
c) Texeme d) None of these

SLR-QH-480

Seat No.	

Set S

Fourth. Y. (B.Tech.) (Computer & Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Compiler Construction (BTN03702)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicates full marks.
3) Assume suitable data if required.

Section – I

Q.2 Attempt any Three. **12**

a) List Phases of Compiler and explain Code Generation.

b) List phases of compiler. Explain symbol table management. Give the translation process for statement VAR position, initial, rate : real Position : = initial + rate*60;

c) Explain Compiler Construction Tools.

d) Explain input buffering with example.

e) Write the algorithm for simulating a DFA and explain with example.

Q.3 Attempt any Two. **16**

a) Explain L-attributed definition with suitable example. Also explain bottom up evaluation of Inherited attribute.

b) What is Specification and Recognition of tokens explain with examples.

c) What are synthesized attributes? Explain S-attributed tree with example $3^{*}5 + 4\mathrm{n}$

Section – II

Q.4 Attempt any Three. **12**

a) Explain Construction of Syntax Tree with example.

b) What is the Activation Record? Elaborate with its contents.

c) What is role of flow graph in the basic block? Justify with example.

d) What is Dynamic storage allocations?

e) Elaborate Intermediate languages and explain Boolean expressions, Assignment statements

Q.5 Attempt any Two. **16**

a) What is optimization? Explain optimization of Basic blocks.

b) What is back patching? Explain back patching for Boolean expression.

c) Write a short on:

i) Peephole Optimization and basic blocks

ii) Data flow analysis and algorithms

SLR-QH-481

Seat No.	

Set P

Fourth. Y. (B.Tech.) (Computer and Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Business Intelligence (BTN03706)

Day & Date: Thursday, 07-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data wherever necessary and mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) The purpose of regression models, also known as _____ models.
a) Explanatory b) Predictive
c) Forecasting d) All

2) How do we perform Bayesian classification when some features are missing?
a) We assuming the missing values as the mean of all values.
b) We ignore the missing features.
c) We integrate the posteriors probabilities over the missing features.
d) Drop the features completely.

3) Agglomerative clustering falls under which type of clustering method?
a) partition b) hierarchical
c) Both d) None of the above

4) Which of the following metrics are used to evaluate classification models?
a) Area under the ROC curve b) F1 score
c) Confusion matrix d) All of the above

5) The problem of finding hidden structure in unlabeled data is called _____.
a) Supervised Learning b) Unsupervised Learning
c) Reinforcement Learning d) All of the above

6) If there are n number of independent variables then the referred regression model is _____.
   a) Simple Linear Regression
   b) Ridge Regression
   c) Multiple Linear Regression
   d) Generalized Linear Regression

7) What is the relation between the distance between clusters and the corresponding class discriminability?
   a) proportional
   b) inversely-proportional
   c) no-relation
   d) We can Say All

8) Data can be store, retrieve and updated in _____.
   a) SMTOP
   b) FTP
   c) OLAP
   d) OLTP

9) The classification of the data mining system involves _____.
   a) Machine learning
   b) Database technology
   c) Information Science
   d) All of the above

10) If the coefficient of determination is a positive value, then the regression equation _____.
   a) must have a positive slope
   b) must have a negative slope
   c) could have either a positive or a negative slope
   d) must have a positive y intercept

11) The most learning models benefit from a preventive standardization of the data is also called as _____.
   a) Normalization
   b) Extraction
   c) Sampling
   d) transformation

12) According to forward search scheme, also referred as _____.
   a) top-down
   b) trade off
   c) bottom-up
   d) None of the above

13) _____ analysis, in which the properties of each single attribute of a dataset are investigated.
   a) bivariate
   b) multivariate
   c) Both a & b
   d) univariate

14) A _____ is definitely the most intuitive graphical representation of the relationship between two numerical attributes.
   a) Scatter plot
   b) Loses plot
   c) Quantile-Quantile plot
   d) Level Curves

SLR-QH-481

Seat No.	

Set P

Fourth. Y. (B.Tech.) (Computer and Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Business Intelligence (BTN03706)

Day & Date: Thursday, 07-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever necessary and mention it clearly.

Section – I

Q.2 Attempt any Three **12**

a) What do you mean by effective and timely decisions? Describe the benefits of a Business intelligence system.

b) How Data mining process provide useful knowledge to decision makers? Explain with neat diagram.

c) What is the purpose of Data exploratory analysis? Explain the three main phases of Data exploratory analysis.

d) Write a short note on Data Reduction.

Q.3 Attempt any One **08**

a) Define Decision system. Describe the phases of Decision-making process in detail.

b) What do you mean by Data validation? Explain techniques used for data validation.

Q.4 Draw architecture of business intelligence system and explain the components of business intelligence system. **08**

Section – II

Q.5 Answer any Four. **16**

a) Describe the purpose of Regression models and list the types of regression.

b) Write a short note on Bayesian methods.

c) Why exponential smoothing models are used?

d) Compare Bivariate and multivariate analysis.

e) Define clustering. Explain any one clustering technique.

Q.6 Answer any One **06**

a) Define Time series. How evaluation and analysis of time series take place?

b) What are the various data mining techniques for BI? Explain classification and its problems in detail.

Q.7 Explain Apriori algorithm & general association rules. **06**

Seat No.	

Set **Q**

Fourth. Y. (B.Tech.) (Computer and Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Business Intelligence (BTN03706)

Day & Date: Thursday, 07-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data wherever necessary and mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) Data can be store, retrieve and updated in _____.
a) SMTOP b) FTP
c) OLAP d) OLTP

2) The classification of the data mining system involves _____.
a) Machine learning b) Database technology
c) Information Science d) All of the above

3) If the coefficient of determination is a positive value, then the regression equation _____.
a) must have a positive slope
b) must have a negative slope
c) could have either a positive or a negative slope
d) must have a positive y intercept

4) The most learning models benefit from a preventive standardization of the data is also called as _____.
a) Normalization b) Extraction
c) Sampling d) transformation

5) According to forward search scheme, also referred as _____.
a) top-down b) trade off
c) bottom-up d) None of the above

6) _____ analysis, in which the properties of each single attribute of a dataset are investigated.
a) bivariate b) multivariate
c) Both a & b d) univariate

7) A _____ is definitely the most intuitive graphical representation of the relationship between two numerical attributes.
a) Scatter plot b) Loses plot
c) Quantile-Quantile plot d) Level Curves

8) The purpose of regression models, also known as _____ models.
a) Explanatory b) Predictive
c) Forecasting d) All

9) How do we perform Bayesian classification when some features are missing?
a) We assuming the missing values as the mean of all values.
b) We ignore the missing features.
c) We integrate the posteriors probabilities over the missing features.
d) Drop the features completely.

10) Agglomerative clustering falls under which type of clustering method?
a) partition b) hierarchical
c) Both d) None of the above

11) Which of the following metrics are used to evaluate classification models?
a) Area under the ROC curve b) F1 score
c) Confusion matrix d) All of the above

12) The problem of finding hidden structure in unlabeled data is called _____.
a) Supervised Learning b) Unsupervised Learning
c) Reinforcement Learning d) All of the above

13) If there are n number of independent variables then the referred regression model is _____.
a) Simple Linear Regression b) Ridge Regression
c) Multiple Linear Regression d) Generalized Linear Regression

14) What is the relation between the distance between clusters and the corresponding class discriminability?
a) proportional b) inversely-proportional
c) no-relation d) We can Say All

SLR-QH-481

Seat No.	

Set Q

Fourth. Y. (B.Tech.) (Computer and Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Business Intelligence (BTN03706)

Day & Date: Thursday, 07-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever necessary and mention it clearly.

Section – I

Q.2 Attempt any Three **12**

a) What do you mean by effective and timely decisions? Describe the benefits of a Business intelligence system.

b) How Data mining process provide useful knowledge to decision makers? Explain with neat diagram.

c) What is the purpose of Data exploratory analysis? Explain the three main phases of Data exploratory analysis.

d) Write a short note on Data Reduction.

Q.3 Attempt any One **08**

a) Define Decision system. Describe the phases of Decision-making process in detail.

b) What do you mean by Data validation? Explain techniques used for data validation.

Q.4 Draw architecture of business intelligence system and explain the components of business intelligence system. **08**

Section – II

Q.5 Answer any Four. **16**

a) Describe the purpose of Regression models and list the types of regression.

b) Write a short note on Bayesian methods.

c) Why exponential smoothing models are used?

d) Compare Bivariate and multivariate analysis.

e) Define clustering. Explain any one clustering technique.

Q.6 Answer any One **06**

a) Define Time series. How evaluation and analysis of time series take place?

b) What are the various data mining techniques for BI? Explain classification and its problems in detail.

Q.7 Explain Apriori algorithm & general association rules. **06**

Seat No.	

Set **R**

Fourth. Y. (B.Tech.) (Computer and Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Business Intelligence (BTN03706)

Day & Date: Thursday, 07-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data wherever necessary and mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) The most learning models benefit from a preventive standardization of the data is also called as _____.
a) Normalization b) Extraction
c) Sampling d) transformation

2) According to forward search scheme, also referred as _____.
a) top-down b) trade off
c) bottom-up d) None of the above

3) _____ analysis, in which the properties of each single attribute of a dataset are investigated.
a) bivariate b) multivariate
c) Both a & b d) univariate

4) A _____ is definitely the most intuitive graphical representation of the relationship between two numerical attributes.
a) Scatter plot b) Loses plot
c) Quantile-Quantile plot d) Level Curves

5) The purpose of regression models, also known as _____ models.
a) Explanatory b) Predictive
c) Forecasting d) All

6) How do we perform Bayesian classification when some features are missing?
a) We assuming the missing values as the mean of all values.
b) We ignore the missing features.
c) We integrate the posteriors probabilities over the missing features.
d) Drop the features completely.

7) Agglomerative clustering falls under which type of clustering method?
a) partition b) hierarchical
c) Both d) None of the above

8) Which of the following metrics are used to evaluate classification models?
a) Area under the ROC curve b) F1 score
c) Confusion matrix d) All of the above

9) The problem of finding hidden structure in unlabeled data is called _____.
a) Supervised Learning b) Unsupervised Learning
c) Reinforcement Learning d) All of the above

10) If there are n number of independent variables then the referred regression model is _____.
a) Simple Linear Regression b) Ridge Regression
c) Multiple Linear Regression d) Generalized Linear Regression

11) What is the relation between the distance between clusters and the corresponding class discriminability?
a) proportional b) inversely-proportional
c) no-relation d) We can Say All

12) Data can be store, retrieve and updated in _____.
a) SMTOP b) FTP
c) OLAP d) OLTP

13) The classification of the data mining system involves _____.
a) Machine learning b) Database technology
c) Information Science d) All of the above

14) If the coefficient of determination is a positive value, then the regression equation _____.
a) must have a positive slope
b) must have a negative slope
c) could have either a positive or a negative slope
d) must have a positive y intercept

SLR-QH-481

Seat No.	

Set R

Fourth. Y. (B.Tech.) (Computer and Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Business Intelligence (BTN03706)

Day & Date: Thursday, 07-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever necessary and mention it clearly.

Section – I

Q.2 Attempt any Three **12**

a) What do you mean by effective and timely decisions? Describe the benefits of a Business intelligence system.

b) How Data mining process provide useful knowledge to decision makers? Explain with neat diagram.

c) What is the purpose of Data exploratory analysis? Explain the three main phases of Data exploratory analysis.

d) Write a short note on Data Reduction.

Q.3 Attempt any One **08**

a) Define Decision system. Describe the phases of Decision-making process in detail.

b) What do you mean by Data validation? Explain techniques used for data validation.

Q.4 Draw architecture of business intelligence system and explain the components of business intelligence system. **08**

Section – II

Q.5 Answer any Four. **16**

a) Describe the purpose of Regression models and list the types of regression.

b) Write a short note on Bayesian methods.

c) Why exponential smoothing models are used?

d) Compare Bivariate and multivariate analysis.

e) Define clustering. Explain any one clustering technique.

Q.6 **Answer any One** **06**

a) Define Time series. How evaluation and analysis of time series take place?

b) What are the various data mining techniques for BI? Explain classification and its problems in detail.

Q.7 Explain Apriori algorithm & general association rules. **06**

Seat No.	

Set **S**

Fourth. Y. (B.Tech.) (Computer and Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Business Intelligence (BTN03706)

Day & Date: Thursday, 07-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data wherever necessary and mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) If there are n number of independent variables then the referred regression model is _____.
a) Simple Linear Regression b) Ridge Regression
c) Multiple Linear Regression d) Generalized Linear Regression

2) What is the relation between the distance between clusters and the corresponding class discriminability?
a) proportional b) inversely-proportional
c) no-relation d) We can Say All

3) Data can be store, retrieve and updated in _____.
a) SMTOP b) FTP
c) OLAP d) OLTP

4) The classification of the data mining system involves _____.
a) Machine learning b) Database technology
c) Information Science d) All of the above

5) If the coefficient of determination is a positive value, then the regression equation _____.
a) must have a positive slope
b) must have a negative slope
c) could have either a positive or a negative slope
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6) The most learning models benefit from a preventive standardization of the data is also called as _____.
a) Normalization b) Extraction
c) Sampling d) transformation

7) According to forward search scheme, also referred as _____.
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8) _____ analysis, in which the properties of each single attribute of a dataset are investigated.
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9) A _____ is definitely the most intuitive graphical representation of the relationship between two numerical attributes.
a) Scatter plot b) Loses plot
c) Quantile-Quantile plot d) Level Curves

10) The purpose of regression models, also known as _____ models.
a) Explanatory b) Predictive
c) Forecasting d) All

11) How do we perform Bayesian classification when some features are missing?
a) We assuming the missing values as the mean of all values.
b) We ignore the missing features.
c) We integrate the posteriors probabilities over the missing features.
d) Drop the features completely.

12) Agglomerative clustering falls under which type of clustering method?
a) partition b) hierarchical
c) Both d) None of the above

13) Which of the following metrics are used to evaluate classification models?
a) Area under the ROC curve b) F1 score
c) Confusion matrix d) All of the above

14) The problem of finding hidden structure in unlabeled data is called _____.
a) Supervised Learning b) Unsupervised Learning
c) Reinforcement Learning d) All of the above

SLR-QH-481

Seat No.	

Set S

Fourth. Y. (B.Tech.) (Computer and Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Business Intelligence (BTN03706)

Day & Date: Thursday, 07-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever necessary and mention it clearly.

Section – I

Q.2 Attempt any Three **12**

a) What do you mean by effective and timely decisions? Describe the benefits of a Business intelligence system.

b) How Data mining process provide useful knowledge to decision makers? Explain with neat diagram.

c) What is the purpose of Data exploratory analysis? Explain the three main phases of Data exploratory analysis.

d) Write a short note on Data Reduction.

Q.3 Attempt any One **08**

a) Define Decision system. Describe the phases of Decision-making process in detail.

b) What do you mean by Data validation? Explain techniques used for data validation.

Q.4 Draw architecture of business intelligence system and explain the components of business intelligence system. **08**

Section – II

Q.5 Answer any Four. **16**

a) Describe the purpose of Regression models and list the types of regression.

b) Write a short note on Bayesian methods.

c) Why exponential smoothing models are used?

d) Compare Bivariate and multivariate analysis.

e) Define clustering. Explain any one clustering technique.

Q.6 **Answer any One** **06**

a) Define Time series. How evaluation and analysis of time series take place?

b) What are the various data mining techniques for BI? Explain classification and its problems in detail.

Q.7 Explain Apriori algorithm & general association rules. **06**

SLR-QH-482

Seat No.	

Set P

Fourth. Y. (B.Tech.) (Computer and Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Data Mining (BTN03707)

Day & Date: Thursday, 07-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Multiple Choice Questions: **14**

1) Which of the following is an essential process in which the intelligent methods are applied to extract data patterns?
a) Warehousing b) Data Mining
c) Text Mining d) Data Selection

2) What are the functions of Data Mining?
a) Association and correctional analysis classification
b) Prediction and characterization
c) Cluster analysis and Evolution analysis
d) All of the above

3) Which one of the following can be considered as the final output of the hierarchal type of clustering?
a) A tree which displays how the close thing are to each other
b) Assignment of each point to clusters
c) Finalize estimation of cluster centroids
d) None of the above

4) Which one of the following statements about the K-means clustering is incorrect?
a) The goal of the k-means clustering is to partition (n) observation into (k) clusters
b) K-means clustering can be defined as the method of quantization
c) The nearest neighbour is the same as the K-means
d) All of the above

5) Data warehouse contains _____.
a) Database Table b) Online data
c) Flat File d) All of the above

6) Which of the following statements is correct about data mining?
   a) It can be referred to as the procedure of mining knowledge from data
   b) Data mining can be defined as the procedure of extracting information from a set of the data.
   c) The procedure of data mining also involves several other processes like data cleaning, data transformation, and data integration.
   d) All of the above

7) Which of the following can be considered as the classification or mapping of a set or class with some predefined group or classes?
   a) Data set
   b) Data Characterization
   c) Data Sub Structure
   d) Data Discrimination

8) Which one of the following can be defined as the data object which does not comply with the general behavior (or the model of available data)?
   a) Evaluation Analysis
   b) Outliner Analysis
   c) Classification
   d) Prediction

9) The classification of the data mining system involves: _____.
   a) Database technology
   b) Information Science
   c) Machine learning
   d) All of the above

10) Euclidean distance measure is can also defined as _____.
   a) The process of finding a solution for a problem simply by enumerating all possible solutions according to some predefined order and then testing them
   b) The distance between two points as calculated using the Pythagoras theorem
   c) A stage of the KDD process in which new data is added to the existing selection.
   d) All of the above

11) What is classification in data mining?
   a) Setting up a target data
   b) Data mining procedure to sort data
   c) A method to find data
   d) Generalizing structures

12) What is Regression analysis?
   a) A model with the most negligible errors to derive a relationship in data
   b) Data mining procedure to sort data
   c) A method to find data
   d) None of the above

13) What is Web usage mining?

a) Find suitable data and information about the user's information
b) Find suitable data and information for the web page design
c) Find suitable data and information for the web page architecture
d) none of the above

14) What is the attribute selection method?

a) Method to select set of attributes that define tuples
b) Data mining procedure to sort data
c) A method to find data
d) A method that chooses the best attribute

Seat No.	

Set **P**

Fourth. Y. (B.Tech.) (Computer and Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Data Mining (BTN03707)

Day & Date: Thursday, 07-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary and mention it clearly.

SECTION – I

Q.2 Answer the following. (Any Four) **16**

a) Explain technological support for data mining.

b) Explain the Cluster Analysis.

c) Discuss needs to preprocess the data.

d) Explain Bayesian Classifiers.

e) Compare Data mining and Knowledge Discovery in Databases.

Q.3 Answer the following. (Any Two) **12**

a) Explain Decision Tree Based Algorithms.

b) Explain pattern mining in multilevel and multidimensional space.

c) Explain KDD process.

SECTION – II

Q.4 Answer the following. (Any Four) **16**

a) Explain Evaluation of Clustering.

b) Explain the web crawlers.

c) Explain the Outliers and Outlier Analysis.

d) Explain Large Item sets.

e) Explain Sampling Algorithm.

Q.5 Answer the following. (Any Two) **12**

a) Explain and write apriori algorithm for frequent item set mining with suitable example.

b) Explain Outlier detection methods with example.

c) Explain k-Means, k-Medoids partitioning methods.

Seat No.		Set	Q

Fourth. Y. (B.Tech.) (Computer and Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Data Mining (BTN03707)

Day & Date: Thursday, 07-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Multiple Choice Questions: **14**

1) Which one of the following can be defined as the data object which does not comply with the general behavior (or the model of available data)?
a) Evaluation Analysis b) Outliner Analysis
c) Classification d) Prediction

2) The classification of the data mining system involves: _____.
a) Database technology b) Information Science
c) Machine learning d) All of the above

3) Euclidean distance measure is can also defined as _____.
a) The process of finding a solution for a problem simply by enumerating all possible solutions according to some predefined order and then testing them
b) The distance between two points as calculated using the Pythagoras theorem
c) A stage of the KDD process in which new data is added to the existing selection.
d) All of the above

4) What is classification in data mining?
a) Setting up a target data
b) Data mining procedure to sort data
c) A method to find data
d) Generalizing structures

5) What is Regression analysis?
a) A model with the most negligible errors to derive a relationship in data
b) Data mining procedure to sort data
c) A method to find data
d) None of the above

6) What is Web usage mining?
   a) Find suitable data and information about the user's information
   b) Find suitable data and information for the web page design
   c) Find suitable data and information for the web page architecture
   d) none of the above

7) What is the attribute selection method?
   a) Method to select set of attributes that define tuples
   b) Data mining procedure to sort data
   c) A method to find data
   d) A method that chooses the best attribute

8) Which of the following is an essential process in which the intelligent methods are applied to extract data patterns?
   a) Warehousing
   b) Data Mining
   c) Text Mining
   d) Data Selection

9) What are the functions of Data Mining?
   a) Association and correctional analysis classification
   b) Prediction and characterization
   c) Cluster analysis and Evolution analysis
   d) All of the above

10) Which one of the following can be considered as the final output of the hierarchal type of clustering?
   a) A tree which displays how the close thing are to each other
   b) Assignment of each point to clusters
   c) Finalize estimation of cluster centroids
   d) None of the above

11) Which one of the following statements about the K-means clustering is incorrect?
   a) The goal of the k-means clustering is to partition (n) observation into (k) clusters
   b) K-means clustering can be defined as the method of quantization
   c) The nearest neighbour is the same as the K-means
   d) All of the above

12) Data warehouse contains _____.
   a) Database Table
   b) Online data
   c) Flat File
   d) All of the above

13) Which of the following statements is correct about data mining?
   a) It can be referred to as the procedure of mining knowledge from data
   b) Data mining can be defined as the procedure of extracting information from a set of the data.
   c) The procedure of data mining also involves several other processes like data cleaning, data transformation, and data integration.
   d) All of the above

14) Which of the following can be considered as the classification or mapping of a set or class with some predefined group or classes?

a) Data set
b) Data Characterization
c) Data Sub Structure
d) Data Discrimination

Seat No.	

Set **Q**

Fourth. Y. (B.Tech.) (Computer and Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Data Mining (BTN03707)

Day & Date: Thursday, 07-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary and mention it clearly.

SECTION – I

Q.2 Answer the following. (Any Four) **16**

a) Explain technological support for data mining.

b) Explain the Cluster Analysis.

c) Discuss needs to preprocess the data.

d) Explain Bayesian Classifiers.

e) Compare Data mining and Knowledge Discovery in Databases.

Q.3 Answer the following. (Any Two) **12**

a) Explain Decision Tree Based Algorithms.

b) Explain pattern mining in multilevel and multidimensional space.

c) Explain KDD process.

SECTION – II

Q.4 Answer the following. (Any Four) **16**

a) Explain Evaluation of Clustering.

b) Explain the web crawlers.

c) Explain the Outliers and Outlier Analysis.

d) Explain Large Item sets.

e) Explain Sampling Algorithm.

Q.5 Answer the following. (Any Two) **12**

a) Explain and write apriori algorithm for frequent item set mining with suitable example.

b) Explain Outlier detection methods with example.

c) Explain k-Means, k-Medoids partitioning methods.

Seat No.	

Set **R**

Fourth. Y. (B.Tech.) (Computer and Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Data Mining (BTN03707)

Day & Date: Thursday, 07-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Multiple Choice Questions: **14**

1) What is classification in data mining?
a) Setting up a target data
b) Data mining procedure to sort data
c) A method to find data
d) Generalizing structures

2) What is Regression analysis?
a) A model with the most negligible errors to derive a relationship in data
b) Data mining procedure to sort data
c) A method to find data
d) None of the above

3) What is Web usage mining?
a) Find suitable data and information about the user's information
b) Find suitable data and information for the web page design
c) Find suitable data and information for the web page architecture
d) none of the above

4) What is the attribute selection method?
a) Method to select set of attributes that define tuples
b) Data mining procedure to sort data
c) A method to find data
d) A method that chooses the best attribute

5) Which of the following is an essential process in which the intelligent methods are applied to extract data patterns?
a) Warehousing b) Data Mining
c) Text Mining d) Data Selection

6) What are the functions of Data Mining?
   a) Association and correctional analysis classification
   b) Prediction and characterization
   c) Cluster analysis and Evolution analysis
   d) All of the above

7) Which one of the following can be considered as the final output of the hierarchal type of clustering?
   a) A tree which displays how the close thing are to each other
   b) Assignment of each point to clusters
   c) Finalize estimation of cluster centroids
   d) None of the above

8) Which one of the following statements about the K-means clustering is incorrect?
   a) The goal of the k-means clustering is to partition (n) observation into (k) clusters
   b) K-means clustering can be defined as the method of quantization
   c) The nearest neighbour is the same as the K-means
   d) All of the above

9) Data warehouse contains _____.
   a) Database Table
   b) Online data
   c) Flat File
   d) All of the above

10) Which of the following statements is correct about data mining?
   a) It can be referred to as the procedure of mining knowledge from data
   b) Data mining can be defined as the procedure of extracting information from a set of the data.
   c) The procedure of data mining also involves several other processes like data cleaning, data transformation, and data integration.
   d) All of the above

11) Which of the following can be considered as the classification or mapping of a set or class with some predefined group or classes?
   a) Data set
   b) Data Characterization
   c) Data Sub Structure
   d) Data Discrimination

12) Which one of the following can be defined as the data object which does not comply with the general behavior (or the model of available data)?
   a) Evaluation Analysis
   b) Outliner Analysis
   c) Classification
   d) Prediction

13) The classification of the data mining system involves: _____.
   a) Database technology
   b) Information Science
   c) Machine learning
   d) All of the above

14) Euclidean distance measure is can also defined as _____.

a) The process of finding a solution for a problem simply by enumerating all possible solutions according to some predefined order and then testing them
b) The distance between two points as calculated using the Pythagoras theorem
c) A stage of the KDD process in which new data is added to the existing selection.
d) All of the above

Seat No.	

Set **R**

Fourth. Y. (B.Tech.) (Computer and Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Data Mining (BTN03707)

Day & Date: Thursday, 07-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary and mention it clearly.

SECTION – I

Q.2 Answer the following. (Any Four) **16**

a) Explain technological support for data mining.

b) Explain the Cluster Analysis.

c) Discuss needs to preprocess the data.

d) Explain Bayesian Classifiers.

e) Compare Data mining and Knowledge Discovery in Databases.

Q.3 Answer the following. (Any Two) **12**

a) Explain Decision Tree Based Algorithms.

b) Explain pattern mining in multilevel and multidimensional space.

c) Explain KDD process.

SECTION – II

Q.4 Answer the following. (Any Four) **16**

a) Explain Evaluation of Clustering.

b) Explain the web crawlers.

c) Explain the Outliers and Outlier Analysis.

d) Explain Large Item sets.

e) Explain Sampling Algorithm.

Q.5 Answer the following. (Any Two) **12**

a) Explain and write apriori algorithm for frequent item set mining with suitable example.

b) Explain Outlier detection methods with example.

c) Explain k-Means, k-Medoids partitioning methods.

Seat No.		Set	S

Fourth. Y. (B.Tech.) (Computer and Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Data Mining (BTN03707)

Day & Date: Thursday, 07-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Multiple Choice Questions: **14**

1) Which of the following statements is correct about data mining?
a) It can be referred to as the procedure of mining knowledge from data
b) Data mining can be defined as the procedure of extracting information from a set of the data.
c) The procedure of data mining also involves several other processes like data cleaning, data transformation, and data integration.
d) All of the above

2) Which of the following can be considered as the classification or mapping of a set or class with some predefined group or classes?
a) Data set b) Data Characterization
c) Data Sub Structure d) Data Discrimination

3) Which one of the following can be defined as the data object which does not comply with the general behavior (or the model of available data)?
a) Evaluation Analysis b) Outliner Analysis
c) Classification d) Prediction

4) The classification of the data mining system involves: _____.
a) Database technology b) Information Science
c) Machine learning d) All of the above

5) Euclidean distance measure is can also defined as _____.
a) The process of finding a solution for a problem simply by enumerating all possible solutions according to some predefined order and then testing them
b) The distance between two points as calculated using the Pythagoras theorem
c) A stage of the KDD process in which new data is added to the existing selection.
d) All of the above

6) What is classification in data mining?
   a) Setting up a target data
   b) Data mining procedure to sort data
   c) A method to find data
   d) Generalizing structures

7) What is Regression analysis?
   a) A model with the most negligible errors to derive a relationship in data
   b) Data mining procedure to sort data
   c) A method to find data
   d) None of the above

8) What is Web usage mining?
   a) Find suitable data and information about the user's information
   b) Find suitable data and information for the web page design
   c) Find suitable data and information for the web page architecture
   d) none of the above

9) What is the attribute selection method?
   a) Method to select set of attributes that define tuples
   b) Data mining procedure to sort data
   c) A method to find data
   d) A method that chooses the best attribute

10) Which of the following is an essential process in which the intelligent methods are applied to extract data patterns?
   a) Warehousing
   b) Data Mining
   c) Text Mining
   d) Data Selection

11) What are the functions of Data Mining?
   a) Association and correctional analysis classification
   b) Prediction and characterization
   c) Cluster analysis and Evolution analysis
   d) All of the above

12) Which one of the following can be considered as the final output of the hierarchal type of clustering?
   a) A tree which displays how the close thing are to each other
   b) Assignment of each point to clusters
   c) Finalize estimation of cluster centroids
   d) None of the above

13) Which one of the following statements about the K-means clustering is incorrect?
   a) The goal of the k-means clustering is to partition (n) observation into (k) clusters
   b) K-means clustering can be defined as the method of quantization
   c) The nearest neighbour is the same as the K-means
   d) All of the above

14) Data warehouse contains _____.

a) Database Table
b) Online data
c) Flat File
d) All of the above

Seat No.	

Set **S**

Fourth. Y. (B.Tech.) (Computer and Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Data Mining (BTN03707)

Day & Date: Thursday, 07-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary and mention it clearly.

SECTION – I

Q.2 Answer the following. (Any Four) **16**

a) Explain technological support for data mining.

b) Explain the Cluster Analysis.

c) Discuss needs to preprocess the data.

d) Explain Bayesian Classifiers.

e) Compare Data mining and Knowledge Discovery in Databases.

Q.3 Answer the following. (Any Two) **12**

a) Explain Decision Tree Based Algorithms.

b) Explain pattern mining in multilevel and multidimensional space.

c) Explain KDD process.

SECTION – II

Q.4 Answer the following. (Any Four) **16**

a) Explain Evaluation of Clustering.

b) Explain the web crawlers.

c) Explain the Outliers and Outlier Analysis.

d) Explain Large Item sets.

e) Explain Sampling Algorithm.

Q.5 Answer the following. (Any Two) **12**

a) Explain and write apriori algorithm for frequent item set mining with suitable example.

b) Explain Outlier detection methods with example.

c) Explain k-Means, k-Medoids partitioning methods.

SLR-QH-483

Seat No.		Set	P

Fourth. Y. (B.Tech.) (Computer and Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Distributed Systems (BTN03708)

Day & Date: Thursday, 07-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct option from the following. **14**

1) Which type of operating system allows multiple users to use the system simultaneously?
a) Single-user OS
b) Multi-user OS
c) Real-time OS
d) Embedded OS

2) Which of the following best describes a distributed system?
a) A system with a single processing unit
b) A network of computers that work together to achieve a common goal
c) A computer system with a centralized database
d) A system where tasks are processed sequentially

3) What is a message passing in a distributed system?
a) A mechanism to store data across multiple systems
b) A communication method where processes exchange messages
c) A method to ensure data consistency in databases
d) A technique for compressing large data files

4) A good message-passing system should provide _____.
a) Scalability and portability
b) Synchronous communication only
c) Support for a single platform
d) Limited fault tolerance

5) The first step in implementing an RPC mechanism is _____.
a) Stub generation
b) Server management
c) Defining the interface
d) Marshalling arguments

6) RPC messages are used for _____.
   a) Encoding arguments and results
   b) Managing server states
   c) Encrypting data
   d) Synchronizing clocks

7) Process migration in distributed systems is primarily used for _____.
   a) Fault tolerance and load balancing
   b) Increasing network traffic
   c) Reducing the number of processes
   d) Improving user interfaces

8) In a distributed system, threads are used to _____.
   a) Execute processes in isolation
   b) Allow concurrent execution within the same process
   c) Synchronize access to shared resources
   d) Both b) and c)

9) What is mutual exclusion in distributed systems?
   a) Ensuring all processes execute simultaneously
   b) Preventing multiple processes from accessing a shared resource concurrently
   c) Allowing processes to communicate freely
   d) Ignoring resource requests

10) Mutual exclusion algorithms can be classified into which two categories?
   a) Centralized and decentralized
   b) Token-based and non-token-based
   c) Static and dynamic
   d) Time-based and event-based

11) What is a deadlock in distributed systems?
   a) A state where processes continue to execute normally.
   b) A situation where processes wait indefinitely for resources held by each other.
   c) A state where only one process can execute at a time.
   d) A scenario where no processes can execute.

12) Which strategy involves periodically checking for the presence of deadlock and recovering from it?
   a) Deadlock Prevention
   b) Deadlock Avoidance
   c) Deadlock Detection and Recovery
   d) Deadlock Ignorance

13) Which mechanism is commonly used for data distribution in DFS?
   a) Hashing
   b) Load balancing
   c) Mirroring
   d) Partitioning

14) What is one primary motivation for using DSM?

a) To simplify the programming model for distributed systems
b) To increase local disk storage capacity
c) To enhance the graphical user interface
d) To reduce power consumption in computing systems

SLR-QH-483

Seat No.		Set	P

Fourth. Y. (B.Tech.) (Computer and Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Distributed Systems (BTN03708)

Day & Date: Thursday, 07-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Solve Any Four questions. **16**

a) What is a Distributed System?

b) Describe issues involved in failure recovery with the help of distributed computations.

c) Explain transparencies in RPC.

d) Explain implementation of logical clock using counter.

e) Explain clock synchronization issues.

Q.3 Solve Any Two questions. **12**

a) What is a distributed operating system? Explain the microkernel approach for designing the Distributed Operating System.

b) Differentiate between the monolithic kernel-and microkernel approaches for designing a distributed operating system. Discuss their relative advantages and disadvantages.

c) Draw and explain the format of RPC reply messages.

SECTION – II

Q.4 Solve Any Four questions. **16**

a) Explain the token ring approach for mutual exclusion.

b) Explain the centralized mutual exclusion with examples.

c) Explain global deadlock detection (Distributed deadlock detection) with the help of examples.

d) List and explain the mechanisms for building a Distributed File System (DFS).

e) Compare message passing and Distributed Shared Memory (DSM).

Q.5 Solve Any Two questions. **12**

a) What is a deadlock? Explain deadlock avoidance strategy in distributed systems.

b) Explain the architecture and the services of the Distributed File System. (DFS)

c) With a diagram Explain the architecture of distributed shared memory (DSM).

SLR-QH-483

Seat No.		Set	Q

Fourth. Y. (B.Tech.) (Computer and Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Distributed Systems (BTN03708)

Day & Date: Thursday, 07-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct option from the following. **14**

1) In a distributed system, threads are used to _____.
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b) Allow concurrent execution within the same process
c) Synchronize access to shared resources
d) Both b) and c)

2) What is mutual exclusion in distributed systems?
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3) Mutual exclusion algorithms can be classified into which two categories?
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c) Static and dynamic
d) Time-based and event-based

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a) A state where processes continue to execute normally.
b) A situation where processes wait indefinitely for resources held by each other.
c) A state where only one process can execute at a time.
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   c) Encrypting data
   d) Synchronizing clocks

14) Process migration in distributed systems is primarily used for _____.

a) Fault tolerance and load balancing
b) Increasing network traffic
c) Reducing the number of processes
d) Improving user interfaces

SLR-QH-483

Seat No.		Set	Q

Fourth. Y. (B.Tech.) (Computer and Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Distributed Systems (BTN03708)

Day & Date: Thursday, 07-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Solve Any Four questions. **16**

a) What is a Distributed System?

b) Describe issues involved in failure recovery with the help of distributed computations.

c) Explain transparencies in RPC.

d) Explain implementation of logical clock using counter.

e) Explain clock synchronization issues.

Q.3 Solve Any Two questions. **12**

a) What is a distributed operating system? Explain the microkernel approach for designing the Distributed Operating System.

b) Differentiate between the monolithic kernel-and microkernel approaches for designing a distributed operating system. Discuss their relative advantages and disadvantages.

c) Draw and explain the format of RPC reply messages.

SECTION – II

Q.4 Solve Any Four questions. **16**

a) Explain the token ring approach for mutual exclusion.

b) Explain the centralized mutual exclusion with examples.

c) Explain global deadlock detection (Distributed deadlock detection) with the help of examples.

d) List and explain the mechanisms for building a Distributed File System (DFS).

e) Compare message passing and Distributed Shared Memory (DSM).

Q.5 Solve Any Two questions. **12**

a) What is a deadlock? Explain deadlock avoidance strategy in distributed systems.

b) Explain the architecture and the services of the Distributed File System. (DFS)

c) With a diagram Explain the architecture of distributed shared memory (DSM).

SLR-QH-483

Seat No.		Set	R

Fourth. Y. (B.Tech.) (Computer and Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Distributed Systems (BTN03708)

Day & Date: Thursday, 07-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct option from the following. **14**

1) What is a deadlock in distributed systems?
a) A state where processes continue to execute normally.
b) A situation where processes wait indefinitely for resources held by each other.
c) A state where only one process can execute at a time.
d) A scenario where no processes can execute.

2) Which strategy involves periodically checking for the presence of deadlock and recovering from it?
a) Deadlock Prevention
b) Deadlock Avoidance
c) Deadlock Detection and Recovery
d) Deadlock Ignorance

3) Which mechanism is commonly used for data distribution in DFS?
a) Hashing b) Load balancing
c) Mirroring d) Partitioning

4) What is one primary motivation for using DSM?
a) To simplify the programming model for distributed systems
b) To increase local disk storage capacity
c) To enhance the graphical user interface
d) To reduce power consumption in computing systems

5) Which type of operating system allows multiple users to use the system simultaneously?
a) Single-user OS b) Multi-user OS
c) Real-time OS d) Embedded OS

6) Which of the following best describes a distributed system?
   a) A system with a single processing unit
   b) A network of computers that work together to achieve a common goal
   c) A computer system with a centralized database
   d) A system where tasks are processed sequentially

7) What is a message passing in a distributed system?
   a) A mechanism to store data across multiple systems
   b) A communication method where processes exchange messages
   c) A method to ensure data consistency in databases
   d) A technique for compressing large data files

8) A good message-passing system should provide _____.
   a) Scalability and portability
   b) Synchronous communication only
   c) Support for a single platform
   d) Limited fault tolerance

9) The first step in implementing an RPC mechanism is _____.
   a) Stub generation
   b) Server management
   c) Defining the interface
   d) Marshalling arguments

10) RPC messages are used for _____.
   a) Encoding arguments and results
   b) Managing server states
   c) Encrypting data
   d) Synchronizing clocks

11) Process migration in distributed systems is primarily used for _____.
   a) Fault tolerance and load balancing
   b) Increasing network traffic
   c) Reducing the number of processes
   d) Improving user interfaces

12) In a distributed system, threads are used to _____.
   a) Execute processes in isolation
   b) Allow concurrent execution within the same process
   c) Synchronize access to shared resources
   d) Both b) and c)

13) What is mutual exclusion in distributed systems?
   a) Ensuring all processes execute simultaneously
   b) Preventing multiple processes from accessing a shared resource concurrently
   c) Allowing processes to communicate freely
   d) Ignoring resource requests

14) Mutual exclusion algorithms can be classified into which two categories?

a) Centralized and decentralized
b) Token-based and non-token-based
c) Static and dynamic
d) Time-based and event-based

SLR-QH-483

Seat No.		Set	R

Fourth. Y. (B.Tech.) (Computer and Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Distributed Systems (BTN03708)

Day & Date: Thursday, 07-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Solve Any Four questions. **16**

a) What is a Distributed System?

b) Describe issues involved in failure recovery with the help of distributed computations.

c) Explain transparencies in RPC.

d) Explain implementation of logical clock using counter.

e) Explain clock synchronization issues.

Q.3 Solve Any Two questions. **12**

a) What is a distributed operating system? Explain the microkernel approach for designing the Distributed Operating System.

b) Differentiate between the monolithic kernel-and microkernel approaches for designing a distributed operating system. Discuss their relative advantages and disadvantages.

c) Draw and explain the format of RPC reply messages.

SECTION – II

Q.4 Solve Any Four questions. **16**

a) Explain the token ring approach for mutual exclusion.

b) Explain the centralized mutual exclusion with examples.

c) Explain global deadlock detection (Distributed deadlock detection) with the help of examples.

d) List and explain the mechanisms for building a Distributed File System (DFS).

e) Compare message passing and Distributed Shared Memory (DSM).

Q.5 Solve Any Two questions. **12**

a) What is a deadlock? Explain deadlock avoidance strategy in distributed systems.

b) Explain the architecture and the services of the Distributed File System. (DFS)

c) With a diagram Explain the architecture of distributed shared memory (DSM).

SLR-QH-483

Seat No.		Set	S

Fourth. Y. (B.Tech.) (Computer and Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Distributed Systems (BTN03708)

Day & Date: Thursday, 07-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct option from the following. **14**

1) RPC messages are used for _____.
a) Encoding arguments and results
b) Managing server states
c) Encrypting data
d) Synchronizing clocks

2) Process migration in distributed systems is primarily used for _____.
a) Fault tolerance and load balancing
b) Increasing network traffic
c) Reducing the number of processes
d) Improving user interfaces

3) In a distributed system, threads are used to _____.
a) Execute processes in isolation
b) Allow concurrent execution within the same process
c) Synchronize access to shared resources
d) Both b) and c)

4) What is mutual exclusion in distributed systems?
a) Ensuring all processes execute simultaneously
b) Preventing multiple processes from accessing a shared resource concurrently
c) Allowing processes to communicate freely
d) Ignoring resource requests

5) Mutual exclusion algorithms can be classified into which two categories?
a) Centralized and decentralized
b) Token-based and non-token-based
c) Static and dynamic
d) Time-based and event-based

6) What is a deadlock in distributed systems?
   a) A state where processes continue to execute normally.
   b) A situation where processes wait indefinitely for resources held by each other.
   c) A state where only one process can execute at a time.
   d) A scenario where no processes can execute.

7) Which strategy involves periodically checking for the presence of deadlock and recovering from it?
   a) Deadlock Prevention
   b) Deadlock Avoidance
   c) Deadlock Detection and Recovery
   d) Deadlock Ignorance

8) Which mechanism is commonly used for data distribution in DFS?
   a) Hashing
   b) Load balancing
   c) Mirroring
   d) Partitioning

9) What is one primary motivation for using DSM?
   a) To simplify the programming model for distributed systems
   b) To increase local disk storage capacity
   c) To enhance the graphical user interface
   d) To reduce power consumption in computing systems

10) Which type of operating system allows multiple users to use the system simultaneously?
   a) Single-user OS
   b) Multi-user OS
   c) Real-time OS
   d) Embedded OS

11) Which of the following best describes a distributed system?
   a) A system with a single processing unit
   b) A network of computers that work together to achieve a common goal
   c) A computer system with a centralized database
   d) A system where tasks are processed sequentially

12) What is a message passing in a distributed system?
   a) A mechanism to store data across multiple systems
   b) A communication method where processes exchange messages
   c) A method to ensure data consistency in databases
   d) A technique for compressing large data files

13) A good message-passing system should provide _____.
   a) Scalability and portability
   b) Synchronous communication only
   c) Support for a single platform
   d) Limited fault tolerance

14) The first step in implementing an RPC mechanism is _____.

a) Stub generation
b) Server management
c) Defining the interface
d) Marshalling arguments

SLR-QH-483

Seat No.		Set	S

Fourth. Y. (B.Tech.) (Computer and Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Distributed Systems (BTN03708)

Day & Date: Thursday, 07-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Solve Any Four questions. **16**

a) What is a Distributed System?

b) Describe issues involved in failure recovery with the help of distributed computations.

c) Explain transparencies in RPC.

d) Explain implementation of logical clock using counter.

e) Explain clock synchronization issues.

Q.3 Solve Any Two questions. **12**

a) What is a distributed operating system? Explain the microkernel approach for designing the Distributed Operating System.

b) Differentiate between the monolithic kernel-and microkernel approaches for designing a distributed operating system. Discuss their relative advantages and disadvantages.

c) Draw and explain the format of RPC reply messages.

SECTION – II

Q.4 Solve Any Four questions. **16**

a) Explain the token ring approach for mutual exclusion.

b) Explain the centralized mutual exclusion with examples.

c) Explain global deadlock detection (Distributed deadlock detection) with the help of examples.

d) List and explain the mechanisms for building a Distributed File System (DFS).

e) Compare message passing and Distributed Shared Memory (DSM).

Q.5 Solve Any Two questions. **12**

a) What is a deadlock? Explain deadlock avoidance strategy in distributed systems.

b) Explain the architecture and the services of the Distributed File System. (DFS)

c) With a diagram Explain the architecture of distributed shared memory (DSM).

SLR-QH-484

Seat No.	

Set P

Fourth. Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026 Management Information System (BTN03709)

Day & Date: Thursday, 07-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the following. 14

1) What is a key characteristic of new information systems?
a) Increased reliance on mainframe computers
b) Limited access to data and information
c) Integration of cloud computing and big data analytics
d) Centralized decision-making processes

2) Business processes refer to _____.
a) Activities and tasks performed to achieve business goals
b) Hardware and software used in business operations
c) The organizational structure of a business
c) The financial transactions of a business

3) What is the role of information systems in supply chain management?
a) Tracking employee attendance and performance
b) Managing customer relationship activities
c) Optimizing inventory levels and logistics
d) Monitoring competitor strategies and market trends

4) What are some potential risks associated with strategic information systems?
a) Improved decision-making and competitive advantage
b) Increased data security breaches and cyber threats
c) Enhanced collaboration and information sharing
d) Streamlined business processes and reduced costs

5) Which of the following is an example of an ethical issue related to the use of artificial intelligence (Al)?
   a) Bias in Al algorithms
   b) Lack of data privacy regulations
   c) High costs of Al implementation
   d) All of the above

6) Which of the following is a principle for ethical decision-making in information systems?
   a) Fairness
   b) Responsibility
   c) Integrity
   d) All of the above

7) Which management issue is associated with IT infrastructure resource allocation?
   a) Capacity planning
   b) Vendor management
   c) Performance monitoring
   d) Risk assessment

8) Which emerging technology has the potential to revolutionize IT infrastructure by enabling decentralized and transparent transactions?
   a) Artificial intelligence (Al)
   b) Blockchain
   c) Edge computing
   d) Internet of Things (IoT)

9) Which of the following is a key networking technology used in telecommunications networks?
   a) Cloud computing
   b) Wi-Fi
   c) Blockchain
   d) Artificial intelligence

10) Local area networks (LANs) are used for _____.
   a) Connecting computers within a small geographic area
   b) Connecting computers across wide geographic regions
   c) Providing internet access to mobile devices
   d) Enabling wireless communication between devices

11) Which of the following is NOT considered as another security measure in IT security management'?
   a) Security codes
   b) Security Monitors
   c) Fault Tolerant Systems
   d) Disaster Recovery

12) Fault tolerant systems in IT security management aim to _____.
   a) Encrypt data transmissions for privacy
   b) Prevent unauthorized access to a network
   c) Ensure system reliability and availability
   d) Monitor employee communications and data leaks

13) What is B2B e-commerce?

a) Business-to-customer e-commerce
b) Business-to-business e-commerce
c) Customer-to-customer e-commerce
d) None of the above

14) What is m-commerce?

a) Mobile commerce
b) Mail-order commerce
c) Marketing commerce
d) None of the above

Seat No.	

Set **P**

Fourth. Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026 Management Information System (BTN03709)

Day & Date: Thursday, 07-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figure to right indicate full marks.

SECTION – I

Q.2 Solve Any Four questions. **16**

a) What is the Role of Information Systems in Business Today?

b) What is new in information systems?

c) What are Competitive strategies using information systems?

d) Which Challenges posed by strategic information systems?

e) Explain Ethical, Social, Political issues raised by information systems.

Q.3 Solve Any Two questions. **12**

a) Which are Tools and technologies for collaboration and social business?

b) Describe about Organizations and its features.

c) Explain challenges to the protection of individual privacy and intellectual property.

SECTION – II

Q.4 Solve Any Four questions. **16**

a) Explain IT Infrastructure.

b) How to Organize Data in a Traditional File Environment?

c) What are Major Capabilities of Database Management Systems?

d) Which are Tools of Security Management?

e) Explain Features of e-commerce?

Q.5 Solve Any Two questions. **12**

a) Explain Different types of networks with Diagrams.

b) Explain the following Internetworked Security Defenses.
i) Encryption
ii) Firewalls
iii) Denial of Service Attacks

c) What is the role of M-commerce in business & its applications?

Seat No.	

Set **Q**

Fourth. Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026 Management Information System (BTN03709)

Day & Date: Thursday, 07-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the following. 14

1) Which emerging technology has the potential to revolutionize IT infrastructure by enabling decentralized and transparent transactions?
a) Artificial intelligence (Al) b) Blockchain
c) Edge computing d) Internet of Things (IoT)

2) Which of the following is a key networking technology used in telecommunications networks?
a) Cloud computing b) Wi-Fi
c) Blockchain d) Artificial intelligence

3) Local area networks (LANs) are used for _____.
a) Connecting computers within a small geographic area
b) Connecting computers across wide geographic regions
c) Providing internet access to mobile devices
d) Enabling wireless communication between devices

4) Which of the following is NOT considered as another security measure in IT security management'?
a) Security codes b) Security Monitors
c) Fault Tolerant Systems d) Disaster Recovery

5) Fault tolerant systems in IT security management aim to _____.
a) Encrypt data transmissions for privacy
b) Prevent unauthorized access to a network
c) Ensure system reliability and availability
d) Monitor employee communications and data leaks

6) What is B2B e-commerce?
   a) Business-to-customer e-commerce
   b) Business-to-business e-commerce
   c) Customer-to-customer e-commerce
   d) None of the above

7) What is m-commerce?
   a) Mobile commerce
   b) Mail-order commerce
   c) Marketing commerce
   d) None of the above

8) What is a key characteristic of new information systems?
   a) Increased reliance on mainframe computers
   b) Limited access to data and information
   c) Integration of cloud computing and big data analytics
   d) Centralized decision-making processes

9) Business processes refer to _____.
   a) Activities and tasks performed to achieve business goals
   b) Hardware and software used in business operations
   c) The organizational structure of a business
   c) The financial transactions of a business

10) What is the role of information systems in supply chain management?
   a) Tracking employee attendance and performance
   b) Managing customer relationship activities
   c) Optimizing inventory levels and logistics
   d) Monitoring competitor strategies and market trends

11) What are some potential risks associated with strategic information systems?
   a) Improved decision-making and competitive advantage
   b) Increased data security breaches and cyber threats
   c) Enhanced collaboration and information sharing
   d) Streamlined business processes and reduced costs

12) Which of the following is an example of an ethical issue related to the use of artificial intelligence (Al)?
   a) Bias in Al algorithms
   b) Lack of data privacy regulations
   c) High costs of Al implementation
   d) All of the above

13) Which of the following is a principle for ethical decision-making in information systems?
   a) Fairness
   b) Responsibility
   c) Integrity
   d) All of the above

14) Which management issue is associated with IT infrastructure resource allocation?

a) Capacity planning
b) Vendor management
c) Performance monitoring
d) Risk assessment

Seat No.	

Set **Q**

Fourth. Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026 Management Information System (BTN03709)

Day & Date: Thursday, 07-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figure to right indicate full marks.

SECTION – I

Q.2 Solve Any Four questions. **16**

a) What is the Role of Information Systems in Business Today?

b) What is new in information systems?

c) What are Competitive strategies using information systems?

d) Which Challenges posed by strategic information systems?

e) Explain Ethical, Social, Political issues raised by information systems.

Q.3 Solve Any Two questions. **12**

a) Which are Tools and technologies for collaboration and social business?

b) Describe about Organizations and its features.

c) Explain challenges to the protection of individual privacy and intellectual property.

SECTION – II

Q.4 Solve Any Four questions. **16**

a) Explain IT Infrastructure.

b) How to Organize Data in a Traditional File Environment?

c) What are Major Capabilities of Database Management Systems?

d) Which are Tools of Security Management?

e) Explain Features of e-commerce?

Q.5 Solve Any Two questions. **12**

a) Explain Different types of networks with Diagrams.

b) Explain the following Internetworked Security Defenses.
i) Encryption
ii) Firewalls
iii) Denial of Service Attacks

c) What is the role of M-commerce in business & its applications?

Seat No.	

Set **R**

Fourth. Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026 Management Information System (BTN03709)

Day & Date: Thursday, 07-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the following. 14

1) Which of the following is NOT considered as another security measure in IT security management'?
a) Security codes b) Security Monitors
c) Fault Tolerant Systems d) Disaster Recovery

2) Fault tolerant systems in IT security management aim to _____.
a) Encrypt data transmissions for privacy
b) Prevent unauthorized access to a network
c) Ensure system reliability and availability
d) Monitor employee communications and data leaks

3) What is B2B e-commerce?
a) Business-to-customer e-commerce
b) Business-to-business e-commerce
c) Customer-to-customer e-commerce
d) None of the above

4) What is m-commerce?
a) Mobile commerce b) Mail-order commerce
c) Marketing commerce d) None of the above

5) What is a key characteristic of new information systems?
a) Increased reliance on mainframe computers
b) Limited access to data and information
c) Integration of cloud computing and big data analytics
d) Centralized decision-making processes

6) Business processes refer to _____.
   a) Activities and tasks performed to achieve business goals
   b) Hardware and software used in business operations
   c) The organizational structure of a business
   c) The financial transactions of a business

7) What is the role of information systems in supply chain management?
   a) Tracking employee attendance and performance
   b) Managing customer relationship activities
   c) Optimizing inventory levels and logistics
   d) Monitoring competitor strategies and market trends

8) What are some potential risks associated with strategic information systems?
   a) Improved decision-making and competitive advantage
   b) Increased data security breaches and cyber threats
   c) Enhanced collaboration and information sharing
   d) Streamlined business processes and reduced costs

9) Which of the following is an example of an ethical issue related to the use of artificial intelligence (Al)?
   a) Bias in Al algorithms
   b) Lack of data privacy regulations
   c) High costs of Al implementation
   d) All of the above

10) Which of the following is a principle for ethical decision-making in information systems?
   a) Fairness b) Responsibility
   c) Integrity d) All of the above

11) Which management issue is associated with IT infrastructure resource allocation?
   a) Capacity planning
   b) Vendor management
   c) Performance monitoring
   d) Risk assessment

12) Which emerging technology has the potential to revolutionize IT infrastructure by enabling decentralized and transparent transactions?
   a) Artificial intelligence (Al) b) Blockchain
   c) Edge computing d) Internet of Things (IoT)

13) Which of the following is a key networking technology used in telecommunications networks?
   a) Cloud computing b) Wi-Fi
   c) Blockchain d) Artificial intelligence

14) Local area networks (LANs) are used for _____.

a) Connecting computers within a small geographic area
b) Connecting computers across wide geographic regions
c) Providing internet access to mobile devices
d) Enabling wireless communication between devices

Seat No.	

Set **R**

Fourth. Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026 Management Information System (BTN03709)

Day & Date: Thursday, 07-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figure to right indicate full marks.

SECTION – I

Q.2 Solve Any Four questions. **16**

a) What is the Role of Information Systems in Business Today?

b) What is new in information systems?

c) What are Competitive strategies using information systems?

d) Which Challenges posed by strategic information systems?

e) Explain Ethical, Social, Political issues raised by information systems.

Q.3 Solve Any Two questions. **12**

a) Which are Tools and technologies for collaboration and social business?

b) Describe about Organizations and its features.

c) Explain challenges to the protection of individual privacy and intellectual property.

SECTION – II

Q.4 Solve Any Four questions. **16**

a) Explain IT Infrastructure.

b) How to Organize Data in a Traditional File Environment?

c) What are Major Capabilities of Database Management Systems?

d) Which are Tools of Security Management?

e) Explain Features of e-commerce?

Q.5 Solve Any Two questions. **12**

a) Explain Different types of networks with Diagrams.

b) Explain the following Internetworked Security Defenses.
i) Encryption
ii) Firewalls
iii) Denial of Service Attacks

c) What is the role of M-commerce in business & its applications?

Seat No.	

Set **S**

Fourth. Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026 Management Information System (BTN03709)

Day & Date: Thursday, 07-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the following. 14

1) Which of the following is a principle for ethical decision-making in information systems?
a) Fairness b) Responsibility
c) Integrity d) All of the above

2) Which management issue is associated with IT infrastructure resource allocation?
a) Capacity planning
b) Vendor management
c) Performance monitoring
d) Risk assessment

3) Which emerging technology has the potential to revolutionize IT infrastructure by enabling decentralized and transparent transactions?
a) Artificial intelligence (Al) b) Blockchain
c) Edge computing d) Internet of Things (IoT)

4) Which of the following is a key networking technology used in telecommunications networks?
a) Cloud computing b) Wi-Fi
c) Blockchain d) Artificial intelligence

5) Local area networks (LANs) are used for _____.
a) Connecting computers within a small geographic area
b) Connecting computers across wide geographic regions
c) Providing internet access to mobile devices
d) Enabling wireless communication between devices

6) Which of the following is NOT considered as another security measure in IT security management'?
   a) Security codes
   b) Security Monitors
   c) Fault Tolerant Systems
   d) Disaster Recovery

7) Fault tolerant systems in IT security management aim to _____.
   a) Encrypt data transmissions for privacy
   b) Prevent unauthorized access to a network
   c) Ensure system reliability and availability
   d) Monitor employee communications and data leaks

8) What is B2B e-commerce?
   a) Business-to-customer e-commerce
   b) Business-to-business e-commerce
   c) Customer-to-customer e-commerce
   d) None of the above

9) What is m-commerce?
   a) Mobile commerce
   b) Mail-order commerce
   c) Marketing commerce
   d) None of the above

10) What is a key characteristic of new information systems?
   a) Increased reliance on mainframe computers
   b) Limited access to data and information
   c) Integration of cloud computing and big data analytics
   d) Centralized decision-making processes

11) Business processes refer to _____.
   a) Activities and tasks performed to achieve business goals
   b) Hardware and software used in business operations
   c) The organizational structure of a business
   c) The financial transactions of a business

12) What is the role of information systems in supply chain management?
   a) Tracking employee attendance and performance
   b) Managing customer relationship activities
   c) Optimizing inventory levels and logistics
   d) Monitoring competitor strategies and market trends

13) What are some potential risks associated with strategic information systems?
   a) Improved decision-making and competitive advantage
   b) Increased data security breaches and cyber threats
   c) Enhanced collaboration and information sharing
   d) Streamlined business processes and reduced costs

14) Which of the following is an example of an ethical issue related to the use of artificial intelligence (Al)?

a) Bias in Al algorithms
b) Lack of data privacy regulations
c) High costs of Al implementation
d) All of the above

Seat No.	

Set **S**

Fourth. Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026 Management Information System (BTN03709)

Day & Date: Thursday, 07-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figure to right indicate full marks.

SECTION – I

Q.2 Solve Any Four questions. **16**

a) What is the Role of Information Systems in Business Today?

b) What is new in information systems?

c) What are Competitive strategies using information systems?

d) Which Challenges posed by strategic information systems?

e) Explain Ethical, Social, Political issues raised by information systems.

Q.3 Solve Any Two questions. **12**

a) Which are Tools and technologies for collaboration and social business?

b) Describe about Organizations and its features.

c) Explain challenges to the protection of individual privacy and intellectual property.

SECTION – II

Q.4 Solve Any Four questions. **16**

a) Explain IT Infrastructure.

b) How to Organize Data in a Traditional File Environment?

c) What are Major Capabilities of Database Management Systems?

d) Which are Tools of Security Management?

e) Explain Features of e-commerce?

Q.5 Solve Any Two questions. **12**

a) Explain Different types of networks with Diagrams.

b) Explain the following Internetworked Security Defenses.
i) Encryption
ii) Firewalls
iii) Denial of Service Attacks

c) What is the role of M-commerce in business & its applications?

SLR-QH-486

Seat No.	

Set P

Fourth. Y. (B.Tech.) (Computer and Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Big Data Analytics (BTN03711)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Answer cannot be changed once it is marked.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answers. **14**

1) Choose the machine generated structured data _____.
a) Scientific data b) Social media data
c) point-of-scale d) postgresSql

2) What is the characteristic of data dealing with its retention?
a) Volatility b) Variability
c) Velocity d) Volume

3) _____ is a collection of data that is used in volume, yet growing exponentially with time.
a) Big Database b) Big DBMS
c) Big Datafile d) Big Data

4) Select the characteristics of Semi-structured data _____.
a) Inconsistent Structure b) Self-describing
c) Schema blended with value d) All

5) What are the Hadoop core components?
a) Data and code b) HBase and Flume
c) HDFS and MapReduce d) Data storage and Daemons

6) System will continue to function even when network partition occurs is _____ in CAP Theorem.
a) Consistency b) Availability
c) Partition Tolerant d) None of the above

7) The _____ technology helps query data that resides in a computer's RAM rather than data stored on physical disks.
a) Massively Parallel Processing
b) In-Memory analytics
c) Symmetric Multiprocessing System
d) Distributed Systems

8) All of the following accurately describe Hadoop, except _____.
a) Open Source
b) Java Based
c) Real Time
d) Distributed computing approach

9) Data that does not conform to a data model or data schema is known as _____.
a) Structured data
b) Unstructured data
c) Semi-structured data
d) All of the mentioned above

10) Which of the following is equivalent to SQL command- Select * from employees where designation = "Manager"?
a) employees.find({"designation": "Manager"})
b) db.employees.find({"designation: Manager"})
c) db.employees.find({"designation":"Manager"})
d) db.employees.find({Designation="Manager"})

11) PIG is _____.
a) dataflow language
b) NoSQL database
c) import export tool
d) scheduling engine

12) Cassandra uses a protocol called _____ to discover location and state information.
a) gossip
b) intergos
c) goss
d) all of the mentioned

13) Which of the following is used by Hive?
a) HDFS for storage
b) Map Reduce for execution
c) RDBMS for metadata storage
d) All of the above

14) All of the following accurately describe Hadoop, except _____.
a) Open Source
b) Java Based
c) Real Time
d) Distributed computing approach

Seat No.	

Set **P**

Fourth. Y. (B.Tech.) (Computer and Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Big Data Analytics (BTN03711)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data whenever necessary.

SECTION – I

Q.2 Attempt any Four. **16**

a) What are the Sources of Structured data? Why it is easy to work with structured data?

b) How is big data analysis helpful in increasing business revenue?

c) Distinguish the features of Hadoop 1.0 and Hadoop 2.x

d) What is anatomy of File read and File Write operations in HDFS Daemons? Write steps.

e) What is Big Data Analytics? Explain advantages and disadvantages of big data analytics.

Q.3 Attempt any Two. **12**

a) What are the benefits of Big Data? Discuss challenges under Big Data. How Big Data Analytics can be useful in the development of smart cities.

b) How does MapReduce work? Explain with suitable example.

c) What is CAP theorem? Why it guarantees only two terms out of three? Elaborate with reason.

SECTION – II

Q.4 Attempt any Four. **16**

a) What is Pig Latin? Explain the ETL processing with Pig.

b) List four important differences between SQL and MongoDB.

c) What is static and dynamic partitioning in HIVE? Illustrate with example.

d) Write MongoDB query for an objective given below:

i) Create a collection “students” and insert 5 documents into the students collection by “_id” and “stdname” array.

ii) Check these documents are present in students collection.

iii) Find that document from students collection where “joy” is present in 4th index position of the students array.

e) Write difference between SQL and MongoDB.

Q.5 Attempt any Two. **12**

a) Explain the features of Cassandra. What are the collections in CQLSH?

b) Draw the architecture of Hive and explain its components.

c) Write HQL (HIVE QUERY LANGUAGE) queries along with its syntax for the following.

i) Create a table named Employee having fields. {name,designation,department,salary}

ii) Insert the data of four employees from text file using LOAD statement.

iii) Add three Partitions to the table and rename them to Emp 1, Emp2, Emp3.

SLR-QH-486

Seat No.	

Set Q

Fourth. Y. (B.Tech.) (Computer and Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Big Data Analytics (BTN03711)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Answer cannot be changed once it is marked.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answers. 14

1) All of the following accurately describe Hadoop, except _____.
a) Open Source
b) Java Based
c) Real Time
d) Distributed computing approach

2) Data that does not conform to a data model or data schema is known as _____.
a) Structured data
b) Unstructured data
c) Semi-structured data
d) All of the mentioned above

3) Which of the following is equivalent to SQL command- Select * from employees where designation = "Manager"?
a) employees.find({"designation": "Manager"})
b) db.employees.find({"designation: Manager"})
c) db.employees.find({"designation":"Manager"})
d) db.employees.find({Designation="Manager"})

4) PIG is _____.
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c) Velocity
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10) _____ is a collection of data that is used in volume, yet growing exponentially with time.
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11) Select the characteristics of Semi-structured data _____.
a) Inconsistent Structure
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c) Schema blended with value
d) All

12) What are the Hadoop core components?
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a) Consistency
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c) Partition Tolerant
d) None of the above

14) The _____ technology helps query data that resides in a computer's RAM rather than data stored on physical disks.
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b) In-Memory analytics
c) Symmetric Multiprocessing System
d) Distributed Systems

Seat No.	

Set **Q**

Fourth. Y. (B.Tech.) (Computer and Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Big Data Analytics (BTN03711)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data whenever necessary.

SECTION – I

Q.2 Attempt any Four. **16**

a) What are the Sources of Structured data? Why it is easy to work with structured data?

b) How is big data analysis helpful in increasing business revenue?

c) Distinguish the features of Hadoop 1.0 and Hadoop 2.x

d) What is anatomy of File read and File Write operations in HDFS Daemons? Write steps.

e) What is Big Data Analytics? Explain advantages and disadvantages of big data analytics.

Q.3 Attempt any Two. **12**

a) What are the benefits of Big Data? Discuss challenges under Big Data. How Big Data Analytics can be useful in the development of smart cities.

b) How does MapReduce work? Explain with suitable example.

c) What is CAP theorem? Why it guarantees only two terms out of three? Elaborate with reason.

SECTION – II

Q.4 Attempt any Four. **16**

a) What is Pig Latin? Explain the ETL processing with Pig.

b) List four important differences between SQL and MongoDB.

c) What is static and dynamic partitioning in HIVE? Illustrate with example.

d) Write MongoDB query for an objective given below:

i) Create a collection “students” and insert 5 documents into the students collection by “_id” and “stdname” array.

ii) Check these documents are present in students collection.

iii) Find that document from students collection where “joy” is present in 4th index position of the students array.

e) Write difference between SQL and MongoDB.

Q.5 Attempt any Two. **12**

a) Explain the features of Cassandra. What are the collections in CQLSH?

b) Draw the architecture of Hive and explain its components.

c) Write HQL (HIVE QUERY LANGUAGE) queries along with its syntax for the following.

i) Create a table named Employee having fields. {name,designation,department,salary}

ii) Insert the data of four employees from text file using LOAD statement.

iii) Add three Partitions to the table and rename them to Emp 1, Emp2, Emp3.

Seat No.	

Set **R**

Fourth. Y. (B.Tech.) (Computer and Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Big Data Analytics (BTN03711)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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3) Answer cannot be changed once it is marked.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answers. **14**

1) PIG is _____.
a) dataflow language b) NoSQL database
c) import export tool d) scheduling engine

2) Cassandra uses a protocol called _____ to discover location and state information.
a) gossip b) intergos
c) goss d) all of the mentioned

3) Which of the following is used by Hive?
a) HDFS for storage
b) Map Reduce for execution
c) RDBMS for metadata storage
d) All of the above

4) All of the following accurately describe Hadoop, except _____.
a) Open Source
b) Java Based
c) Real Time
d) Distributed computing approach

5) Choose the machine generated structured data _____.
a) Scientific data b) Social media data
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6) What is the characteristic of data dealing with its retention?
a) Volatility b) Variability
c) Velocity d) Volume

7) _____ is a collection of data that is used in volume, yet growing exponentially with time.
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8) Select the characteristics of Semi-structured data _____.
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9) What are the Hadoop core components?
a) Data and code
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14) Which of the following is equivalent to SQL command- Select * from employees where designation = "Manager"?
a) employees.find({"designation": "Manager"})
b) db.employees.find({"designation: Manager"})
c) db.employees.find({"designation":"Manager"})
d) db.employees.find({Designation="Manager"})

Seat No.	

Set **R**

Fourth. Y. (B.Tech.) (Computer and Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Big Data Analytics (BTN03711)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data whenever necessary.

SECTION – I

Q.2 Attempt any Four. **16**

a) What are the Sources of Structured data? Why it is easy to work with structured data?

b) How is big data analysis helpful in increasing business revenue?

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d) What is anatomy of File read and File Write operations in HDFS Daemons? Write steps.

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b) How does MapReduce work? Explain with suitable example.

c) What is CAP theorem? Why it guarantees only two terms out of three? Elaborate with reason.

SECTION – II

Q.4 Attempt any Four. **16**

a) What is Pig Latin? Explain the ETL processing with Pig.

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SLR-QH-486

Seat No.		Set	S

Fourth. Y. (B.Tech.) (Computer and Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Big Data Analytics (BTN03711)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
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4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answers. **14**

1) System will continue to function even when network partition occurs is _____ in CAP Theorem.
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d) None of the above

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5) Which of the following is equivalent to SQL command- Select * from employees where designation = "Manager"?
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a) Inconsistent Structure
b) Self-describing
c) Schema blended with value
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14) What are the Hadoop core components?
a) Data and code
b) HBase and Flume
c) HDFS and MapReduce
d) Data storage and Daemons

Seat No.	

Set **S**

Fourth. Y. (B.Tech.) (Computer and Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Big Data Analytics (BTN03711)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data whenever necessary.

SECTION – I

Q.2 Attempt any Four. **16**

a) What are the Sources of Structured data? Why it is easy to work with structured data?

b) How is big data analysis helpful in increasing business revenue?

c) Distinguish the features of Hadoop 1.0 and Hadoop 2.x

d) What is anatomy of File read and File Write operations in HDFS Daemons? Write steps.

e) What is Big Data Analytics? Explain advantages and disadvantages of big data analytics.

Q.3 Attempt any Two. **12**

a) What are the benefits of Big Data? Discuss challenges under Big Data. How Big Data Analytics can be useful in the development of smart cities.

b) How does MapReduce work? Explain with suitable example.

c) What is CAP theorem? Why it guarantees only two terms out of three? Elaborate with reason.

SECTION – II

Q.4 Attempt any Four. **16**

a) What is Pig Latin? Explain the ETL processing with Pig.

b) List four important differences between SQL and MongoDB.

c) What is static and dynamic partitioning in HIVE? Illustrate with example.

d) Write MongoDB query for an objective given below:

i) Create a collection “students” and insert 5 documents into the students collection by “_id” and “stdname” array.

ii) Check these documents are present in students collection.

iii) Find that document from students collection where “joy” is present in 4th index position of the students array.

e) Write difference between SQL and MongoDB.

Q.5 Attempt any Two. **12**

a) Explain the features of Cassandra. What are the collections in CQLSH?

b) Draw the architecture of Hive and explain its components.

c) Write HQL (HIVE QUERY LANGUAGE) queries along with its syntax for the following.

i) Create a table named Employee having fields. {name,designation,department,salary}

ii) Insert the data of four employees from text file using LOAD statement.

iii) Add three Partitions to the table and rename them to Emp 1, Emp2, Emp3.

SLR-QH-488

Seat No.		Set	P

Fourth.Y. (B.Tech.) (Computer and Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Deep Learning (BTN03713)

Day & Date: Monday, 11-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to right indicates full marks.
4) Make suitable assumptions (if necessary and state them clearly).

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) What does LSTM stand for?
a) Long Short Term Memory
b) Least Squares Term Memory
c) Least Square Time Mean
d) Long Short Threshold Memory

2) In the neural network, every parameter can have their different learning rate.
a) TRUE b) FALSE
c) Can't say d) None of these

3) Which of the following functions can be used as an activation function in the output layer if we wish to predict the probabilities of n classes ($p1, p2..pk$) such that sum of p over all n equals to 1?
a) Softmax b) ReLu
c) Sigmoid d) Tanh

4) K-fold cross-validation is _____.
a) linear in K b) quadratic in K
c) cubic in K d) exponential in K

5) What is the best Neural Network Model for Temporal Data?
a) Recurrent Neural Network b) Convolution Neural Networks
c) Temporal Neural Networks d) Multi-Layer perceptions

6) De-noising and Contractive are examples of _____.
a) Auto encoders
b) Convolution Neural Networks
c) Recurrent Neural Networks
d) None

7) The reuse of a pre-trained model on a new problem is known as _____.
a) Learning rate b) Bias
c) Variance d) Transfer learning

8) Recurrent Neural Networks are best suited for speech recognition.
a) True b) False

9) After training a neural network, you observe a large gap between the training accuracy (100%) and the test accuracy (42%). Which of the following methods is commonly used to reduce this gap?
a) Generative advisaral network b) Sigmoid function
c) RMSProp Optimizer d) Droupout

10) Which of the following statement is true regrading dropout?
i) Dropout gives a way to approximate by combining many different architectures
ii) Dropout demands high learning rates
iii) Dropout can help preventing overfitting
a) Both i and ii b) Both i and iii
c) Both ii and iii d) All i, ii and iii

11) Which of the option is correct regarding following statement?
Statement 1. Auto encoders are a supervised learning technique,
Statement 2. Auto encoder's output is exactly the same as the input
a) Both the statements are TRUE
b) Statement 1 is TRUE, but statement 2 is FALSE.
c) Statement 1 is FALSE, but statement 2 is TRUE.
d) Both the statements are FALSE

12) _____ is a Neural Nets way of classifying inputs.
a) Forward Propagation b) Activation
c) Classification d) All of these

13) _____ Types of transfer learning.
a) Inductive transfer learning
b) Transudative transfer learning
c) Both a and b
d) None of the above

14) _____ is a pooling operation that selects the maximum element from the region of the feature map covered by the filter.
a) Max Pooling b) Average Pooling
c) Global pooling d) None of these

Seat No.	

Set **P**

Fourth.Y. (B.Tech.) (Computer and Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Deep Learning (BTN03713)

Day & Date: Monday, 11-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Make suitable assumptions (if necessary and state them clearly).

SECTION – I

Q.2 Attempt Any Four. **16**

a) Explain Deep feed Forword Neural Network.

b) Explain the term Keras and Tensorflow.

c) Assume a simple deep learning model with 3 neurons and inputs = 3, 4, 5 The weights to the input neurons are 6, 7 and 8 respectively. Assume the activation function is a linear constant value of 4. Calculate the output?

d) Explain Biological Neuron vs. Artificial Neuron.

e) Explain Vanishing Gradient problem.

Q.3 Attempt Any One. **06**

a) Explain various Activation functions.

b) Discuss different types of hyper parameter.

Q.4 Attempt the following/Write a short note on **06**

a) Early Stopping

b) Dropout

SECTION – II

Q.5 Attempt Any Four. **16**

a) Explain Bidirectional RNN.

b) Write a short note on VGGNet.

c) Explain Convolution and Pooling operation in CNN.

d) Write short note on Bidirectional LSTM.

e) Explain the use of auto encoder in dimensionality reduction & classification.

Q.6 Attempt Any One. **06**

a) Explain Transfer Learning with its applications.

b) Explain SGD optimizer for CNNs.

Q.7 Attempt the following. **06**

Explain different types of Autoencoder.

Seat No.	

Set **Q**

Fourth.Y. (B.Tech.) (Computer and Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Deep Learning (BTN03713)

Day & Date: Monday, 11-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to right indicates full marks.
4) Make suitable assumptions (if necessary and state them clearly).

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Recurrent Neural Networks are best suited for speech recognition.
a) True b) False

2) After training a neural network, you observe a large gap between the training accuracy (100%) and the test accuracy (42%). Which of the following methods is commonly used to reduce this gap?
a) Generative advisaral network b) Sigmoid function
c) RMSProp Optimizer d) Droupout

3) Which of the following statement is true regrading dropout?
i) Dropout gives a way to approximate by combining many different architectures
ii) Dropout demands high learning rates
iii) Dropout can help preventing overfitting
a) Both i and ii b) Both i and iii
c) Both ii and iii d) All i, ii and iii

4) Which of the option is correct regarding following statement?
Statement 1. Auto encoders are a supervised learning technique,
Statement 2. Auto encoder's output is exactly the same as the input
a) Both the statements are TRUE
b) Statement 1 is TRUE, but statement 2 is FALSE.
c) Statement 1 is FALSE, but statement 2 is TRUE.
d) Both the statements are FALSE

5) _____ is a Neural Nets way of classifying inputs.
a) Forward Propagation b) Activation
c) Classification d) All of these

6) _____ Types of transfer learning.
a) Inductive transfer learning
b) Transudative transfer learning
c) Both a and b
d) None of the above

7) _____ is a pooling operation that selects the maximum element from the region of the feature map covered by the filter.
a) Max Pooling
b) Average Pooling
c) Global pooling
d) None of these

8) What does LSTM stand for?
a) Long Short Term Memory
b) Least Squares Term Memory
c) Least Square Time Mean
d) Long Short Threshold Memory

9) In the neural network, every parameter can have their different learning rate.
a) TRUE
b) FALSE
c) Can't say
d) None of these

10) Which of the following functions can be used as an activation function in the output layer if we wish to predict the probabilities of n classes ($p1, p2..pk$) such that sum of p over all n equals to 1?
a) Softmax
b) ReLu
c) Sigmoid
d) Tanh

11) K-fold cross-validation is _____.
a) linear in K
b) quadratic in K
c) cubic in K
d) exponential in K

12) What is the best Neural Network Model for Temporal Data?
a) Recurrent Neural Network
b) Convolution Neural Networks
c) Temporal Neural Networks
d) Multi-Layer perceptions

13) De-noising and Contractive are examples of _____.
a) Auto encoders
b) Convolution Neural Networks
c) Recurrent Neural Networks
d) None

14) The reuse of a pre-trained model on a new problem is known as _____.
a) Learning rate
b) Bias
c) Variance
d) Transfer learning

SLR-QH-488

Seat No.	

Set Q

Fourth.Y. (B.Tech.) (Computer and Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Deep Learning (BTN03713)

Day & Date: Monday, 11-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Make suitable assumptions (if necessary and state them clearly).

SECTION – I

Q.2 Attempt Any Four. **16**

a) Explain Deep feed Forword Neural Network.

b) Explain the term Keras and Tensorflow.

c) Assume a simple deep learning model with 3 neurons and inputs = 3, 4, 5 The weights to the input neurons are 6, 7 and 8 respectively. Assume the activation function is a linear constant value of 4. Calculate the output?

d) Explain Biological Neuron vs. Artificial Neuron.

e) Explain Vanishing Gradient problem.

Q.3 Attempt Any One. **06**

a) Explain various Activation functions.

b) Discuss different types of hyper parameter.

Q.4 Attempt the following/Write a short note on **06**

a) Early Stopping

b) Dropout

SECTION – II

Q.5 Attempt Any Four. **16**

a) Explain Bidirectional RNN.

b) Write a short note on VGGNet.

c) Explain Convolution and Pooling operation in CNN.

d) Write short note on Bidirectional LSTM.

e) Explain the use of auto encoder in dimensionality reduction & classification.

Q.6 Attempt Any One. **06**

a) Explain Transfer Learning with its applications.

b) Explain SGD optimizer for CNNs.

Q.7 Attempt the following. **06**

Explain different types of Autoencoder.

Seat No.	

Set **R**

Fourth.Y. (B.Tech.) (Computer and Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Deep Learning (BTN03713)

Day & Date: Monday, 11-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to right indicates full marks.
4) Make suitable assumptions (if necessary and state them clearly).

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which of the option is correct regarding following statement?
Statement 1. Auto encoders are a supervised learning technique,
Statement 2. Auto encoder's output is exactly the same as the input
a) Both the statements are TRUE
b) Statement 1 is TRUE, but statement 2 is FALSE.
c) Statement 1 is FALSE, but statement 2 is TRUE.
d) Both the statements are FALSE

2) _____ is a Neural Nets way of classifying inputs.
a) Forward Propagation b) Activation
c) Classification d) All of these

3) _____ Types of transfer learning.
a) Inductive transfer learning
b) Transudative transfer learning
c) Both a and b
d) None of the above

4) _____ is a pooling operation that selects the maximum element from the region of the feature map covered by the filter.
a) Max Pooling b) Average Pooling
c) Global pooling d) None of these

5) What does LSTM stand for?
a) Long Short Term Memory
b) Least Squares Term Memory
c) Least Square Time Mean
d) Long Short Threshold Memory

6) In the neural network, every parameter can have their different learning rate.

a) TRUE
b) FALSE
c) Can't say
d) None of these

7) Which of the following functions can be used as an activation function in the output layer if we wish to predict the probabilities of n classes ($p1, p2..pk$) such that sum of p over all n equals to 1?

a) Softmax
b) ReLu
c) Sigmoid
d) Tanh

8) K-fold cross-validation is _____.

a) linear in K
b) quadratic in K
c) cubic in K
d) exponential in K

9) What is the best Neural Network Model for Temporal Data?

a) Recurrent Neural Network
b) Convolution Neural Networks
c) Temporal Neural Networks
d) Multi-Layer perceptions

10) De-noising and Contractive are examples of _____.

a) Auto encoders
b) Convolution Neural Networks
c) Recurrent Neural Networks
d) None

11) The reuse of a pre-trained model on a new problem is known as _____.

a) Learning rate
b) Bias
c) Variance
d) Transfer learning

12) Recurrent Neural Networks are best suited for speech recognition.

a) True
b) False

13) After training a neural network, you observe a large gap between the training accuracy (100%) and the test accuracy (42%). Which of the following methods is commonly used to reduce this gap?

a) Generative advisaral network
b) Sigmoid function
c) RMSProp Optimizer
d) Droupout

14) Which of the following statement is true regrading dropout?

i) Dropout gives a way to approximate by combining many different architectures
ii) Dropout demands high learning rates
iii) Dropout can help preventing overfitting

a) Both i and ii
b) Both i and iii
c) Both ii and iii
d) All i, ii and iii

Seat No.	

Set **R**

Fourth.Y. (B.Tech.) (Computer and Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Deep Learning (BTN03713)

Day & Date: Monday, 11-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Make suitable assumptions (if necessary and state them clearly).

SECTION – I

Q.2 Attempt Any Four. **16**

a) Explain Deep feed Forword Neural Network.

b) Explain the term Keras and Tensorflow.

c) Assume a simple deep learning model with 3 neurons and inputs = 3, 4, 5 The weights to the input neurons are 6, 7 and 8 respectively. Assume the activation function is a linear constant value of 4. Calculate the output?

d) Explain Biological Neuron vs. Artificial Neuron.

e) Explain Vanishing Gradient problem.

Q.3 Attempt Any One. **06**

a) Explain various Activation functions.

b) Discuss different types of hyper parameter.

Q.4 Attempt the following/Write a short note on **06**

a) Early Stopping

b) Dropout

SECTION – II

Q.5 Attempt Any Four. **16**

a) Explain Bidirectional RNN.

b) Write a short note on VGGNet.

c) Explain Convolution and Pooling operation in CNN.

d) Write short note on Bidirectional LSTM.

e) Explain the use of auto encoder in dimensionality reduction & classification.

Q.6 Attempt Any One. **06**

a) Explain Transfer Learning with its applications.

b) Explain SGD optimizer for CNNs.

Q.7 Attempt the following. **06**

Explain different types of Autoencoder.

SLR-QH-488

Seat No.		Set	S

Fourth.Y. (B.Tech.) (Computer and Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Deep Learning (BTN03713)

Day & Date: Monday, 11-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to right indicates full marks.
4) Make suitable assumptions (if necessary and state them clearly).

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) De-noising and Contractive are examples of _____.
a) Auto encoders
b) Convolution Neural Networks
c) Recurrent Neural Networks
d) None

2) The reuse of a pre-trained model on a new problem is known as _____.
a) Learning rate b) Bias
c) Variance d) Transfer learning

3) Recurrent Neural Networks are best suited for speech recognition.
a) True b) False

4) After training a neural network, you observe a large gap between the training accuracy (100%) and the test accuracy (42%). Which of the following methods is commonly used to reduce this gap?
a) Generative advisaral network b) Sigmoid function
c) RMSProp Optimizer d) Droupout

5) Which of the following statement is true regrading dropout?
i) Dropout gives a way to approximate by combining many different architectures
ii) Dropout demands high learning rates
iii) Dropout can help preventing overfitting
a) Both i and ii b) Both i and iii
c) Both ii and iii d) All i, ii and iii

6) Which of the option is correct regarding following statement?
Statement 1. Auto encoders are a supervised learning technique,
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d) Both the statements are FALSE

7) _____ is a Neural Nets way of classifying inputs.
a) Forward Propagation
b) Activation
c) Classification
d) All of these

8) _____ Types of transfer learning.
a) Inductive transfer learning
b) Transudative transfer learning
c) Both a and b
d) None of the above

9) _____ is a pooling operation that selects the maximum element from the region of the feature map covered by the filter.
a) Max Pooling
b) Average Pooling
c) Global pooling
d) None of these

10) What does LSTM stand for?
a) Long Short Term Memory
b) Least Squares Term Memory
c) Least Square Time Mean
d) Long Short Threshold Memory

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b) FALSE
c) Can't say
d) None of these

12) Which of the following functions can be used as an activation function in the output layer if we wish to predict the probabilities of n classes ($p1, p2..pk$) such that sum of p over all n equals to 1?
a) Softmax
b) ReLu
c) Sigmoid
d) Tanh

13) K-fold cross-validation is _____.
a) linear in K
b) quadratic in K
c) cubic in K
d) exponential in K

14) What is the best Neural Network Model for Temporal Data?
a) Recurrent Neural Network
b) Convolution Neural Networks
c) Temporal Neural Networks
d) Multi-Layer perceptions

SLR-QH-488

Seat No.	

Set S

Fourth.Y. (B.Tech.) (Computer and Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Deep Learning (BTN03713)

Day & Date: Monday, 11-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Make suitable assumptions (if necessary and state them clearly).

SECTION – I

Q.2 Attempt Any Four. **16**

a) Explain Deep feed Forword Neural Network.

b) Explain the term Keras and Tensorflow.

c) Assume a simple deep learning model with 3 neurons and inputs = 3, 4, 5 The weights to the input neurons are 6, 7 and 8 respectively. Assume the activation function is a linear constant value of 4. Calculate the output?

d) Explain Biological Neuron vs. Artificial Neuron.

e) Explain Vanishing Gradient problem.

Q.3 Attempt Any One. **06**

a) Explain various Activation functions.

b) Discuss different types of hyper parameter.

Q.4 Attempt the following/Write a short note on **06**

a) Early Stopping

b) Dropout

SECTION – II

Q.5 Attempt Any Four. **16**

a) Explain Bidirectional RNN.

b) Write a short note on VGGNet.

c) Explain Convolution and Pooling operation in CNN.

d) Write short note on Bidirectional LSTM.

e) Explain the use of auto encoder in dimensionality reduction & classification.

Q.6 Attempt Any One. **06**

a) Explain Transfer Learning with its applications.

b) Explain SGD optimizer for CNNs.

Q.7 Attempt the following. **06**

Explain different types of Autoencoder.

SLR-QH-489

Seat No.		Set	P

Fourth. Y. (B.Tech.) (Computer and Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Predictive Analytics (BTN03715)

Day & Date: Monday, 11-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Multiple Choice questions. **14**

1) Which of the following is a popular tool used in predictive analytics?
a) Microsoft Word b) Jupyter Notebook
c) Adobe Photoshop d) Google Chrome

2) What does RFM analysis stand for in target marketing?
a) Recent, Frequent, Monetary b) Recent, Favorite, Market
c) Recent, Frequent, Marketable d) Reliable, Frequent, Monetary

3) Which type of distance measure is commonly used in K-means clustering?
a) Manhattan distance b) Cosine similarity
c) Pearson correlation d) Hamming distance

4) What is an example of unstructured data?
a) Database tables b) Spreadsheets
c) Text documents d) CSV files

5) What is the main goal of exploratory data analysis (EDA)?
a) Predicting future trends
b) Cleaning data
c) Understanding data characteristics
d) Storing data

6) What distinguishes prescriptive models from other types of analytical models?
a) They focus on describing past events.
b) They predict future outcomes with high accuracy.
c) They suggest optimal actions based on data analysis.
d) They diagnose problems in real-time.

7) What is the purpose of data profiling?
a) Visualizing data
b) Predicting outcomes
c) Analyzing data quality
d) Storing data

8) Which method is used to find natural groupings in data?
a) Regression analysis
b) Classification
c) Clustering
d) Association rule mining

9) What is a limitation of the K-means clustering algorithm?
a) Sensitivity to outliers
b) Inability to handle large datasets
c) Requirement for hierarchical data
d) Lack of scalability

10) Which tool is often used for understanding customer segmentation in target marketing?
a) Google Analytics
b) CRM software
c) ERP system
d) SCM software

11) Which of the following methods is used to prevent overfitting in predictive models?
a) Increasing model complexity
b) Using all available data for training
c) Cross-validation
d) Ignoring irrelevant features

12) Which of the following is a benefit of target marketing?
a) Reduced marketing costs
b) Increased product diversity
c) Higher customer retention
d) Faster product development

13) What is the fundamental principle behind nearest neighbors clustering?
a) Grouping data points based on their proximity to each other
b) Assigning labels to data points based on majority voting
c) Maximizing intra-cluster similarity
d) Minimizing intra-cluster variance

14) Which algorithm is a popular choice for nearest neighbor clustering?
a) K-means
b) DBSCAN
c) Mean-shift
d) k-nearest neighbors (KNN)

SLR-QH-489

Seat No.	

Set P

Fourth. Y. (B.Tech.) (Computer and Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Predictive Analytics (BTN03715)

Day & Date: Monday, 11-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Solve Any Four. **16**

a) What is Predictive Analytics? Explain advantages and strategies of Predictive Analytics.

b) Explain Online marketing and retail.

c) How to Identifying data categories?

d) Explain constantly changing your data.

e) How to start predictive analytics project?

Q.3 Solve Any Two. **12**

a) Explain Big Data.

b) How to Identifying data categories?

c) Write a short note on: Surveying Marketplace

SECTION – II

Q.4 Solve Any Four. **16**

a) Explain linear regression with example.

b) Explain Healthcare analytics case studies: Google flu trends, Cancer survivability predictors.

c) Explain Twitter-based predictors of political campaign outcomes.

d) Explain structuring the data: extracting, transforming and loading the data.

e) Explain reducing the dimensionality of data.

Q.5 Solve Any Two. **12**

a) Explain Twitter-based predictors of political campaign outcomes.

b) How to Find Association in data items?

c) Explain support vector machines with example.

SLR-QH-489

Seat No.		Set	Q

Fourth. Y. (B.Tech.) (Computer and Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Predictive Analytics (BTN03715)

Day & Date: Monday, 11-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Multiple Choice questions. **14**

1) Which method is used to find natural groupings in data?
a) Regression analysis b) Classification
c) Clustering d) Association rule mining

2) What is a limitation of the K-means clustering algorithm?
a) Sensitivity to outliers
b) Inability to handle large datasets
c) Requirement for hierarchical data
d) Lack of scalability

3) Which tool is often used for understanding customer segmentation in target marketing?
a) Google Analytics b) CRM software
c) ERP system d) SCM software

4) Which of the following methods is used to prevent overfitting in predictive models?
a) Increasing model complexity
b) Using all available data for training
c) Cross-validation
d) Ignoring irrelevant features

5) Which of the following is a benefit of target marketing?
a) Reduced marketing costs
b) Increased product diversity
c) Higher customer retention
d) Faster product development

6) What is the fundamental principle behind nearest neighbors clustering?
a) Grouping data points based on their proximity to each other
b) Assigning labels to data points based on majority voting
c) Maximizing intra-cluster similarity
d) Minimizing intra-cluster variance

7) Which algorithm is a popular choice for nearest neighbor clustering?
a) K-means
b) DBSCAN
c) Mean-shift
d) k-nearest neighbors (KNN)

8) Which of the following is a popular tool used in predictive analytics?
a) Microsoft Word
b) Jupyter Notebook
c) Adobe Photoshop
d) Google Chrome

9) What does RFM analysis stand for in target marketing?
a) Recent, Frequent, Monetary
b) Recent, Favorite, Market
c) Recent, Frequent, Marketable
d) Reliable, Frequent, Monetary

10) Which type of distance measure is commonly used in K-means clustering?
a) Manhattan distance
b) Cosine similarity
c) Pearson correlation
d) Hamming distance

11) What is an example of unstructured data?
a) Database tables
b) Spreadsheets
c) Text documents
d) CSV files

12) What is the main goal of exploratory data analysis (EDA)?
a) Predicting future trends
b) Cleaning data
c) Understanding data characteristics
d) Storing data

13) What distinguishes prescriptive models from other types of analytical models?
a) They focus on describing past events.
b) They predict future outcomes with high accuracy.
c) They suggest optimal actions based on data analysis.
d) They diagnose problems in real-time.

14) What is the purpose of data profiling?
a) Visualizing data
b) Predicting outcomes
c) Analyzing data quality
d) Storing data

SLR-QH-489

Seat No.	

Set Q

Fourth. Y. (B.Tech.) (Computer and Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Predictive Analytics (BTN03715)

Day & Date: Monday, 11-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Solve Any Four. **16**

a) What is Predictive Analytics? Explain advantages and strategies of Predictive Analytics.

b) Explain Online marketing and retail.

c) How to Identifying data categories?

d) Explain constantly changing your data.

e) How to start predictive analytics project?

Q.3 Solve Any Two. **12**

a) Explain Big Data.

b) How to Identifying data categories?

c) Write a short note on: Surveying Marketplace

SECTION – II

Q.4 Solve Any Four. **16**

a) Explain linear regression with example.

b) Explain Healthcare analytics case studies: Google flu trends, Cancer survivability predictors.

c) Explain Twitter-based predictors of political campaign outcomes.

d) Explain structuring the data: extracting, transforming and loading the data.

e) Explain reducing the dimensionality of data.

Q.5 Solve Any Two. **12**

a) Explain Twitter-based predictors of political campaign outcomes.

b) How to Find Association in data items?

c) Explain support vector machines with example.

Seat No.	

Set **R**

Fourth. Y. (B.Tech.) (Computer and Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Predictive Analytics (BTN03715)

Day & Date: Monday, 11-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Multiple Choice questions. **14**

1) Which of the following methods is used to prevent overfitting in predictive models?
a) Increasing model complexity
b) Using all available data for training
c) Cross-validation
d) Ignoring irrelevant features

2) Which of the following is a benefit of target marketing?
a) Reduced marketing costs
b) Increased product diversity
c) Higher customer retention
d) Faster product development

3) What is the fundamental principle behind nearest neighbors clustering?
a) Grouping data points based on their proximity to each other
b) Assigning labels to data points based on majority voting
c) Maximizing intra-cluster similarity
d) Minimizing intra-cluster variance

4) Which algorithm is a popular choice for nearest neighbor clustering?
a) K-means b) DBSCAN
c) Mean-shift d) k-nearest neighbors (KNN)

5) Which of the following is a popular tool used in predictive analytics?
a) Microsoft Word b) Jupyter Notebook
c) Adobe Photoshop d) Google Chrome

6) What does RFM analysis stand for in target marketing?
a) Recent, Frequent, Monetary b) Recent, Favorite, Market
c) Recent, Frequent, Marketable d) Reliable, Frequent, Monetary

7) Which type of distance measure is commonly used in K-means clustering?
   a) Manhattan distance
   b) Cosine similarity
   c) Pearson correlation
   d) Hamming distance

8) What is an example of unstructured data?
   a) Database tables
   b) Spreadsheets
   c) Text documents
   d) CSV files

9) What is the main goal of exploratory data analysis (EDA)?
   a) Predicting future trends
   b) Cleaning data
   c) Understanding data characteristics
   d) Storing data

10) What distinguishes prescriptive models from other types of analytical models?
   a) They focus on describing past events.
   b) They predict future outcomes with high accuracy.
   c) They suggest optimal actions based on data analysis.
   d) They diagnose problems in real-time.

11) What is the purpose of data profiling?
   a) Visualizing data
   b) Predicting outcomes
   c) Analyzing data quality
   d) Storing data

12) Which method is used to find natural groupings in data?
   a) Regression analysis
   b) Classification
   c) Clustering
   d) Association rule mining

13) What is a limitation of the K-means clustering algorithm?
   a) Sensitivity to outliers
   b) Inability to handle large datasets
   c) Requirement for hierarchical data
   d) Lack of scalability

14) Which tool is often used for understanding customer segmentation in target marketing?
   a) Google Analytics
   b) CRM software
   c) ERP system
   d) SCM software

SLR-QH-489

Seat No.	

Set R

Fourth. Y. (B.Tech.) (Computer and Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Predictive Analytics (BTN03715)

Day & Date: Monday, 11-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Solve Any Four. **16**

a) What is Predictive Analytics? Explain advantages and strategies of Predictive Analytics.

b) Explain Online marketing and retail.

c) How to Identifying data categories?

d) Explain constantly changing your data.

e) How to start predictive analytics project?

Q.3 Solve Any Two. **12**

a) Explain Big Data.

b) How to Identifying data categories?

c) Write a short note on: Surveying Marketplace

SECTION – II

Q.4 Solve Any Four. **16**

a) Explain linear regression with example.

b) Explain Healthcare analytics case studies: Google flu trends, Cancer survivability predictors.

c) Explain Twitter-based predictors of political campaign outcomes.

d) Explain structuring the data: extracting, transforming and loading the data.

e) Explain reducing the dimensionality of data.

Q.5 Solve Any Two. **12**

a) Explain Twitter-based predictors of political campaign outcomes.

b) How to Find Association in data items?

c) Explain support vector machines with example.

SLR-QH-489

Seat No.		Set	S

Fourth. Y. (B.Tech.) (Computer and Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Predictive Analytics (BTN03715)

Day & Date: Monday, 11-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Multiple Choice questions. **14**

1) What distinguishes prescriptive models from other types of analytical models?
a) They focus on describing past events.
b) They predict future outcomes with high accuracy.
c) They suggest optimal actions based on data analysis.
d) They diagnose problems in real-time.

2) What is the purpose of data profiling?
a) Visualizing data b) Predicting outcomes
c) Analyzing data quality d) Storing data

3) Which method is used to find natural groupings in data?
a) Regression analysis b) Classification
c) Clustering d) Association rule mining

4) What is a limitation of the K-means clustering algorithm?
a) Sensitivity to outliers
b) Inability to handle large datasets
c) Requirement for hierarchical data
d) Lack of scalability

5) Which tool is often used for understanding customer segmentation in target marketing?
a) Google Analytics b) CRM software
c) ERP system d) SCM software

6) Which of the following methods is used to prevent overfitting in predictive models?
   a) Increasing model complexity
   b) Using all available data for training
   c) Cross-validation
   d) Ignoring irrelevant features

7) Which of the following is a benefit of target marketing?
   a) Reduced marketing costs
   b) Increased product diversity
   c) Higher customer retention
   d) Faster product development

8) What is the fundamental principle behind nearest neighbors clustering?
   a) Grouping data points based on their proximity to each other
   b) Assigning labels to data points based on majority voting
   c) Maximizing intra-cluster similarity
   d) Minimizing intra-cluster variance

9) Which algorithm is a popular choice for nearest neighbor clustering?
   a) K-means
   b) DBSCAN
   c) Mean-shift
   d) k-nearest neighbors (KNN)

10) Which of the following is a popular tool used in predictive analytics?
   a) Microsoft Word
   b) Jupyter Notebook
   c) Adobe Photoshop
   d) Google Chrome

11) What does RFM analysis stand for in target marketing?
   a) Recent, Frequent, Monetary
   b) Recent, Favorite, Market
   c) Recent, Frequent, Marketable
   d) Reliable, Frequent, Monetary

12) Which type of distance measure is commonly used in K-means clustering?
   a) Manhattan distance
   b) Cosine similarity
   c) Pearson correlation
   d) Hamming distance

13) What is an example of unstructured data?
   a) Database tables
   b) Spreadsheets
   c) Text documents
   d) CSV files

14) What is the main goal of exploratory data analysis (EDA)?
   a) Predicting future trends
   b) Cleaning data
   c) Understanding data characteristics
   d) Storing data

SLR-QH-489

Seat No.	

Set S

Fourth. Y. (B.Tech.) (Computer and Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Predictive Analytics (BTN03715)

Day & Date: Monday, 11-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Solve Any Four. **16**

a) What is Predictive Analytics? Explain advantages and strategies of Predictive Analytics.

b) Explain Online marketing and retail.

c) How to Identifying data categories?

d) Explain constantly changing your data.

e) How to start predictive analytics project?

Q.3 Solve Any Two. **12**

a) Explain Big Data.

b) How to Identifying data categories?

c) Write a short note on: Surveying Marketplace

SECTION – II

Q.4 Solve Any Four. **16**

a) Explain linear regression with example.

b) Explain Healthcare analytics case studies: Google flu trends, Cancer survivability predictors.

c) Explain Twitter-based predictors of political campaign outcomes.

d) Explain structuring the data: extracting, transforming and loading the data.

e) Explain reducing the dimensionality of data.

Q.5 Solve Any Two. **12**

a) Explain Twitter-based predictors of political campaign outcomes.

b) How to Find Association in data items?

c) Explain support vector machines with example.

SLR-QH-490

Seat No.		Set	P

Fourth. Y. (B.Tech.) (Computer & Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Information Auditing and Monitoring (BTN03717)

Day & Date: Monday, 11-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Alternative from the option and rewrite the sentence. **14**

1) Which tool is commonly used to analyze and manage audit trails?
a) Antivirus software
b) SIEM (Security Information and Event Management) system
c) Vulnerability scanner
d) Data backup solution

2) What is the primary purpose of record retention policies?
a) To manage and retain records for compliance, legal, and operational needs
b) To ensure data privacy
c) To encrypt sensitive data
d) To perform regular data backups

3) Where a warning banner is usually displayed?
a) On the homepage of a website
b) On login screens or initial access points of systems
c) In email communications
d) In the system's user manual

4) What is the primary goal of traffic analysis in network security?
a) To collect emails from users
b) To control user permissions on a network
c) To optimize the system's operating system
d) To analyze network traffic for signs of suspicious or malicious activities

5) What is the primary purpose of network monitoring tools?
a) Detect and prevent malware infections
b) Manage user access controls
c) Analyze network traffic and performance
d) Encrypt sensitive data

6) What is the primary purpose of security metrics in information auditing?
a) To measure the effectiveness of security controls
b) To increase the number of security incidents
c) To reduce the need for compliance
d) To enhance user experience

7) Which of the following should be included in the Rules of Engagement?
a) Detailed descriptions of each vulnerability found
b) The scope of the systems and networks to be tested
c) The identities of the testing team members
d) The cost of the testing service

8) What is the first step in the planning phase of a penetration test?
a) Conducting the actual testing
b) Analyzing vulnerabilities
c) Defining the scope of the test
d) Writing the final report

9) What is the main purpose of a Denial of Service (DoS) attack?
a) To disrupt service availability
b) To steal data
c) To gain unauthorized access
d) To execute malicious code

10) What is a common password cracking tool?
a) Wireshark
b) John the Ripper
c) Burp Suite
d) Nessus

11) What is a critical risk associated with a stolen laptop?
a) Loss of physical hardware
b) Loss of user training
c) Unauthorized access to sensitive data
d) Increased software licensing costs

12) What is a common risk associated with Bluetooth technology?
a) Slow data transfer
b) Unauthorized access through pairing
c) High battery consumption
d) Compatibility issues

13) What is a critical item on a pre-penetration testing checklist?

a) Securing client approval and agreements
b) Installing new software
c) Informing all employees of the test
d) Deleting old logs

14) Which type of attack is commonly simulated in external penetration testing?

a) Insider threats
b) Phishing attacks
c) Web application attacks
d) Social engineering attacks

SLR-QH-490

Seat No.	

Set P

Fourth. Y. (B.Tech.) (Computer & Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Information Auditing and Monitoring (BTN03717)

Day & Date: Monday, 11-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

SECTION – I

Q.2 Solve any three of the following. **12**

a) What are Audit Trails? Give the purpose of Audit Trails.

b) What is Record Retention? What are the key aspects of Record Retention?

c) Describe the Warning Banners with examples.

d) Explain the variances in performance metrics.

Q.3 Solve any two of the followings. **16**

a) What are Security metrics? Explain in detail.

b) Write a note on:
i) Reporting timeline
ii) Traffic analysis
iii) Trend analysis

c) What is Compliance? Explain with its key aspects and its purpose.

SECTION – II

Q.4 Solve any three of the following. **12**

a) What are the Rules of Engagement (RoE) in a penetration test, and why are they necessary?

b) What should be included in a pre-penetration testing checklist?

c) What is Denial of Service (DoS) testing, and why is it important in penetration testing?

d) What are security patches, and why is it important for organizations to apply them regularly?

Q.5 Solve any two of the followings. **16**

a) Describe the steps involved in vulnerability analysis during a penetration test. How do these steps help in identifying and mitigating risks?

b) Describe common types of social engineering attacks used in penetration testing and explain their impact on organizational security.

c) Describe the key components of a penetration testing report. How should it be structured to ensure that stakeholders can understand and act on the findings?

SLR-QH-490

Seat No.	

Set Q

Fourth. Y. (B.Tech.) (Computer & Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Information Auditing and Monitoring (BTN03717)

Day & Date: Monday, 11-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Alternative from the option and rewrite the sentence. **14**

1) What is the first step in the planning phase of a penetration test?
a) Conducting the actual testing
b) Analyzing vulnerabilities
c) Defining the scope of the test
d) Writing the final report

2) What is the main purpose of a Denial of Service (DoS) attack?
a) To disrupt service availability
b) To steal data
c) To gain unauthorized access
d) To execute malicious code

3) What is a common password cracking tool?
a) Wireshark b) John the Ripper
c) Burp Suite d) Nessus

4) What is a critical risk associated with a stolen laptop?
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b) Loss of user training
c) Unauthorized access to sensitive data
d) Increased software licensing costs

5) What is a common risk associated with Bluetooth technology?
a) Slow data transfer
b) Unauthorized access through pairing
c) High battery consumption
d) Compatibility issues

6) What is a critical item on a pre-penetration testing checklist?
   a) Securing client approval and agreements
   b) Installing new software
   c) Informing all employees of the test
   d) Deleting old logs

7) Which type of attack is commonly simulated in external penetration testing?
   a) Insider threats
   b) Phishing attacks
   c) Web application attacks
   d) Social engineering attacks

8) Which tool is commonly used to analyze and manage audit trails?
   a) Antivirus software
   b) SIEM (Security Information and Event Management) system
   c) Vulnerability scanner
   d) Data backup solution

9) What is the primary purpose of record retention policies?
   a) To manage and retain records for compliance, legal, and operational needs
   b) To ensure data privacy
   c) To encrypt sensitive data
   d) To perform regular data backups

10) Where a warning banner is usually displayed?
   a) On the homepage of a website
   b) On login screens or initial access points of systems
   c) In email communications
   d) In the system's user manual

11) What is the primary goal of traffic analysis in network security?
   a) To collect emails from users
   b) To control user permissions on a network
   c) To optimize the system's operating system
   d) To analyze network traffic for signs of suspicious or malicious activities

12) What is the primary purpose of network monitoring tools?
   a) Detect and prevent malware infections
   b) Manage user access controls
   c) Analyze network traffic and performance
   d) Encrypt sensitive data

13) What is the primary purpose of security metrics in information auditing?
   a) To measure the effectiveness of security controls
   b) To increase the number of security incidents
   c) To reduce the need for compliance
   d) To enhance user experience

14) Which of the following should be included in the Rules of Engagement?

a) Detailed descriptions of each vulnerability found
b) The scope of the systems and networks to be tested
c) The identities of the testing team members
d) The cost of the testing service

Seat No.	

Set **Q**

Fourth. Y. (B.Tech.) (Computer & Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Information Auditing and Monitoring (BTN03717)

Day & Date: Monday, 11-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

SECTION – I

Q.2 Solve any three of the following. **12**

a) What are Audit Trails? Give the purpose of Audit Trails.

b) What is Record Retention? What are the key aspects of Record Retention?

c) Describe the Warning Banners with examples.

d) Explain the variances in performance metrics.

Q.3 Solve any two of the followings. **16**

a) What are Security metrics? Explain in detail.

b) Write a note on:
i) Reporting timeline
ii) Traffic analysis
iii) Trend analysis

c) What is Compliance? Explain with its key aspects and its purpose.

SECTION – II

Q.4 Solve any three of the following. **12**

a) What are the Rules of Engagement (RoE) in a penetration test, and why are they necessary?

b) What should be included in a pre-penetration testing checklist?

c) What is Denial of Service (DoS) testing, and why is it important in penetration testing?

d) What are security patches, and why is it important for organizations to apply them regularly?

Q.5 Solve any two of the followings. **16**

a) Describe the steps involved in vulnerability analysis during a penetration test. How do these steps help in identifying and mitigating risks?

b) Describe common types of social engineering attacks used in penetration testing and explain their impact on organizational security.

c) Describe the key components of a penetration testing report. How should it be structured to ensure that stakeholders can understand and act on the findings?

SLR-QH-490

Seat No.	

Set R

Fourth. Y. (B.Tech.) (Computer & Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Information Auditing and Monitoring (BTN03717)

Day & Date: Monday, 11-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Alternative from the option and rewrite the sentence. **14**

1) What is a critical risk associated with a stolen laptop?
a) Loss of physical hardware
b) Loss of user training
c) Unauthorized access to sensitive data
d) Increased software licensing costs

2) What is a common risk associated with Bluetooth technology?
a) Slow data transfer
b) Unauthorized access through pairing
c) High battery consumption
d) Compatibility issues

3) What is a critical item on a pre-penetration testing checklist?
a) Securing client approval and agreements
b) Installing new software
c) Informing all employees of the test
d) Deleting old logs

4) Which type of attack is commonly simulated in external penetration testing?
a) Insider threats
b) Phishing attacks
c) Web application attacks
d) Social engineering attacks

5) Which tool is commonly used to analyze and manage audit trails?
a) Antivirus software
b) SIEM (Security Information and Event Management) system
c) Vulnerability scanner
d) Data backup solution

6) What is the primary purpose of record retention policies?
   a) To manage and retain records for compliance, legal, and operational needs
   b) To ensure data privacy
   c) To encrypt sensitive data
   d) To perform regular data backups

7) Where a warning banner is usually displayed?
   a) On the homepage of a website
   b) On login screens or initial access points of systems
   c) In email communications
   d) In the system's user manual

8) What is the primary goal of traffic analysis in network security?
   a) To collect emails from users
   b) To control user permissions on a network
   c) To optimize the system's operating system
   d) To analyze network traffic for signs of suspicious or malicious activities

9) What is the primary purpose of network monitoring tools?
   a) Detect and prevent malware infections
   b) Manage user access controls
   c) Analyze network traffic and performance
   d) Encrypt sensitive data

10) What is the primary purpose of security metrics in information auditing?
   a) To measure the effectiveness of security controls
   b) To increase the number of security incidents
   c) To reduce the need for compliance
   d) To enhance user experience

11) Which of the following should be included in the Rules of Engagement?
   a) Detailed descriptions of each vulnerability found
   b) The scope of the systems and networks to be tested
   c) The identities of the testing team members
   d) The cost of the testing service

12) What is the first step in the planning phase of a penetration test?
   a) Conducting the actual testing
   b) Analyzing vulnerabilities
   c) Defining the scope of the test
   d) Writing the final report

13) What is the main purpose of a Denial of Service (DoS) attack?
   a) To disrupt service availability
   b) To steal data
   c) To gain unauthorized access
   d) To execute malicious code

14) What is a common password cracking tool?

a) Wireshark
b) John the Ripper
c) Burp Suite
d) Nessus

Seat No.	

Set **R**

Fourth. Y. (B.Tech.) (Computer & Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Information Auditing and Monitoring (BTN03717)

Day & Date: Monday, 11-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

SECTION – I

Q.2 Solve any three of the following. **12**

a) What are Audit Trails? Give the purpose of Audit Trails.

b) What is Record Retention? What are the key aspects of Record Retention?

c) Describe the Warning Banners with examples.

d) Explain the variances in performance metrics.

Q.3 Solve any two of the followings. **16**

a) What are Security metrics? Explain in detail.

b) Write a note on:
i) Reporting timeline
ii) Traffic analysis
iii) Trend analysis

c) What is Compliance? Explain with its key aspects and its purpose.

SECTION – II

Q.4 Solve any three of the following. **12**

a) What are the Rules of Engagement (RoE) in a penetration test, and why are they necessary?

b) What should be included in a pre-penetration testing checklist?

c) What is Denial of Service (DoS) testing, and why is it important in penetration testing?

d) What are security patches, and why is it important for organizations to apply them regularly?

Q.5 Solve any two of the followings. **16**

a) Describe the steps involved in vulnerability analysis during a penetration test. How do these steps help in identifying and mitigating risks?

b) Describe common types of social engineering attacks used in penetration testing and explain their impact on organizational security.

c) Describe the key components of a penetration testing report. How should it be structured to ensure that stakeholders can understand and act on the findings?

SLR-QH-490

Seat No.		Set	S

Fourth. Y. (B.Tech.) (Computer & Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Information Auditing and Monitoring (BTN03717)

Day & Date: Monday, 11-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Alternative from the option and rewrite the sentence. **14**

1) What is the primary purpose of security metrics in information auditing?
a) To measure the effectiveness of security controls
b) To increase the number of security incidents
c) To reduce the need for compliance
d) To enhance user experience

2) Which of the following should be included in the Rules of Engagement?
a) Detailed descriptions of each vulnerability found
b) The scope of the systems and networks to be tested
c) The identities of the testing team members
d) The cost of the testing service

3) What is the first step in the planning phase of a penetration test?
a) Conducting the actual testing
b) Analyzing vulnerabilities
c) Defining the scope of the test
d) Writing the final report

4) What is the main purpose of a Denial of Service (DoS) attack?
a) To disrupt service availability
b) To steal data
c) To gain unauthorized access
d) To execute malicious code

5) What is a common password cracking tool?
a) Wireshark b) John the Ripper
c) Burp Suite d) Nessus

6) What is a critical risk associated with a stolen laptop?
   a) Loss of physical hardware
   b) Loss of user training
   c) Unauthorized access to sensitive data
   d) Increased software licensing costs

7) What is a common risk associated with Bluetooth technology?
   a) Slow data transfer
   b) Unauthorized access through pairing
   c) High battery consumption
   d) Compatibility issues

8) What is a critical item on a pre-penetration testing checklist?
   a) Securing client approval and agreements
   b) Installing new software
   c) Informing all employees of the test
   d) Deleting old logs

9) Which type of attack is commonly simulated in external penetration testing?
   a) Insider threats
   b) Phishing attacks
   c) Web application attacks
   d) Social engineering attacks

10) Which tool is commonly used to analyze and manage audit trails?
   a) Antivirus software
   b) SIEM (Security Information and Event Management) system
   c) Vulnerability scanner
   d) Data backup solution

11) What is the primary purpose of record retention policies?
   a) To manage and retain records for compliance, legal, and operational needs
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   c) To encrypt sensitive data
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13) What is the primary goal of traffic analysis in network security?
   a) To collect emails from users
   b) To control user permissions on a network
   c) To optimize the system's operating system
   d) To analyze network traffic for signs of suspicious or malicious activities

14) What is the primary purpose of network monitoring tools?

a) Detect and prevent malware infections
b) Manage user access controls
c) Analyze network traffic and performance
d) Encrypt sensitive data

Seat No.	

Set **S**

Fourth. Y. (B.Tech.) (Computer & Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Information Auditing and Monitoring (BTN03717)

Day & Date: Monday, 11-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

SECTION – I

Q.2 Solve any three of the following. **12**

a) What are Audit Trails? Give the purpose of Audit Trails.

b) What is Record Retention? What are the key aspects of Record Retention?

c) Describe the Warning Banners with examples.

d) Explain the variances in performance metrics.

Q.3 Solve any two of the followings. **16**

a) What are Security metrics? Explain in detail.

b) Write a note on:
i) Reporting timeline
ii) Traffic analysis
iii) Trend analysis

c) What is Compliance? Explain with its key aspects and its purpose.

SECTION – II

Q.4 Solve any three of the following. **12**

a) What are the Rules of Engagement (RoE) in a penetration test, and why are they necessary?

b) What should be included in a pre-penetration testing checklist?

c) What is Denial of Service (DoS) testing, and why is it important in penetration testing?

d) What are security patches, and why is it important for organizations to apply them regularly?

Q.5 Solve any two of the followings. **16**

a) Describe the steps involved in vulnerability analysis during a penetration test. How do these steps help in identifying and mitigating risks?

b) Describe common types of social engineering attacks used in penetration testing and explain their impact on organizational security.

c) Describe the key components of a penetration testing report. How should it be structured to ensure that stakeholders can understand and act on the findings?

SLR-QH-491

Seat No.	

Set P

Fourth. Y. (B.Tech.) (Computer & Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
UI/UX Technology (BTN03719)

Day & Date: Wednesday, 13-05-2026 Max. Marks: 50
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to right indicates full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 20 Minutes Marks:10

Q.1 Choose the correct alternatives from the options and rewrite the sentence. **10**

1) The function which is called to render HTML to a web page in react?
a) ReactDOM_render() b) render()
c) render_DOM() d) DOM_HTML

2) Which of the following is correct about JavaScript?
a) JavaScript is an Object-Based language
b) JavaScript is Assembly-language
c) JavaScript is an Object-Oriented language
d) JavaScript is a High-level language

3) Which of the following are the advantages of React.js?
a) React.js can increase the application's performance with Virtual DOM
b) React.js is easy to integrate with other frameworks such as Angular, BackboneJS since it is only a view library
c) React.js can render both on client and server side
d) All of the above

4) Which of the following CSS property is used to set the background image of an element?
a) background-attachment b) background-image
c) background-color d) None of these

5) Which of the following command is used to install create-react-app?
a) npm install -g create-react-app
b) npm install create-react-app
c) npm install -f create-react-app
d) install -g create-react-app

6) What does ES6 stand for?

a) ECMAScript 6
b) ECMA 6
c) ECMAJavaScript 6
d) EJavaScript 6

7) Which of the following number object function returns the value of the number in JavaScript?

a) toString()
b) valueOf()
c) toLocaleString()
d) toPrecision()

8) What is a CSS selector?

a) A CSS selector is the CSS class name
b) A CSS selector is the set of properties that are going to be applied on HTML elements
c) A CSS selector is name of CSS file
d) A CSS selector is the first part of a CSS Rule. It may an HTML element or pattern of elements

9) Which of the following is the correct way to create a function in PHP?

a) Create myFunction()
b) New_function myFunction()
c) function myFunction()
d) None of the above

10) A class is a type of function, but instead of using the keyword function to initiate it, which keyword do we use?

a) Constructor
b) Class
c) Object
d) DataObject

SLR-QH-491

Seat No.	

Set P

Fourth. Y. (B.Tech.) (Computer & Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
UI/UX Technology (BTN03719)

Day & Date: Wednesday, 13-05-2026 Max. Marks: 40
Time: 10:00 AM To 01:00 PM

Instructions: 1) Attempt any four questions.
2) Figures to the right indicate full marks.
3) Assume suitable data whenever necessary and mention it clearly.

Q.2 Write short notes. **10**
i) Explain the Fundamentals of ReactJS.
ii) Differences between GET and POST methods

Q.3 Explain CSS and its types with examples. **10**

Q.4 What is JavaScript Array, explain JavaScript Objects in Arrays & Arrays in Objects. **10**

Q.5 Explain JSON and how the JSON Data Transfer Between Client and Server. **10**

Q.6 Explain JQuery Selectors with examples. **10**

Q.7 Write short notes. **10**
i) What is the usage of the Electron? Or what is Electron.js used for?
ii) What are the different types of variables present in PHP and What are the rules for naming a PHP variable?

SLR-QH-491

Seat No.	

Set Q

Fourth. Y. (B.Tech.) (Computer & Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
UI/UX Technology (BTN03719)

Day & Date: Wednesday, 13-05-2026 Max. Marks: 50
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to right indicates full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 20 Minutes Marks:10

Q.1 Choose the correct alternatives from the options and rewrite the sentence. **10**

1) What does ES6 stand for?
a) ECMAScript 6 b) ECMA 6
c) ECMAJavaScript 6 d) EJavaScript 6

2) Which of the following number object function returns the value of the number in JavaScript?
a) toString() b) valueOf()
c) toLocaleString() d) toPrecision()

3) What is a CSS selector?
a) A CSS selector is the CSS class name
b) A CSS selector is the set of properties that are going to be applied on HTML elements
c) A CSS selector is name of CSS file
d) A CSS selector is the first part of a CSS Rule. It may an HTML element or pattern of elements

4) Which of the following is the correct way to create a function in PHP?
a) Create myFunction() b) New_function myFunction()
c) function myFunction() d) None of the above

5) A class is a type of function, but instead of using the keyword function to initiate it, which keyword do we use?
a) Constructor b) Class
c) Object d) DataObject

6) The function which is called to render HTML to a web page in react?
   a) ReactDOM_render()
   b) render()
   c) render_DOM()
   d) DOM_HTML

7) Which of the following is correct about JavaScript?
   a) JavaScript is an Object-Based language
   b) JavaScript is Assembly-language
   c) JavaScript is an Object-Oriented language
   d) JavaScript is a High-level language

8) Which of the following are the advantages of React.js?
   a) React.js can increase the application's performance with Virtual DOM
   b) React.js is easy to integrate with other frameworks such as Angular, BackboneJS since it is only a view library
   c) React.js can render both on client and server side
   d) All of the above

9) Which of the following CSS property is used to set the background image of an element?
   a) background-attachment
   b) background-image
   c) background-color
   d) None of these

10) Which of the following command is used to install create-react-app?
   a) npm install -g create-react-app
   b) npm install create-react-app
   c) npm install -f create-react-app
   d) install -g create-react-app

Seat No.	

Set **Q**

Fourth. Y. (B.Tech.) (Computer & Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
UI/UX Technology (BTN03719)

Day & Date: Wednesday, 13-05-2026 Max. Marks: 40
Time: 10:00 AM To 01:00 PM

Instructions: 1) Attempt any four questions.
2) Figures to the right indicate full marks.
3) Assume suitable data whenever necessary and mention it clearly.

Q.2 Write short notes. **10**
i) Explain the Fundamentals of ReactJS.
ii) Differences between GET and POST methods

Q.3 Explain CSS and its types with examples. **10**

Q.4 What is JavaScript Array, explain JavaScript Objects in Arrays & Arrays in Objects. **10**

Q.5 Explain JSON and how the JSON Data Transfer Between Client and Server. **10**

Q.6 Explain JQuery Selectors with examples. **10**

Q.7 Write short notes. **10**
i) What is the usage of the Electron? Or what is Electron.js used for?
ii) What are the different types of variables present in PHP and What are the rules for naming a PHP variable?

Seat No.	

Set **R**

Fourth. Y. (B.Tech.) (Computer & Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
UI/UX Technology (BTN03719)

Day & Date: Wednesday, 13-05-2026 Max. Marks: 50
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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3) Figures to right indicates full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 20 Minutes Marks:10

Q.1 Choose the correct alternatives from the options and rewrite the sentence. **10**

1) Which of the following is the correct way to create a function in PHP?
a) Create myFunction() b) New_function myFunction()
c) function myFunction() d) None of the above

2) A class is a type of function, but instead of using the keyword function to initiate it, which keyword do we use?
a) Constructor b) Class
c) Object d) DataObject

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c) background-color
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SLR-QH-491

Seat No.	

Set R

Fourth. Y. (B.Tech.) (Computer & Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
UI/UX Technology (BTN03719)

Day & Date: Wednesday, 13-05-2026 Max. Marks: 40
Time: 10:00 AM To 01:00 PM

Instructions: 1) Attempt any four questions.
2) Figures to the right indicate full marks.
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Q.2 Write short notes. **10**
i) Explain the Fundamentals of ReactJS.
ii) Differences between GET and POST methods

Q.3 Explain CSS and its types with examples. **10**

Q.4 What is JavaScript Array, explain JavaScript Objects in Arrays & Arrays in Objects. **10**

Q.5 Explain JSON and how the JSON Data Transfer Between Client and Server. **10**

Q.6 Explain JQuery Selectors with examples. **10**

Q.7 Write short notes. **10**
i) What is the usage of the Electron? Or what is Electron.js used for?
ii) What are the different types of variables present in PHP and What are the rules for naming a PHP variable?

Seat No.	

Set | S

Fourth. Y. (B.Tech.) (Computer & Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
UI/UX Technology (BTN03719)

Day & Date: Wednesday, 13-05-2026 Max. Marks: 50
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to right indicates full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 20 Minutes Marks:10

Q.1 Choose the correct alternatives from the options and rewrite the sentence. **10**

1) Which of the following are the advantages of React.js?
a) React.js can increase the application's performance with Virtual DOM
b) React.js is easy to integrate with other frameworks such as Angular, BackboneJS since it is only a view library
c) React.js can render both on client and server side
d) All of the above

2) Which of the following CSS property is used to set the background image of an element?
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c) background-color d) None of these

3) Which of the following command is used to install create-react-app?
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b) npm install create-react-app
c) npm install -f create-react-app
d) install -g create-react-app

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c) toLocaleString() d) toPrecision()

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   a) A CSS selector is the CSS class name
   b) A CSS selector is the set of properties that are going to be applied on HTML elements
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   d) A CSS selector is the first part of a CSS Rule. It may an HTML element or pattern of elements

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   b) New_function myFunction()
   c) function myFunction()
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   a) Constructor
   b) Class
   c) Object
   d) DataObject

9) The function which is called to render HTML to a web page in react?
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   b) render()
   c) render_DOM()
   d) DOM_HTML

10) Which of the following is correct about JavaScript?
   a) JavaScript is an Object-Based language
   b) JavaScript is Assembly-language
   c) JavaScript is an Object-Oriented language
   d) JavaScript is a High-level language

SLR-QH-491

Seat No.	

Set S

Fourth. Y. (B.Tech.) (Computer & Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
UI/UX Technology (BTN03719)

Day & Date: Wednesday, 13-05-2026 Max. Marks: 40
Time: 10:00 AM To 01:00 PM

Instructions: 1) Attempt any four questions.
2) Figures to the right indicate full marks.
3) Assume suitable data whenever necessary and mention it clearly.

Q.2 Write short notes. **10**
i) Explain the Fundamentals of ReactJS.
ii) Differences between GET and POST methods

Q.3 Explain CSS and its types with examples. **10**

Q.4 What is JavaScript Array, explain JavaScript Objects in Arrays & Arrays in Objects. **10**

Q.5 Explain JSON and how the JSON Data Transfer Between Client and Server. **10**

Q.6 Explain JQuery Selectors with examples. **10**

Q.7 Write short notes. **10**
i) What is the usage of the Electron? Or what is Electron.js used for?
ii) What are the different types of variables present in PHP and What are the rules for naming a PHP variable?

SLR-QH-492

Seat No.	

Set | **P**

Fourth. Y. (B.Tech.) (Computer and Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Software Licences and Practices (BTN03720)

Day & Date: Wednesday, 13-05-2026 Max. Marks: 50
Time: 10:00 AM To 12:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

Q.1 Attempt Any Five the following. **30**

a) Write a note on Contract & Copyright.

b) Discuss on Patents.

c) Explain Microsoft Shared Source Initiative.

d) What is an open-source software license? Discuss its significance in software development.

e) Discuss the benefits and limitations of the Sun Community Source License.

f) Discuss common issues faced in the enforcement of copyrights and patents.

Q.2 Attempt Any Two the following. **20**

a) Write a detail note on Multiple and Cross Licensing.

b) State the benefits of Open Source Software Licensing. Explain how Community Enforcement of Open Source and Free Software Licenses works with an example.

c) Explain how statutory laws influence the creation and enforcement of software contracts. Provide examples of significant developments.

SLR-QH-493

Seat No.		Set	P

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Electromagnetic Field Theory (ENTPCC-07)

Day & Date: Saturday, 02-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer from the options. **14**

1) Two vectors $\bar{A} = 5a\hat{x} + 2a\hat{y} - 3a\hat{z}$ and $\bar{B} = 4a\hat{x} - 7a\hat{y} + 2a\hat{z}$ are _____ to each other.
a) parallel b) independent
c) perpendicular d) both b) and c)

2) Gradient is applied on _____ and resultant is _____.
a) Scalar, Scalar b) Scalar, Vector
c) Vector, Scalar d) Vector, Vector

3) The force on a charge $2C$ in a field $1\ V/m$ is _____.
a) $0\ N$ b) $1\ N$
c) $2\ N$ d) $3\ N$

4) For a test charge placed at infinity, the electric field will be _____.
a) Zero b) Unity
c) + Infinity d) - Infinity

5) A uniform surface charge of $\rho s = 2\ \mu C/m^2$, is situated at $z = 2$ plane. Then _____ is the value of flux density at $P(1,1,1)m$.
a) 10^{-6} b) -10^{-6}
c) 10^{6} d) -10^{6}

6) Biot Savart law in magnetic field is analogous to _____ law in electric field.
a) Gauss law b) Faraday law
c) Coulomb's law d) Ampere law

7) _____ is the magnetic field intensity when the flux density is 8×10^{-6} Tesla in the medium of air.

a) 6.36 A/m
b) 3.63 A/m
c) 6.63 A/m
d) 3.36 A/m

8) The charge builds up in the capacitor is due to _____ quantity.

a) Conduction current
b) Displacement current
c) Convection current
d) Direct current

9) _____ is the displacement current density of a material with flux density of $5 \sin t$.

a) $2.5 \cos t$
b) $2.5 \sin t$
c) $5 \cos t$
d) $5 \sin t$

10) Electromagnetic waves are produced by _____.

a) static charge
b) accelerating charge
c) moving charge
d) charged particles

11) The correct expression for the Poynting vector is _____.

a) $S = E \times B$
b) $S = E \times B/2$
c) $S = E \times B/\mu_0$
d) $S = E \times B/2\mu_0$

12) For a low loss line when both conductor and dielectric loss is small, the assumption that could be made is _____.

a) $R << \omega L$ and $G << \omega C$
b) $R << \omega C$ and $G << \omega L$
c) $R >> \omega L$ and $G >> \omega C$
d) $R >> \omega C$ and $G >> \omega L$

13) If the inductance and capacitance of a transmission line are $45\ \mathrm{mH/m}$ and $10\mu\mathrm{F/m}$, the characteristic impedance of the transmission line is _____.

a) $50\ \Omega$
b) $67.08\ \Omega$
c) $100\ \Omega$
d) $200\ \Omega$

14) For a lossless line, _____ of the following is true.

a) $\gamma = j\beta$
b) $\gamma = \alpha$
c) $\gamma = \alpha + j\beta$
d) $\gamma = \alpha^* j\beta$

Seat No.	

Set P

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Electromagnetic Field Theory (ENTPCC-07)

Day & Date: Saturday, 02-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Make suitable assumptions if necessary and state them clearly.

Section – I

Q.2 Attempt any three. **12**

a) State and explain Coulomb's law.

b) Explain in brief about divergence and curl of vectors with physical significance.

c) A charge $Q_1 = 5nc$ is located at $P(2,3,5)$ and another charge $Q_2 = 4nc$ is located at $R(3,2,3)$. Find Electric Field intensity $(\bar{E})$ at point $(6,7,8)$.

d) Express the value of magnetic field intensity $(\bar{H})$ at $P(0, 0.2, 0)$ in the field of a current filament $3A$ in $\hat{a}_z$ direction at $x = 0.1, y = 0.3$.

Q.3 Attempt any two. **16**

a) From Biot-Savart law derive the expression for magnetic field intensity due to the finite length of filament carrying current placed along z axis.

b) A line charge density $\rho_l = 15nc/m$ is located in free space on the line $y = 3, x = 4$ and a point charge $Q = 2 \times 10^{-12} C$ located at the origin.
Find:
i) $\bar{E}$ due to line charge at $(8, 9, 10)$
ii) $\bar{E}$ due to point charge at $(8, 9, 10)$
iii) $\bar{E}$ due to line and point charge at $(8, 9, 10)$

c) State importance of boundary conditions. Derive the boundary conditions in terms of tangent and normal components for electrostatic field.

Section – II

Q.4 Attempt any three. **12**

a) Draw standing wave pattern. Derive standing wave ratio in terms of reflection coefficient.

b) Find the amplitude of the displacement current density inside a large oil filled power capacitor given that
$\overline{\mathrm{E}} = 80\cos(6.277 \times 10^8 t - 2.092y)\hat{a}_z$

c) What is skin depth? Derive the expression for skin depth.

d) A transmission line operating at $3\mathrm{MHz}$ having $\mathrm{R} = 13.52\Omega/\mathrm{m}$, $\mathrm{L} = 3.45\mathrm{mH/m}, \mathrm{G} = 4.42 \times 10^8\ \mathrm{mho/m}, \mathrm{C} = 8.06\mathrm{nF/m}$,
Find:
i) Attenuation constant
ii) Phase constant

Q.5 Attempt any two. **16**

a) Write Maxwell's equations for:
i) Time varying field
ii) Static field
iii) Time Harmonic field
iv) Free space

b) Derive Helmotz's wave equation for dielectric media in terms of $\bar{E}$ and $\bar{H}$. Also write these for sinusoidal time variations.

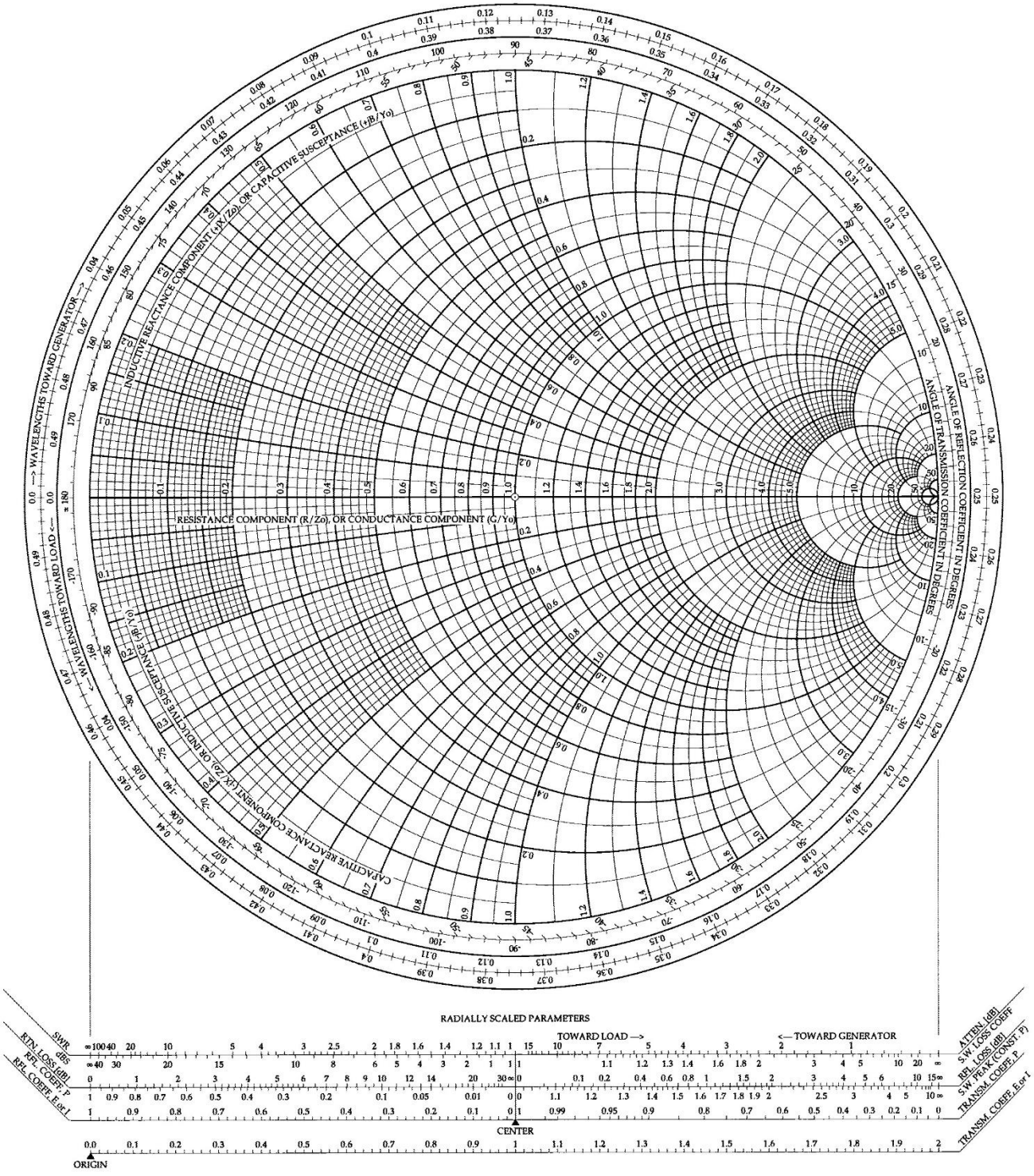
c) A certain transmission line has characteristic impedance $Z_0 = 75 + j0.1\Omega$ is terminated in the load impedance $Z_L = 70 + j50\Omega$ then calculate:
i) Reflection coefficient
ii) SWR using analytical method. Also calculate these with smith chart.

SLR-QH-493

Set P

The Complete Smith Chart

Black Magic Design



Seat No.	

Set **Q**

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Electromagnetic Field Theory (ENTPCC-07)

Day & Date: Saturday, 02-05-2026 Max. Marks: 70
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MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer from the options. **14**

1) The charge builds up in the capacitor is due to _____ quantity.
a) Conduction current b) Displacement current
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2) _____ is the displacement current density of a material with flux density of $5 \sin t$.
a) $2.5 \cos t$ b) $2.5 \sin t$
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4) The correct expression for the Poynting vector is _____.
a) $S = E \times B$ b) $S = E \times B/2$
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a) parallel b) independent

c) perpendicular d) both b) and c)

9) Gradient is applied on _____ and resultant is _____.

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a) Zero b) Unity

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14) _____ is the magnetic field intensity when the flux density is 8×10^{-6} Tesla in the medium of air.

a) 6.36 A/m b) 3.63 A/m

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Seat No.	

Set **Q**

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Electromagnetic Field Theory (ENTPCC-07)

Day & Date: Saturday, 02-05-2026 Max. Marks: 56
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Q.3 Attempt any two. **16**

a) From Biot-Savart law derive the expression for magnetic field intensity due to the finite length of filament carrying current placed along z axis.

b) A line charge density $\rho_l = 15nc/m$ is located in free space on the line $y = 3, x = 4$ and a point charge $Q = 2 \times 10^{-12} C$ located at the origin.
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iii) $\bar{E}$ due to line and point charge at $(8, 9, 10)$

c) State importance of boundary conditions. Derive the boundary conditions in terms of tangent and normal components for electrostatic field.

Section – II

Q.4 Attempt any three. **12**

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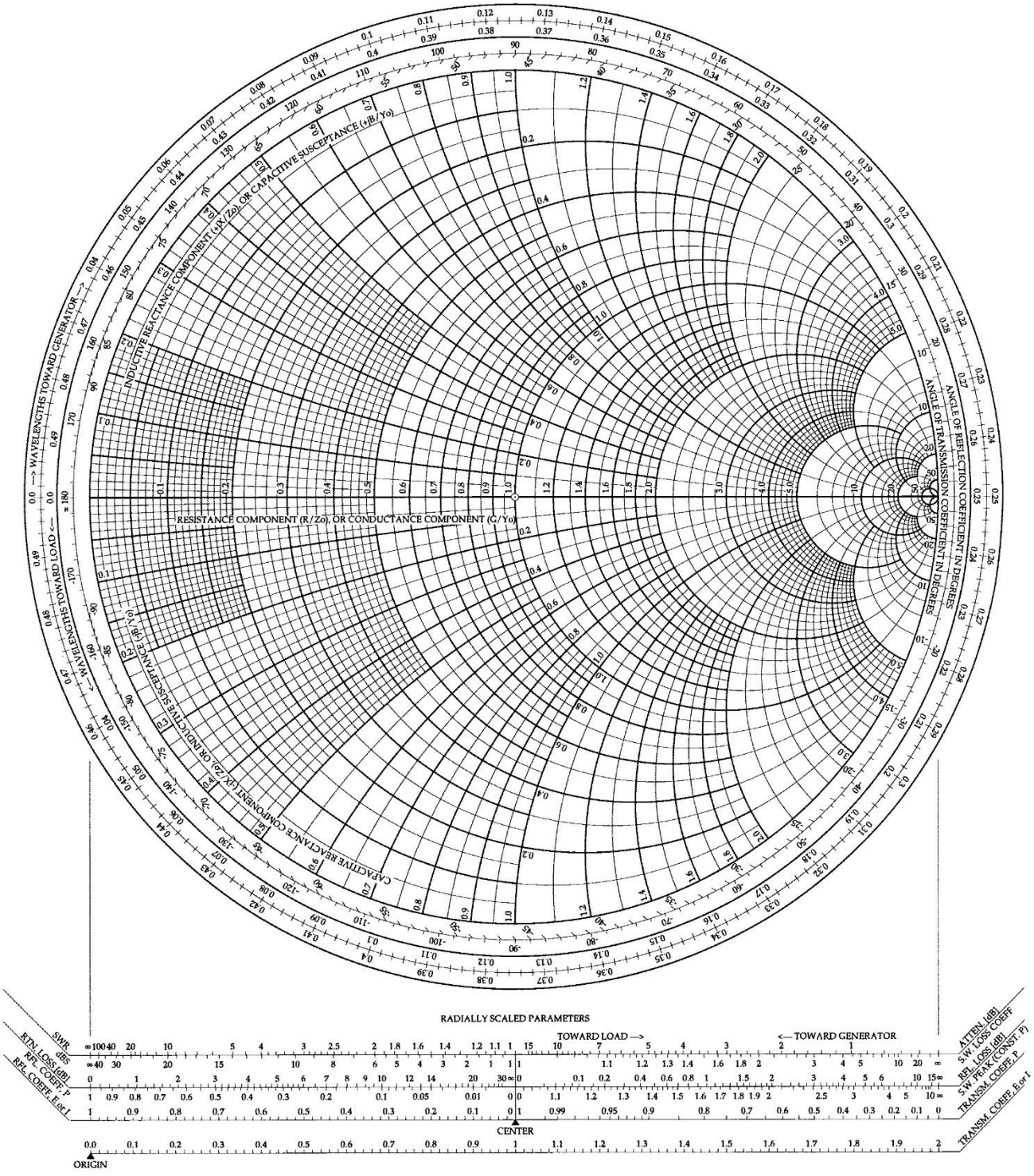
ii) SWR using analytical method. Also calculate these with smith chart.

The Complete Smith Chart

Black Magic Design



Seat No.		Set	R

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Electromagnetic Field Theory (ENTPCC-07)

Day & Date: Saturday, 02-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer from the options. **14**

1) The correct expression for the Poynting vector is _____.
a) $S = E \times B$ b) $S = E \times B/2$
c) $S = E \times B/\mu_0$ d) $S = E \times B/2\mu_0$

2) For a low loss line when both conductor and dielectric loss is small, the assumption that could be made is _____.
a) $R << \omega L$ and $G << \omega C$
b) $R << \omega C$ and $G << \omega L$
c) $R >> \omega L$ and $G >> \omega C$
d) $R >> \omega C$ and $G >> \omega L$

3) If the inductance and capacitance of a transmission line are $45\ \mathrm{mH/m}$ and $10\mu\mathrm{F/m}$, the characteristic impedance of the transmission line is _____.
a) $50\ \Omega$ b) $67.08\ \Omega$
c) $100\ \Omega$ d) $200\ \Omega$

4) For a lossless line, _____ of the following is true.
a) $\gamma = j\beta$ b) $\gamma = \alpha$
c) $\gamma = \alpha + j\beta$ d) $\gamma = \alpha^* j\beta$

5) Two vectors $\bar{A} = 5a\hat{x} + 2a\hat{y} - 3a\hat{z}$ and $\bar{B} = 4a\hat{x} - 7a\hat{y} + 2a\hat{z}$ are _____ to each other.
a) parallel b) independent
c) perpendicular d) both b) and c)

6) Gradient is applied on _____ and resultant is _____.
a) Scalar, Scalar b) Scalar, Vector
c) Vector, Scalar d) Vector, Vector

7) The force on a charge $2C$ in a field $1\ V/m$ is _____.
a) $0\ N$ b) $1\ N$
c) $2\ N$ d) $3\ N$

8) For a test charge placed at infinity, the electric field will be _____.
a) Zero b) Unity
c) + Infinity d) - Infinity

9) A uniform surface charge of $\rho s = 2\ \mu C/m^2$, is situated at $z = 2$ plane. Then _____ is the value of flux density at $P(1,1,1)m$.
a) 10^{-6} b) -10^{-6}
c) 10^{6} d) -10^{6}

10) Biot Savart law in magnetic field is analogous to _____ law in electric field.
a) Gauss law b) Faraday law
c) Coulomb's law d) Ampere law

11) _____ is the magnetic field intensity when the flux density is 8×10^{-6} Tesla in the medium of air.
a) 6.36 A/m b) 3.63 A/m
c) 6.63 A/m d) 3.36 A/m

12) The charge builds up in the capacitor is due to _____ quantity.
a) Conduction current b) Displacement current
c) Convection current d) Direct current

13) _____ is the displacement current density of a material with flux density of $5 \sin t$.
a) $2.5 \cos t$ b) $2.5 \sin t$
c) $5 \cos t$ d) $5 \sin t$

14) Electromagnetic waves are produced by _____.
a) static charge b) accelerating charge
c) moving charge d) charged particles

Seat No.	

Set R

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Electromagnetic Field Theory (ENTPCC-07)

Day & Date: Saturday, 02-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
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Section – I

Q.2 Attempt any three. **12**

a) State and explain Coulomb's law.

b) Explain in brief about divergence and curl of vectors with physical significance.

c) A charge $Q_1 = 5nc$ is located at $P(2,3,5)$ and another charge $Q_2 = 4nc$ is located at $R(3,2,3)$. Find Electric Field intensity $(\bar{E})$ at point $(6,7,8)$.

d) Express the value of magnetic field intensity $(\bar{H})$ at $P(0, 0.2, 0)$ in the field of a current filament $3A$ in $\hat{a}_z$ direction at $x = 0.1, y = 0.3$.

Q.3 Attempt any two. **16**

a) From Biot-Savart law derive the expression for magnetic field intensity due to the finite length of filament carrying current placed along z axis.

b) A line charge density $\rho_l = 15nc/m$ is located in free space on the line $y = 3, x = 4$ and a point charge $Q = 2 \times 10^{-12} C$ located at the origin.
Find:
i) $\bar{E}$ due to line charge at $(8, 9, 10)$
ii) $\bar{E}$ due to point charge at $(8, 9, 10)$
iii) $\bar{E}$ due to line and point charge at $(8, 9, 10)$

c) State importance of boundary conditions. Derive the boundary conditions in terms of tangent and normal components for electrostatic field.

Section – II

Q.4 Attempt any three. **12**

a) Draw standing wave pattern. Derive standing wave ratio in terms of reflection coefficient.

b) Find the amplitude of the displacement current density inside a large oil filled power capacitor given that
$\overline{\mathrm{E}} = 80\cos(6.277 \times 10^8 t - 2.092y)\hat{a}_z$

c) What is skin depth? Derive the expression for skin depth.

d) A transmission line operating at $3\mathrm{MHz}$ having $\mathrm{R} = 13.52\Omega/\mathrm{m}$, $\mathrm{L} = 3.45\mathrm{mH/m}, \mathrm{G} = 4.42 \times 10^8\ \mathrm{mho/m}, \mathrm{C} = 8.06\mathrm{nF/m}$,
Find:
i) Attenuation constant
ii) Phase constant

Q.5 Attempt any two. **16**

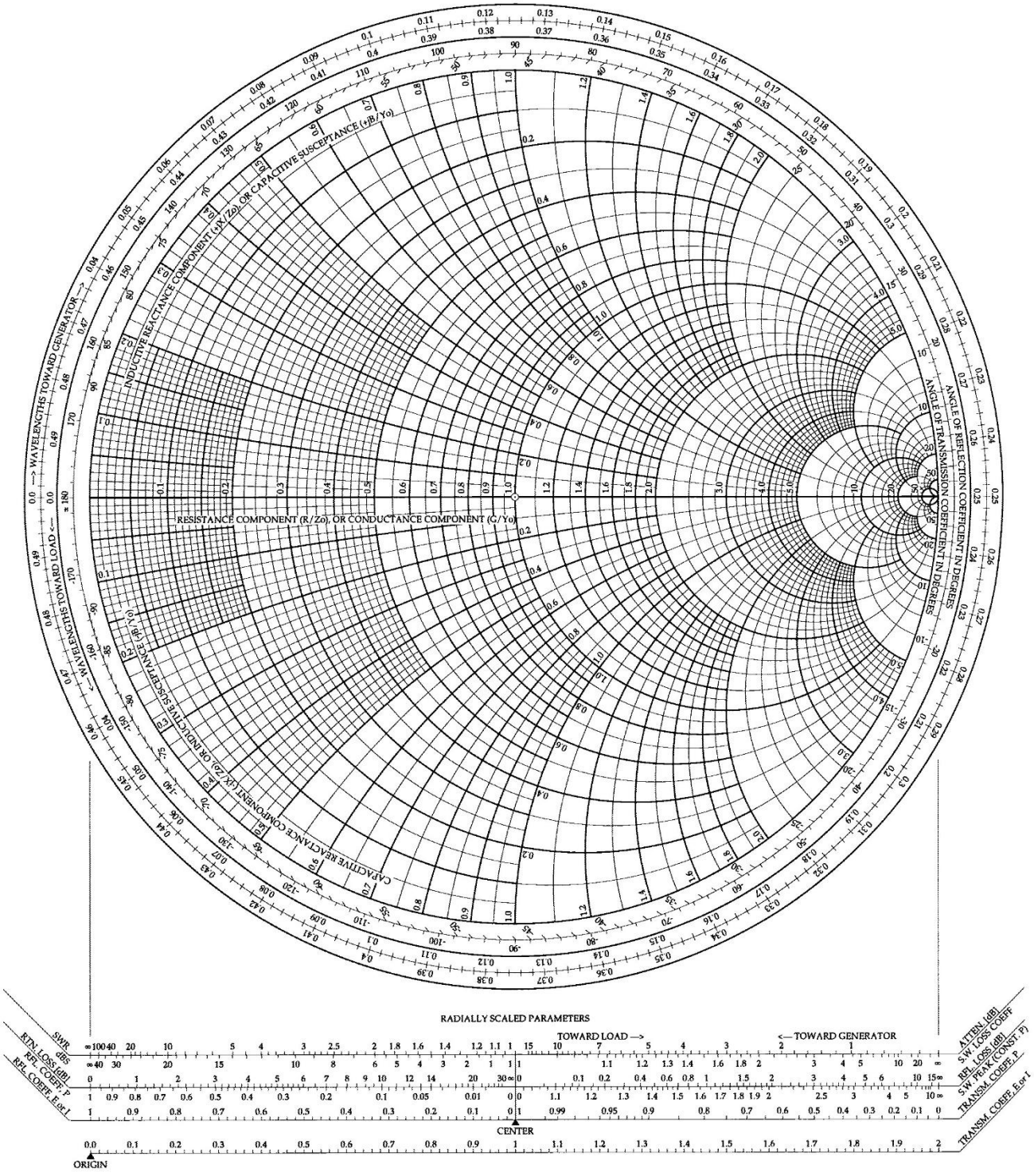
a) Write Maxwell's equations for:
i) Time varying field
ii) Static field
iii) Time Harmonic field
iv) Free space

b) Derive Helmotz's wave equation for dielectric media in terms of $\bar{E}$ and $\bar{H}$. Also write these for sinusoidal time variations.

c) A certain transmission line has characteristic impedance $Z_0 = 75 + j0.1\Omega$ is terminated in the load impedance $Z_L = 70 + j50\Omega$ then calculate:
i) Reflection coefficient
ii) SWR using analytical method. Also calculate these with smith chart.

The Complete Smith Chart

Black Magic Design



Seat No.	

Set **S**

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Electromagnetic Field Theory (ENTPCC-07)

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Time: 10:00 AM To 01:00 PM

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MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer from the options. **14**

1) Biot Savart law in magnetic field is analogous to _____ law in electric field.
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c) Coulomb's law d) Ampere law

2) _____ is the magnetic field intensity when the flux density is 8×10^{-6} Tesla in the medium of air.
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3) The charge builds up in the capacitor is due to _____ quantity.
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5) Electromagnetic waves are produced by _____.
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6) The correct expression for the Poynting vector is _____.
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a) parallel
b) independent
c) perpendicular
d) both b) and c)

11) Gradient is applied on _____ and resultant is _____.
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b) Scalar, Vector
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12) The force on a charge $2C$ in a field $1\ V/m$ is _____.
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d) $3\ N$

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b) Unity
c) + Infinity
d) - Infinity

14) A uniform surface charge of $\rho s = 2\ \mu C/m^2$, is situated at $z = 2$ plane. Then _____ is the value of flux density at $P(1,1,1)m$.
a) 10^{-6}
b) -10^{-6}
c) 10^{6}
d) -10^{6}

Seat No.		Set	S

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Electromagnetic Field Theory (ENTPCC-07)

Day & Date: Saturday, 02-05-2026 Max. Marks: 56
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Section – I

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d) Express the value of magnetic field intensity $(\bar{H})$ at $P(0, 0.2, 0)$ in the field of a current filament $3A$ in $\hat{a}_z$ direction at $x = 0.1, y = 0.3$.

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b) A line charge density $\rho_l = 15nc/m$ is located in free space on the line $y = 3, x = 4$ and a point charge $Q = 2 \times 10^{-12} C$ located at the origin.
Find:
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iii) $\bar{E}$ due to line and point charge at $(8, 9, 10)$

c) State importance of boundary conditions. Derive the boundary conditions in terms of tangent and normal components for electrostatic field.

Section – II

Q.4 Attempt any three. **12**

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b) Find the amplitude of the displacement current density inside a large oil filled power capacitor given that
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c) What is skin depth? Derive the expression for skin depth.

d) A transmission line operating at $3\mathrm{MHz}$ having $\mathrm{R} = 13.52\Omega/\mathrm{m}$, $\mathrm{L} = 3.45\mathrm{mH/m}, \mathrm{G} = 4.42 \times 10^8\ \mathrm{mho/m}, \mathrm{C} = 8.06\mathrm{nF/m}$,
Find:
i) Attenuation constant
ii) Phase constant

Q.5 Attempt any two. **16**

a) Write Maxwell's equations for:
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ii) Static field
iii) Time Harmonic field
iv) Free space

b) Derive Helmotz's wave equation for dielectric media in terms of $\bar{E}$ and $\bar{H}$. Also write these for sinusoidal time variations.

c) A certain transmission line has characteristic impedance $Z_0 = 75 + j0.1\Omega$ is terminated in the load impedance $Z_L = 70 + j50\Omega$ then calculate:
i) Reflection coefficient
ii) SWR using analytical method. Also calculate these with smith chart.

The Complete Smith Chart

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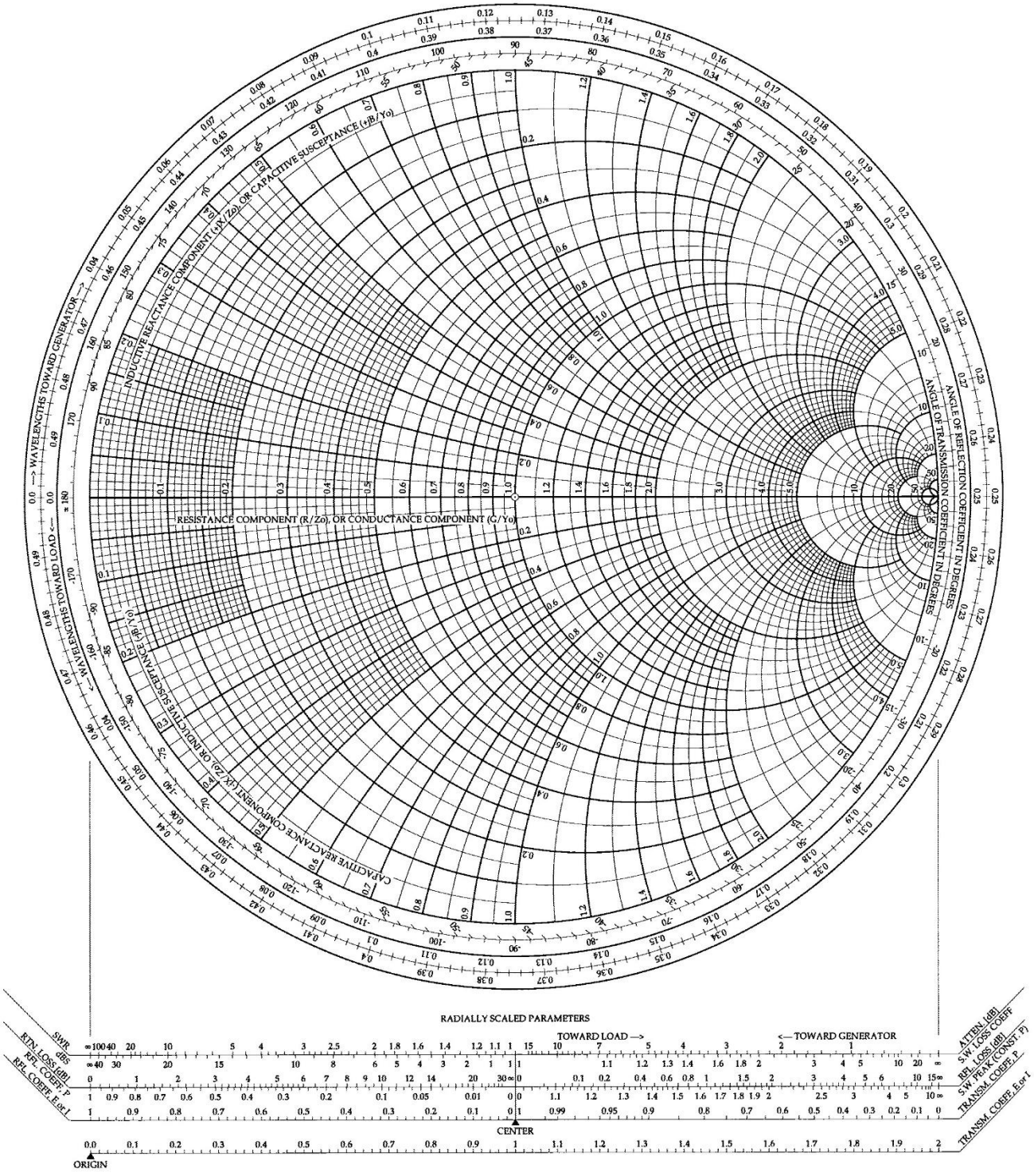

SLR-QH-494

Seat No.	

Set P

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Digital Signal Processing (ENTPCC-08)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) The direct evaluation DFT requires _____ complex additions.
a) $N(N-1)$ b) N^2
c) $N(N+1)$ d) $\frac{N(N-1)}{2}$

2) DFT is _____.
a) Discrete Fourier series
b) Discrete Fourier transform
c) Discrete time Fourier transform
d) Discrete time Fourier series

3) The fast Fourier transform is an algorithm used to compute the _____.
a) DFT b) FT
c) Convolution d) Circular Convolution

4) Circular convolution of the sequences $x(n) = \{1,2,3\}$ and $h(n) = \{1,1,1\}$ is _____.
a) $\{1,2,1\}$ b) $\{3,3,3\}$
c) $\{6,6,6\}$ d) $\{3,2,2\}$

5) The methods to calculate filtering of long duration sequences is _____.
a) Overlap save b) Overlap add
c) FIR and IIR d) Both a and b

6) IDFT of $Y(k) = \{4,4,4,4\}$ is _____.

a) $\{4,0,0,0\}$ b) $\{0,4,0,0\}$

c) $\{0,0,4,0\}$ d) $\{0,0,0,4\}$

7) The circular convolution of two sequences in time domain is equivalent to _____.

a) Multiplication of DFTs of two sequences

b) Summation of DFTs of two sequences

c) Difference of DFTs of two sequences

d) All above

8) If the impulse response of a system is over a finite duration, then it is _____.

a) a moving average system b) an auto regressive system

c) an ARMA system d) an IIR system

9) The impulse response of ideal filter is _____.

a) causal b) non causal

c) non-causal & finite d) None

10) IIR digital filters are of the nature _____.

a) Recursive b) non Recursive

c) Reversive d) non Reversive

11) Specify the correct equation for Hanning window _____.

a) $\omega_R(n) = 1$

b) $\omega(n) = 0.5 + 0.5\cos\left({}^{2\pi n}/_{N-1}\right)$

c) $\omega(n) = 0.46 + 0.54\cos\left({}^{2\pi n}/_{N-1}\right)$

d) $\omega(n) = 0.54 + 0.46\cos\left({}^{2\pi n}/_{N-1}\right)$

12) To meet the magnitude response specification for a transition width, one has to _____.

a) select a proper window b) select a Kaiser window

c) select filter order d) select rectangular window

13) Given that $H(z)$ is a causal and stable IIR filter, if z in $H(z)$ is replaced by $-z$, the resulting filter will be _____.

a) neither stable nor causal b) stable but non causal

c) unstable but causal d) both stable & causal

14) Impulse invariant method will convert analog filter that has _____.

a) same frequency response as that of analog filter and stable

b) different frequency response and is unstable

c) same frequency response and is unstable

d) different frequency response and is stable

Seat No.	

Set **P**

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Digital Signal Processing (ENTPCC-08)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
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3) Assume suitable data if necessary.

SECTION – I

Q.2 Attempt Any Four of the following question. **16**

a) Perform circular convolution for $x_1(n) = \{1,3,2,5\}$ and $x_2(n) = \{1,2,3,4\}$

b) Differentiate between DFT and FFT.

c) Derive Multiplication in time domain DFT Property?

d) Compute four point DFT of a sequence $x(n) = \{5,2,3,1\}$

e) Compute IDFT of $X(k) = \{7, -1 + j, -1, -1 - j\}$

Q.3 Attempt Any Two of the following question. **12**

a) Find the DFT of a sequence $x(n) = \{2,2,2,2,2,2,0,0\}$ using DIT FFT algorithm.

b) Find the output value of a filter whose impulse response is $h(n) = \{1,2\}$ and input signal is $x(n) = \{1, -1,2,3,4,5,6, -1,0,2,1,5,1\}$ using overlap add method.

c) Find circular convolution of the following sequences $x(n) = \{1,8,2,10\}$; $h(n) = \{1,1,1,1\}$ using DFT and IDFT method.

SECTION – II

Q.4 Attempt Any Four of the following question. **16**

a) Obtain the Cascade form realization for the system function given by

$$H(z) = \frac{1 + {}^{1}/_{4}\, z^{-1}}{\left(1 + {}^{1}/_{2}\, z^{-1}\right)\left(1 + {}^{1}/_{2}\, z^{-1} + {}^{1}/_{4}\, z^{-1}\right)}$$

b) Prove that

$$\Omega_c = \frac{\Omega_p}{\left(10^{0.1\alpha_p} - 1\right)^{1/2N}} = \frac{\Omega_s}{\left(10^{0.1\alpha_s} - 1\right)^{1/2N}}$$

c) Explain briefly the method of designing FIR filter using Fourier series?

d) What is warping effect? What is its effect on magnitude and phase response?

e) Explain the application of DSP in audio processing?

Q.5 Attempt Any Two of the following question. **12**

a) Design an ideal high pass filter with a frequency response

$Hd(e^{j\omega}) = 1$ for $\frac{\pi}{4} \leq |\omega| \leq \pi$

$= 0$ for $|\omega| \leq \frac{\pi}{4}$

Find the values of $h(n)$ for $N = 11$, Find frequency response $\bar{H}(e^{j\omega})$

b) Using bilinear transformation obtain $H(z)$ if $H(s) = \frac{1}{(S+1)^2}$ for T=0.1 sec

c) Apply impulse invariant method and find $H(z)$ for

$H(s) = \frac{s+a}{(s+a)^2 + b^2}$

SLR-QH-494

Seat No.	

Set Q

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Digital Signal Processing (ENTPCC-08)

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MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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1) If the impulse response of a system is over a finite duration, then it is _____.
a) a moving average system b) an auto regressive system
c) an ARMA system d) an IIR system

2) The impulse response of ideal filter is _____.
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a) Recursive b) non Recursive
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4) Specify the correct equation for Hanning window _____.
a) $\omega_R(n) = 1$
b) $\omega(n) = 0.5 + 0.5\cos\left({}^{2\pi n}/_{N-1}\right)$
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5) To meet the magnitude response specification for a transition width, one has to _____.
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a) $\{1,2,1\}$
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12) The methods to calculate filtering of long duration sequences is _____.

a) Overlap save
b) Overlap add
c) FIR and IIR
d) Both a and b

13) IDFT of $Y(k) = \{4,4,4,4\}$ is _____.

a) $\{4,0,0,0\}$
b) $\{0,4,0,0\}$
c) $\{0,0,4,0\}$
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14) The circular convolution of two sequences in time domain is equivalent to _____.

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SLR-QH-494

Seat No.	

Set Q

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b) Prove that

$$\Omega_c = \frac{\Omega_p}{\left(10^{0.1\alpha_p} - 1\right)^{1/2N}} = \frac{\Omega_s}{\left(10^{0.1\alpha_s} - 1\right)^{1/2N}}$$

c) Explain briefly the method of designing FIR filter using Fourier series?

d) What is warping effect? What is its effect on magnitude and phase response?

e) Explain the application of DSP in audio processing?

Q.5 Attempt Any Two of the following question. **12**

a) Design an ideal high pass filter with a frequency response

$Hd(e^{j\omega}) = 1$ for $\frac{\pi}{4} \leq |\omega| \leq \pi$

$= 0$ for $|\omega| \leq \frac{\pi}{4}$

Find the values of $h(n)$ for $N = 11$, Find frequency response $\bar{H}(e^{j\omega})$

b) Using bilinear transformation obtain $H(z)$ if $H(s) = \frac{1}{(S+1)^2}$ for T=0.1 sec

c) Apply impulse invariant method and find $H(z)$ for

$H(s) = \frac{s+a}{(s+a)^2 + b^2}$

Seat No.	

Set **R**

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Digital Signal Processing (ENTPCC-08)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book Page no 03 (Starring page of the Answer Book Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of Page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) Specify the correct equation for Hanning window _____.
a) $\omega_R(n) = 1$
b) $\omega(n) = 0.5 + 0.5\cos\left({}^{2\pi n}/_{N-1}\right)$
c) $\omega(n) = 0.46 + 0.54\cos\left({}^{2\pi n}/_{N-1}\right)$
d) $\omega(n) = 0.54 + 0.46\cos\left({}^{2\pi n}/_{N-1}\right)$

2) To meet the magnitude response specification for a transition width, one has to _____.
a) select a proper window b) select a Kaiser window
c) select filter order d) select rectangular window

3) Given that $H(z)$ is a causal and stable IIR filter, if z in $H(z)$ is replaced by $-z$, the resulting filter will be _____.
a) neither stable nor causal b) stable but non causal
c) unstable but causal d) both stable & causal

4) Impulse invariant method will convert analog filter that has _____.
a) same frequency response as that of analog filter and stable
b) different frequency response and is unstable
c) same frequency response and is unstable
d) different frequency response and is stable

5) The direct evaluation DFT requires _____ complex additions.
a) $N(N-1)$ b) N^2
c) $N(N+1)$ d) $\frac{N(N-1)}{2}$

6) DFT is _____.
a) Discrete Fourier series
b) Discrete Fourier transform
c) Discrete time Fourier transform
d) Discrete time Fourier series

7) The fast Fourier transform is an algorithm used to compute the _____.
a) DFT b) FT
c) Convolution d) Circular Convolution

8) Circular convolution of the sequences $x(n) = \{1,2,3\}$ and $h(n) = \{1,1,1\}$ is _____.
a) $\{1,2,1\}$ b) $\{3,3,3\}$
c) $\{6,6,6\}$ d) $\{3,2,2\}$

9) The methods to calculate filtering of long duration sequences is _____.
a) Overlap save b) Overlap add
c) FIR and IIR d) Both a and b

10) IDFT of $Y(k) = \{4,4,4,4\}$ is _____.
a) $\{4,0,0,0\}$ b) $\{0,4,0,0\}$
c) $\{0,0,4,0\}$ d) $\{0,0,0,4\}$

11) The circular convolution of two sequences in time domain is equivalent to _____.
a) Multiplication of DFTs of two sequences
b) Summation of DFTs of two sequences
c) Difference of DFTs of two sequences
d) All above

12) If the impulse response of a system is over a finite duration, then it is _____.
a) a moving average system b) an auto regressive system
c) an ARMA system d) an IIR system

13) The impulse response of ideal filter is _____.
a) causal b) non causal
c) non-causal & finite d) None

14) IIR digital filters are of the nature _____.
a) Recursive b) non Recursive
c) Reversive d) non Reversive

SLR-QH-494

Seat No.	

Set R

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Digital Signal Processing (ENTPCC-08)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

SECTION – I

Q.2 Attempt Any Four of the following question. 16

a) Perform circular convolution for $x_1(n) = \{1,3,2,5\}$ and $x_2(n) = \{1,2,3,4\}$

b) Differentiate between DFT and FFT.

c) Derive Multiplication in time domain DFT Property?

d) Compute four point DFT of a sequence $x(n) = \{5,2,3,1\}$

e) Compute IDFT of $X(k) = \{7, -1 + j, -1, -1 - j\}$

Q.3 Attempt Any Two of the following question. 12

a) Find the DFT of a sequence $x(n) = \{2,2,2,2,2,2,0,0\}$ using DIT FFT algorithm.

b) Find the output value of a filter whose impulse response is $h(n) = \{1,2\}$ and input signal is $x(n) = \{1, -1,2,3,4,5,6, -1,0,2,1,5,1\}$ using overlap add method.

c) Find circular convolution of the following sequences $x(n) = \{1,8,2,10\}$; $h(n) = \{1,1,1,1\}$ using DFT and IDFT method.

SECTION – II

Q.4 Attempt Any Four of the following question. 16

a) Obtain the Cascade form realization for the system function given by

$$H(z) = \frac{1 + {}^{1}/_{4}\, z^{-1}}{\left(1 + {}^{1}/_{2}\, z^{-1}\right)\left(1 + {}^{1}/_{2}\, z^{-1} + {}^{1}/_{4}\, z^{-1}\right)}$$

b) Prove that

$$\Omega_c = \frac{\Omega_p}{\left(10^{0.1\alpha_p} - 1\right)^{1/2N}} = \frac{\Omega_s}{\left(10^{0.1\alpha_s} - 1\right)^{1/2N}}$$

c) Explain briefly the method of designing FIR filter using Fourier series?

d) What is warping effect? What is its effect on magnitude and phase response?

e) Explain the application of DSP in audio processing?

Q.5 Attempt Any Two of the following question. **12**

a) Design an ideal high pass filter with a frequency response

$Hd(e^{j\omega}) = 1$ for $\frac{\pi}{4} \leq |\omega| \leq \pi$

$= 0$ for $|\omega| \leq \frac{\pi}{4}$

Find the values of $h(n)$ for $N = 11$, Find frequency response $\bar{H}(e^{j\omega})$

b) Using bilinear transformation obtain $H(z)$ if $H(s) = \frac{1}{(S+1)^2}$ for T=0.1 sec

c) Apply impulse invariant method and find $H(z)$ for

$H(s) = \frac{s+a}{(s+a)^2 + b^2}$

SLR-QH-494

Seat No.	

Set S

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Digital Signal Processing (ENTPCC-08)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book Page no 03 (Starring page of the Answer Book Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of Page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) IDFT of $Y(k) = \{4,4,4,4\}$ is _____.
a) $\{4,0,0,0\}$ b) $\{0,4,0,0\}$
c) $\{0,0,4,0\}$ d) $\{0,0,0,4\}$

2) The circular convolution of two sequences in time domain is equivalent to _____.
a) Multiplication of DFTs of two sequences
b) Summation of DFTs of two sequences
c) Difference of DFTs of two sequences
d) All above

3) If the impulse response of a system is over a finite duration, then it is _____.
a) a moving average system b) an auto regressive system
c) an ARMA system d) an IIR system

4) The impulse response of ideal filter is _____.
a) causal b) non causal
c) non-causal & finite d) None

5) IIR digital filters are of the nature _____.
a) Recursive b) non Recursive
c) Reversive d) non Reversive

6) Specify the correct equation for Hanning window _____.

a) $\omega_R(n) = 1$

b) $\omega(n) = 0.5 + 0.5\cos\left({}^{2\pi n}/_{N-1}\right)$

c) $\omega(n) = 0.46 + 0.54\cos\left({}^{2\pi n}/_{N-1}\right)$

d) $\omega(n) = 0.54 + 0.46\cos\left({}^{2\pi n}/_{N-1}\right)$

7) To meet the magnitude response specification for a transition width, one has to _____.

a) select a proper window
b) select a Kaiser window
c) select filter order
d) select rectangular window

8) Given that $H(z)$ is a causal and stable IIR filter, if z in $H(z)$ is replaced by $-z$, the resulting filter will be _____.

a) neither stable nor causal
b) stable but non causal
c) unstable but causal
d) both stable & causal

9) Impulse invariant method will convert analog filter that has _____.

a) same frequency response as that of analog filter and stable
b) different frequency response and is unstable
c) same frequency response and is unstable
d) different frequency response and is stable

10) The direct evaluation DFT requires _____ complex additions.

a) $N(N-1)$
b) N^2
c) $N(N+1)$
d) $\frac{N(N-1)}{2}$

11) DFT is _____.

a) Discrete Fourier series
b) Discrete Fourier transform
c) Discrete time Fourier transform
d) Discrete time Fourier series

12) The fast Fourier transform is an algorithm used to compute the _____.

a) DFT
b) FT
c) Convolution
d) Circular Convolution

13) Circular convolution of the sequences $x(n) = \{1,2,3\}$ and $h(n) = \{1,1,1\}$ is _____.

a) $\{1,2,1\}$
b) $\{3,3,3\}$
c) $\{6,6,6\}$
d) $\{3,2,2\}$

14) The methods to calculate filtering of long duration sequences is _____.

a) Overlap save
b) Overlap add
c) FIR and IIR
d) Both a and b

SLR-QH-494

Seat No.		Set	S

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Digital Signal Processing (ENTPCC-08)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

SECTION – I

Q.2 Attempt Any Four of the following question. 16

a) Perform circular convolution for $x_1(n) = \{1,3,2,5\}$ and $x_2(n) = \{1,2,3,4\}$

b) Differentiate between DFT and FFT.

c) Derive Multiplication in time domain DFT Property?

d) Compute four point DFT of a sequence $x(n) = \{5,2,3,1\}$

e) Compute IDFT of $X(k) = \{7, -1 + j, -1, -1 - j\}$

Q.3 Attempt Any Two of the following question. 12

a) Find the DFT of a sequence $x(n) = \{2,2,2,2,2,2,0,0\}$ using DIT FFT algorithm.

b) Find the output value of a filter whose impulse response is $h(n) = \{1,2\}$ and input signal is $x(n) = \{1, -1,2,3,4,5,6, -1,0,2,1,5,1\}$ using overlap add method.

c) Find circular convolution of the following sequences $x(n) = \{1,8,2,10\}$; $h(n) = \{1,1,1,1\}$ using DFT and IDFT method.

SECTION – II

Q.4 Attempt Any Four of the following question. 16

a) Obtain the Cascade form realization for the system function given by

$$H(z) = \frac{1 + {}^{1}/_{4}\, z^{-1}}{\left(1 + {}^{1}/_{2}\, z^{-1}\right)\left(1 + {}^{1}/_{2}\, z^{-1} + {}^{1}/_{4}\, z^{-1}\right)}$$

b) Prove that

$$\Omega_c = \frac{\Omega_p}{\left(10^{0.1\alpha_p} - 1\right)^{1/2N}} = \frac{\Omega_s}{\left(10^{0.1\alpha_s} - 1\right)^{1/2N}}$$

c) Explain briefly the method of designing FIR filter using Fourier series?

d) What is warping effect? What is its effect on magnitude and phase response?

e) Explain the application of DSP in audio processing?

Q.5 Attempt Any Two of the following question. **12**

a) Design an ideal high pass filter with a frequency response

$Hd(e^{j\omega}) = 1$ for $\frac{\pi}{4} \leq |\omega| \leq \pi$

$= 0$ for $|\omega| \leq \frac{\pi}{4}$

Find the values of $h(n)$ for $N = 11$, Find frequency response $\bar{H}(e^{j\omega})$

b) Using bilinear transformation obtain $H(z)$ if $H(s) = \frac{1}{(S+1)^2}$ for T=0.1 sec

c) Apply impulse invariant method and find $H(z)$ for

$H(s) = \frac{s+a}{(s+a)^2 + b^2}$

SLR-QH-495

Seat No.	

Set P

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Microcontrollers and Applications (ENTPCC-09)

Day & Date: Thursday, 07-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to right indicates full marks.
4) Assume suitable data if required.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose correct option from the following: **14**

1) The internal ROM memory of the 8051 is _____.
a) 4 Kbytes b) 8 Kbytes
c) 128 bytes d) 256 bytes

2) The o/p of program code will be _____
LOOP: MOV A,#0Ah
DEC A
JNZ LOOP

a) loop execute 10 times b) loop execute 01 time
c) gives error d) loop execute 0A times

3) Why is the flag bit TXIF tested or examined in the PIR1 register after shifting all the data bits during the initialization process of USART in asynchronous mode?
a) For ensuring the transmission of byte
b) For ensuring the reception of byte
c) For ensuring the on-chip baud rate generation
d) For ensuring the 9th bit as a parity

4) What is the address range of Register bank 1 in 8051?
a) 00h-07h b) 08h-0Fh
c) 08h-7Fh d) 08h-FFh

5) Which of the following commands will move the number 27H into the accumulator?
a) MOV A, #27 b) MOV A, #27h
c) MOV A, 27h d) MOV A, @27h

6) Vector address of INT0 interrupt is _____ h.
a) 0003 b) 0013
c) 000B d) 001B

7) Which of the following instructions will load the value A5H into the higher byte of Timer0?
a) MOV TH0,#0A5h b) MOV TH0,@A5h
c) MOV TH0,#A5h d) MOV T0,A5h

8) The 8-bit address bus allows access to an address range of _____.
a) 0000 to FFFF h b) 000 to FFF h
c) 00 to FF h d) 0000 to 0FFF h

9) PIC 16F877A is a _____ bit microcontroller.
a) 64 b) 4
c) 32 d) 8

10) Which flags are more likely to get affected in status registers by Arithmetic and Logical Unit (ALU) of PIC 16 FXXX on the basis of instructions execution?
a) Carry (C) Flags b) Zero (Z) Flags
c) Digit Carry (DC) Flags d) All of the above

11) Which status bits exhibit carry from 8^{th} bit during 8-bit addition?
a) Carry bit b) Digits Carry bit (DC)
c) Both a & b d) None of these

12) Which mode allows to deliver the contents of 16-bit timer into a SFR on the basis of rising/falling edge detection?
a) MSSP Mode b) Compare Mode
c) PWM Mode d) Capture Mode

13) Where does the comparison level occur for 16-bit contents in the compare mode operation?
a) Between CCPR1 register & TMR1
b) Between CCPR1 & CCPR2 registers
c) Between CCPR2 register & TMR1
d) Between CCPR2 register & TMR0

14) Program Memory (ROM), Data Memory (RAM) and Data Memory (EEPROM) for PIC 16F877 are _____ respectively.
a) 8K × 8, 368 × 8, 256 × 8 b) 14K × 8, 14K × 8, 256 × 8
c) 8K × 14, 368 × 16, 256 × 8 d) 8K × 14, 368 × 8, 256 × 8

Seat No.	

Set | P

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Microcontrollers and Applications (ENTPCC-09)

Day & Date: Thursday, 07-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if required.

SECTION – I

Q.2 Attempt the following. (Any Four) **16**

a) Compare Von Neumann Architecture and Harvard architecture.

b) Explain any 4 Arithmetic instructions with examples.

c) Write ALP for delay 200ms; Use Timer 0 in Mode 1.

d) Write a short note on Memory organization in 8051.

e) What are the other functions of I/O pins of PORT3?

Q.3 Attempt the following. (Any Two) **12**

a) Write a Program to interface 16×2 LCD display with 8051 to send word “SOLAPUR”.

b) Draw and explain the External Memory Interfacing with 8051. Attach 4 KB RAM externally. Also find the starting and end address.

c) Write a short note on
i) PSW
ii) IE
iii) PCON

SECTION – II

Q.4 Attempt the following. (Any Four) **16**

a) Explain following instructions
i) DECF f,d
ii) RLF f,d
iii) ANDWF f,d
iv) MOVLW k

b) Explain various kinds of RESET in PIC.

c) Explain pin configuration for Arduino Uno board.

d) Brief about the SFRs associated with Interrupts in PIC 16F877.

e) Write a short note on features of Arduino Uno.

Q.5 Attempt the following. (Any Two) **12**

a) Explain in detail:
- i) PORTS
- ii) STATUS
- iii) OPTION_REG registers in PIC 16F877

b) Explain CCP module in PIC 16F877 with logical diagram.

c) Write a program to interface Ultrasonic sensor to Arduino Uno.

Seat No.	

Set **Q**

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Microcontrollers and Applications (ENTPCC-09)

Day & Date: Thursday, 07-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to right indicates full marks.
4) Assume suitable data if required.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose correct option from the following: **14**

1) The 8-bit address bus allows access to an address range of _____.
a) 0000 to FFFF h b) 000 to FFF h
c) 00 to FF h d) 0000 to 0FFF h

2) PIC 16F877A is a _____ bit microcontroller.
a) 64 b) 4
c) 32 d) 8

3) Which flags are more likely to get affected in status registers by Arithmetic and Logical Unit (ALU) of PIC 16 FXXX on the basis of instructions execution?
a) Carry (C) Flags b) Zero (Z) Flags
c) Digit Carry (DC) Flags d) All of the above

4) Which status bits exhibit carry from 8^{th} bit during 8-bit addition?
a) Carry bit b) Digits Carry bit (DC)
c) Both a & b d) None of these

5) Which mode allows to deliver the contents of 16-bit timer into a SFR on the basis of rising/falling edge detection?
a) MSSP Mode b) Compare Mode
c) PWM Mode d) Capture Mode

6) Where does the comparison level occur for 16-bit contents in the compare mode operation?
a) Between CCPR1 register & TMR1
b) Between CCPR1 & CCPR2 registers
c) Between CCPR2 register & TMR1
d) Between CCPR2 register & TMR0

7) Program Memory (ROM), Data Memory (RAM) and Data Memory (EEPROM) for PIC 16F877 are _____ respectively.

a) 8K × 8, 368 × 8, 256 × 8 b) 14K × 8, 14K × 8, 256 × 8
c) 8K × 14, 368 × 16, 256 × 8 d) 8K × 14, 368 × 8, 256 × 8

8) The internal ROM memory of the 8051 is _____.

a) 4 Kbytes b) 8 Kbytes
c) 128 bytes d) 256 bytes

9) The o/p of program code will be _____

```
LOOP: MOV A,#0Ah
      DEC A
      JNZ LOOP
```

a) loop execute 10 times b) loop execute 01 time
c) gives error d) loop execute 0A times

10) Why is the flag bit TXIF tested or examined in the PIR1 register after shifting all the data bits during the initialization process of USART in asynchronous mode?

a) For ensuring the transmission of byte
b) For ensuring the reception of byte
c) For ensuring the on-chip baud rate generation
d) For ensuring the 9th bit as a parity

11) What is the address range of Register bank 1 in 8051?

a) 00h-07h b) 08h-0Fh
c) 08h-7Fh d) 08h-FFh

12) Which of the following commands will move the number 27H into the accumulator?

a) MOV A, #27 b) MOV A, #27h
c) MOV A, 27h d) MOV A, @27h

13) Vector address of INT0 interrupt is _____ h.

a) 0003 b) 0013
c) 000B d) 001B

14) Which of the following instructions will load the value A5H into the higher byte of Timer0?

a) MOV TH0,#0A5h b) MOV TH0,@A5h
c) MOV TH0,#A5h d) MOV T0,A5h

Seat No.	

Set **Q**

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Microcontrollers and Applications (ENTPCC-09)

Day & Date: Thursday, 07-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if required.

SECTION – I

Q.2 Attempt the following. (Any Four) **16**

a) Compare Von Neumann Architecture and Harvard architecture.

b) Explain any 4 Arithmetic instructions with examples.

c) Write ALP for delay 200ms; Use Timer 0 in Mode 1.

d) Write a short note on Memory organization in 8051.

e) What are the other functions of I/O pins of PORT3?

Q.3 Attempt the following. (Any Two) **12**

a) Write a Program to interface 16×2 LCD display with 8051 to send word “SOLAPUR”.

b) Draw and explain the External Memory Interfacing with 8051. Attach 4 KB RAM externally. Also find the starting and end address.

c) Write a short note on
i) PSW
ii) IE
iii) PCON

SECTION – II

Q.4 Attempt the following. (Any Four) **16**

a) Explain following instructions
i) DECF f,d
ii) RLF f,d
iii) ANDWF f,d
iv) MOVLW k

b) Explain various kinds of RESET in PIC.

c) Explain pin configuration for Arduino Uno board.

d) Brief about the SFRs associated with Interrupts in PIC 16F877.

e) Write a short note on features of Arduino Uno.

Q.5 Attempt the following. (Any Two) **12**

a) Explain in detail:
- i) PORTS
- ii) STATUS
- iii) OPTION_REG registers in PIC 16F877

b) Explain CCP module in PIC 16F877 with logical diagram.

c) Write a program to interface Ultrasonic sensor to Arduino Uno.

Seat No.	

Set **R**

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Microcontrollers and Applications (ENTPCC-09)

Day & Date: Thursday, 07-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to right indicates full marks.
4) Assume suitable data if required.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose correct option from the following: **14**

1) Which status bits exhibit carry from 8^{th} bit during 8-bit addition?
a) Carry bit b) Digits Carry bit (DC)
c) Both a & b d) None of these

2) Which mode allows to deliver the contents of 16-bit timer into a SFR on the basis of rising/falling edge detection?
a) MSSP Mode b) Compare Mode
c) PWM Mode d) Capture Mode

3) Where does the comparison level occur for 16-bit contents in the compare mode operation?
a) Between CCPR1 register & TMR1
b) Between CCPR1 & CCPR2 registers
c) Between CCPR2 register & TMR1
d) Between CCPR2 register & TMR0

4) Program Memory (ROM), Data Memory (RAM) and Data Memory (EEPROM) for PIC 16F877 are _____ respectively.
a) 8K × 8, 368 × 8, 256 × 8 b) 14K × 8, 14K × 8, 256 × 8
c) 8K × 14, 368 × 16, 256 × 8 d) 8K × 14, 368 × 8, 256 × 8

5) The internal ROM memory of the 8051 is _____.
a) 4 Kbytes b) 8 Kbytes
c) 128 bytes d) 256 bytes

6) The o/p of program code will be _____

```
LOOP: MOV A,#0Ah
      DEC A
      JNZ LOOP
```

a) loop execute 10 times
b) loop execute 01 time
c) gives error
d) loop execute 0A times

7) Why is the flag bit TXIF tested or examined in the PIR1 register after shifting all the data bits during the initialization process of USART in asynchronous mode?

a) For ensuring the transmission of byte
b) For ensuring the reception of byte
c) For ensuring the on-chip baud rate generation
d) For ensuring the 9th bit as a parity

8) What is the address range of Register bank 1 in 8051?

a) 00h-07h
b) 08h-0Fh
c) 08h-7Fh
d) 08h-FFh

9) Which of the following commands will move the number 27H into the accumulator?

a) MOV A, #27
b) MOV A, #27h
c) MOV A, 27h
d) MOV A, @27h

10) Vector address of INT0 interrupt is _____ h.

a) 0003
b) 0013
c) 000B
d) 001B

11) Which of the following instructions will load the value A5H into the higher byte of Timer0?

a) MOV TH0,#0A5h
b) MOV TH0,@A5h
c) MOV TH0,#A5h
d) MOV T0,A5h

12) The 8-bit address bus allows access to an address range of _____.

a) 0000 to FFFF h
b) 000 to FFF h
c) 00 to FF h
d) 0000 to 0FFF h

13) PIC 16F877A is a _____ bit microcontroller.

a) 64
b) 4
c) 32
d) 8

14) Which flags are more likely to get affected in status registers by Arithmetic and Logical Unit (ALU) of PIC 16 FXXX on the basis of instructions execution?

a) Carry (C) Flags
b) Zero (Z) Flags
c) Digit Carry (DC) Flags
d) All of the above

Seat No.	

Set **R**

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Microcontrollers and Applications (ENTPCC-09)

Day & Date: Thursday, 07-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if required.

SECTION – I

Q.2 Attempt the following. (Any Four) **16**

a) Compare Von Neumann Architecture and Harvard architecture.

b) Explain any 4 Arithmetic instructions with examples.

c) Write ALP for delay 200ms; Use Timer 0 in Mode 1.

d) Write a short note on Memory organization in 8051.

e) What are the other functions of I/O pins of PORT3?

Q.3 Attempt the following. (Any Two) **12**

a) Write a Program to interface 16×2 LCD display with 8051 to send word “SOLAPUR”.

b) Draw and explain the External Memory Interfacing with 8051. Attach 4 KB RAM externally. Also find the starting and end address.

c) Write a short note on
i) PSW
ii) IE
iii) PCON

SECTION – II

Q.4 Attempt the following. (Any Four) **16**

a) Explain following instructions
i) DECF f,d
ii) RLF f,d
iii) ANDWF f,d
iv) MOVLW k

b) Explain various kinds of RESET in PIC.

c) Explain pin configuration for Arduino Uno board.

d) Brief about the SFRs associated with Interrupts in PIC 16F877.

e) Write a short note on features of Arduino Uno.

Q.5 Attempt the following. (Any Two) **12**

a) Explain in detail:
- i) PORTS
- ii) STATUS
- iii) OPTION_REG registers in PIC 16F877

b) Explain CCP module in PIC 16F877 with logical diagram.

c) Write a program to interface Ultrasonic sensor to Arduino Uno.

Seat No.	

Set **S**

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Microcontrollers and Applications (ENTPCC-09)

Day & Date: Thursday, 07-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to right indicates full marks.
4) Assume suitable data if required.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose correct option from the following: **14**

1) Vector address of INT0 interrupt is _____ h.
a) 0003 b) 0013
c) 000B d) 001B

2) Which of the following instructions will load the value A5H into the higher byte of Timer0?
a) MOV TH0,#0A5h b) MOV TH0,@A5h
c) MOV TH0,#A5h d) MOV T0,A5h

3) The 8-bit address bus allows access to an address range of _____.
a) 0000 to FFFF h b) 000 to FFF h
c) 00 to FF h d) 0000 to 0FFF h

4) PIC 16F877A is a _____ bit microcontroller.
a) 64 b) 4
c) 32 d) 8

5) Which flags are more likely to get affected in status registers by Arithmetic and Logical Unit (ALU) of PIC 16 FXXX on the basis of instructions execution?
a) Carry (C) Flags b) Zero (Z) Flags
c) Digit Carry (DC) Flags d) All of the above

6) Which status bits exhibit carry from 8^{th} bit during 8-bit addition?
a) Carry bit b) Digits Carry bit (DC)
c) Both a & b d) None of these

7) Which mode allows to deliver the contents of 16-bit timer into a SFR on the basis of rising/falling edge detection?

a) MSSP Mode
b) Compare Mode
c) PWM Mode
d) Capture Mode

8) Where does the comparison level occur for 16-bit contents in the compare mode operation?

a) Between CCPR1 register & TMR1
b) Between CCPR1 & CCPR2 registers
c) Between CCPR2 register & TMR1
d) Between CCPR2 register & TMR0

9) Program Memory (ROM), Data Memory (RAM) and Data Memory (EEPROM) for PIC 16F877 are _____ respectively.

a) 8K × 8, 368 × 8, 256 × 8
b) 14K × 8, 14K × 8, 256 × 8
c) 8K × 14, 368 × 16, 256 × 8
d) 8K × 14, 368 × 8, 256 × 8

10) The internal ROM memory of the 8051 is _____.

a) 4 Kbytes
b) 8 Kbytes
c) 128 bytes
d) 256 bytes

11) The o/p of program code will be _____

```
LOOP: MOV A,#0Ah
      DEC A
      JNZ LOOP
```

a) loop execute 10 times
b) loop execute 01 time
c) gives error
d) loop execute 0A times

12) Why is the flag bit TXIF tested or examined in the PIR1 register after shifting all the data bits during the initialization process of USART in asynchronous mode?

a) For ensuring the transmission of byte
b) For ensuring the reception of byte
c) For ensuring the on-chip baud rate generation
d) For ensuring the 9th bit as a parity

13) What is the address range of Register bank 1 in 8051?

a) 00h-07h
b) 08h-0Fh
c) 08h-7Fh
d) 08h-FFh

14) Which of the following commands will move the number 27H into the accumulator?

a) MOV A, #27
b) MOV A, #27h
c) MOV A, 27h
d) MOV A, @27h

Seat No.	

Set **S**

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Microcontrollers and Applications (ENTPCC-09)

Day & Date: Thursday, 07-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if required.

SECTION – I

Q.2 Attempt the following. (Any Four) **16**

a) Compare Von Neumann Architecture and Harvard architecture.

b) Explain any 4 Arithmetic instructions with examples.

c) Write ALP for delay 200ms; Use Timer 0 in Mode 1.

d) Write a short note on Memory organization in 8051.

e) What are the other functions of I/O pins of PORT3?

Q.3 Attempt the following. (Any Two) **12**

a) Write a Program to interface 16×2 LCD display with 8051 to send word “SOLAPUR”.

b) Draw and explain the External Memory Interfacing with 8051. Attach 4 KB RAM externally. Also find the starting and end address.

c) Write a short note on
i) PSW
ii) IE
iii) PCON

SECTION – II

Q.4 Attempt the following. (Any Four) **16**

a) Explain following instructions
i) DECF f,d
ii) RLF f,d
iii) ANDWF f,d
iv) MOVLW k

b) Explain various kinds of RESET in PIC.

c) Explain pin configuration for Arduino Uno board.

d) Brief about the SFRs associated with Interrupts in PIC 16F877.

e) Write a short note on features of Arduino Uno.

Q.5 Attempt the following. (Any Two) **12**

a) Explain in detail:
- i) PORTS
- ii) STATUS
- iii) OPTION_REG registers in PIC 16F877

b) Explain CCP module in PIC 16F877 with logical diagram.

c) Write a program to interface Ultrasonic sensor to Arduino Uno.

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Seat No.	

Set P

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026

Digital Logic Design (ENTPEC – 01A)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data wherever necessary and mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 MCQ type question, all Compulsory. **14**

1) A full subtracter circuit requires _____.
a) two inputs and two outputs b) three inputs and one output
c) two inputs and three outputs d) three inputs and two outputs

2) A decoder converts _____.
a) non coded information into coded form
b) coded information into non coded form
c) HIGHs to LOWs
d) LOWs to HIGHs

3) While obtaining minimal sum of products expression _____.
a) All don't cares are ignored
b) All don't cares are treated as logic 1's
c) All don't cares are treated as logic 0's
d) Only such don't cares that help minimization are treated as logic 1's

4) In positive logic _____.
a) a HIGH = 1, a LOW = 0 b) a LOW = 1, a HIGH = 0
c) only HIGHs are present d) only LOWs are present

5) Grouping on a K-map always results in the elimination of _____.
a) variables within the loop that appear only in their uncomplemented form
b) variables that remain unchanged within the loop
c) variables within the loop that appear only in their complemented form
d) variables within the loop that appear in both complemented and uncomplemented form

6) A full-adder has a $C_{in} = 0$. What are the sum $(\sum)$ and the carry (C_{out}) when $A = 1$ and $B = 1$?

a) $\sum = 0, C_{out} = 0$ b) $\sum = 0, C_{out} = 1$

c) $\sum = 1, C_{out} = 0$ d) $\sum = 1, C_{out} = 1$

7) The following number system is used for K-map representation?

a) Binary b) BCD

c) Gray d) Hexadecimal

8) The MOD number of counter is _____.

a) The max. possible number of states

b) The actual number of states in a sequence

c) The number of flip-flops

d) None of these

9) What is the largest number of data inputs which a data selector with two control inputs can handle?

a) 2 b) 8

c) 4 d) 16

10) The terminal count of modulus-11 binary counter is _____.

a) 1010 b) 1001

c) 1000 d) 1100

11) A BCD counter is a _____.

a) binary counter b) full-modulus counter

c) decade counter d) divide-by-09 counter

12) A modulus-16 ring counter requires _____ flip-flops.

a) 10 b) 4

c) 16 d) 2

13) State reduction gives _____.

a) Reduction in number of flip-flops

b) Number of flip-flops remain same

c) a or b

d) None of these

14) To operate correctly, starting a ring shift counter requires _____.

a) clearing all the flip-flops

b) clearing one flip-flop and presetting all others

c) presetting all the flip-flops

d) pre-setting one flip-flop and clearing all others

Seat No.	

Set **P**

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Digital Logic Design (ENTPEC – 01A)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever necessary and mention it clearly.

Section – I

Q.2 Attempt Any Four of the following. **16**

a) Write short note on characteristics of Logic Families.

b) Describe types of hazards in detail.

c) Design and explain 1 - Bit Comparator.

d) Implement half adder using 3:8 Decoder.

e) Implement the following function using NAND gates
$F(A, B, C, D) = \sum m(0, 1, 2, 3, 5, 7, 8, 9, 10, 11)$

Q.3 Attempt Any Two of the following. **12**

a) Implement the following function using single 4:1 Multiplexer:
$F(P, Q, R, S) = \sum m(0, 1, 3, 4, 8, 9, 11, 12, 13, 14, 15)$

b) Explain Master-Slave JK flip-flop in detail

c) Draw Logical diagram of SR flip-flop. Also write the characteristic table, characteristic equation and excitation table of JK flip-flop.

Section – II

Q.4 Answer Any Four of the following. **16**

a) What is shift register. Explain various types of shift registers.

b) Differentiate between Synchronous and Asynchronous sequential circuits.

c) Differentiate between Moore and Mealy state Machines.

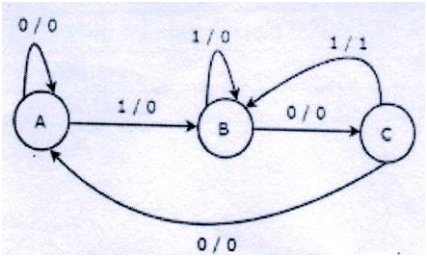
d) Design mod-6 asynchronous counter using T flip-flop.

e) Design mod-7 counter using IC 7490.

Q.5 Answer Any Two of the following. **12**

a) Design 4-bit synchronous counter using T flip-flop.

b) Design a sequential circuit using T-flip-flop for the given state diagram.



c) Design a sequential circuit with two D flip flops A and B, one input X. When X = 0, the state remains same. When X = 1 then Circuit passes through state transitions from 00 to 01 to 11 to 10 and back to 00 and repeats.

Seat No.	

Set **Q**

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026

Digital Logic Design (ENTPEC – 01A)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data wherever necessary and mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 MCQ type question, all Compulsory. **14**

1) The MOD number of counter is _____.
a) The max. possible number of states
b) The actual number of states in a sequence
c) The number of flip-flops
d) None of these

2) What is the largest number of data inputs which a data selector with two control inputs can handle?
a) 2 b) 8
c) 4 d) 16

3) The terminal count of modulus-11 binary counter is _____.
a) 1010 b) 1001
c) 1000 d) 1100

4) A BCD counter is a _____.
a) binary counter b) full-modulus counter
c) decade counter d) divide-by-09 counter

5) A modulus-16 ring counter requires _____ flip-flops.
a) 10 b) 4
c) 16 d) 2

6) State reduction gives _____.
a) Reduction in number of flip-flops
b) Number of flip-flops remain same
c) a or b
d) None of these

7) To operate correctly, starting a ring shift counter requires _____.
   a) clearing all the flip-flops
   b) clearing one flip-flop and presetting all others
   c) presetting all the flip-flops
   d) pre-setting one flip-flop and clearing all others

8) A full subtracter circuit requires _____.
   a) two inputs and two outputs
   b) three inputs and one output
   c) two inputs and three outputs
   d) three inputs and two outputs

9) A decoder converts _____.
   a) non coded information into coded form
   b) coded information into non coded form
   c) HIGHs to LOWs
   d) LOWs to HIGHs

10) While obtaining minimal sum of products expression _____.
   a) All don't cares are ignored
   b) All don't cares are treated as logic 1's
   c) All don't cares are treated as logic 0's
   d) Only such don't cares that help minimization are treated as logic 1's

11) In positive logic _____.
   a) a HIGH $= 1$, a LOW $= 0$
   b) a LOW $= 1$, a HIGH $= 0$
   c) only HIGHs are present
   d) only LOWs are present

12) Grouping on a K-map always results in the elimination of _____.
   a) variables within the loop that appear only in their uncomplemented form
   b) variables that remain unchanged within the loop
   c) variables within the loop that appear only in their complemented form
   d) variables within the loop that appear in both complemented and uncomplemented form

13) A full-adder has a $\mathrm{C_{in}} = 0$. What are the sum $(\sum)$ and the carry $(\mathrm{C_{out}})$ when $\mathrm{A} = 1$ and $\mathrm{B} = 1$?
   a) $\sum = 0, \mathrm{C_{out}} = 0$
   b) $\sum = 0, \mathrm{C_{out}} = 1$
   c) $\sum = 1, \mathrm{C_{out}} = 0$
   d) $\sum = 1, \mathrm{C_{out}} = 1$

14) The following number system is used for K-map representation?
   a) Binary
   b) BCD
   c) Gray
   d) Hexadecimal

Seat No.	

Set **Q**

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Digital Logic Design (ENTPEC – 01A)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever necessary and mention it clearly.

Section – I

Q.2 Attempt Any Four of the following. **16**

a) Write short note on characteristics of Logic Families.

b) Describe types of hazards in detail.

c) Design and explain 1 - Bit Comparator.

d) Implement half adder using 3:8 Decoder.

e) Implement the following function using NAND gates
$F(A, B, C, D) = \sum m(0, 1, 2, 3, 5, 7, 8, 9, 10, 11)$

Q.3 Attempt Any Two of the following. **12**

a) Implement the following function using single 4:1 Multiplexer:
$F(P, Q, R, S) = \sum m(0, 1, 3, 4, 8, 9, 11, 12, 13, 14, 15)$

b) Explain Master-Slave JK flip-flop in detail

c) Draw Logical diagram of SR flip-flop. Also write the characteristic table, characteristic equation and excitation table of JK flip-flop.

Section – II

Q.4 Answer Any Four of the following. **16**

a) What is shift register. Explain various types of shift registers.

b) Differentiate between Synchronous and Asynchronous sequential circuits.

c) Differentiate between Moore and Mealy state Machines.

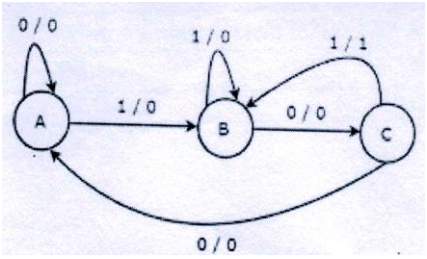
d) Design mod-6 asynchronous counter using T flip-flop.

e) Design mod-7 counter using IC 7490.

Q.5 Answer Any Two of the following. **12**

a) Design 4-bit synchronous counter using T flip-flop.

b) Design a sequential circuit using T-flip-flop for the given state diagram.



c) Design a sequential circuit with two D flip flops A and B, one input X. When X = 0, the state remains same. When X = 1 then Circuit passes through state transitions from 00 to 01 to 11 to 10 and back to 00 and repeats.

Seat No.	

Set **R**

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026

Digital Logic Design (ENTPEC – 01A)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
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4) Assume suitable data wherever necessary and mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 MCQ type question, all Compulsory. **14**

1) A BCD counter is a _____.
a) binary counter b) full-modulus counter
c) decade counter d) divide-by-09 counter

2) A modulus-16 ring counter requires _____ flip-flops.
a) 10 b) 4
c) 16 d) 2

3) State reduction gives _____.
a) Reduction in number of flip-flops
b) Number of flip-flops remain same
c) a or b
d) None of these

4) To operate correctly, starting a ring shift counter requires _____.
a) clearing all the flip-flops
b) clearing one flip-flop and presetting all others
c) presetting all the flip-flops
d) pre-setting one flip-flop and clearing all others

5) A full subtracter circuit requires _____.
a) two inputs and two outputs b) three inputs and one output
c) two inputs and three outputs d) three inputs and two outputs

6) A decoder converts _____.
a) non coded information into coded form
b) coded information into non coded form
c) HIGHs to LOWs
d) LOWs to HIGHs

7) While obtaining minimal sum of products expression _____.
   a) All don't cares are ignored
   b) All don't cares are treated as logic 1's
   c) All don't cares are treated as logic 0's
   d) Only such don't cares that help minimization are treated as logic 1's

8) In positive logic _____.
   a) a HIGH $= 1$, a LOW $= 0$
   b) a LOW $= 1$, a HIGH $= 0$
   c) only HIGHs are present
   d) only LOWs are present

9) Grouping on a K-map always results in the elimination of _____.
   a) variables within the loop that appear only in their uncomplemented form
   b) variables that remain unchanged within the loop
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10) A full-adder has a $C_{in} = 0$. What are the sum $(\sum)$ and the carry (C_{out}) when $A = 1$ and $B = 1$?
   a) $\sum = 0, C_{out} = 0$
   b) $\sum = 0, C_{out} = 1$
   c) $\sum = 1, C_{out} = 0$
   d) $\sum = 1, C_{out} = 1$

11) The following number system is used for K-map representation?
   a) Binary
   b) BCD
   c) Gray
   d) Hexadecimal

12) The MOD number of counter is _____.
   a) The max. possible number of states
   b) The actual number of states in a sequence
   c) The number of flip-flops
   d) None of these

13) What is the largest number of data inputs which a data selector with two control inputs can handle?
   a) 2
   b) 8
   c) 4
   d) 16

14) The terminal count of modulus-11 binary counter is _____.
   a) 1010
   b) 1001
   c) 1000
   d) 1100

Seat No.	

Set **R**

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Digital Logic Design (ENTPEC – 01A)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever necessary and mention it clearly.

Section – I

Q.2 Attempt Any Four of the following. **16**

a) Write short note on characteristics of Logic Families.

b) Describe types of hazards in detail.

c) Design and explain 1 - Bit Comparator.

d) Implement half adder using 3:8 Decoder.

e) Implement the following function using NAND gates
$F(A, B, C, D) = \sum m(0, 1, 2, 3, 5, 7, 8, 9, 10, 11)$

Q.3 Attempt Any Two of the following. **12**

a) Implement the following function using single 4:1 Multiplexer:
$F(P, Q, R, S) = \sum m(0, 1, 3, 4, 8, 9, 11, 12, 13, 14, 15)$

b) Explain Master-Slave JK flip-flop in detail

c) Draw Logical diagram of SR flip-flop. Also write the characteristic table, characteristic equation and excitation table of JK flip-flop.

Section – II

Q.4 Answer Any Four of the following. **16**

a) What is shift register. Explain various types of shift registers.

b) Differentiate between Synchronous and Asynchronous sequential circuits.

c) Differentiate between Moore and Mealy state Machines.

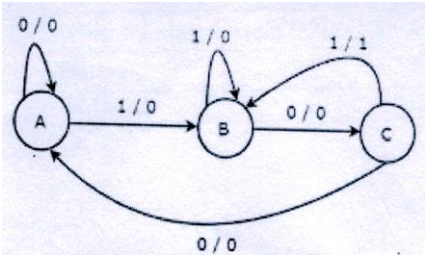
d) Design mod-6 asynchronous counter using T flip-flop.

e) Design mod-7 counter using IC 7490.

Q.5 Answer Any Two of the following. **12**

a) Design 4-bit synchronous counter using T flip-flop.

b) Design a sequential circuit using T-flip-flop for the given state diagram.



c) Design a sequential circuit with two D flip flops A and B, one input X. When X = 0, the state remains same. When X = 1 then Circuit passes through state transitions from 00 to 01 to 11 to 10 and back to 00 and repeats.

Seat No.	

Set **S**

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026

Digital Logic Design (ENTPEC – 01A)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
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4) Assume suitable data wherever necessary and mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 MCQ type question, all Compulsory. **14**

1) A full-adder has a $C_{in} = 0$. What are the sum $(\sum)$ and the carry (C_{out}) when $A = 1$ and $B = 1$?
a) $\sum = 0, C_{out} = 0$ b) $\sum = 0, C_{out} = 1$
c) $\sum = 1, C_{out} = 0$ d) $\sum = 1, C_{out} = 1$

2) The following number system is used for K-map representation?
a) Binary b) BCD
c) Gray d) Hexadecimal

3) The MOD number of counter is _____.
a) The max. possible number of states
b) The actual number of states in a sequence
c) The number of flip-flops
d) None of these

4) What is the largest number of data inputs which a data selector with two control inputs can handle?
a) 2 b) 8
c) 4 d) 16

5) The terminal count of modulus-11 binary counter is _____.
a) 1010 b) 1001
c) 1000 d) 1100

6) A BCD counter is a _____.
a) binary counter b) full-modulus counter
c) decade counter d) divide-by-09 counter

7) A modulus-16 ring counter requires _____ flip-flops.
a) 10 b) 4
c) 16 d) 2

8) State reduction gives _____.
a) Reduction in number of flip-flops
b) Number of flip-flops remain same
c) a or b
d) None of these

9) To operate correctly, starting a ring shift counter requires _____.
a) clearing all the flip-flops
b) clearing one flip-flop and presetting all others
c) presetting all the flip-flops
d) pre-setting one flip-flop and clearing all others

10) A full subtracter circuit requires _____.
a) two inputs and two outputs b) three inputs and one output
c) two inputs and three outputs d) three inputs and two outputs

11) A decoder converts _____.
a) non coded information into coded form
b) coded information into non coded form
c) HIGHs to LOWs
d) LOWs to HIGHs

12) While obtaining minimal sum of products expression _____.
a) All don't cares are ignored
b) All don't cares are treated as logic 1's
c) All don't cares are treated as logic 0's
d) Only such don't cares that help minimization are treated as logic 1's

13) In positive logic _____.
a) a HIGH = 1, a LOW = 0 b) a LOW = 1, a HIGH = 0
c) only HIGHs are present d) only LOWs are present

14) Grouping on a K-map always results in the elimination of _____.
a) variables within the loop that appear only in their uncomplemented form
b) variables that remain unchanged within the loop
c) variables within the loop that appear only in their complemented form
d) variables within the loop that appear in both complemented and uncomplemented form

Seat No.	

Set **S**

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Digital Logic Design (ENTPEC – 01A)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever necessary and mention it clearly.

Section – I

Q.2 Attempt Any Four of the following. **16**

a) Write short note on characteristics of Logic Families.

b) Describe types of hazards in detail.

c) Design and explain 1 - Bit Comparator.

d) Implement half adder using 3:8 Decoder.

e) Implement the following function using NAND gates
$F(A, B, C, D) = \sum m(0, 1, 2, 3, 5, 7, 8, 9, 10, 11)$

Q.3 Attempt Any Two of the following. **12**

a) Implement the following function using single 4:1 Multiplexer:
$F(P, Q, R, S) = \sum m(0, 1, 3, 4, 8, 9, 11, 12, 13, 14, 15)$

b) Explain Master-Slave JK flip-flop in detail

c) Draw Logical diagram of SR flip-flop. Also write the characteristic table, characteristic equation and excitation table of JK flip-flop.

Section – II

Q.4 Answer Any Four of the following. **16**

a) What is shift register. Explain various types of shift registers.

b) Differentiate between Synchronous and Asynchronous sequential circuits.

c) Differentiate between Moore and Mealy state Machines.

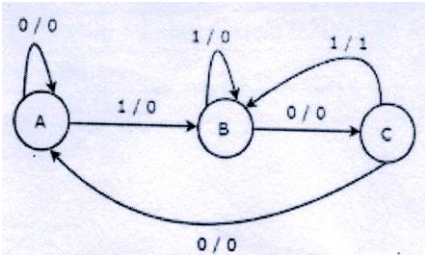
d) Design mod-6 asynchronous counter using T flip-flop.

e) Design mod-7 counter using IC 7490.

Q.5 Answer Any Two of the following. **12**

a) Design 4-bit synchronous counter using T flip-flop.

b) Design a sequential circuit using T-flip-flop for the given state diagram.



c) Design a sequential circuit with two D flip flops A and B, one input X. When X = 0, the state remains same. When X = 1 then Circuit passes through state transitions from 00 to 01 to 11 to 10 and back to 00 and repeats.

SLR-QH-497

Seat No.	

Set P

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026

Fundamentals of Image Processing (ENTPEC – 01B)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data wherever necessary and mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 MCQ type question, all Compulsory. **14**

1) The first step in a digital image processing system is _____.
a) Image enhancement b) Image acquisition
c) Image restoration d) Image segmentation

2) The spatial resolution of an image refers to _____.
a) Number of bits per pixel
b) Number of pixels per unit area
c) Contrast level of an image
d) Gray-level distribution

3) Power-law transformation is commonly known as _____.
a) Gamma correction b) Log correction
c) Histogram equalization d) Contrast stretching

4) Contrast stretching improves _____.
a) Spatial resolution
b) Dynamic range of gray levels
c) Noise removal
d) Histogram equalization

5) The Discrete Fourier Transform (DFT) is mainly used in image processing to _____.
a) Compress an image
b) Transform an image from spatial domain to frequency domain
c) Remove colors from an image
d) Convert binary image to grayscale

6) The main drawback of Ideal High Pass Filtering is _____.
a) Smooth output
b) Ringing artifacts due to sharp cutoff
c) Low contrast
d) Loss of phase information

7) Canny, Sobel, and Prewitt operators are used for _____.
a) Thresholding b) Edge detection
c) Region merging d) Smoothing

8) Watershed segmentation is based on the concept of _____.
a) Histogram equalization b) Topographic interpretation
c) Frequency domain filtering d) KL transform

9) In region splitting and merging, segmentation starts with _____.
a) Single pixel b) Entire image
c) Histogram of image d) Edge map

10) DCT (Discrete Cosine Transform) is widely used in _____.
a) Image restoration b) Image compression (JPEG)
c) Image segmentation d) Medical imaging

11) KL Transform is also known as _____.
a) Hotelling Transform b) Discrete Fourier Transform
c) Cosine Transform d) Laplace Transform

12) DCT uses _____.
a) Cosine basis functions only b) Sine basis functions only
c) Complex exponentials d) Random functions

13) Histogram specification is also known as _____.
a) Histogram stretching b) Histogram matching
c) Histogram equalization d) Histogram scaling

14) Medical image processing applications include _____.
a) Tumor detection b) Disease classification
c) 3D visualization of organs d) All of the above

Seat No.	

Set | **P**

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Fundamentals of Image Processing (ENTPEC – 01B)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever necessary and mention it clearly.

SECTION – I

Q.2 Solve any four of the following. **16**

a) What is sampling and quantization in image processing?

b) Explain RGB color Model.

c) What are the basic gray level transformations?

d) Explain smoothing filters.

e) What is digital negative? Give an application for it. Find the digital Negative of the image $f(x,y)$.

$$f(x,y) = \begin{matrix} 4 & 3 & 2 & 1 \\ 3 & 1 & 2 & 4 \\ 5 & 1 & 6 & 2 \\ 2 & 3 & 5 & 6 \end{matrix}$$

Q.3 Solve any two of the following. **12**

a) Explain with block diagram components of the Image processing system.

b) Explain Gaussian and Butterworth filters for smoothening and sharpening.

c) Explain with neat diagram gray level slicing & bit plane slicing.

SECTION – II

Q.4 Answer any four of the following. **16**

a) Explain Point, line and edge detection.

b) Write a mask of Roberts operator, Sobel operator and Prewitt operator.

c) Explain Discrete Cosine Transform.

d) What is the global threshold for segmentation? Give algorithm for obtaining threshold value.

e) Define histogram and explain histogram equalization.

Q.5 Answer any two of the following. **12**

a) Explain Fourier Transform: Discrete and Continuous and Give Properties of Fourier Transform.

b) Explain Dilation & erosion with Example.

c) Explain fingerprint recognition as an application in image processing.

Seat No.	

Set **Q**

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026

Fundamentals of Image Processing (ENTPEC – 01B)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data wherever necessary and mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 MCQ type question, all Compulsory. **14**

1) Watershed segmentation is based on the concept of _____.
a) Histogram equalization b) Topographic interpretation
c) Frequency domain filtering d) KL transform

2) In region splitting and merging, segmentation starts with _____.
a) Single pixel b) Entire image
c) Histogram of image d) Edge map

3) DCT (Discrete Cosine Transform) is widely used in _____.
a) Image restoration b) Image compression (JPEG)
c) Image segmentation d) Medical imaging

4) KL Transform is also known as _____.
a) Hotelling Transform b) Discrete Fourier Transform
c) Cosine Transform d) Laplace Transform

5) DCT uses _____.
a) Cosine basis functions only b) Sine basis functions only
c) Complex exponentials d) Random functions

6) Histogram specification is also known as _____.
a) Histogram stretching b) Histogram matching
c) Histogram equalization d) Histogram scaling

7) Medical image processing applications include _____.
a) Tumor detection b) Disease classification
c) 3D visualization of organs d) All of the above

8) The first step in a digital image processing system is _____.
a) Image enhancement b) Image acquisition
c) Image restoration d) Image segmentation

9) The spatial resolution of an image refers to _____.
a) Number of bits per pixel
b) Number of pixels per unit area
c) Contrast level of an image
d) Gray-level distribution

10) Power-law transformation is commonly known as _____.
a) Gamma correction b) Log correction
c) Histogram equalization d) Contrast stretching

11) Contrast stretching improves _____.
a) Spatial resolution
b) Dynamic range of gray levels
c) Noise removal
d) Histogram equalization

12) The Discrete Fourier Transform (DFT) is mainly used in image processing to _____.
a) Compress an image
b) Transform an image from spatial domain to frequency domain
c) Remove colors from an image
d) Convert binary image to grayscale

13) The main drawback of Ideal High Pass Filtering is _____.
a) Smooth output
b) Ringing artifacts due to sharp cutoff
c) Low contrast
d) Loss of phase information

14) Canny, Sobel, and Prewitt operators are used for _____.
a) Thresholding b) Edge detection
c) Region merging d) Smoothing

Seat No.	

Set **Q**

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Fundamentals of Image Processing (ENTPEC – 01B)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever necessary and mention it clearly.

SECTION – I

Q.2 Solve any four of the following. **16**

a) What is sampling and quantization in image processing?

b) Explain RGB color Model.

c) What are the basic gray level transformations?

d) Explain smoothing filters.

e) What is digital negative? Give an application for it. Find the digital Negative of the image $f(x,y)$.

$$f(x,y) = \begin{matrix} 4 & 3 & 2 & 1 \\ 3 & 1 & 2 & 4 \\ 5 & 1 & 6 & 2 \\ 2 & 3 & 5 & 6 \end{matrix}$$

Q.3 Solve any two of the following. **12**

a) Explain with block diagram components of the Image processing system.

b) Explain Gaussian and Butterworth filters for smoothening and sharpening.

c) Explain with neat diagram gray level slicing & bit plane slicing.

SECTION – II

Q.4 Answer any four of the following. **16**

a) Explain Point, line and edge detection.

b) Write a mask of Roberts operator, Sobel operator and Prewitt operator.

c) Explain Discrete Cosine Transform.

d) What is the global threshold for segmentation? Give algorithm for obtaining threshold value.

e) Define histogram and explain histogram equalization.

Q.5 Answer any two of the following. **12**

a) Explain Fourier Transform: Discrete and Continuous and Give Properties of Fourier Transform.

b) Explain Dilation & erosion with Example.

c) Explain fingerprint recognition as an application in image processing.

SLR-QH-497

Seat No.	

Set R

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026

Fundamentals of Image Processing (ENTPEC – 01B)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data wherever necessary and mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 MCQ type question, all Compulsory. **14**

1) KL Transform is also known as _____.
a) Hotelling Transform b) Discrete Fourier Transform
c) Cosine Transform d) Laplace Transform

2) DCT uses _____.
a) Cosine basis functions only b) Sine basis functions only
c) Complex exponentials d) Random functions

3) Histogram specification is also known as _____.
a) Histogram stretching b) Histogram matching
c) Histogram equalization d) Histogram scaling

4) Medical image processing applications include _____.
a) Tumor detection b) Disease classification
c) 3D visualization of organs d) All of the above

5) The first step in a digital image processing system is _____.
a) Image enhancement b) Image acquisition
c) Image restoration d) Image segmentation

6) The spatial resolution of an image refers to _____.
a) Number of bits per pixel
b) Number of pixels per unit area
c) Contrast level of an image
d) Gray-level distribution

7) Power-law transformation is commonly known as _____.
a) Gamma correction b) Log correction
c) Histogram equalization d) Contrast stretching

8) Contrast stretching improves _____.
   a) Spatial resolution
   b) Dynamic range of gray levels
   c) Noise removal
   d) Histogram equalization

9) The Discrete Fourier Transform (DFT) is mainly used in image processing to _____.
   a) Compress an image
   b) Transform an image from spatial domain to frequency domain
   c) Remove colors from an image
   d) Convert binary image to grayscale

10) The main drawback of Ideal High Pass Filtering is _____.
   a) Smooth output
   b) Ringing artifacts due to sharp cutoff
   c) Low contrast
   d) Loss of phase information

11) Canny, Sobel, and Prewitt operators are used for _____.
   a) Thresholding
   b) Edge detection
   c) Region merging
   d) Smoothing

12) Watershed segmentation is based on the concept of _____.
   a) Histogram equalization
   b) Topographic interpretation
   c) Frequency domain filtering
   d) KL transform

13) In region splitting and merging, segmentation starts with _____.
   a) Single pixel
   b) Entire image
   c) Histogram of image
   d) Edge map

14) DCT (Discrete Cosine Transform) is widely used in _____.
   a) Image restoration
   b) Image compression (JPEG)
   c) Image segmentation
   d) Medical imaging

Seat No.	

Set R

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Fundamentals of Image Processing (ENTPEC – 01B)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever necessary and mention it clearly.

SECTION – I

Q.2 Solve any four of the following. **16**

a) What is sampling and quantization in image processing?

b) Explain RGB color Model.

c) What are the basic gray level transformations?

d) Explain smoothing filters.

e) What is digital negative? Give an application for it. Find the digital Negative of the image $f(x,y)$.

$$f(x,y) = \begin{matrix} 4 & 3 & 2 & 1 \\ 3 & 1 & 2 & 4 \\ 5 & 1 & 6 & 2 \\ 2 & 3 & 5 & 6 \end{matrix}$$

Q.3 Solve any two of the following. **12**

a) Explain with block diagram components of the Image processing system.

b) Explain Gaussian and Butterworth filters for smoothening and sharpening.

c) Explain with neat diagram gray level slicing & bit plane slicing.

SECTION – II

Q.4 Answer any four of the following. **16**

a) Explain Point, line and edge detection.

b) Write a mask of Roberts operator, Sobel operator and Prewitt operator.

c) Explain Discrete Cosine Transform.

d) What is the global threshold for segmentation? Give algorithm for obtaining threshold value.

e) Define histogram and explain histogram equalization.

Q.5 Answer any two of the following. **12**

a) Explain Fourier Transform: Discrete and Continuous and Give Properties of Fourier Transform.

b) Explain Dilation & erosion with Example.

c) Explain fingerprint recognition as an application in image processing.

Seat No.	

Set **S**

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026

Fundamentals of Image Processing (ENTPEC – 01B)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data wherever necessary and mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 MCQ type question, all Compulsory. **14**

1) The main drawback of Ideal High Pass Filtering is _____.
a) Smooth output
b) Ringing artifacts due to sharp cutoff
c) Low contrast
d) Loss of phase information

2) Canny, Sobel, and Prewitt operators are used for _____.
a) Thresholding b) Edge detection
c) Region merging d) Smoothing

3) Watershed segmentation is based on the concept of _____.
a) Histogram equalization b) Topographic interpretation
c) Frequency domain filtering d) KL transform

4) In region splitting and merging, segmentation starts with _____.
a) Single pixel b) Entire image
c) Histogram of image d) Edge map

5) DCT (Discrete Cosine Transform) is widely used in _____.
a) Image restoration b) Image compression (JPEG)
c) Image segmentation d) Medical imaging

6) KL Transform is also known as _____.
a) Hotelling Transform b) Discrete Fourier Transform
c) Cosine Transform d) Laplace Transform

7) DCT uses _____.
a) Cosine basis functions only b) Sine basis functions only
c) Complex exponentials d) Random functions

8) Histogram specification is also known as _____.
   a) Histogram stretching
   b) Histogram matching
   c) Histogram equalization
   d) Histogram scaling

9) Medical image processing applications include _____.
   a) Tumor detection
   b) Disease classification
   c) 3D visualization of organs
   d) All of the above

10) The first step in a digital image processing system is _____.
   a) Image enhancement
   b) Image acquisition
   c) Image restoration
   d) Image segmentation

11) The spatial resolution of an image refers to _____.
   a) Number of bits per pixel
   b) Number of pixels per unit area
   c) Contrast level of an image
   d) Gray-level distribution

12) Power-law transformation is commonly known as _____.
   a) Gamma correction
   b) Log correction
   c) Histogram equalization
   d) Contrast stretching

13) Contrast stretching improves _____.
   a) Spatial resolution
   b) Dynamic range of gray levels
   c) Noise removal
   d) Histogram equalization

14) The Discrete Fourier Transform (DFT) is mainly used in image processing to _____.
   a) Compress an image
   b) Transform an image from spatial domain to frequency domain
   c) Remove colors from an image
   d) Convert binary image to grayscale

Seat No.	

Set **S**

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Fundamentals of Image Processing (ENTPEC – 01B)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever necessary and mention it clearly.

SECTION – I

Q.2 Solve any four of the following. **16**

a) What is sampling and quantization in image processing?

b) Explain RGB color Model.

c) What are the basic gray level transformations?

d) Explain smoothing filters.

e) What is digital negative? Give an application for it. Find the digital Negative of the image $f(x,y)$.

$$f(x,y) = \begin{matrix} 4 & 3 & 2 & 1 \\ 3 & 1 & 2 & 4 \\ 5 & 1 & 6 & 2 \\ 2 & 3 & 5 & 6 \end{matrix}$$

Q.3 Solve any two of the following. **12**

a) Explain with block diagram components of the Image processing system.

b) Explain Gaussian and Butterworth filters for smoothening and sharpening.

c) Explain with neat diagram gray level slicing & bit plane slicing.

SECTION – II

Q.4 Answer any four of the following. **16**

a) Explain Point, line and edge detection.

b) Write a mask of Roberts operator, Sobel operator and Prewitt operator.

c) Explain Discrete Cosine Transform.

d) What is the global threshold for segmentation? Give algorithm for obtaining threshold value.

e) Define histogram and explain histogram equalization.

Q.5 Answer any two of the following. **12**

a) Explain Fourier Transform: Discrete and Continuous and Give Properties of Fourier Transform.

b) Explain Dilation & erosion with Example.

c) Explain fingerprint recognition as an application in image processing.

SLR-QH-498

Seat No.		Set	P

Marks Obtained		Signature of Examiner		Signature of Junior Supervisor	

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Creativity and Design Thinking (AEC-02)

Day & Date: Tuesday, 12-05-2026 Max. Marks: 50
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Mention Question Paper Set (P/Q/R/S) on Top of Page.
4) Use of non-programmable calculators is allowed.

Answer

Q.1 Multiple Choice Questions.

1) Innovation mainly focuses on _____.
a) Generating ideas only b) Implementing creative ideas
c) Copying others d) Marketing

2) Creativity and Innovation together lead to _____.
a) Routine performance b) Problem discovery
c) Practical novelty d) Mechanical repetition

3) A characteristic of a creative person is _____.
a) Rigidity b) Curiosity
c) Fearfulness d) Passivity

4) Which of the following represents a major *barrier* to creativity?
a) Time pressure b) Risk-taking
c) Playfulness d) Flexibility

5) The “Ideate” stage in design thinking focuses on _____.
a) Understanding users b) Generating solutions
c) Testing ideas d) Building prototypes

6) Design thinking is fundamentally _____.
a) User-centered b) Manager-centered
c) Engineer-centered d) Cost-centered

7) Which of these helps to *overcome* creative blocks?
a) Collaboration b) Fear of mistakes
c) Over-planning d) Isolation

8) A design thinker empathizes to _____.
a) Know customer feelings and needs
b) Find product cost
c) Estimate profit
d) Collect market data

9) The *Define* phase results in _____.
a) Problem statement b) Prototype
c) Survey d) Marketing plan

10) Barriers to creativity can be removed through _____.
a) Open communication b) Discouragement
c) Repetition d) Judgmental thinking

11) The last phase of design thinking is _____.
a) Prototype b) Test
c) Ideate d) Define

12) Which term best describes the ability to see connections between unrelated ideas?
a) Fluency b) Flexibility
c) Originality d) Association

13) One of the benefits of design thinking is _____.
a) Focusing on user-friendly solutions
b) Ignoring customers
c) Cost reduction only
d) Quick fixes

14) Divergent and convergent thinking together ensure _____.
a) Balance between idea generation and selection
b) Faster production
c) Market analysis
d) Less creativity

15) In brainstorming, criticism should be ____.
a) Encouraged b) Postponed
c) Ignored d) Repeated

16) SCAMPER is mainly used for _____.
a) Modifying existing ideas b) Market study
c) Testing materials d) Estimating cost

17) In mind mapping, central themes are _____.
a) Placed at center with branches outward
b) At the edges
c) Hidden
d) Random

18) TRIZ encourages _____.
a) Systematic innovation through contradictions
b) Copying existing patents
c) Brainstorm blocking
d) Linear analysis

19) Which is a creative ideation technique?
a) Storyboarding b) Checklist creation
c) Prototype testing d) Quality audit

20) Concept sketching helps _____.
a) Express ideas visually b) Replace written reports
c) Perform tests d) Manage finance

21) In SCAMPER, “C” stands for _____.
a) Combine b) Copy
c) Create d) Classify

22) The purpose of divergent thinking is to _____.
a) Explore many possibilities b) Select one answer
c) Limit imagination d) Finalize design

23) Which of the following tools is best suited for *organizing ideas?*
a) Mind map b) Pie chart
c) Spreadsheet d) Histogram

24) “Storytelling” in concept development helps designers _____.
a) Communicate user experiences effectively
b) Draw detailed schematics
c) Analyze budget
d) Fix prototypes

25) The last step of concept development is _____.
a) Visualization of ideas b) Brainstorming
c) TRIZ analysis d) Market feedback

26) Prototyping in design helps _____.
a) Convert abstract ideas into tangible models
b) Replace manufacturing
c) Finalize budgets
d) Avoid testing

27) Which prototype type is *cheapest* and fastest?
a) Low-fidelity b) High-fidelity
c) Final d) Medium

28) High-fidelity prototypes allow _____.
a) User interaction and realism
b) Concept only
c) Paper sketching
d) Cost saving only

29) The iterative approach focuses on _____.
a) Refining design through repeated feedback
b) Making single model
c) Reducing creativity
d) Avoiding testing

30) The first step in rapid prototyping is _____.
a) 3D CAD modeling b) Final assembly
c) Testing d) Polishing

31) Which tool is commonly used in rapid prototyping?
a) 3D printer b) Spreadsheet
c) CNC lathe d) Mind map

32) User testing is most crucial in which stage?
a) Prototype evaluation b) Ideation
c) Definition d) Empathize

33) A real-life application of creative design is _____.
a) Smart wearable devices b) Paper waste
c) Redundant designs d) Manual data entry

34) Brainstorming during prototype improvement helps _____.
a) Generate alternative solutions
b) Restrict ideas
c) Delay work
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35) Which of the following prototypes allows early visualization?
a) Sketch model b) CAD simulation
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c) Prototype sketch
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39) Which phase is crucial for sustainability decisions?
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40) Product life-cycle assessment includes _____.
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c) Marketing only
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41) A product designed for durability supports _____.
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c) Short-term use d) High waste

42) Eco-friendly design considers _____.
a) Material selection and energy efficiency
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43) “Design for reuse” aims to _____.
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45) Spiral model combines _____.
a) Prototyping and risk management
b) Linear and agile stages
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46) The staged (waterfall) model is _____.
a) Sequential b) Iterative
c) Flexible d) Rapid

47) Case studies in sustainable design show _____.
a) Application of eco-friendly materials
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48) The most important sustainability factor in manufacturing is _____.
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b) Advertisement
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d) Design color

49) Which practice promotes a circular economy?
a) Recycling and remanufacturing
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50) Sustainable engineering mainly targets _____.
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b) Maximizing output only
c) Technological monopoly
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Seat No.		Set	Q

Marks Obtained		Signature of Examiner		Signature of Junior Supervisor	

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Creativity and Design Thinking (AEC-02)

Day & Date: Tuesday, 12-05-2026 Max. Marks: 50
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Mention Question Paper Set (P/Q/R/S) on Top of Page.
4) Use of non-programmable calculators is allowed.

Answer

Q.1 Multiple Choice Questions.

1) In SCAMPER, "C" stands for _____.
a) Combine b) Copy
c) Create d) Classify

2) The purpose of divergent thinking is to _____.
a) Explore many possibilities b) Select one answer
c) Limit imagination d) Finalize design

3) Which of the following tools is best suited for *organizing ideas?*
a) Mind map b) Pie chart
c) Spreadsheet d) Histogram

4) "Storytelling" in concept development helps designers _____.
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d) Fix prototypes

5) The last step of concept development is _____.
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6) Prototyping in design helps _____.
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7) Which prototype type is *cheapest* and fastest?
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50) Concept sketching helps _____.

a) Express ideas visually
b) Replace written reports
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Seat No.		Set	R

Marks Obtained		Signature of Examiner		Signature of Junior Supervisor	

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Creativity and Design Thinking (AEC-02)

Day & Date: Tuesday, 12-05-2026 Max. Marks: 50
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
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3) Mention Question Paper Set (P/Q/R/S) on Top of Page.
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c) Marketing only
d) Storage cost

SLR-QH-498

Seat No.		Set	S

Marks Obtained		Signature of Examiner		Signature of Junior Supervisor	

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Creativity and Design Thinking (AEC-02)

Day & Date: Tuesday, 12-05-2026 Max. Marks: 50
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
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Answer

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b) Prototype
c) Survey
d) Marketing plan

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a) Open communication
b) Discouragement
c) Repetition
d) Judgmental thinking

SLR-QH-499

Seat No.		Set	P

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Honors in Artificial Intelligence and Machine Learning
Machine Learning (ENTHON-03A)

Day & Date: Thursday, 14-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. **14**

1) How can you handle missing or corrupted data in a dataset?
a) Drop missing rows or columns
b) Assign a unique category to missing values
c) Replace missing values with mean/median/mode
d) All of the above

2) What is machine learning?
a) Selective acquisition of knowledge through the use of manual programs
b) Selective acquisition of knowledge through the use of computer programs
c) Autonomous acquisition of knowledge through the use of manual programs
d) Autonomous acquisition of knowledge through the use of computer programs

3) Machine learning algorithms build a model based on sample data, known as _____.
a) Training Data b) Transfer Data
c) Data Training d) None of the above

4) _____ is the machine learning algorithms that can be used with labeled data.
a) Regression algorithms b) Clustering algorithms
c) Association algorithms d) All of the above

5) _____ is used as an input to the machine learning model for training and prediction purposes.
a) Feature
b) Feature Vector
c) Both a and b
d) None of the above

6) _____ is the scenario when the model fails to decipher the underlying trend in the input data.
a) Overfitting
b) Underfitting
c) Both a and b
d) None of the above

7) The term machine learning was coined by _____.
a) James Gosling
b) Arthur Samuel
c) Guido van Rossum
d) None of the above

8) Which of the following is not a supervised learning?
a) PCA
b) Naive Bayesian
c) Linear Regression
d) Decision Tree

9) The most common issue when using ML is _____.
a) Lack of skilled resources
b) Inadequate Infrastructure
c) Poor Data Quality
d) None of these

10) _____ is a widely used and effective machine learning algorithm based on the idea of bagging.
a) Regression
b) Classification
c) Decision Tree
d) Random Forest

11) Real-Time decisions, Game Al, Learning Tasks, Skill acquisition, and Robot Navigation are applications of _____.
a) Reinforcement Learning
b) Supervised Learning: Classification
c) Unsupervised Learning: Regression
d) None of the above

12) _____ is a disadvantage of decision trees.
a) Decision trees are robust to outliers
b) Decision trees are prone to be overfit
c) Both a and b
d) None of the above

13) _____ is a part of machine learning that works with neural networks.
a) Artificial intelligence
b) Deep learning
c) Both a and b
d) None of the above

14) Which machine learning models are trained to make a series of decisions based on the rewards and feedback they receive for their actions?
a) Supervised learning
b) Unsupervised learning
c) Reinforcement learning
d) All of the above

Seat No.		Set	P

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Honors in Artificial Intelligence and Machine Learning
Machine Learning (ENTHON-03A)

Day & Date: Thursday, 14-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt Any Four Questions. **16**

a) Explain data processing steps for ML in brief.

b) Explain Binary Classification with examples.

c) Explain concept of perceptron with neat diagram.

d) Explain Supervised type of learning with examples.

e) Explain the type of regression. Illustrate K means clustering algorithm with an example.

Q.3 Attempt Any Two Questions. **12**

a) Distinguish between supervised learning and Reinforcement learning. Illustrate with an example.

b) Compare Classification with regression with an example.

c) Explain overfitting and underfitting. How it can affect model generalization.

SECTION – II

Q.4 Attempt Any Four Questions. **16**

a) Explain Feed Forward Network & Back Propagation Algorithm.

b) Explain naive bayes classification in brief.

c) Explain the terms: Gini Index.

d) Describe the random forest algorithm in brief.

e) What is ANN? Explain different types of ANN.

Q.5 Attempt Any Two Questions. **12**

a) Explain Self driving cars as Machine Learning application in brief.

b) Discuss decision tree algorithm with example. Mention its advantages and disadvantages.

c) Differentiate between Deep learning vs Machine Learning.

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Honors in Artificial Intelligence and Machine Learning
Machine Learning (ENTHON-03A)

Day & Date: Thursday, 14-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. **14**

1) Which of the following is not a supervised learning?
a) PCA b) Naive Bayesian
c) Linear Regression d) Decision Tree

2) The most common issue when using ML is _____.
a) Lack of skilled resources b) Inadequate Infrastructure
c) Poor Data Quality d) None of these

3) _____ is a widely used and effective machine learning algorithm based on the idea of bagging.
a) Regression b) Classification
c) Decision Tree d) Random Forest

4) Real-Time decisions, Game Al, Learning Tasks, Skill acquisition, and Robot Navigation are applications of _____.
a) Reinforcement Learning
b) Supervised Learning: Classification
c) Unsupervised Learning: Regression
d) None of the above

5) _____ is a disadvantage of decision trees.
a) Decision trees are robust to outliers
b) Decision trees are prone to be overfit
c) Both a and b
d) None of the above

6) _____ is a part of machine learning that works with neural networks.
a) Artificial intelligence b) Deep learning
c) Both a and b d) None of the above

7) Which machine learning models are trained to make a series of decisions based on the rewards and feedback they receive for their actions?

a) Supervised learning
b) Unsupervised learning
c) Reinforcement learning
d) All of the above

8) How can you handle missing or corrupted data in a dataset?

a) Drop missing rows or columns
b) Assign a unique category to missing values
c) Replace missing values with mean/median/mode
d) All of the above

9) What is machine learning?

a) Selective acquisition of knowledge through the use of manual programs
b) Selective acquisition of knowledge through the use of computer programs
c) Autonomous acquisition of knowledge through the use of manual programs
d) Autonomous acquisition of knowledge through the use of computer programs

10) Machine learning algorithms build a model based on sample data, known as _____.

a) Training Data
b) Transfer Data
c) Data Training
d) None of the above

11) _____ is the machine learning algorithms that can be used with labeled data.

a) Regression algorithms
b) Clustering algorithms
c) Association algorithms
d) All of the above

12) _____ is used as an input to the machine learning model for training and prediction purposes.

a) Feature
b) Feature Vector
c) Both a and b
d) None of the above

13) _____ is the scenario when the model fails to decipher the underlying trend in the input data.

a) Overfitting
b) Underfitting
c) Both a and b
d) None of the above

14) The term machine learning was coined by _____.

a) James Gosling
b) Arthur Samuel
c) Guido van Rossum
d) None of the above

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Honors in Artificial Intelligence and Machine Learning
Machine Learning (ENTHON-03A)

Day & Date: Thursday, 14-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt Any Four Questions. **16**

a) Explain data processing steps for ML in brief.

b) Explain Binary Classification with examples.

c) Explain concept of perceptron with neat diagram.

d) Explain Supervised type of learning with examples.

e) Explain the type of regression. Illustrate K means clustering algorithm with an example.

Q.3 Attempt Any Two Questions. **12**

a) Distinguish between supervised learning and Reinforcement learning. Illustrate with an example.

b) Compare Classification with regression with an example.

c) Explain overfitting and underfitting. How it can affect model generalization.

SECTION – II

Q.4 Attempt Any Four Questions. **16**

a) Explain Feed Forward Network & Back Propagation Algorithm.

b) Explain naive bayes classification in brief.

c) Explain the terms: Gini Index.

d) Describe the random forest algorithm in brief.

e) What is ANN? Explain different types of ANN.

Q.5 Attempt Any Two Questions. **12**

a) Explain Self driving cars as Machine Learning application in brief.

b) Discuss decision tree algorithm with example. Mention its advantages and disadvantages.

c) Differentiate between Deep learning vs Machine Learning.

Seat No.	

Set **R**

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Honors in Artificial Intelligence and Machine Learning
Machine Learning (ENTHON-03A)

Day & Date: Thursday, 14-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. **14**

1) Real-Time decisions, Game Al, Learning Tasks, Skill acquisition, and Robot Navigation are applications of _____.
a) Reinforcement Learning
b) Supervised Learning: Classification
c) Unsupervised Learning: Regression
d) None of the above

2) _____ is a disadvantage of decision trees.
a) Decision trees are robust to outliers
b) Decision trees are prone to be overfit
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3) _____ is a part of machine learning that works with neural networks.
a) Artificial intelligence b) Deep learning
c) Both a and b d) None of the above

4) Which machine learning models are trained to make a series of decisions based on the rewards and feedback they receive for their actions?
a) Supervised learning b) Unsupervised learning
c) Reinforcement learning d) All of the above

5) How can you handle missing or corrupted data in a dataset?
a) Drop missing rows or columns
b) Assign a unique category to missing values
c) Replace missing values with mean/median/mode
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   c) Poor Data Quality
   d) None of these

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   b) Classification
   c) Decision Tree
   d) Random Forest

Seat No.		Set	R

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Honors in Artificial Intelligence and Machine Learning
Machine Learning (ENTHON-03A)

Day & Date: Thursday, 14-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt Any Four Questions. **16**

a) Explain data processing steps for ML in brief.

b) Explain Binary Classification with examples.

c) Explain concept of perceptron with neat diagram.

d) Explain Supervised type of learning with examples.

e) Explain the type of regression. Illustrate K means clustering algorithm with an example.

Q.3 Attempt Any Two Questions. **12**

a) Distinguish between supervised learning and Reinforcement learning. Illustrate with an example.

b) Compare Classification with regression with an example.

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SECTION – II

Q.4 Attempt Any Four Questions. **16**

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b) Explain naive bayes classification in brief.

c) Explain the terms: Gini Index.

d) Describe the random forest algorithm in brief.

e) What is ANN? Explain different types of ANN.

Q.5 Attempt Any Two Questions. **12**

a) Explain Self driving cars as Machine Learning application in brief.

b) Discuss decision tree algorithm with example. Mention its advantages and disadvantages.

c) Differentiate between Deep learning vs Machine Learning.

Seat No.		Set	S

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Honors in Artificial Intelligence and Machine Learning
Machine Learning (ENTHON-03A)

Day & Date: Thursday, 14-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) _____ is the scenario when the model fails to decipher the underlying trend in the input data.
a) Overfitting b) Underfitting
c) Both a and b d) None of the above

2) The term machine learning was coined by _____.
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c) Guido van Rossum d) None of the above

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c) Decision Tree d) Random Forest

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c) Unsupervised Learning: Regression
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b) Decision trees are prone to be overfit
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b) Feature Vector
c) Both a and b
d) None of the above

SLR-QH-499

Seat No.		Set	S

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Honors in Artificial Intelligence and Machine Learning
Machine Learning (ENTHON-03A)

Day & Date: Thursday, 14-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt Any Four Questions. **16**

a) Explain data processing steps for ML in brief.

b) Explain Binary Classification with examples.

c) Explain concept of perceptron with neat diagram.

d) Explain Supervised type of learning with examples.

e) Explain the type of regression. Illustrate K means clustering algorithm with an example.

Q.3 Attempt Any Two Questions. **12**

a) Distinguish between supervised learning and Reinforcement learning. Illustrate with an example.

b) Compare Classification with regression with an example.

c) Explain overfitting and underfitting. How it can affect model generalization.

SECTION – II

Q.4 Attempt Any Four Questions. **16**

a) Explain Feed Forward Network & Back Propagation Algorithm.

b) Explain naive bayes classification in brief.

c) Explain the terms: Gini Index.

d) Describe the random forest algorithm in brief.

e) What is ANN? Explain different types of ANN.

Q.5 Attempt Any Two Questions. **12**

a) Explain Self driving cars as Machine Learning application in brief.

b) Discuss decision tree algorithm with example. Mention its advantages and disadvantages.

c) Differentiate between Deep learning vs Machine Learning.

SLR-QH-502

Seat No.	

Set P

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026 Electromagnetic Field Theory (BTN06501)

Day & Date: Saturday, 02-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data wherever necessary and mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which coordinate system is most suitable for analyzing points in a sphere?
a) Cartesian b) Cylindrical
c) Polar d) Spherical

2) The differential volume dv in a cylindrical coordinate system is?
a) $dxdydz$ b) $\rho d\rho d\phi dz$
c) $\rho^2 d\rho d\phi dz$ d) $d\rho d\phi dz$

3) $\bar{a}_r . \bar{a}_\Phi =$
a) 1 b) zero
c) $\bar{a}_\theta$ d) None

4) Which of the following is false for Coulomb's Law, where Q1 and Q2 - point charges?
a) Force is proportional to Q1.Q2
b) Force is inversely proportional to square of distance between Q1 and Q2
c) Direction is along the direction of line joining point charges Q1 and Q2
d) Depends on permeability of the media

5) The Coulomb constant $\left(\frac{1}{4\pi\varepsilon}\right) =$ _____.
a) 9×10^{-9} b) 9×10^{-8}
c) 9×10^{9} d) 9×10^{8}

6) According to Gauss's law, the electric flux through a closed surface is _____.
a) Directly proportional to the charge enclosed
b) Independent of the charge enclosed
c) Dependent on the shape of the surface
d) Equal to the charge outside the surface

7) Inside a good conductor, the electric field (E) is _____.
a) Infinite
b) Maximum
c) Zero
d) Dependent on voltage

8) The term (dD/dt) in the Maxwell law represents _____.
a) Conduction current
b) Magnetization current
c) Displacement current
d) Convection current

9) Maxwell's equation $\nabla \times \vec{E} = -\frac{\partial \vec{B}}{\partial t}$ is based on _____.
a) Faraday's law of induction
b) Ampere's Law
c) Gauss's Law
d) Ohm's Law

10) In free space (vacuum) for EM wave equation, which of the following is true?
a) $\rho = 0, \vec{J} = 0$
b) $\rho = \epsilon_0, \vec{J} = 0$
c) $\rho = 0, \vec{J} = \mu_0$
d) $\rho = \rho_0, \vec{J} = \vec{J}_0$

11) What is the time-harmonic form of Maxwell's Equation $\left(\nabla \times E = -\frac{\partial B}{\partial t}\right)$?
a) $\nabla \times E = \omega B$
b) $\nabla \times E = -j\omega B$
c) $\nabla \times E = j\omega B$
d) $\nabla \times E = B/j\omega$

12) For a Transmission line with characteristic impedance $Z_0 = 100\Omega$ and a load impedance is $Z_L = 300 + j300\Omega$ the normalized load impedance is _____.
a) $1 + j1$
b) $2 + j2$
c) $3 + j1$
d) $3 + j3$

13) What is the characteristic impedance (Z_0) of a lossless transmission line?
a) $\sqrt{L/C}$
b) $\sqrt{C/L}$
c) $1/\sqrt{LC}$
d) $\sqrt{R/G}$

14) For a lossless line, what are the conditions for the primary constants?
a) $R = 0, G = 0$
b) $R = 0, L = 0$
c) $G = 0, C = 0$
d) $G = 0, L = 0$

Seat No.	

Set **P**

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Electromagnetic Field Theory (BTN06501)

Day & Date: Saturday, 02-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever necessary and mention it clearly.

Section – I

Q.2 Attempt the Any Four. **16**

a) Find a force on charge Q1 $= 3\mu$C due to charge Q2 $= 30\ \mu$C, where Q1 is at point (0,2,1) and Q2 at (2,1,0).

b) Transform the vector $\bar{a}_x$ to Cylindrical Coordinate system at a point (ρ =4, Φ=120°, z=2).

c) Explain Cylindrical Coordinate system in detail with suitable diagram.

d) By using Gauss's law, explain point to point electric field intensity for single spherical shell carrying charge Q with radius R meters.

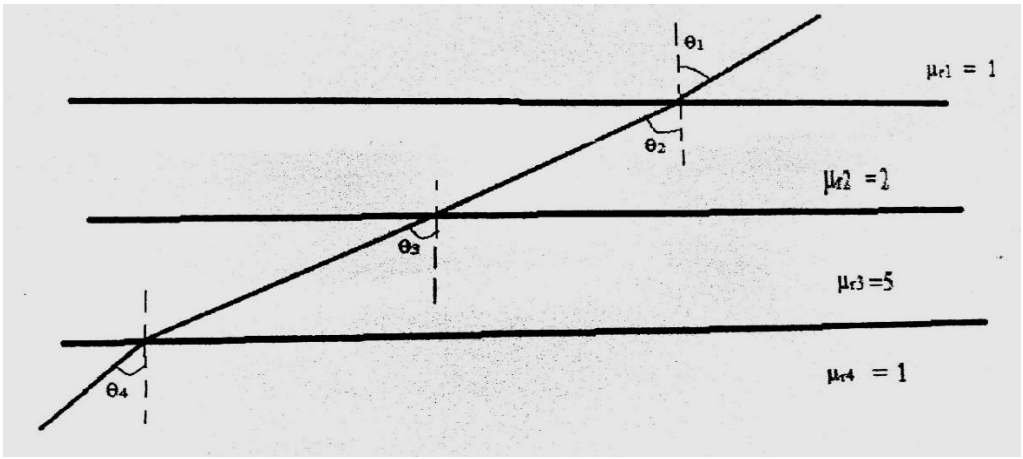
e) Prove $\bar{E} = -\bar{W}$

Q.3 Attempt Any Two. **12**

a) Derive the expression for electric dipole.

b) State and derive for Biot Savart's Law.

c) Two Infinite slabs of magnetic materials are located in a free space. Let unit vector $\hat{a}_z$ is directed upwards. If region 1 is represented by $H = \hat{a}_x - 2\hat{a}_y + 3\hat{a}_z$ KA/m. Determine angle between H and $\hat{a}_z$ in region $1, 2, 3, 4$ as shown in Figure below with permeability's $\mu_{r1} = 1, \mu_{r2} = 2, \mu_{r3} = 5$ and $\mu_{r4} = 1$ respectively.



Section – II

Q.4 Attempt Any Four. **16**

a) Give the Maxwell's Equation of static field.

b) Explain Harmonically Varying Field.

c) State and explain Maxwell's equations in point and Integral form.

d) Explain Transmission line equation with suitable diagram.

e) Derive Continuity equation.

Q.5 Attempt Any Two. **12**

a) State and Explain Poynting theorem with suitable diagram.

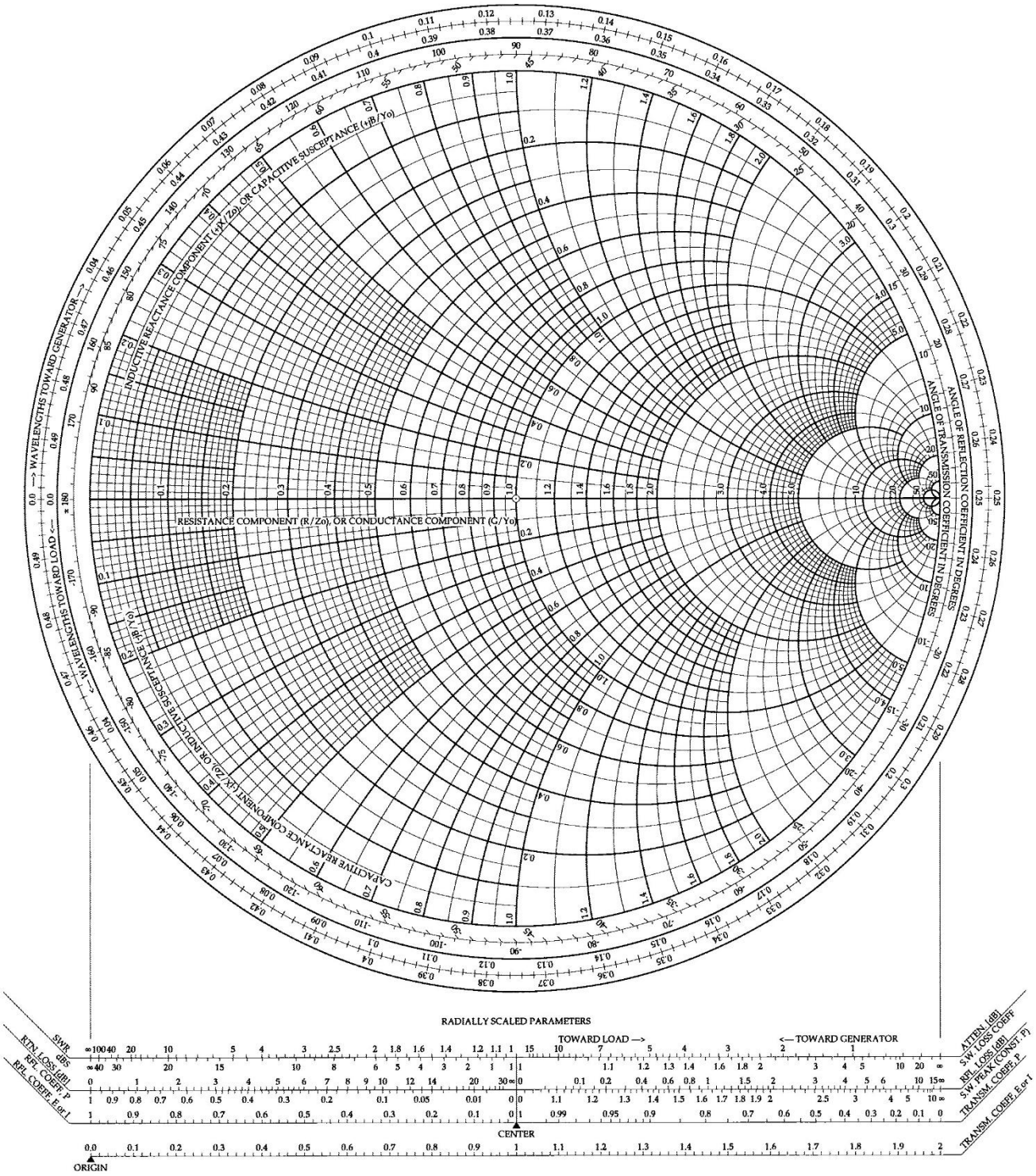
b) A lossless transmission line with characteristics impedance 300 Ω is terminated in a load 300 + j 300 Ω. Using Smith chart, find the

i) VSWR
ii) Magnitude and angle of reflection coefficient at the load
iii) Load admittance
iv) Reflection coefficient at distance of $\lambda/4$ from load.

c) Derive EM wave equation.

The Complete Smith Chart

Black Magic Design



Seat No.	

Set **Q**

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Electromagnetic Field Theory (BTN06501)

Day & Date: Saturday, 02-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) The term (dD/dt) in the Maxwell law represents _____.
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4) What is the time-harmonic form of Maxwell's Equation $\left(\nabla \times E = -\frac{\partial B}{\partial t}\right)$?
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7) For a lossless line, what are the conditions for the primary constants?

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13) According to Gauss's law, the electric flux through a closed surface is _____.

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d) Equal to the charge outside the surface

14) Inside a good conductor, the electric field (E) is _____.

a) Infinite b) Maximum

c) Zero d) Dependent on voltage

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Electromagnetic Field Theory (BTN06501)

Day & Date: Saturday, 02-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
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Section – I

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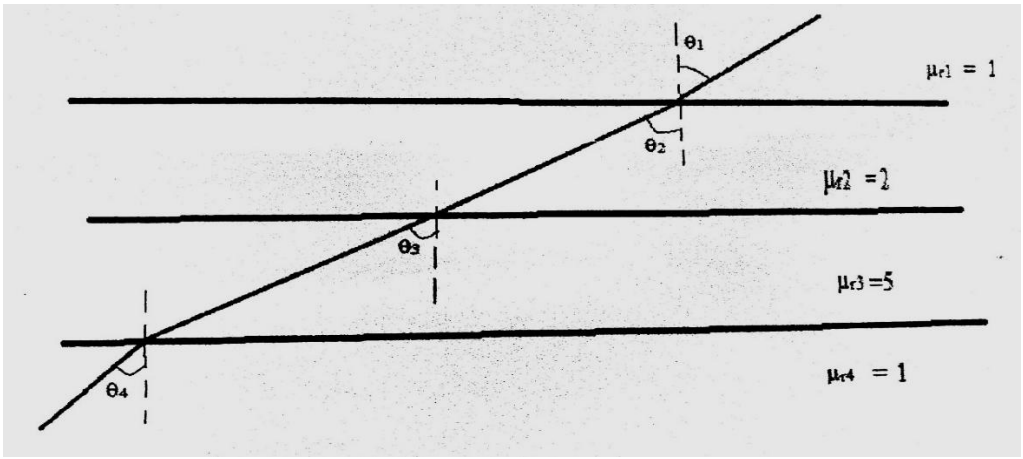
b) State and derive for Biot Savart's Law.

c) Two Infinite slabs of magnetic materials are located in a free space. Let unit vector $\hat{a}_z$ is directed upwards. If region 1 is represented by $H = \hat{a}_x - 2\hat{a}_y + 3\hat{a}_z$ KA/m. Determine angle between H and $\hat{a}_z$ in region $1, 2, 3, 4$ as shown in Figure below with permeability's $\mu_{r1} = 1, \mu_{r2} = 2, \mu_{r3} = 5$ and $\mu_{r4} = 1$ respectively.



Section – II

Q.4 Attempt Any Four. **16**

a) Give the Maxwell's Equation of static field.

b) Explain Harmonically Varying Field.

c) State and explain Maxwell's equations in point and Integral form.

d) Explain Transmission line equation with suitable diagram.

e) Derive Continuity equation.

Q.5 Attempt Any Two. **12**

a) State and Explain Poynting theorem with suitable diagram.

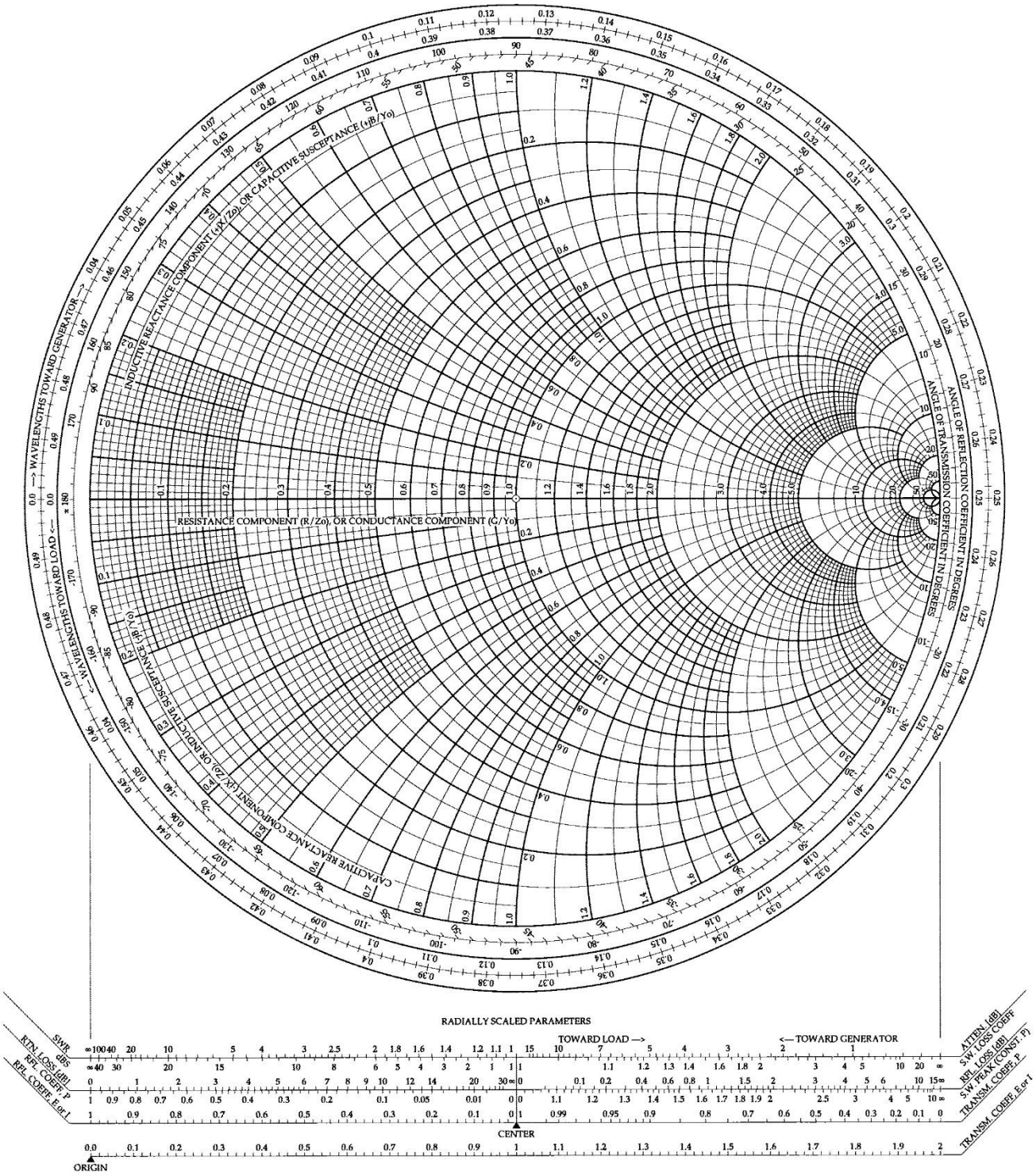
b) A lossless transmission line with characteristics impedance 300 Ω is terminated in a load 300 + j 300 Ω. Using Smith chart, find the

i) VSWR
ii) Magnitude and angle of reflection coefficient at the load
iii) Load admittance
iv) Reflection coefficient at distance of $\lambda/4$ from load.

c) Derive EM wave equation.

The Complete Smith Chart

Black Magic Design



Seat No.	

Set **R**

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026 Electromagnetic Field Theory (BTN06501)

Day & Date: Saturday, 02-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data wherever necessary and mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. 14

1) What is the time-harmonic form of Maxwell's Equation $\left(\nabla \times E = -\frac{\partial B}{\partial t}\right)$?

a) $\nabla \times E = \omega B$ b) $\nabla \times E = -j\omega B$
c) $\nabla \times E = j\omega B$ d) $\nabla \times E = B/j\omega$

2) For a Transmission line with characteristic impedance $Z_0 = 100\Omega$ and a load impedance is $Z_L = 300 + j300\Omega$ the normalized load impedance is _____.

a) $1 + j1$ b) $2 + j2$
c) $3 + j1$ d) $3 + j3$

3) What is the characteristic impedance (Z_0) of a lossless transmission line?

a) $\sqrt{L/C}$ b) $\sqrt{C/L}$
c) $1/\sqrt{LC}$ d) $\sqrt{R/G}$

4) For a lossless line, what are the conditions for the primary constants?

a) $R = 0, G = 0$ b) $R = 0, L = 0$
c) $G = 0, C = 0$ d) $G = 0, L = 0$

5) Which coordinate system is most suitable for analyzing points in a sphere?

a) Cartesian b) Cylindrical
c) Polar d) Spherical

6) The differential volume dv in a cylindrical coordinate system is?

a) $dxdydz$ b) $\rho d\rho d\phi dz$
c) $\rho^2 d\rho d\phi dz$ d) $d\rho d\phi dz$

7) $\bar{a}_r . \bar{a}_\Phi =$

a) 1 b) zero

c) $\bar{a}_\theta$ d) None

8) Which of the following is false for Coulomb's Law, where Q1 and Q2 - point charges?

a) Force is proportional to Q1.Q2

b) Force is inversely proportional to square of distance between Q1 and Q2

c) Direction is along the direction of line joining point charges Q1 and Q2

d) Depends on permeability of the media

9) The Coulomb constant $\left(\frac{1}{4\pi\varepsilon}\right) =$ _____.

a) 9×10^{-9} b) 9×10^{-8}

c) 9×10^{9} d) 9×10^{8}

10) According to Gauss's law, the electric flux through a closed surface is _____.

a) Directly proportional to the charge enclosed

b) Independent of the charge enclosed

c) Dependent on the shape of the surface

d) Equal to the charge outside the surface

11) Inside a good conductor, the electric field (E) is _____.

a) Infinite b) Maximum

c) Zero d) Dependent on voltage

12) The term (dD/dt) in the Maxwell law represents _____.

a) Conduction current b) Magnetization current

c) Displacement current d) Convection current

13) Maxwell's equation $\nabla \times \vec{E} = -\frac{\partial \vec{B}}{\partial t}$ is based on _____.

a) Faraday's law of induction b) Ampere's Law

c) Gauss's Law d) Ohm's Law

14) In free space (vacuum) for EM wave equation, which of the following is true?

a) $\rho = 0, \vec{J} = 0$ b) $\rho = \epsilon_0, \vec{J} = 0$

c) $\rho = 0, \vec{J} = \mu_0$ d) $\rho = \rho_0, \vec{J} = \vec{J}_0$

Seat No.	

Set **R**

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Electromagnetic Field Theory (BTN06501)

Day & Date: Saturday, 02-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever necessary and mention it clearly.

Section – I

Q.2 Attempt the Any Four. **16**

a) Find a force on charge Q1 $= 3\mu$C due to charge Q2 $= 30\ \mu$C, where Q1 is at point (0,2,1) and Q2 at (2,1,0).

b) Transform the vector $\bar{a}_x$ to Cylindrical Coordinate system at a point (ρ =4, Φ=120°, z=2).

c) Explain Cylindrical Coordinate system in detail with suitable diagram.

d) By using Gauss's law, explain point to point electric field intensity for single spherical shell carrying charge Q with radius R meters.

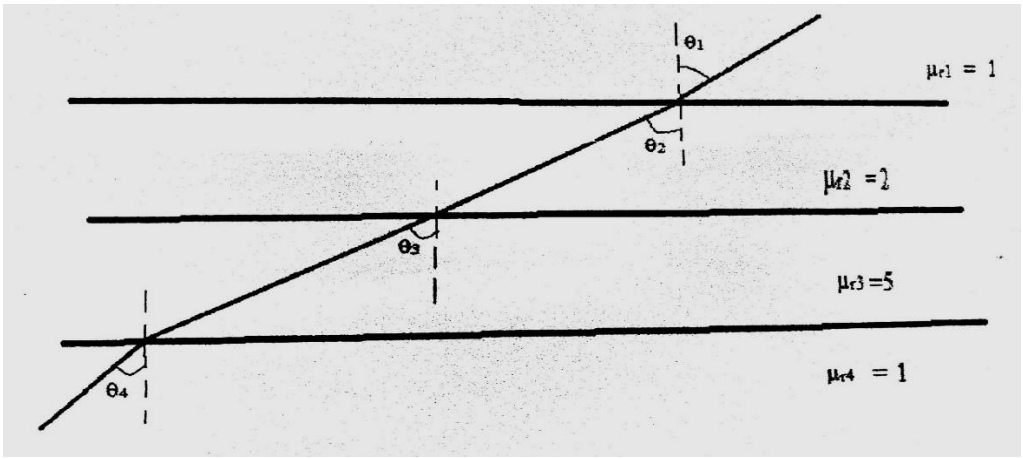
e) Prove $\bar{E} = -\bar{W}$

Q.3 Attempt Any Two. **12**

a) Derive the expression for electric dipole.

b) State and derive for Biot Savart's Law.

c) Two Infinite slabs of magnetic materials are located in a free space. Let unit vector $\hat{a}_z$ is directed upwards. If region 1 is represented by $H = \hat{a}_x - 2\hat{a}_y + 3\hat{a}_z$ KA/m. Determine angle between H and $\hat{a}_z$ in region $1, 2, 3, 4$ as shown in Figure below with permeability's $\mu_{r1} = 1, \mu_{r2} = 2, \mu_{r3} = 5$ and $\mu_{r4} = 1$ respectively.



Section – II

Q.4 Attempt Any Four. **16**

a) Give the Maxwell's Equation of static field.

b) Explain Harmonically Varying Field.

c) State and explain Maxwell's equations in point and Integral form.

d) Explain Transmission line equation with suitable diagram.

e) Derive Continuity equation.

Q.5 Attempt Any Two. **12**

a) State and Explain Poynting theorem with suitable diagram.

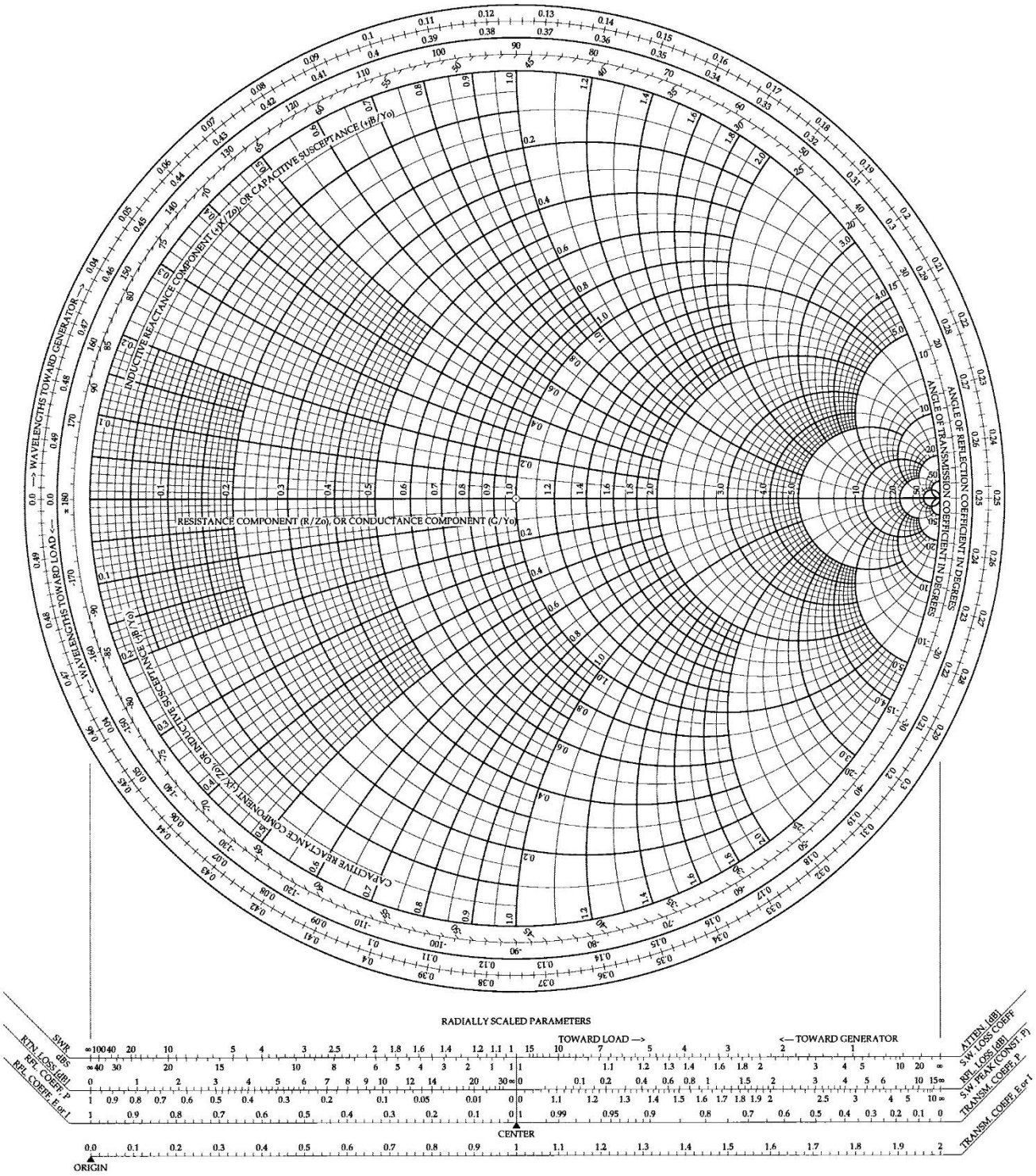
b) A lossless transmission line with characteristics impedance 300 Ω is terminated in a load 300 + j 300 Ω. Using Smith chart, find the

i) VSWR
ii) Magnitude and angle of reflection coefficient at the load
iii) Load admittance
iv) Reflection coefficient at distance of $\lambda/4$ from load.

c) Derive EM wave equation.

The Complete Smith Chart

Black Magic Design



Seat No.	

Set **S**

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026 Electromagnetic Field Theory (BTN06501)

Day & Date: Saturday, 02-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data wherever necessary and mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) According to Gauss's law, the electric flux through a closed surface is _____.
a) Directly proportional to the charge enclosed
b) Independent of the charge enclosed
c) Dependent on the shape of the surface
d) Equal to the charge outside the surface

2) Inside a good conductor, the electric field (E) is _____.
a) Infinite b) Maximum
c) Zero d) Dependent on voltage

3) The term (dD/dt) in the Maxwell law represents _____.
a) Conduction current b) Magnetization current
c) Displacement current d) Convection current

4) Maxwell's equation $\nabla \times \vec{E} = -\frac{\partial \vec{B}}{\partial t}$ is based on _____.
a) Faraday's law of induction b) Ampere's Law
c) Gauss's Law d) Ohm's Law

5) In free space (vacuum) for EM wave equation, which of the following is true?
a) $\rho = 0, \vec{J} = 0$ b) $\rho = \epsilon_0, \vec{J} = 0$
c) $\rho = 0, \vec{J} = \mu_0$ d) $\rho = \rho_0, \vec{J} = \vec{J}_0$

6) What is the time-harmonic form of Maxwell's Equation $\left(\nabla \times E = -\frac{\partial B}{\partial t}\right)$?
a) $\nabla \times E = \omega B$ b) $\nabla \times E = -j\omega B$
c) $\nabla \times E = j\omega B$ d) $\nabla \times E = B/j\omega$

7) For a Transmission line with characteristic impedance $Z_0 = 100\Omega$ and a load impedance is $Z_L = 300 + j300\Omega$ the normalized load impedance is _____.

a) $1 + j1$ b) $2 + j2$
c) $3 + j1$ d) $3 + j3$

8) What is the characteristic impedance (Z_0) of a lossless transmission line?

a) $\sqrt{L/C}$ b) $\sqrt{C/L}$
c) $1/\sqrt{LC}$ d) $\sqrt{R/G}$

9) For a lossless line, what are the conditions for the primary constants?

a) $R = 0, G = 0$ b) $R = 0, L = 0$
c) $G = 0, C = 0$ d) $G = 0, L = 0$

10) Which coordinate system is most suitable for analyzing points in a sphere?

a) Cartesian b) Cylindrical
c) Polar d) Spherical

11) The differential volume dv in a cylindrical coordinate system is?

a) $dxdydz$ b) $\rho d\rho d\phi dz$
c) $\rho^2 d\rho d\phi dz$ d) $d\rho d\phi dz$

12) $\bar{a}_r . \bar{a}_\Phi =$

a) 1 b) zero
c) $\bar{a}_\theta$ d) None

13) Which of the following is false for Coulomb's Law, where Q1 and Q2 - point charges?

a) Force is proportional to Q1.Q2
b) Force is inversely proportional to square of distance between Q1 and Q2
c) Direction is along the direction of line joining point charges Q1 and Q2
d) Depends on permeability of the media

14) The Coulomb constant $\left(\frac{1}{4\pi\varepsilon}\right) =$ _____.

a) 9×10^{-9} b) 9×10^{-8}
c) 9×10^{9} d) 9×10^{8}

Seat No.	

Set **S**

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Electromagnetic Field Theory (BTN06501)

Day & Date: Saturday, 02-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever necessary and mention it clearly.

Section – I

Q.2 Attempt the Any Four. **16**

a) Find a force on charge Q1 $= 3\mu$C due to charge Q2 $= 30\ \mu$C, where Q1 is at point (0,2,1) and Q2 at (2,1,0).

b) Transform the vector $\bar{a}_x$ to Cylindrical Coordinate system at a point (ρ =4, Φ=120°, z=2).

c) Explain Cylindrical Coordinate system in detail with suitable diagram.

d) By using Gauss's law, explain point to point electric field intensity for single spherical shell carrying charge Q with radius R meters.

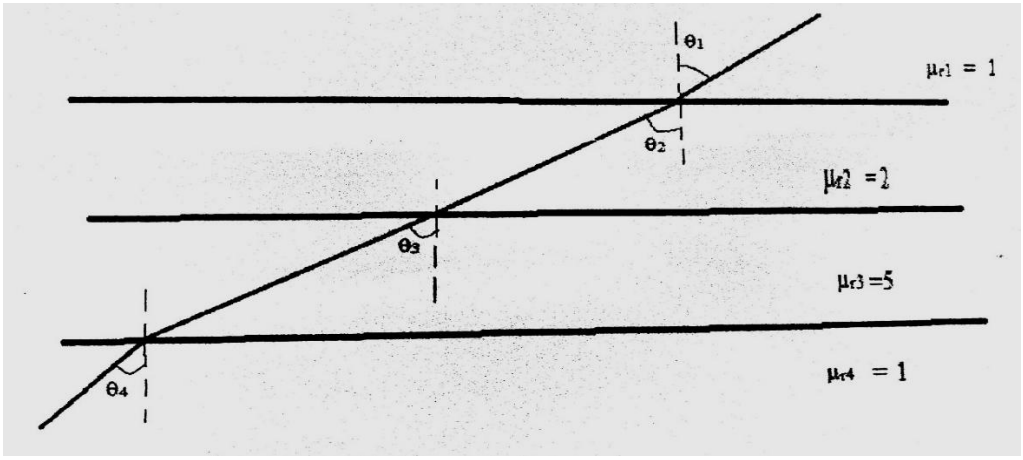
e) Prove $\bar{E} = -\bar{W}$

Q.3 Attempt Any Two. **12**

a) Derive the expression for electric dipole.

b) State and derive for Biot Savart's Law.

c) Two Infinite slabs of magnetic materials are located in a free space. Let unit vector $\hat{a}_z$ is directed upwards. If region 1 is represented by $H = \hat{a}_x - 2\hat{a}_y + 3\hat{a}_z$ KA/m. Determine angle between H and $\hat{a}_z$ in region $1, 2, 3, 4$ as shown in Figure below with permeability's $\mu_{r1} = 1, \mu_{r2} = 2, \mu_{r3} = 5$ and $\mu_{r4} = 1$ respectively.



Section – II

Q.4 Attempt Any Four. **16**

a) Give the Maxwell's Equation of static field.

b) Explain Harmonically Varying Field.

c) State and explain Maxwell's equations in point and Integral form.

d) Explain Transmission line equation with suitable diagram.

e) Derive Continuity equation.

Q.5 Attempt Any Two. **12**

a) State and Explain Poynting theorem with suitable diagram.

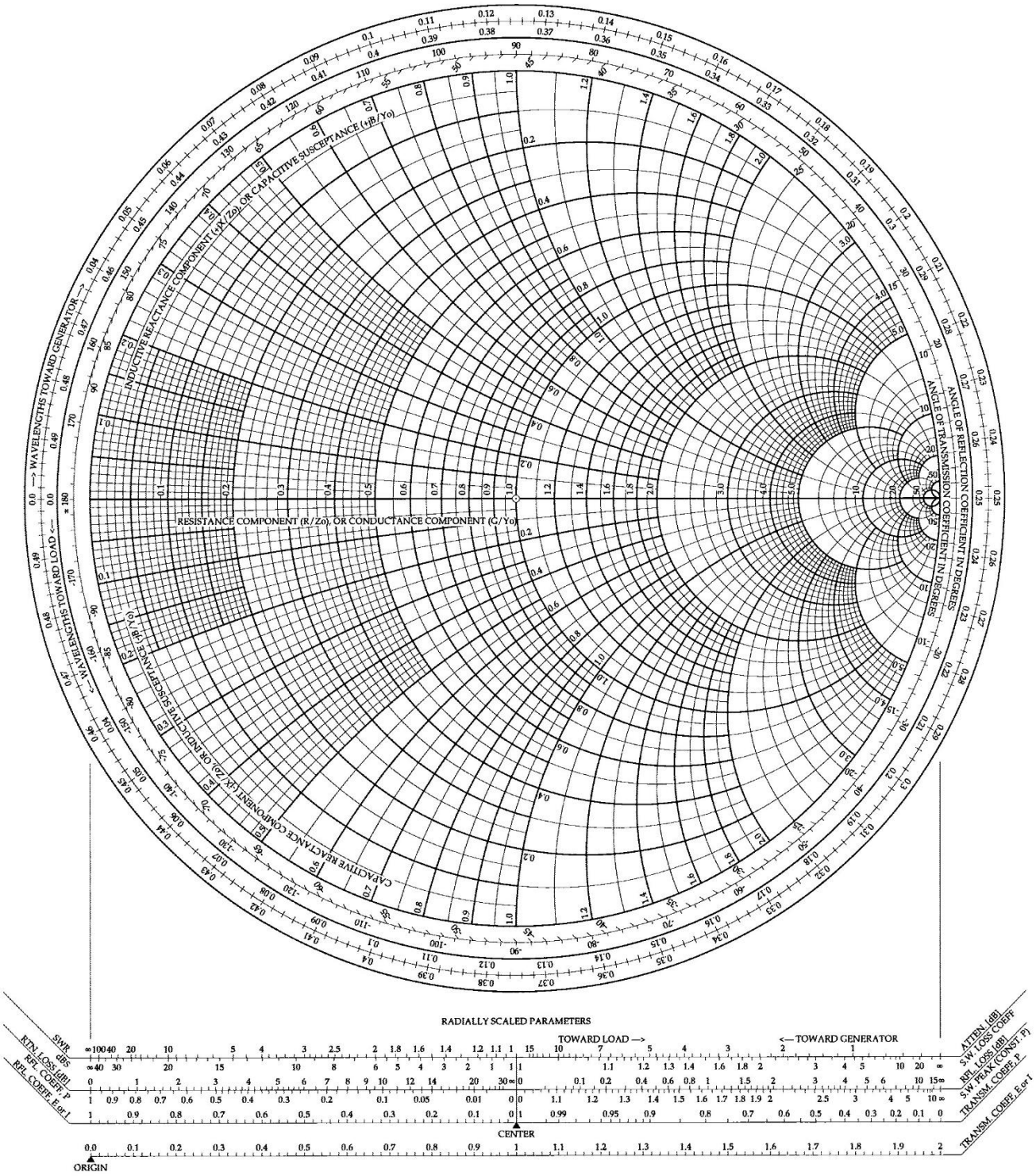
b) A lossless transmission line with characteristics impedance 300 Ω is terminated in a load 300 + j 300 Ω. Using Smith chart, find the

i) VSWR
ii) Magnitude and angle of reflection coefficient at the load
iii) Load admittance
iv) Reflection coefficient at distance of $\lambda/4$ from load.

c) Derive EM wave equation.

The Complete Smith Chart

Black Magic Design



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Seat No.	

Set P

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Sem - I) (New/Old) (CBCS) Examination: March/April – 2026 Microcontrollers and Applications (BTN06502)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternative from the options. 14

1) The internal RAM memory of the 8051 is _____.
a) 4 Kbytes b) 6 Kbytes
c) 128 bytes d) 256 bytes

2) This program code will be executed continuously _____.
```
LOOP: MOV A,#03h
      DEC A
      JNZ LOOP
```
a) TRUE b) FALSE
c) gives error d) loop execute 3 times

3) After reset the stack pointer in microcontroller 8051 is initialized to _____.
a) 70 H b) FF H
c) 00 H d) 07 H

4) Vector address of timer /counter 1 interrupt is _____ h.
a) 0003 b) 0013
c) 000B d) 001B

5) Program status word register of 8051 is _____.
a) Only bit addressable
b) Only byte addressable
c) Bit addressable as well as byte addressable
d) None of these

6) What is the address range of Register bank 0 in 8051?
a) 00h-07h b) 00h-FFh
c) 80h-7Fh d) 80h-FFh

7) Which of the following instructions will load the value 25H into the lower byte of Timer0?

a) MOV TL0,#25h
b) MOV TL0,25h
c) MOV T0,#25h
d) MOV T0,25h

8) The contents of the accumulator after this operation
MOV A,#0CH
ANL A,#0CH
will be _____.

a) 00001100
b) 00001101
c) 11111111
d) 11000000

9) PIC 16F877A is a _____ bit microcontroller.

a) 8
b) 4
c) 32
d) 64

10) Which flags are more likely to get affected in status registers by Arithmetic and Logical Unit (ALU) of PIC 16 FXXX on the basis of instructions execution?

a) Carry (C) Flags
b) Zero (Z) Flags
c) Digit Carry (DC) Flags
d) All of the above

11) Which status bits exhibit carry from lower 4 bits during 8-bit addition and are especially beneficial for BCD addition?

a) Carry bit
b) Digits Carry bit (DC)
c) Both a & b
d) none of these

12) FLASH program memory, Data Memory (RAM) and Data Memory (EEPROM) for PIC 16F877 are _____.

a) 8K × 8, 368 × 8, 256 × 8
b) 14K × 8, 14 K × 8, 256 × 8
c) 8K × 14, 368 × 16, 256 x 8
d) 8K × 14, 368 × 8, 256 × 8

13) Which command enables the PIC to enter into the power down mode during the operation of watchdog timer (WDT)?

a) SLEEP
b) RESET
c) STATUS
d) CLR

14) Where is the result stored after an execution of increment and decrement operations over the special - purpose registers in PIC?

a) File Register
b) Working Register
c) Both a & b
d) None of the above

Seat No.	

Set **P**

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Sem - I) (New/Old) (CBCS) Examination: March/April – 2026
Microcontrollers and Applications (BTN06502)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever necessary.

SECTION – I

Q.2 Attempt Any Four questions. **16**

a) State functional difference between Microprocessor & Microcontroller.

b) Explain different Addressing modes with example in 8051.

c) Write ALP for delay 200ms; Use Timer 0 in Mode 1.

d) Explain different features of 8051.

e) Explain the multifunction facility of port-3 in 8051.

Q.3 Attempt Any Two questions. **12**

a) Draw and explain the External Memory Interfacing with 8051. Attach 8KB RAM externally. Also find the starting and end address.

b) Write a Program to interface the 3×3 matrix keypad as input and 7-segment display as output with 8051.

c) Write a short note on:
i) TMOD
ii) SCON
iii) SBUF

SECTION – II

Q.4 Attempt Any Four questions. **16**

a) Explain following instructions
- i) SWAF
- ii) RRF
- iii) INCFSZ
- iv) BTFSC

b) Compare features of 8051 and PIC16F877.

c) Explain STATUS register of 16F877.

d) Brief about the SFRs associated with Timers in PIC 16F877

e) Write a short note on:
- i) BOR
- ii) WDT in PIC 16F877.

Q.5 Attempt Any Two questions. **12**

a) Explain in detail
- i) PORTS
- ii) PCON
- iii) OPTION_REG in PIC 16F877

b) Explain A/D conversion in PIC 16F877 with logical diagram.

c) Explain the USART modules in PIC 16F877.

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Sem - I) (New/Old) (CBCS) Examination: March/April – 2026
Microcontrollers and Applications (BTN06502)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternative from the options. **14**

1) The contents of the accumulator after this operation
MOV A,#0CH
ANL A,#0CH
will be _____.
a) 00001100 b) 00001101
c) 11111111 d) 11000000

2) PIC 16F877A is a _____ bit microcontroller.
a) 8 b) 4
c) 32 d) 64

3) Which flags are more likely to get affected in status registers by Arithmetic and Logical Unit (ALU) of PIC 16 FXXX on the basis of instructions execution?
a) Carry (C) Flags b) Zero (Z) Flags
c) Digit Carry (DC) Flags d) All of the above

4) Which status bits exhibit carry from lower 4 bits during 8-bit addition and are especially beneficial for BCD addition?
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c) Both a & b d) none of these

5) FLASH program memory, Data Memory (RAM) and Data Memory (EEPROM) for PIC 16F877 are _____.
a) 8K × 8, 368 × 8, 256 × 8 b) 14K × 8, 14 K × 8, 256 × 8
c) 8K × 14, 368 × 16, 256 x 8 d) 8K × 14, 368 × 8, 256 × 8

6) Which command enables the PIC to enter into the power down mode during the operation of watchdog timer (WDT)?
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7) Where is the result stored after an execution of increment and decrement operations over the special - purpose registers in PIC?

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LOOP: MOV A,#03h
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11) Vector address of timer /counter 1 interrupt is _____ h.

a) 0003
b) 0013
c) 000B
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12) Program status word register of 8051 is _____.

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b) Only byte addressable
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13) What is the address range of Register bank 0 in 8051?

a) 00h-07h
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14) Which of the following instructions will load the value 25H into the lower byte of Timer0?

a) MOV TL0,#25h
b) MOV TL0,25h
c) MOV T0,#25h
d) MOV T0,25h

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Sem - I) (New/Old) (CBCS) Examination: March/April – 2026
Microcontrollers and Applications (BTN06502)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
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SECTION – I

Q.2 Attempt Any Four questions. **16**

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c) Write ALP for delay 200ms; Use Timer 0 in Mode 1.

d) Explain different features of 8051.

e) Explain the multifunction facility of port-3 in 8051.

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a) Draw and explain the External Memory Interfacing with 8051. Attach 8KB RAM externally. Also find the starting and end address.

b) Write a Program to interface the 3×3 matrix keypad as input and 7-segment display as output with 8051.

c) Write a short note on:
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SECTION – II

Q.4 Attempt Any Four questions. **16**

a) Explain following instructions
- i) SWAF
- ii) RRF
- iii) INCFSZ
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b) Compare features of 8051 and PIC16F877.

c) Explain STATUS register of 16F877.

d) Brief about the SFRs associated with Timers in PIC 16F877

e) Write a short note on:
- i) BOR
- ii) WDT in PIC 16F877.

Q.5 Attempt Any Two questions. **12**

a) Explain in detail
- i) PORTS
- ii) PCON
- iii) OPTION_REG in PIC 16F877

b) Explain A/D conversion in PIC 16F877 with logical diagram.

c) Explain the USART modules in PIC 16F877.

Seat No.	

Set **R**

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Sem - I) (New/Old) (CBCS) Examination: March/April – 2026
Microcontrollers and Applications (BTN06502)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternative from the options. 14

1) Which status bits exhibit carry from lower 4 bits during 8-bit addition and are especially beneficial for BCD addition?
a) Carry bit b) Digits Carry bit (DC)
c) Both a & b d) none of these

2) FLASH program memory, Data Memory (RAM) and Data Memory (EEPROM) for PIC 16F877 are _____.
a) 8K × 8, 368 × 8, 256 × 8 b) 14K × 8, 14 K × 8, 256 × 8
c) 8K × 14, 368 × 16, 256 x 8 d) 8K × 14, 368 × 8, 256 × 8

3) Which command enables the PIC to enter into the power down mode during the operation of watchdog timer (WDT)?
a) SLEEP b) RESET
c) STATUS d) CLR

4) Where is the result stored after an execution of increment and decrement operations over the special - purpose registers in PIC?
a) File Register b) Working Register
c) Both a & b d) None of the above

5) The internal RAM memory of the 8051 is _____.
a) 4 Kbytes b) 6 Kbytes
c) 128 bytes d) 256 bytes

6) This program code will be executed continuously _____.

```
LOOP: MOV A,#03h
      DEC A
      JNZ LOOP
```

a) TRUE b) FALSE
c) gives error d) loop execute 3 times

7) After reset the stack pointer in microcontroller 8051 is initialized to _____.
a) 70 H b) FF H
c) 00 H d) 07 H

8) Vector address of timer /counter 1 interrupt is _____ h.
a) 0003 b) 0013
c) 000B d) 001B

9) Program status word register of 8051 is _____.
a) Only bit addressable
b) Only byte addressable
c) Bit addressable as well as byte addressable
d) None of these

10) What is the address range of Register bank 0 in 8051?
a) 00h-07h b) 00h-FFh
c) 80h-7Fh d) 80h-FFh

11) Which of the following instructions will load the value 25H into the lower byte of Timer0?
a) MOV TL0,#25h b) MOV TL0,25h
c) MOV T0,#25h d) MOV T0,25h

12) The contents of the accumulator after this operation
MOV A,#0CH
ANL A,#0CH
will be _____.
a) 00001100 b) 00001101
c) 11111111 d) 11000000

13) PIC 16F877A is a _____ bit microcontroller.
a) 8 b) 4
c) 32 d) 64

14) Which flags are more likely to get affected in status registers by Arithmetic and Logical Unit (ALU) of PIC 16 FXXX on the basis of instructions execution?
a) Carry (C) Flags b) Zero (Z) Flags
c) Digit Carry (DC) Flags d) All of the above

Seat No.	

Set **R**

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Sem - I) (New/Old) (CBCS) Examination: March/April – 2026
Microcontrollers and Applications (BTN06502)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever necessary.

SECTION – I

Q.2 Attempt Any Four questions. **16**

a) State functional difference between Microprocessor & Microcontroller.

b) Explain different Addressing modes with example in 8051.

c) Write ALP for delay 200ms; Use Timer 0 in Mode 1.

d) Explain different features of 8051.

e) Explain the multifunction facility of port-3 in 8051.

Q.3 Attempt Any Two questions. **12**

a) Draw and explain the External Memory Interfacing with 8051. Attach 8KB RAM externally. Also find the starting and end address.

b) Write a Program to interface the 3×3 matrix keypad as input and 7-segment display as output with 8051.

c) Write a short note on:
i) TMOD
ii) SCON
iii) SBUF

SECTION – II

Q.4 Attempt Any Four questions. **16**

a) Explain following instructions
- i) SWAF
- ii) RRF
- iii) INCFSZ
- iv) BTFSC

b) Compare features of 8051 and PIC16F877.

c) Explain STATUS register of 16F877.

d) Brief about the SFRs associated with Timers in PIC 16F877

e) Write a short note on:
- i) BOR
- ii) WDT in PIC 16F877.

Q.5 Attempt Any Two questions. **12**

a) Explain in detail
- i) PORTS
- ii) PCON
- iii) OPTION_REG in PIC 16F877

b) Explain A/D conversion in PIC 16F877 with logical diagram.

c) Explain the USART modules in PIC 16F877.

SLR-QH-503

Seat No.	

Set S

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Sem - I) (New/Old) (CBCS) Examination: March/April – 2026
Microcontrollers and Applications (BTN06502)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternative from the options. **14**

1) What is the address range of Register bank 0 in 8051?
a) 00h-07h b) 00h-FFh
c) 80h-7Fh d) 80h-FFh

2) Which of the following instructions will load the value 25H into the lower byte of Timer0?
a) MOV TL0,#25h b) MOV TL0,25h
c) MOV T0,#25h d) MOV T0,25h

3) The contents of the accumulator after this operation
MOV A,#0CH
ANL A,#0CH
will be _____.
a) 00001100 b) 00001101
c) 11111111 d) 11000000

4) PIC 16F877A is a _____ bit microcontroller.
a) 8 b) 4
c) 32 d) 64

5) Which flags are more likely to get affected in status registers by Arithmetic and Logical Unit (ALU) of PIC 16 FXXX on the basis of instructions execution?
a) Carry (C) Flags b) Zero (Z) Flags
c) Digit Carry (DC) Flags d) All of the above

6) Which status bits exhibit carry from lower 4 bits during 8-bit addition and are especially beneficial for BCD addition?
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7) FLASH program memory, Data Memory (RAM) and Data Memory (EEPROM) for PIC 16F877 are _____.

a) 8K × 8, 368 × 8, 256 × 8 b) 14K × 8, 14 K × 8, 256 × 8
c) 8K × 14, 368 × 16, 256 x 8 d) 8K × 14, 368 × 8, 256 × 8

8) Which command enables the PIC to enter into the power down mode during the operation of watchdog timer (WDT)?

a) SLEEP b) RESET
c) STATUS d) CLR

9) Where is the result stored after an execution of increment and decrement operations over the special - purpose registers in PIC?

a) File Register b) Working Register
c) Both a & b d) None of the above

10) The internal RAM memory of the 8051 is _____.

a) 4 Kbytes b) 6 Kbytes
c) 128 bytes d) 256 bytes

11) This program code will be executed continuously _____.

```
LOOP: MOV A,#03h
      DEC A
      JNZ LOOP
```

a) TRUE b) FALSE
c) gives error d) loop execute 3 times

12) After reset the stack pointer in microcontroller 8051 is initialized to _____.

a) 70 H b) FF H
c) 00 H d) 07 H

13) Vector address of timer /counter 1 interrupt is _____ h.

a) 0003 b) 0013
c) 000B d) 001B

14) Program status word register of 8051 is _____.

a) Only bit addressable
b) Only byte addressable
c) Bit addressable as well as byte addressable
d) None of these

Seat No.	

Set **S**

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Sem - I) (New/Old) (CBCS) Examination: March/April – 2026
Microcontrollers and Applications (BTN06502)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever necessary.

SECTION – I

Q.2 Attempt Any Four questions. **16**

a) State functional difference between Microprocessor & Microcontroller.

b) Explain different Addressing modes with example in 8051.

c) Write ALP for delay 200ms; Use Timer 0 in Mode 1.

d) Explain different features of 8051.

e) Explain the multifunction facility of port-3 in 8051.

Q.3 Attempt Any Two questions. **12**

a) Draw and explain the External Memory Interfacing with 8051. Attach 8KB RAM externally. Also find the starting and end address.

b) Write a Program to interface the 3×3 matrix keypad as input and 7-segment display as output with 8051.

c) Write a short note on:
i) TMOD
ii) SCON
iii) SBUF

SECTION – II

Q.4 Attempt Any Four questions. **16**

a) Explain following instructions
- i) SWAF
- ii) RRF
- iii) INCFSZ
- iv) BTFSC

b) Compare features of 8051 and PIC16F877.

c) Explain STATUS register of 16F877.

d) Brief about the SFRs associated with Timers in PIC 16F877

e) Write a short note on:
- i) BOR
- ii) WDT in PIC 16F877.

Q.5 Attempt Any Two questions. **12**

a) Explain in detail
- i) PORTS
- ii) PCON
- iii) OPTION_REG in PIC 16F877

b) Explain A/D conversion in PIC 16F877 with logical diagram.

c) Explain the USART modules in PIC 16F877.

SLR-QH-504

Seat No.	

Set P

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Digital Signal Processing (BTN06503)

Day & Date: Thursday, 07-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to right indicates full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Correlation is basically used to _____.
a) Add two signals b) Subtract two signals
c) Compare Two signals d) None

2) If the sequence x(n) is real and even its corresponding DFT values are _____.
a) Imaginary and odd b) Imaginary and even
c) Real and even d) None

3) The size of input data blocks in overlap add method is _____.
a) L b) $L+M$
c) $L+M-1$ d) $L+M+1$

4) Transform domain is used as it _____.
a) Enhance the signal b) Compress the signal
c) Reduces data points d) Increases data points

5) For DIF FFT algorithm _____.
a) Input sequence is natural order
b) Input sequence is in bit reversal order
c) Output sequence is in natural order
d) Both input and output sequence are in bit reversal order

6) Linear convolution of two real sequences with P and Q points, respectively can be converted to circular convolution by appending extra zeros to every sequence until its length is _____.
a) $P+Q$ b) $P+Q+1$
c) $P+Q-1$ d) $P-Q-1$

7) Circular convolution of the sequence $x(n) = \{1,2,1\}$ and $h(n) = \{1,-2,2\}$ is _____.

a) $\{3,2,-1\}$ b) $\{-1,2,3\}$

c) $\{2,3,-1\}$ d) $\{3,2,-2\}$

8) Which of the following has linear Phase?

a) IIR Filter b) FIR Filter

c) LP Filter d) None

9) The frequency Sampling structure are efficient because _____.

a) Sample Points are less

b) Some Sampled DFT coefficients are zero when filter is narrow band.

c) Some Sampled Values are assumed zero

d) Parallel structures are efficient

10) Goertzel algorithm evaluates the _____.

a) DTFT coefficients b) DFT coefficients

c) Z transform d) FT coefficients

11) FIR filer is also known as _____ filter.

a) Cascade structure b) Transversal

c) ARMA d) AR

12) The approximate width of the main lobe in Hanning window of Length M is _____.

a) $8\,\pi/M$ b) $4\,\pi/M$

c) $12\,\pi/M$ d) $16\,\pi/M$

13) Kaiser window has an adjustable parameter that controls _____.

a) stop band width b) main lobe width

c) stop band attenuation d) None of these

14) IIR filter design is based on _____ filter design.

a) Analog b) discrete time

c) Digital d) None

Seat No.	

Set **P**

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Digital Signal Processing (BTN06503)

Day & Date: Thursday, 07-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

SECTION – I

Q.2 Attempt any four. **16**

a) Find Cross Correlation of two finite Length Sequences $x(n) = \{1,2,3,4,5\}\ y(n) = \{5,6,7,8,9\}$

b) Determine the 8 point DFT of the sequence $x(n) = \{1,1,1,1,1,1,0,0\}$

c) Find the IDFT of the sequences $x(n) = \{0, 2, 4, 6\}$

d) Compute Autocorrelation of the sequence $x(n) = \{1,2,3,4\}$

e) Give the relationship between DFT and Z transform.

Q.3 Attempt any two. **12**

a) What is DFT? What are the properties of DFT? Explain circular convolution properties of DFT.

b) Perform circular convolution of the following sequence $x(n) = \{1,1,2,1\}$ and $h(n) = \{1,2,3,4\}$

c) Input $x(n) = \{-1,4,7,3,-2,9,10,5,12,-5,8\}$. Let impulse response of filter $h(n) = \{3,2,1,1\}$. Use overlap adds method to find convolution.

SECTION – II

Q.4 Attempt any four. **16**

a) Explain Fourier series method for designing FIR filter?

b) Explain difference between FIR filter and IIR filter.

c) Explain steps of windowing technique for designing FIR filter.

d) For analog transfer function $H(s) = 1/(s+1)(s+2)$. Determine $H(z)$ using impulse invariant technique. (Assume T=1 sec with block diagram)

e) Determine the Direct form realization of system function.
$H(z) = 1 + 2z^{-1} - 3z^{-2} - 4z^{-3} - 4z^{-5}$

Q.5 Attempt any two. **12**

a) Convert the given analog transfer function into equivalent digital transfer function using impulse invariant transformation technique (T = 1 second/sample)

$$H_a(S) = \frac{s + 0.1}{(s + 0.1)^2 + 9}$$

b) Design an ideal High pass filter whose desired frequency response

$$H_d(e^{i\omega}) = 1 \quad \pi \geq |\omega| \geq \pi/3$$
$$0 \quad \text{otherwise}$$

Using Hamming Window,

i) Determine Impulse Response for $N = 9$

ii) Determine Transfer function at realizable filter

c) Explain the application of DSP in Audio Processing.

SLR-QH-504

Seat No.	

Set Q

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Digital Signal Processing (BTN06503)

Day & Date: Thursday, 07-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to right indicates full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which of the following has linear Phase?
a) IIR Filter b) FIR Filter
c) LP Filter d) None

2) The frequency Sampling structure are efficient because _____.
a) Sample Points are less
b) Some Sampled DFT coefficients are zero when filter is narrow band.
c) Some Sampled Values are assumed zero
d) Parallel structures are efficient

3) Goertzel algorithm evaluates the _____.
a) DTFT coefficients b) DFT coefficients
c) Z transform d) FT coefficients

4) FIR filer is also known as _____ filter.
a) Cascade structure b) Transversal
c) ARMA d) AR

5) The approximate width of the main lobe in Hanning window of Length M is _____.
a) $8\,\pi/M$ b) $4\,\pi/M$
c) $12\,\pi/M$ d) $16\,\pi/M$

6) Kaiser window has an adjustable parameter that controls _____.
a) stop band width b) main lobe width
c) stop band attenuation d) None of these

7) IIR filter design is based on _____ filter design.
a) Analog b) discrete time
c) Digital d) None

8) Correlation is basically used to _____.
a) Add two signals b) Subtract two signals
c) Compare Two signals d) None

9) If the sequence x(n) is real and even its corresponding DFT values are _____.
a) Imaginary and odd b) Imaginary and even
c) Real and even d) None

10) The size of input data blocks in overlap add method is _____.
a) L b) $L+M$
c) $L+M-1$ d) $L+M+1$

11) Transform domain is used as it _____.
a) Enhance the signal b) Compress the signal
c) Reduces data points d) Increases data points

12) For DIF FFT algorithm _____.
a) Input sequence is natural order
b) Input sequence is in bit reversal order
c) Output sequence is in natural order
d) Both input and output sequence are in bit reversal order

13) Linear convolution of two real sequences with P and Q points, respectively can be converted to circular convolution by appending extra zeros to every sequence until its length is _____.
a) $P+Q$ b) $P+Q+1$
c) $P+Q-1$ d) $P-Q-1$

14) Circular convolution of the sequence $x(n)=\{1,2,1\}$ and $h(n)=\{1,-2,2\}$ is _____.
a) $\{3,2,-1\}$ b) $\{-1,2,3\}$
c) $\{2,3,-1\}$ d) $\{3,2,-2\}$

Seat No.	

Set **Q**

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Digital Signal Processing (BTN06503)

Day & Date: Thursday, 07-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

SECTION – I

Q.2 Attempt any four. **16**

a) Find Cross Correlation of two finite Length Sequences $x(n) = \{1,2,3,4,5\}\ y(n) = \{5,6,7,8,9\}$

b) Determine the 8 point DFT of the sequence $x(n) = \{1,1,1,1,1,1,0,0\}$

c) Find the IDFT of the sequences $x(n) = \{0, 2, 4, 6\}$

d) Compute Autocorrelation of the sequence $x(n) = \{1,2,3,4\}$

e) Give the relationship between DFT and Z transform.

Q.3 Attempt any two. **12**

a) What is DFT? What are the properties of DFT? Explain circular convolution properties of DFT.

b) Perform circular convolution of the following sequence $x(n) = \{1,1,2,1\}$ and $h(n) = \{1,2,3,4\}$

c) Input $x(n) = \{-1,4,7,3,-2,9,10,5,12,-5,8\}$. Let impulse response of filter $h(n) = \{3,2,1,1\}$. Use overlap adds method to find convolution.

SECTION – II

Q.4 Attempt any four. **16**

a) Explain Fourier series method for designing FIR filter?

b) Explain difference between FIR filter and IIR filter.

c) Explain steps of windowing technique for designing FIR filter.

d) For analog transfer function $H(s) = 1/(s+1)(s+2)$. Determine $H(z)$ using impulse invariant technique. (Assume T=1 sec with block diagram)

e) Determine the Direct form realization of system function.
$H(z) = 1 + 2z^{-1} - 3z^{-2} - 4z^{-3} - 4z^{-5}$

Q.5 Attempt any two. **12**

a) Convert the given analog transfer function into equivalent digital transfer function using impulse invariant transformation technique (T = 1 second/sample)

$$H_a(S) = \frac{s + 0.1}{(s + 0.1)^2 + 9}$$

b) Design an ideal High pass filter whose desired frequency response

$$H_d(e^{i\omega}) = \begin{matrix} 1 & \pi \geq |\omega| \geq \pi/3 \\ 0 & \text{otherwise} \end{matrix}$$

Using Hamming Window,

i) Determine Impulse Response for $N = 9$

ii) Determine Transfer function at realizable filter

c) Explain the application of DSP in Audio Processing.

Seat No.	

Set **R**

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Digital Signal Processing (BTN06503)

Day & Date: Thursday, 07-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to right indicates full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) FIR filer is also known as _____ filter.
a) Cascade structure b) Transversal
c) ARMA d) AR

2) The approximate width of the main lobe in Hanning window of Length M is _____.
a) $8\,\pi/M$ b) $4\,\pi/M$
c) $12\,\pi/M$ d) $16\,\pi/M$

3) Kaiser window has an adjustable parameter that controls _____.
a) stop band width b) main lobe width
c) stop band attenuation d) None of these

4) IIR filter design is based on _____ filter design.
a) Analog b) discrete time
c) Digital d) None

5) Correlation is basically used to _____.
a) Add two signals b) Subtract two signals
c) Compare Two signals d) None

6) If the sequence x(n) is real and even its corresponding DFT values are _____.
a) Imaginary and odd b) Imaginary and even
c) Real and even d) None

7) The size of input data blocks in overlap add method is _____.
a) L b) $L+M$
c) $L+M-1$ d) $L+M+1$

8) Transform domain is used as it _____.
a) Enhance the signal
b) Compress the signal
c) Reduces data points
d) Increases data points

9) For DIF FFT algorithm _____.
a) Input sequence is natural order
b) Input sequence is in bit reversal order
c) Output sequence is in natural order
d) Both input and output sequence are in bit reversal order

10) Linear convolution of two real sequences with P and Q points, respectively can be converted to circular convolution by appending extra zeros to every sequence until its length is _____.
a) $P + Q$
b) $P + Q + 1$
c) $P + Q - 1$
d) $P - Q - 1$

11) Circular convolution of the sequence $x(n) = \{1,2,1\}$ and $h(n) = \{1, -2,2\}$ is _____.
a) $\{3,2, -1\}$
b) $\{-1,2,3\}$
c) $\{2,3, -1\}$
d) $\{3,2, -2\}$

12) Which of the following has linear Phase?
a) IIR Filter
b) FIR Filter
c) LP Filter
d) None

13) The frequency Sampling structure are efficient because _____.
a) Sample Points are less
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c) Some Sampled Values are assumed zero
d) Parallel structures are efficient

14) Goertzel algorithm evaluates the _____.
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b) DFT coefficients
c) Z transform
d) FT coefficients

Seat No.	

Set **R**

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Digital Signal Processing (BTN06503)

Day & Date: Thursday, 07-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

SECTION – I

Q.2 Attempt any four. **16**

a) Find Cross Correlation of two finite Length Sequences $x(n) = \{1,2,3,4,5\}$ $y(n) = \{5,6,7,8,9\}$

b) Determine the 8 point DFT of the sequence $x(n) = \{1,1,1,1,1,1,0,0\}$

c) Find the IDFT of the sequences $x(n) = \{0, 2, 4, 6\}$

d) Compute Autocorrelation of the sequence $x(n) = \{1,2,3,4\}$

e) Give the relationship between DFT and Z transform.

Q.3 Attempt any two. **12**

a) What is DFT? What are the properties of DFT? Explain circular convolution properties of DFT.

b) Perform circular convolution of the following sequence $x(n) = \{1,1,2,1\}$ and $h(n) = \{1,2,3,4\}$

c) Input $x(n) = \{-1,4,7,3,-2,9,10,5,12,-5,8\}$. Let impulse response of filter $h(n) = \{3,2,1,1\}$. Use overlap adds method to find convolution.

SECTION – II

Q.4 Attempt any four. **16**

a) Explain Fourier series method for designing FIR filter?

b) Explain difference between FIR filter and IIR filter.

c) Explain steps of windowing technique for designing FIR filter.

d) For analog transfer function $H(s) = 1/(s+1)(s+2)$. Determine $H(z)$ using impulse invariant technique. (Assume T=1 sec with block diagram)

e) Determine the Direct form realization of system function.
$H(z) = 1 + 2z^{-1} - 3z^{-2} - 4z^{-3} - 4z^{-5}$

Q.5 Attempt any two. **12**

a) Convert the given analog transfer function into equivalent digital transfer function using impulse invariant transformation technique (T = 1 second/sample)

$$H_a(S) = \frac{s + 0.1}{(s + 0.1)^2 + 9}$$

b) Design an ideal High pass filter whose desired frequency response

$$H_d(e^{i\omega}) = \begin{matrix} 1 & \pi \geq |\omega| \geq \pi/3 \\ 0 & \text{otherwise} \end{matrix}$$

Using Hamming Window,

i) Determine Impulse Response for $N = 9$

ii) Determine Transfer function at realizable filter

c) Explain the application of DSP in Audio Processing.

Seat No.		Set	S

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Digital Signal Processing (BTN06503)

Day & Date: Thursday, 07-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to right indicates full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Linear convolution of two real sequences with P and Q points, respectively can be converted to circular convolution by appending extra zeros to every sequence until its length is _____.
a) $P+Q$ b) $P+Q+1$
c) $P+Q-1$ d) $P-Q-1$

2) Circular convolution of the sequence $x(n)=\{1,2,1\}$ and $h(n)=\{1,-2,2\}$ is _____.
a) $\{3,2,-1\}$ b) $\{-1,2,3\}$
c) $\{2,3,-1\}$ d) $\{3,2,-2\}$

3) Which of the following has linear Phase?
a) IIR Filter b) FIR Filter
c) LP Filter d) None

4) The frequency Sampling structure are efficient because _____.
a) Sample Points are less
b) Some Sampled DFT coefficients are zero when filter is narrow band.
c) Some Sampled Values are assumed zero
d) Parallel structures are efficient

5) Goertzel algorithm evaluates the _____.
a) DTFT coefficients b) DFT coefficients
c) Z transform d) FT coefficients

6) FIR filer is also known as _____ filter.
a) Cascade structure b) Transversal
c) ARMA d) AR

7) The approximate width of the main lobe in Hanning window of Length M is _____.

a) $8\,\pi/M$ b) $4\,\pi/M$

c) $12\,\pi/M$ d) $16\,\pi/M$

8) Kaiser window has an adjustable parameter that controls _____.

a) stop band width b) main lobe width

c) stop band attenuation d) None of these

9) IIR filter design is based on _____ filter design.

a) Analog b) discrete time

c) Digital d) None

10) Correlation is basically used to _____.

a) Add two signals b) Subtract two signals

c) Compare Two signals d) None

11) If the sequence x(n) is real and even its corresponding DFT values are _____.

a) Imaginary and odd b) Imaginary and even

c) Real and even d) None

12) The size of input data blocks in overlap add method is _____.

a) L b) $L+M$

c) $L+M-1$ d) $L+M+1$

13) Transform domain is used as it _____.

a) Enhance the signal b) Compress the signal

c) Reduces data points d) Increases data points

14) For DIF FFT algorithm _____.

a) Input sequence is natural order

b) Input sequence is in bit reversal order

c) Output sequence is in natural order

d) Both input and output sequence are in bit reversal order

Seat No.	

Set **S**

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Digital Signal Processing (BTN06503)

Day & Date: Thursday, 07-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

SECTION – I

Q.2 Attempt any four. **16**

a) Find Cross Correlation of two finite Length Sequences $x(n) = \{1,2,3,4,5\}\ y(n) = \{5,6,7,8,9\}$

b) Determine the 8 point DFT of the sequence $x(n) = \{1,1,1,1,1,1,0,0\}$

c) Find the IDFT of the sequences $x(n) = \{0, 2, 4, 6\}$

d) Compute Autocorrelation of the sequence $x(n) = \{1,2,3,4\}$

e) Give the relationship between DFT and Z transform.

Q.3 Attempt any two. **12**

a) What is DFT? What are the properties of DFT? Explain circular convolution properties of DFT.

b) Perform circular convolution of the following sequence $x(n) = \{1,1,2,1\}$ and $h(n) = \{1,2,3,4\}$

c) Input $x(n) = \{-1,4,7,3,-2,9,10,5,12,-5,8\}$. Let impulse response of filter $h(n) = \{3,2,1,1\}$. Use overlap adds method to find convolution.

SECTION – II

Q.4 Attempt any four. **16**

a) Explain Fourier series method for designing FIR filter?

b) Explain difference between FIR filter and IIR filter.

c) Explain steps of windowing technique for designing FIR filter.

d) For analog transfer function $H(s) = 1/(s+1)(s+2)$. Determine $H(z)$ using impulse invariant technique. (Assume T=1 sec with block diagram)

e) Determine the Direct form realization of system function.
$H(z) = 1 + 2z^{-1} - 3z^{-2} - 4z^{-3} - 4z^{-5}$

Q.5 Attempt any two. **12**

a) Convert the given analog transfer function into equivalent digital transfer function using impulse invariant transformation technique (T = 1 second/sample)

$$H_a(S) = \frac{s + 0.1}{(s + 0.1)^2 + 9}$$

b) Design an ideal High pass filter whose desired frequency response

$$H_d(e^{i\omega}) = \begin{matrix} 1 & \pi \geq |\omega| \geq \pi/3 \\ 0 & \text{otherwise} \end{matrix}$$

Using Hamming Window,

i) Determine Impulse Response for $N = 9$

ii) Determine Transfer function at realizable filter

c) Explain the application of DSP in Audio Processing.

SLR-QH-505

Seat No.	

Set P

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April - 2026
Managerial Economics (BTN06511)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) In economics, desire backed by purchasing power is known as _____.
a) Utility b) Demand
c) Consumption d) Scarcity

2) Car and petrol are _____.
a) Complimentary goods b) Substitute goods
c) Supplementary goods d) Reserve goods

3) _____ means the total receipts from sales divided by the number of unit sold.
a) Average revenue b) Total revenue
c) Marginal revenue d) Incremental revenue

4) Law of demand shows the functional relationship between _____ and quantity demanded.
a) Supply b) Cost
c) Price d) Requirements

5) When the change in demand is exactly equal to the change in price, it is called _____.
a) Perfectly elastic demand b) Perfectly inelastic demand
c) Relative elastic demand d) Unitary elastic demand

6) _____ Method is also known as Sales-Force-Composite method or collective opinion method.
a) Opinion survey b) Expert opinion
c) Delphi method d) Consumer interview method

7) Functional relationship between input and output known as _____.
a) Conversion b) Production function
c) Work in progress d) Output function

8) Which one of the following is not an internal factor influencing pricing policy?

a) Cost
b) Objectives
c) Marketing mix
d) Demand

9) Unitary elasticity of demand mean _____.

a) $\mathrm{EP} => 1$
b) $\mathrm{EP} =< 1$
c) $\mathrm{EP} = 0$
d) $\mathrm{EP} = 1$

10) Analysis of long run and short run affects of decisions on revenue as well as costs is based on _____.

a) Principle of time perspective
b) Equi-marginal principle
c) Principle
d) None of these

11) A cost that has already been committed and cannot be recovered known as _____.

a) Sunk cost
b) Total cost
c) Full cost
d) Variable cost

12) Firms under perfectly competitive markets generally are _____.

a) Price makers
b) Price givers
c) Price taker
d) None of these

13) Variable costs are _____.

a) sunk costs
b) multiplies by fixed costs
c) costs that change with the level of production
d) defined as the change in total cost resulting from the production of an additional unit of output

14) The market with a single producer _____.

a) perfect competition
b) monopolistic competition
c) oligopoly
d) monopoly

Seat No.	

Set **P**

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April - 2026
Managerial Economics (BTN06511)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Solve any Four. **16**

a) Explain scope of managerial economics for business decision.

b) State the difference between Microeconomics and Macroeconomics.

c) Explain the concept Price ceilings and Price floors.

e) Explain the concept price elasticity and cross elasticity of demand.

f) Explain Integration of economics to managerial decisions.

Q.3 Solve any Two. **12**

a) Explain cardinal and ordinal approach of consumer behaviour.

b) What is mean by determinants of demand? Explain.

c) Explain the following terms
i) Demand
ii) Utility
iii) Supply
iv) Market Equilibrium

SECTION – II

Q.4 Solve any Four. **16**

a) What is Demand Forecasting? Explain its objectives.

b) Describe Survey Methods for demand forecasting.

c) What is meant by Production? Distinguish between fixed and variable inputs.

d) Draw and explain break even analysis curve. What is profit margin of safety.

e) What is market? Explain four types of market structures.

Q.5 Solve any Two. **12**

a) What is Pricing? Explaining factors affecting pricing policy and decisions.

b) Explain the following costs of production:

i) Explicit & Implicit costs
ii) Short run & Long run costs
iii) Incremental & Sunk costs

c) What is Linear programming? Discuss usefulness of its application to practical business problems.

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April - 2026
Managerial Economics (BTN06511)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which one of the following is not an internal factor influencing pricing policy?
a) Cost b) Objectives
c) Marketing mix d) Demand

2) Unitary elasticity of demand mean _____.
a) $\mathrm{EP} => 1$ b) $\mathrm{EP} =< 1$
c) $\mathrm{EP} = 0$ d) $\mathrm{EP} = 1$

3) Analysis of long run and short run affects of decisions on revenue as well as costs is based on _____.
a) Principle of time perspective b) Equi-marginal principle
c) Principle d) None of these

4) A cost that has already been committed and cannot be recovered known as _____.
a) Sunk cost b) Total cost
c) Full cost d) Variable cost

5) Firms under perfectly competitive markets generally are _____.
a) Price makers b) Price givers
c) Price taker d) None of these

6) Variable costs are _____.
a) sunk costs
b) multiplies by fixed costs
c) costs that change with the level of production
d) defined as the change in total cost resulting from the production of an additional unit of output

7) The market with a single producer _____.
a) perfect competition b) monopolistic competition
c) oligopoly d) monopoly

8) In economics, desire backed by purchasing power is known as _____.
a) Utility b) Demand
c) Consumption d) Scarcity

9) Car and petrol are _____.
a) Complimentary goods b) Substitute goods
c) Supplementary goods d) Reserve goods

10) _____ means the total receipts from sales divided by the number of unit sold.
a) Average revenue b) Total revenue
c) Marginal revenue d) Incremental revenue

11) Law of demand shows the functional relationship between _____ and quantity demanded.
a) Supply b) Cost
c) Price d) Requirements

12) When the change in demand is exactly equal to the change in price, it is called _____.
a) Perfectly elastic demand b) Perfectly inelastic demand
c) Relative elastic demand d) Unitary elastic demand

13) _____ Method is also known as Sales-Force-Composite method or collective opinion method.
a) Opinion survey b) Expert opinion
c) Delphi method d) Consumer interview method

14) Functional relationship between input and output known as _____.
a) Conversion b) Production function
c) Work in progress d) Output function

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April - 2026
Managerial Economics (BTN06511)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Solve any Four. **16**

a) Explain scope of managerial economics for business decision.

b) State the difference between Microeconomics and Macroeconomics.

c) Explain the concept Price ceilings and Price floors.

e) Explain the concept price elasticity and cross elasticity of demand.

f) Explain Integration of economics to managerial decisions.

Q.3 Solve any Two. **12**

a) Explain cardinal and ordinal approach of consumer behaviour.

b) What is mean by determinants of demand? Explain.

c) Explain the following terms
i) Demand
ii) Utility
iii) Supply
iv) Market Equilibrium

SECTION – II

Q.4 Solve any Four. **16**

a) What is Demand Forecasting? Explain its objectives.

b) Describe Survey Methods for demand forecasting.

c) What is meant by Production? Distinguish between fixed and variable inputs.

d) Draw and explain break even analysis curve. What is profit margin of safety.

e) What is market? Explain four types of market structures.

Q.5 Solve any Two. **12**

a) What is Pricing? Explaining factors affecting pricing policy and decisions.

b) Explain the following costs of production:

i) Explicit & Implicit costs
ii) Short run & Long run costs
iii) Incremental & Sunk costs

c) What is Linear programming? Discuss usefulness of its application to practical business problems.

Seat No.	

Set **R**

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April - 2026
Managerial Economics (BTN06511)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) A cost that has already been committed and cannot be recovered known as _____.
a) Sunk cost b) Total cost
c) Full cost d) Variable cost

2) Firms under perfectly competitive markets generally are _____.
a) Price makers b) Price givers
c) Price taker d) None of these

3) Variable costs are _____.
a) sunk costs
b) multiplies by fixed costs
c) costs that change with the level of production
d) defined as the change in total cost resulting from the production of an additional unit of output

4) The market with a single producer _____.
a) perfect competition b) monopolistic competition
c) oligopoly d) monopoly

5) In economics, desire backed by purchasing power is known as _____.
a) Utility b) Demand
c) Consumption d) Scarcity

6) Car and petrol are _____.
a) Complimentary goods b) Substitute goods
c) Supplementary goods d) Reserve goods

7) _____ means the total receipts from sales divided by the number of unit sold.

a) Average revenue
b) Total revenue
c) Marginal revenue
d) Incremental revenue

8) Law of demand shows the functional relationship between _____ and quantity demanded.

a) Supply
b) Cost
c) Price
d) Requirements

9) When the change in demand is exactly equal to the change in price, it is called _____.

a) Perfectly elastic demand
b) Perfectly inelastic demand
c) Relative elastic demand
d) Unitary elastic demand

10) _____ Method is also known as Sales-Force-Composite method or collective opinion method.

a) Opinion survey
b) Expert opinion
c) Delphi method
d) Consumer interview method

11) Functional relationship between input and output known as _____.

a) Conversion
b) Production function
c) Work in progress
d) Output function

12) Which one of the following is not an internal factor influencing pricing policy?

a) Cost
b) Objectives
c) Marketing mix
d) Demand

13) Unitary elasticity of demand mean _____.

a) $\mathrm{EP} => 1$
b) $\mathrm{EP} =< 1$
c) $\mathrm{EP} = 0$
d) $\mathrm{EP} = 1$

14) Analysis of long run and short run affects of decisions on revenue as well as costs is based on _____.

a) Principle of time perspective
b) Equi-marginal principle
c) Principle
d) None of these

Seat No.	

Set **R**

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April - 2026
Managerial Economics (BTN06511)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Solve any Four. **16**

a) Explain scope of managerial economics for business decision.

b) State the difference between Microeconomics and Macroeconomics.

c) Explain the concept Price ceilings and Price floors.

e) Explain the concept price elasticity and cross elasticity of demand.

f) Explain Integration of economics to managerial decisions.

Q.3 Solve any Two. **12**

a) Explain cardinal and ordinal approach of consumer behaviour.

b) What is mean by determinants of demand? Explain.

c) Explain the following terms
i) Demand
ii) Utility
iii) Supply
iv) Market Equilibrium

SECTION – II

Q.4 Solve any Four. **16**

a) What is Demand Forecasting? Explain its objectives.

b) Describe Survey Methods for demand forecasting.

c) What is meant by Production? Distinguish between fixed and variable inputs.

d) Draw and explain break even analysis curve. What is profit margin of safety.

e) What is market? Explain four types of market structures.

Q.5 Solve any Two. **12**

a) What is Pricing? Explaining factors affecting pricing policy and decisions.

b) Explain the following costs of production:

i) Explicit & Implicit costs
ii) Short run & Long run costs
iii) Incremental & Sunk costs

c) What is Linear programming? Discuss usefulness of its application to practical business problems.

SLR-QH-505

Seat No.	

Set S

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April - 2026
Managerial Economics (BTN06511)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) _____ Method is also known as Sales-Force-Composite method or collective opinion method.
a) Opinion survey b) Expert opinion
c) Delphi method d) Consumer interview method

2) Functional relationship between input and output known as _____.
a) Conversion b) Production function
c) Work in progress d) Output function

3) Which one of the following is not an internal factor influencing pricing policy?
a) Cost b) Objectives
c) Marketing mix d) Demand

4) Unitary elasticity of demand mean _____.
a) $\mathrm{EP} => 1$ b) $\mathrm{EP} =< 1$
c) $\mathrm{EP} = 0$ d) $\mathrm{EP} = 1$

5) Analysis of long run and short run affects of decisions on revenue as well as costs is based on _____.
a) Principle of time perspective b) Equi-marginal principle
c) Principle d) None of these

6) A cost that has already been committed and cannot be recovered known as _____.
a) Sunk cost b) Total cost
c) Full cost d) Variable cost

7) Firms under perfectly competitive markets generally are _____.
a) Price makers
b) Price givers
c) Price taker
d) None of these

8) Variable costs are _____.
a) sunk costs
b) multiplies by fixed costs
c) costs that change with the level of production
d) defined as the change in total cost resulting from the production of an additional unit of output

9) The market with a single producer _____.
a) perfect competition
b) monopolistic competition
c) oligopoly
d) monopoly

10) In economics, desire backed by purchasing power is known as _____.
a) Utility
b) Demand
c) Consumption
d) Scarcity

11) Car and petrol are _____.
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b) Substitute goods
c) Supplementary goods
d) Reserve goods

12) _____ means the total receipts from sales divided by the number of unit sold.
a) Average revenue
b) Total revenue
c) Marginal revenue
d) Incremental revenue

13) Law of demand shows the functional relationship between _____ and quantity demanded.
a) Supply
b) Cost
c) Price
d) Requirements

14) When the change in demand is exactly equal to the change in price, it is called _____.
a) Perfectly elastic demand
b) Perfectly inelastic demand
c) Relative elastic demand
d) Unitary elastic demand

Seat No.	

Set **S**

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April - 2026
Managerial Economics (BTN06511)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Solve any Four. **16**

a) Explain scope of managerial economics for business decision.

b) State the difference between Microeconomics and Macroeconomics.

c) Explain the concept Price ceilings and Price floors.

e) Explain the concept price elasticity and cross elasticity of demand.

f) Explain Integration of economics to managerial decisions.

Q.3 Solve any Two. **12**

a) Explain cardinal and ordinal approach of consumer behaviour.

b) What is mean by determinants of demand? Explain.

c) Explain the following terms
i) Demand
ii) Utility
iii) Supply
iv) Market Equilibrium

SECTION – II

Q.4 Solve any Four. **16**

a) What is Demand Forecasting? Explain its objectives.

b) Describe Survey Methods for demand forecasting.

c) What is meant by Production? Distinguish between fixed and variable inputs.

d) Draw and explain break even analysis curve. What is profit margin of safety.

e) What is market? Explain four types of market structures.

Q.5 Solve any Two. **12**

a) What is Pricing? Explaining factors affecting pricing policy and decisions.

b) Explain the following costs of production:

i) Explicit & Implicit costs
ii) Short run & Long run costs
iii) Incremental & Sunk costs

c) What is Linear programming? Discuss usefulness of its application to practical business problems.

SLR-QH-506

Seat No.	

Set P

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Sem - I) (New/Old) (CBCS) Examination: March/April - 2026
Project Management and Operation Research (BTN06512)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if required.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Projects management is divided in _____ process groups.
a) 5 b) 7
c) 9 d) 11

2) The PERT in project management means program evaluation and _____ technique.
a) Resource b) Reconciliation
c) Reconsideration d) Review

3) "Risk" usually _____ as the project progresses.
a) Increases b) Reduces
c) Remains Same d) Becomes negligible

4) Assembling project team and assigning their responsibilities are done during which phase of a project management?
a) Initiation b) Planning
c) Execution d) Closure

5) Which of the following is NOT considered Risk Categorization?
a) Internal b) External
c) Technical d) Methodology

6) A hierarchical representation of risks according to their risk categories is called _____.
a) Risk Categorization b) Work Breakdown Structure
c) Risk Data Assessment d) Risk Reassessment

7) The earliest method used for planning of Project was _____.
a) CPM b) PERT
c) Bar chart d) Milestone Chart

8) Operations Research approach is _____.
a) Multidisciplinary b) Scientific
c) Intuitive d) Collect essential data

9) A mixed strategy game can be solved by _____.
a) Simplex Method b) Hungarian Method
c) Graphical method d) Degeneracy Method

10) OR has a characteristic that it is done by a team of _____.
a) Scientist b) Mathematicians
c) Academics d) All of the above

11) OR uses models to help the management to determine its _____.
a) Policies b) Actions
c) Both a) and b) d) None of the above

12) Feasible solution satisfies _____.
a) Only constraints b) only non-negative restriction
c) a) and b) both d) a), b) and optimum solution

13) In graphical representation the bounded region is known as _____ region.
a) Solution b) Basic Solution
c) Feasible Solution d) Optimal

14) In LPP the condition to be satisfied is _____.
a) Constraints have to be linear
b) Objective function has to be linear
c) None of the above
d) Both a) and b)

Seat No.		Set	P

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Sem - I) (New/Old) (CBCS) Examination: March/April - 2026
Project Management and Operation Research (BTN06512)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if required.

SECTION – I

Q.2 Solve Any Four the following. **16**

a) Explain project life cycle concept.
b) Define is risk. Explain its categories.
c) Explain PERT in detail.
d) Compare qualitative and quantitative risk assessment.
e) Explain the characteristics of Project management.

Q.3 Solve Any Two the following. **12**

a) Explain case study on visualization process of GANTT chart.
b) Explain Top-down and Bottom-up budgeting.
c) What is risk identification? Explain in detail about risk register.

SECTION – II

Q.4 Solve Any Four the following. **16**

a) Explain the limitations of operation research.
b) Explain the applications of assignment model?
c) A manufacturing company is engaged in producing three types of products: A,B,C. the production department produces, each day, component sufficient to make 50 units of A, 25 units of B and 30 units of C. the management is confronted with the problem of optimizing the daily production of the assembly department, where only 100 man-hours are available daily for assembling the products. The following additional information is available:

Type of product	Profit contribution per unit product (Rs)	Assembly time per product (Hrs)
A	12	0.8
B	20	1.7
C	45	2.5

Company has daily order commitment 20 units of products A and 15 units of products B and C. Formulate this problem as an LPP model so as to maximize the total Profit.

d) Explain the procedure and techniques for selecting facility location.

e) What is replacement model? Explain categories of replacement Model.

Q.5 Solve Any Two questions. **12**

a) What is Operation Research? Explain in brief the models of Operation Research.

b) What is LPP? Give its applications and advantages of LPP.

c) Use the graphical method to solve the following LP problem.

Maximize $Z = 15x_1 + 10x_2$

Subject to constraints

i) $4x_1 + 6x_2 \leq 360$

ii) $3x_1 + 0x_2 \leq 180$

iii) $0x_1 + 5x_2 \leq 200$ and $x_1, x_2 \geq 0$

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Sem - I) (New/Old) (CBCS) Examination: March/April - 2026
Project Management and Operation Research (BTN06512)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if required.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Operations Research approach is _____.
a) Multidisciplinary b) Scientific
c) Intuitive d) Collect essential data

2) A mixed strategy game can be solved by _____.
a) Simplex Method b) Hungarian Method
c) Graphical method d) Degeneracy Method

3) OR has a characteristic that it is done by a team of _____.
a) Scientist b) Mathematicians
c) Academics d) All of the above

4) OR uses models to help the management to determine its _____.
a) Policies b) Actions
c) Both a) and b) d) None of the above

5) Feasible solution satisfies _____.
a) Only constraints b) only non-negative restriction
c) a) and b) both d) a), b) and optimum solution

6) In graphical representation the bounded region is known as _____ region.
a) Solution b) Basic Solution
c) Feasible Solution d) Optimal

7) In LPP the condition to be satisfied is _____.
a) Constraints have to be linear
b) Objective function has to be linear
c) None of the above
d) Both a) and b)

8) Projects management is divided in _____ process groups.
a) 5 b) 7
c) 9 d) 11

9) The PERT in project management means program evaluation and _____ technique.
a) Resource b) Reconciliation
c) Reconsideration d) Review

10) "Risk" usually _____ as the project progresses.
a) Increases b) Reduces
c) Remains Same d) Becomes negligible

11) Assembling project team and assigning their responsibilities are done during which phase of a project management?
a) Initiation b) Planning
c) Execution d) Closure

12) Which of the following is NOT considered Risk Categorization?
a) Internal b) External
c) Technical d) Methodology

13) A hierarchical representation of risks according to their risk categories is called _____.
a) Risk Categorization b) Work Breakdown Structure
c) Risk Data Assessment d) Risk Reassessment

14) The earliest method used for planning of Project was _____.
a) CPM b) PERT
c) Bar chart d) Milestone Chart

Seat No.		Set	Q

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Sem - I) (New/Old) (CBCS) Examination: March/April - 2026
Project Management and Operation Research (BTN06512)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if required.

SECTION – I

Q.2 Solve Any Four the following. **16**

a) Explain project life cycle concept.
b) Define is risk. Explain its categories.
c) Explain PERT in detail.
d) Compare qualitative and quantitative risk assessment.
e) Explain the characteristics of Project management.

Q.3 Solve Any Two the following. **12**

a) Explain case study on visualization process of GANTT chart.
b) Explain Top-down and Bottom-up budgeting.
c) What is risk identification? Explain in detail about risk register.

SECTION – II

Q.4 Solve Any Four the following. **16**

a) Explain the limitations of operation research.
b) Explain the applications of assignment model?
c) A manufacturing company is engaged in producing three types of products: A,B,C. the production department produces, each day, component sufficient to make 50 units of A, 25 units of B and 30 units of C. the management is confronted with the problem of optimizing the daily production of the assembly department, where only 100 man-hours are available daily for assembling the products. The following additional information is available:

Type of product	Profit contribution per unit product (Rs)	Assembly time per product (Hrs)
A	12	0.8
B	20	1.7
C	45	2.5

Company has daily order commitment 20 units of products A and 15 units of products B and C. Formulate this problem as an LPP model so as to maximize the total Profit.

d) Explain the procedure and techniques for selecting facility location.

e) What is replacement model? Explain categories of replacement Model.

Q.5 Solve Any Two questions. **12**

a) What is Operation Research? Explain in brief the models of Operation Research.

b) What is LPP? Give its applications and advantages of LPP.

c) Use the graphical method to solve the following LP problem.

Maximize $Z = 15x_1 + 10x_2$

Subject to constraints

i) $4x_1 + 6x_2 \leq 360$

ii) $3x_1 + 0x_2 \leq 180$

iii) $0x_1 + 5x_2 \leq 200$ and $x_1, x_2 \geq 0$

Seat No.	

Set **R**

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Sem - I) (New/Old) (CBCS) Examination: March/April - 2026
Project Management and Operation Research (BTN06512)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if required.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) OR uses models to help the management to determine its _____.
a) Policies b) Actions
c) Both a) and b) d) None of the above

2) Feasible solution satisfies _____.
a) Only constraints b) only non-negative restriction
c) a) and b) both d) a), b) and optimum solution

3) In graphical representation the bounded region is known as _____ region.
a) Solution b) Basic Solution
c) Feasible Solution d) Optimal

4) In LPP the condition to be satisfied is _____.
a) Constraints have to be linear
b) Objective function has to be linear
c) None of the above
d) Both a) and b)

5) Projects management is divided in _____ process groups.
a) 5 b) 7
c) 9 d) 11

6) The PERT in project management means program evaluation and _____ technique.
a) Resource b) Reconciliation
c) Reconsideration d) Review

7) "Risk" usually _____ as the project progresses.
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9) Which of the following is NOT considered Risk Categorization?
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10) A hierarchical representation of risks according to their risk categories is called _____.
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11) The earliest method used for planning of Project was _____.
a) CPM b) PERT
c) Bar chart d) Milestone Chart

12) Operations Research approach is _____.
a) Multidisciplinary b) Scientific
c) Intuitive d) Collect essential data

13) A mixed strategy game can be solved by _____.
a) Simplex Method b) Hungarian Method
c) Graphical method d) Degeneracy Method

14) OR has a characteristic that it is done by a team of _____.
a) Scientist b) Mathematicians
c) Academics d) All of the above

Seat No.	

Set **R**

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Sem - I) (New/Old) (CBCS) Examination: March/April - 2026
Project Management and Operation Research (BTN06512)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if required.

SECTION – I

Q.2 Solve Any Four the following. **16**

a) Explain project life cycle concept.
b) Define is risk. Explain its categories.
c) Explain PERT in detail.
d) Compare qualitative and quantitative risk assessment.
e) Explain the characteristics of Project management.

Q.3 Solve Any Two the following. **12**

a) Explain case study on visualization process of GANTT chart.
b) Explain Top-down and Bottom-up budgeting.
c) What is risk identification? Explain in detail about risk register.

SECTION – II

Q.4 Solve Any Four the following. **16**

a) Explain the limitations of operation research.
b) Explain the applications of assignment model?
c) A manufacturing company is engaged in producing three types of products: A,B,C. the production department produces, each day, component sufficient to make 50 units of A, 25 units of B and 30 units of C. the management is confronted with the problem of optimizing the daily production of the assembly department, where only 100 man-hours are available daily for assembling the products. The following additional information is available:

Type of product	Profit contribution per unit product (Rs)	Assembly time per product (Hrs)
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B	20	1.7
C	45	2.5

Company has daily order commitment 20 units of products A and 15 units of products B and C. Formulate this problem as an LPP model so as to maximize the total Profit.

d) Explain the procedure and techniques for selecting facility location.

e) What is replacement model? Explain categories of replacement Model.

Q.5 Solve Any Two questions. **12**

a) What is Operation Research? Explain in brief the models of Operation Research.

b) What is LPP? Give its applications and advantages of LPP.

c) Use the graphical method to solve the following LP problem.

Maximize $Z = 15x_1 + 10x_2$

Subject to constraints

i) $4x_1 + 6x_2 \leq 360$

ii) $3x_1 + 0x_2 \leq 180$

iii) $0x_1 + 5x_2 \leq 200$ and $x_1, x_2 \geq 0$

Seat No.	

Set **S**

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Sem - I) (New/Old) (CBCS) Examination: March/April - 2026
Project Management and Operation Research (BTN06512)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if required.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) A hierarchical representation of risks according to their risk categories is called _____.
a) Risk Categorization b) Work Breakdown Structure
c) Risk Data Assessment d) Risk Reassessment

2) The earliest method used for planning of Project was _____.
a) CPM b) PERT
c) Bar chart d) Milestone Chart

3) Operations Research approach is _____.
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c) Intuitive d) Collect essential data

4) A mixed strategy game can be solved by _____.
a) Simplex Method b) Hungarian Method
c) Graphical method d) Degeneracy Method

5) OR has a characteristic that it is done by a team of _____.
a) Scientist b) Mathematicians
c) Academics d) All of the above

6) OR uses models to help the management to determine its _____.
a) Policies b) Actions
c) Both a) and b) d) None of the above

7) Feasible solution satisfies _____.
a) Only constraints b) only non-negative restriction
c) a) and b) both d) a), b) and optimum solution

8) In graphical representation the bounded region is known as _____ region.
a) Solution
b) Basic Solution
c) Feasible Solution
d) Optimal

9) In LPP the condition to be satisfied is _____.
a) Constraints have to be linear
b) Objective function has to be linear
c) None of the above
d) Both a) and b)

10) Projects management is divided in _____ process groups.
a) 5
b) 7
c) 9
d) 11

11) The PERT in project management means program evaluation and _____ technique.
a) Resource
b) Reconciliation
c) Reconsideration
d) Review

12) "Risk" usually _____ as the project progresses.
a) Increases
b) Reduces
c) Remains Same
d) Becomes negligible

13) Assembling project team and assigning their responsibilities are done during which phase of a project management?
a) Initiation
b) Planning
c) Execution
d) Closure

14) Which of the following is NOT considered Risk Categorization?
a) Internal
b) External
c) Technical
d) Methodology

Seat No.		Set	S

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Sem - I) (New/Old) (CBCS) Examination: March/April - 2026
Project Management and Operation Research (BTN06512)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if required.

SECTION – I

Q.2 Solve Any Four the following. **16**

a) Explain project life cycle concept.
b) Define is risk. Explain its categories.
c) Explain PERT in detail.
d) Compare qualitative and quantitative risk assessment.
e) Explain the characteristics of Project management.

Q.3 Solve Any Two the following. **12**

a) Explain case study on visualization process of GANTT chart.
b) Explain Top-down and Bottom-up budgeting.
c) What is risk identification? Explain in detail about risk register.

SECTION – II

Q.4 Solve Any Four the following. **16**

a) Explain the limitations of operation research.
b) Explain the applications of assignment model?
c) A manufacturing company is engaged in producing three types of products: A,B,C. the production department produces, each day, component sufficient to make 50 units of A, 25 units of B and 30 units of C. the management is confronted with the problem of optimizing the daily production of the assembly department, where only 100 man-hours are available daily for assembling the products. The following additional information is available:

Type of product	Profit contribution per unit product (Rs)	Assembly time per product (Hrs)
A	12	0.8
B	20	1.7
C	45	2.5

Company has daily order commitment 20 units of products A and 15 units of products B and C. Formulate this problem as an LPP model so as to maximize the total Profit.

d) Explain the procedure and techniques for selecting facility location.

e) What is replacement model? Explain categories of replacement Model.

Q.5 Solve Any Two questions. **12**

a) What is Operation Research? Explain in brief the models of Operation Research.

b) What is LPP? Give its applications and advantages of LPP.

c) Use the graphical method to solve the following LP problem.

Maximize $Z = 15x_1 + 10x_2$

Subject to constraints

i) $4x_1 + 6x_2 \leq 360$

ii) $3x_1 + 0x_2 \leq 180$

iii) $0x_1 + 5x_2 \leq 200$ and $x_1, x_2 \geq 0$

SLR-QH-509

Seat No.		Set	P

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April - 2026
Artificial Intelligence (BTN06515)

Day & Date: Tuesday, 12-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Who is known as the - Father of AI?
a) Fisher Ada b) Alan Turing
c) John McCarthy d) Allen Newell

2) Among the given options, which search algorithm requires highest memory?
a) Optimal Search b) Depth First Search
c) Breadth-First Search d) Linear Search

3) Among the given options, which is not the required property of Knowledge?
a) Inferential Efficiency b) Inferential Adequacy
c) Representational Verification d) Representational Adequacy

4) The exploration problem is where _____.
a) Agent contains the knowledge of State and actions
b) Agent does not contain the knowledge of State and actions
c) Only actions are known to the agent
d) None of the above

5) A hybrid Bayesian Network consist _____.
a) Discrete variables only
b) Discontinuous Variable
c) Both Discrete and Continuous variables
d) Continuous Variable only

6) The probabilistic reasoning depends upon ____.
a) Estimation
b) Observations
c) Likelihood
d) All of the above

7) Which of the given element improve the performance of AI agent so that it can make better decisions?
a) Changing
b) Performance Element
c) Learning Element
d) None of the above

8) Which is true for Decision theory?
a) Decision Theory = Probability theory + utility theory
b) Decision Theory = Inference theory + utility theory
c) Decision Theory = Uncertainty + utility theory
d) Decision Theory = Probability theory + preference

9) General algorithm applied on game tree for making decision of win/lose is _____.
a) DFS/BFS Search Algorithms
b) Heuristic Search Algorithms
c) Greedy Search Algorithms
d) MIN/MAX Algorithms

10) The statement comprising the limitations of FOL is/are _____.
a) Expressiveness Formalizing
b) Natural Languages
c) Many-sorted Logic
d) All of the mentioned

11) Translate the following statement into FOL. “For every a, if a is a philosopher, then a is a scholar” _____.
a) ∀ a philosopher(a) scholar(a)
b) ∃ a philosopher(a) scholar(a)
c) All of the mentioned
d) None of the mentioned

12) Which form is called as a conjunction of disjunction of literals?
a) Conjunctive normal form
b) Disjunctive normal form
c) Normal form
d) All of the mentioned

13) How the compactness of the Bayesian network can be described?
a) Locally structured
b) Fully structured
c) Partial structure
d) All of the mentioned

14) Knowledge may be _____.
I) Declarative
II) Procedural
III) Non- procedural
a) Only (I)
b) Only (II)
c) Only (III)
d) Both (I) and (II)

Seat No.	

Set **P**

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April - 2026
Artificial Intelligence (BTN06515)

Day & Date: Tuesday, 12-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt Any Four. **16**

a) Explain the concept of reasoning with defaults.
b) Explain advantages of AI.
c) Explain AO* algorithm with suitable example.
d) Define agent. Explain learning-based agent in AI.
e) Explain different Types of knowledge in AI.

Q.3 Attempt Any Two. **12**

a) Explain AO* algorithm in detail with example in detail.
b) Explain objects, relations, events, actions, time, and space.
c) Define following term.
i) Problem reduction
ii) heuristic
iii) Constraint propagation
iv) Stochastic

SECTION – II

Q.4 Attempt Any Four. **16**

a) Explain probabilistic logic with example.
b) Explain the elementary game theory in AI.
c) Explain different learning forms in AI.
d) Explain decision theory and use of it in AI.
e) Explain scope of AI.

Q.5 Attempt Any Two. **12**

a) Explain Bayes' theorem in detail with example.
b) Explain with two applications in detail, the concept of decision making in AI.
c) Explain sequential decision problems of AI in detail.

Seat No.	

Set **Q**

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April - 2026
Artificial Intelligence (BTN06515)

Day & Date: Tuesday, 12-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which is true for Decision theory?
a) Decision Theory = Probability theory + utility theory
b) Decision Theory = Inference theory + utility theory
c) Decision Theory = Uncertainty + utility theory
d) Decision Theory = Probability theory + preference

2) General algorithm applied on game tree for making decision of win/lose is _____.
a) DFS/BFS Search Algorithms
b) Heuristic Search Algorithms
c) Greedy Search Algorithms
d) MIN/MAX Algorithms

3) The statement comprising the limitations of FOL is/are _____.
a) Expressiveness Formalizing b) Natural Languages
c) Many-sorted Logic d) All of the mentioned

4) Translate the following statement into FOL. "For every a, if a is a philosopher, then a is a scholar" _____.
a) ∀ a philosopher(a) scholar(a) b) ∃ a philosopher(a) scholar(a)
c) All of the mentioned d) None of the mentioned

5) Which form is called as a conjunction of disjunction of literals?
a) Conjunctive normal form b) Disjunctive normal form
c) Normal form d) All of the mentioned

6) How the compactness of the Bayesian network can be described?
a) Locally structured b) Fully structured
c) Partial structure d) All of the mentioned

7) Knowledge may be _____.

I) Declarative
II) Procedural
III) Non- procedural

a) Only (I)
b) Only (II)
c) Only (III)
d) Both (I) and (II)

8) Who is known as the - Father of AI?

a) Fisher Ada
b) Alan Turing
c) John McCarthy
d) Allen Newell

9) Among the given options, which search algorithm requires highest memory?

a) Optimal Search
b) Depth First Search
c) Breadth-First Search
d) Linear Search

10) Among the given options, which is not the required property of Knowledge?

a) Inferential Efficiency
b) Inferential Adequacy
c) Representational Verification
d) Representational Adequacy

11) The exploration problem is where _____.

a) Agent contains the knowledge of State and actions
b) Agent does not contain the knowledge of State and actions
c) Only actions are known to the agent
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12) A hybrid Bayesian Network consist _____.

a) Discrete variables only
b) Discontinuous Variable
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13) The probabilistic reasoning depends upon ____.

a) Estimation
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14) Which of the given element improve the performance of AI agent so that it can make better decisions?

a) Changing
b) Performance Element
c) Learning Element
d) None of the above

Seat No.	

Set **Q**

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April - 2026
Artificial Intelligence (BTN06515)

Day & Date: Tuesday, 12-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt Any Four. **16**

a) Explain the concept of reasoning with defaults.
b) Explain advantages of AI.
c) Explain AO* algorithm with suitable example.
d) Define agent. Explain learning-based agent in AI.
e) Explain different Types of knowledge in AI.

Q.3 Attempt Any Two. **12**

a) Explain AO* algorithm in detail with example in detail.
b) Explain objects, relations, events, actions, time, and space.
c) Define following term.
i) Problem reduction
ii) heuristic
iii) Constraint propagation
iv) Stochastic

SECTION – II

Q.4 Attempt Any Four. **16**

a) Explain probabilistic logic with example.
b) Explain the elementary game theory in AI.
c) Explain different learning forms in AI.
d) Explain decision theory and use of it in AI.
e) Explain scope of AI.

Q.5 Attempt Any Two. **12**

a) Explain Bayes' theorem in detail with example.
b) Explain with two applications in detail, the concept of decision making in AI.
c) Explain sequential decision problems of AI in detail.

SLR-QH-509

Seat No.		Set	R

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April - 2026
Artificial Intelligence (BTN06515)

Day & Date: Tuesday, 12-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Translate the following statement into FOL. "For every a, if a is a philosopher, then a is a scholar" _____.
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c) All of the mentioned d) None of the mentioned

2) Which form is called as a conjunction of disjunction of literals?
a) Conjunctive normal form b) Disjunctive normal form
c) Normal form d) All of the mentioned

3) How the compactness of the Bayesian network can be described?
a) Locally structured b) Fully structured
c) Partial structure d) All of the mentioned

4) Knowledge may be _____.
I) Declarative
II) Procedural
III) Non- procedural
a) Only (I) b) Only (II)
c) Only (III) d) Both (I) and (II)

5) Who is known as the - Father of AI?
a) Fisher Ada b) Alan Turing
c) John McCarthy d) Allen Newell

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13) General algorithm applied on game tree for making decision of win/lose is _____.
a) DFS/BFS Search Algorithms
b) Heuristic Search Algorithms
c) Greedy Search Algorithms
d) MIN/MAX Algorithms

14) The statement comprising the limitations of FOL is/are _____.
a) Expressiveness Formalizing b) Natural Languages
c) Many-sorted Logic d) All of the mentioned

Seat No.	

Set **R**

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April - 2026
Artificial Intelligence (BTN06515)

Day & Date: Tuesday, 12-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt Any Four. **16**

a) Explain the concept of reasoning with defaults.
b) Explain advantages of AI.
c) Explain AO* algorithm with suitable example.
d) Define agent. Explain learning-based agent in AI.
e) Explain different Types of knowledge in AI.

Q.3 Attempt Any Two. **12**

a) Explain AO* algorithm in detail with example in detail.
b) Explain objects, relations, events, actions, time, and space.
c) Define following term.
i) Problem reduction
ii) heuristic
iii) Constraint propagation
iv) Stochastic

SECTION – II

Q.4 Attempt Any Four. **16**

a) Explain probabilistic logic with example.
b) Explain the elementary game theory in AI.
c) Explain different learning forms in AI.
d) Explain decision theory and use of it in AI.
e) Explain scope of AI.

Q.5 Attempt Any Two. **12**

a) Explain Bayes' theorem in detail with example.
b) Explain with two applications in detail, the concept of decision making in AI.
c) Explain sequential decision problems of AI in detail.

Seat No.		Set	S

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April - 2026
Artificial Intelligence (BTN06515)

Day & Date: Tuesday, 12-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) The probabilistic reasoning depends upon ____.
a) Estimation b) Observations
c) Likelihood d) All of the above

2) Which of the given element improve the performance of AI agent so that it can make better decisions?
a) Changing b) Performance Element
c) Learning Element d) None of the above

3) Which is true for Decision theory?
a) Decision Theory = Probability theory + utility theory
b) Decision Theory = Inference theory + utility theory
c) Decision Theory = Uncertainty + utility theory
d) Decision Theory = Probability theory + preference

4) General algorithm applied on game tree for making decision of win/lose is _____.
a) DFS/BFS Search Algorithms
b) Heuristic Search Algorithms
c) Greedy Search Algorithms
d) MIN/MAX Algorithms

5) The statement comprising the limitations of FOL is/are _____.
a) Expressiveness Formalizing b) Natural Languages
c) Many-sorted Logic d) All of the mentioned

6) Translate the following statement into FOL. "For every a, if a is a philosopher, then a is a scholar" _____.
a) ∀ a philosopher(a) scholar(a) b) ∃ a philosopher(a) scholar(a)
c) All of the mentioned d) None of the mentioned

7) Which form is called as a conjunction of disjunction of literals?
a) Conjunctive normal form b) Disjunctive normal form
c) Normal form d) All of the mentioned

8) How the compactness of the Bayesian network can be described?
a) Locally structured b) Fully structured
c) Partial structure d) All of the mentioned

9) Knowledge may be _____.
I) Declarative
II) Procedural
III) Non- procedural
a) Only (I) b) Only (II)
c) Only (III) d) Both (I) and (II)

10) Who is known as the - Father of AI?
a) Fisher Ada b) Alan Turing
c) John McCarthy d) Allen Newell

11) Among the given options, which search algorithm requires highest memory?
a) Optimal Search b) Depth First Search
c) Breadth-First Search d) Linear Search

12) Among the given options, which is not the required property of Knowledge?
a) Inferential Efficiency b) Inferential Adequacy
c) Representational Verification d) Representational Adequacy

13) The exploration problem is where _____.
a) Agent contains the knowledge of State and actions
b) Agent does not contain the knowledge of State and actions
c) Only actions are known to the agent
d) None of the above

14) A hybrid Bayesian Network consist _____.
a) Discrete variables only
b) Discontinuous Variable
c) Both Discrete and Continuous variables
d) Continuous Variable only

SLR-QH-509

Seat No.		Set	S

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April - 2026
Artificial Intelligence (BTN06515)

Day & Date: Tuesday, 12-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt Any Four. **16**

a) Explain the concept of reasoning with defaults.
b) Explain advantages of AI.
c) Explain AO* algorithm with suitable example.
d) Define agent. Explain learning-based agent in AI.
e) Explain different Types of knowledge in AI.

Q.3 Attempt Any Two. **12**

a) Explain AO* algorithm in detail with example in detail.
b) Explain objects, relations, events, actions, time, and space.
c) Define following term.
i) Problem reduction
ii) heuristic
iii) Constraint propagation
iv) Stochastic

SECTION – II

Q.4 Attempt Any Four. **16**

a) Explain probabilistic logic with example.
b) Explain the elementary game theory in AI.
c) Explain different learning forms in AI.
d) Explain decision theory and use of it in AI.
e) Explain scope of AI.

Q.5 Attempt Any Two. **12**

a) Explain Bayes' theorem in detail with example.
b) Explain with two applications in detail, the concept of decision making in AI.
c) Explain sequential decision problems of AI in detail.

Seat No.	

Set **P**

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April - 2026
Data Processing & Feature Engineering (BTN06516)

Day & Date: Tuesday, 12-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternative from the options. **14**

1) In standardization, the features will be rescaled with _____.
a) Mean 0 and Variance 0 b) Mean 0 and Variance 1
c) Mean 1 and Variance 0 d) Mean 1 and Variance 1

2) Quantitative values can be converted to nominal or ordinal values. This process is called _____.
a) Discretization b) Normalization
c) Summarization d) Standardization

3) _____ approach has high computational complexity.
a) Wrapper b) Filter
c) Embedded d) Hybrid

4) What is the difference between supervised and unsupervised learning?
a) Supervised learning requires labeled data while unsupervised learning does not
b) Unsupervised learning requires labeled data while supervised learning does not
c) Supervised learning does not require data while unsupervised learning does
d) There is no difference between supervised and unsupervised learning

5) PCA is a _____.
a) Nonlinear method b) Linear method
c) Continuous method d) Repeated method

6) Which of the following are true about subset selection?
   a) Subset selection can substantially decrease the bias of support vector machines
   b) Ridge regression frequently eliminates some of the features
   c) Finding the true best subset takes exponential time
   d) Subset selection can reduce overfitting

7) Binning is a feature engineering technique used to convert Continuous data into categorical data.
   a) True b) False

8) What is the purpose of model evaluation in machine learning?
   a) To create new models
   b) To compare different models and select the best one
   c) To visualize the data
   d) To pre-process the data before training

9) What is model stacking in machine learning?
   a) A technique to combine multiple base models into a single model for better performance
   b) A method for visualizing high-dimensional data
   c) A process of converting categorical features into numerical representations
   d) A way to evaluate the performance of clustering algorithms

10) What is the primary goal of K-means clustering?
   a) Dimensionality reduction b) Classification
   c) Regression d) Partitioning data into clusters

11) What is the primary purpose of manual feature extraction techniques like SIFT and HOG in image processing?
   a) To convert images into grayscale
   b) To extract semantic features from images automatically
   c) To preprocess images before feeding them to deep learning models
   d) To extract distinctive and robust features from images for various computer vision tasks

12) The architecture of SIFT includes the following steps _____.
   a) Convolutional Layers, Pooling Layers, Fully Connected Layers
   b) Image Gradients, Gradient Orientation Histograms, Response Normalization Layers
   c) Rectified Linear Unit (ReLU) Transformation, Fully Connected Layers, Structure of AlexNet
   d) SIFT does not involve a specific architecture; it is a feature extraction technique

13) In the clustering algorithm the distance between cluster centroid to each object is calculated using _____ method.

a) Euclidean distance
b) Clustering distance
c) Central distance
d) Cluster

14) Which of the following layers in a deep neural network helps to handle variations in object position and scale in images?

a) Fully Connected Layers
b) Convolutional Layers
c) Pooling Layers
d) Response Normalization Layers

SLR-QH-510

Seat No.	

Set P

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April - 2026
Data Processing & Feature Engineering (BTN06516)

Day & Date: Tuesday, 12-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Solve Any Four. **16**

a) What is discretization and why is it used?

b) What is data Quality and explain about it.

c) Explain in detail the four scales of measurements.

d) What are the Advantages and Disadvantages of Dimensionality Reduction?

e) What is the difference between PCA and LDA?

Q.3 Solve Any Two. **12**

a) Explain Linear Discriminant Analysis (LDA).

b) Explain the matrix decomposition procedure.

c) Explain the concept of Principal Component Analysis.

SECTION – II

Q.4 Solve Any Four. **16**

a) Explain with example Log Transform.

b) Explain the process of Binarization.

c) Explain some cases where k-Means clustering fails to give good results.

d) What is the pooling layer? State in brief with suitable diagrams.

e) Explain the Gradient Orientation Histogram.

Q.5 Solve Any Two. **12**

a) Explain the concept of Quantization or Binning.

b) Explain in detail SIFT Architecture with diagram.

c) Explain the convolution layer of Neural Network.

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April - 2026
Data Processing & Feature Engineering (BTN06516)

Day & Date: Tuesday, 12-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternative from the options. **14**

1) What is the purpose of model evaluation in machine learning?
a) To create new models
b) To compare different models and select the best one
c) To visualize the data
d) To pre-process the data before training

2) What is model stacking in machine learning?
a) A technique to combine multiple base models into a single model for better performance
b) A method for visualizing high-dimensional data
c) A process of converting categorical features into numerical representations
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   b) Normalization
   c) Summarization
   d) Standardization

10) _____ approach has high computational complexity.
   a) Wrapper
   b) Filter
   c) Embedded
   d) Hybrid

11) What is the difference between supervised and unsupervised learning?
   a) Supervised learning requires labeled data while unsupervised learning does not
   b) Unsupervised learning requires labeled data while supervised learning does not
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12) PCA is a _____.

a) Nonlinear method
b) Linear method
c) Continuous method
d) Repeated method

13) Which of the following are true about subset selection?

a) Subset selection can substantially decrease the bias of support vector machines
b) Ridge regression frequently eliminates some of the features
c) Finding the true best subset takes exponential time
d) Subset selection can reduce overfitting

14) Binning is a feature engineering technique used to convert Continuous data into categorical data.

a) True
b) False

SLR-QH-510

Seat No.		Set	Q

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April - 2026
Data Processing & Feature Engineering (BTN06516)

Day & Date: Tuesday, 12-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Solve Any Four. **16**

a) What is discretization and why is it used?

b) What is data Quality and explain about it.

c) Explain in detail the four scales of measurements.

d) What are the Advantages and Disadvantages of Dimensionality Reduction?

e) What is the difference between PCA and LDA?

Q.3 Solve Any Two. **12**

a) Explain Linear Discriminant Analysis (LDA).

b) Explain the matrix decomposition procedure.

c) Explain the concept of Principal Component Analysis.

SECTION – II

Q.4 Solve Any Four. **16**

a) Explain with example Log Transform.

b) Explain the process of Binarization.

c) Explain some cases where k-Means clustering fails to give good results.

d) What is the pooling layer? State in brief with suitable diagrams.

e) Explain the Gradient Orientation Histogram.

Q.5 Solve Any Two. **12**

a) Explain the concept of Quantization or Binning.

b) Explain in detail SIFT Architecture with diagram.

c) Explain the convolution layer of Neural Network.

Seat No.		Set	R

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April - 2026
Data Processing & Feature Engineering (BTN06516)

Day & Date: Tuesday, 12-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternative from the options. **14**

1) What is the primary purpose of manual feature extraction techniques like SIFT and HOG in image processing?
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d) SIFT does not involve a specific architecture; it is a feature extraction technique

3) In the clustering algorithm the distance between cluster centroid to each object is calculated using _____ method.
a) Euclidean distance b) Clustering distance
c) Central distance d) Cluster

4) Which of the following layers in a deep neural network helps to handle variations in object position and scale in images?
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b) Convolutional Layers
c) Pooling Layers
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   a) Nonlinear method
   b) Linear method
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10) Which of the following are true about subset selection?
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11) Binning is a feature engineering technique used to convert Continuous data into categorical data.
   a) True
   b) False

12) What is the purpose of model evaluation in machine learning?
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13) What is model stacking in machine learning?

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14) What is the primary goal of K-means clustering?

a) Dimensionality reduction
b) Classification
c) Regression
d) Partitioning data into clusters

Seat No.	

Set **R**

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April - 2026
Data Processing & Feature Engineering (BTN06516)

Day & Date: Tuesday, 12-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Solve Any Four. **16**

a) What is discretization and why is it used?

b) What is data Quality and explain about it.

c) Explain in detail the four scales of measurements.

d) What are the Advantages and Disadvantages of Dimensionality Reduction?

e) What is the difference between PCA and LDA?

Q.3 Solve Any Two. **12**

a) Explain Linear Discriminant Analysis (LDA).

b) Explain the matrix decomposition procedure.

c) Explain the concept of Principal Component Analysis.

SECTION – II

Q.4 Solve Any Four. **16**

a) Explain with example Log Transform.

b) Explain the process of Binarization.

c) Explain some cases where k-Means clustering fails to give good results.

d) What is the pooling layer? State in brief with suitable diagrams.

e) Explain the Gradient Orientation Histogram.

Q.5 Solve Any Two. **12**

a) Explain the concept of Quantization or Binning.

b) Explain in detail SIFT Architecture with diagram.

c) Explain the convolution layer of Neural Network.

Seat No.		Set	S

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April - 2026
Data Processing & Feature Engineering (BTN06516)

Day & Date: Tuesday, 12-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternative from the options. **14**

1) Which of the following are true about subset selection?
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   a) Mean 0 and Variance 0 b) Mean 0 and Variance 1
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11) Quantitative values can be converted to nominal or ordinal values. This process is called _____.
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12) _____ approach has high computational complexity.
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14) PCA is a _____.

a) Nonlinear method
b) Linear method
c) Continuous method
d) Repeated method

SLR-QH-510

Seat No.		Set	S

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April - 2026
Data Processing & Feature Engineering (BTN06516)

Day & Date: Tuesday, 12-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Solve Any Four. **16**

a) What is discretization and why is it used?

b) What is data Quality and explain about it.

c) Explain in detail the four scales of measurements.

d) What are the Advantages and Disadvantages of Dimensionality Reduction?

e) What is the difference between PCA and LDA?

Q.3 Solve Any Two. **12**

a) Explain Linear Discriminant Analysis (LDA).

b) Explain the matrix decomposition procedure.

c) Explain the concept of Principal Component Analysis.

SECTION – II

Q.4 Solve Any Four. **16**

a) Explain with example Log Transform.

b) Explain the process of Binarization.

c) Explain some cases where k-Means clustering fails to give good results.

d) What is the pooling layer? State in brief with suitable diagrams.

e) Explain the Gradient Orientation Histogram.

Q.5 Solve Any Two. **12**

a) Explain the concept of Quantization or Binning.

b) Explain in detail SIFT Architecture with diagram.

c) Explain the convolution layer of Neural Network.

SLR-QH-513

Seat No.		Set	P

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April - 2026
Network Security and Secure Coding (BTN06519)

Day & Date: Tuesday, 12-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct option from the following. **14**

1) Sending fake messages to mislead a recipient falls under which category?
a) Interruption b) Interception
c) Fabrication d) Modification

2) A man-in-the-middle attack involves _____.
a) Intercepting communication between two parties
b) Overloading a network with traffic
c) Exploiting weak encryption
d) Redirecting DNS queries to a malicious server

3) The Diffie-Hellman algorithm is used for _____.
a) Encrypting messages b) Securely exchanging keys
c) Authenticating users d) Generating random numbers

4) Which of the following is a property of a secure hash function?
a) It must be invertible.
b) It must produce a fixed-length output for any input
c) It must use a symmetric key
d) It must encrypt data

5) Which factor enables TCP session hijacking?
a) Lack of encryption
b) Predictable sequence numbers
c) Absence of packet authentication
d) All of the above

6) Which of the following is an example of a public key cryptographic algorithm?
a) AES
b) RSA
c) DES
d) Blowfish

7) The private key in public key infrastructure (PKI) should be _____.
a) Kept confidential and never shared
b) Published in a certificate
c) Stored alongside the public key
d) Signed by the Certificate Authority

8) PGP uses which mechanism to ensure message integrity?
a) Digital certificates
b) Hash functions like SHA-1
c) Symmetric encryption
d) Public key cryptography

9) Which two modes are supported by IPsec for securing traffic?
a) Stream mode and block mode
b) Tunnel mode and transport mode
c) Authentication mode and encryption mode
d) Stateless mode and stateful mode

10) What is the purpose of combining SAs?
a) To improve packet transmission speed
b) To provide a mix of authentication and confidentiality
c) To enable secure DNS queries
d) To eliminate the need for encryption

11) S/MIME ensures email security through _____.
a) Symmetric encryption and hashing
b) Digital certificates and encryption
c) Asymmetric cryptography only
d) Hashing algorithms only

12) The Internet Key Exchange (IKE) protocol in IPsec is used for _____.
a) Generating random numbers
b) Establishing, negotiating, and maintaining Security Associations (SAs)
c) Encrypting IP packets directly
d) Authenticating email messages

13) Which of the following is a characteristic of trusted systems?
a) Mandatory access controls
b) Only encryption
c) Redundancy in hardware
d) Faster network communication

14) A buffer overflow attack occurs when _____.
a) A program terminates unexpectedly
b) More data is written to a buffer than it can hold
c) A memory address becomes invalid
d) The stack pointer is nullified

SLR-QH-513

Seat No.		Set	P

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April - 2026
Network Security and Secure Coding (BTN06519)

Day & Date: Tuesday, 12-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt Any Four questions. **16**

a) Discuss the challenges in maintaining availability in the face of distributed denial-of- service (DDoS) attacks.

b) Explain the concept of format string vulnerabilities with an example.

c) Explain any two methods of key distribution in conventional encryption.

d) Describe the working of the CTR (Counter) mode and state its advantages over other modes.

e) List the main entities involved in the Kerberos authentication system.

Q.3 Attempt Any Two questions. **12**

a) Discuss in detail the various security services — confidentiality, authentication, integrity, nonrepudiation, access control, and availability.

b) Compare all cipher block modes (ECB, CBC, CFB, OFB, CTR) based on error propagation and parallelism.

c) Explain how Kerberos ensures mutual authentication between clients and servers.

SECTION – II

Q.4 Attempt Any Four questions. **16**

a) Differentiate between transport mode and tunnel mode in IPSec.

b) Explain how S/MIME provides authentication and confidentiality.

c) List the major improvements introduced in SNMPv3 over SNMPv1.

d) What is a *firewall?* State the main objectives of a firewall.

e) What is a *secure architecture?* List the main principles of secure architecture design.

Q.5 Attempt Any Two questions. **12**

a) Explain the architecture and working of Pretty Good Privacy (PGP) with a neat diagram.

b) Explain preventive measures and control mechanisms against malicious software.

c) Explain the importance of security by design and how it differs from security as an add-on.

Seat No.		Set	Q

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April - 2026
Network Security and Secure Coding (BTN06519)

Day & Date: Tuesday, 12-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct option from the following. **14**

1) PGP uses which mechanism to ensure message integrity?
a) Digital certificates
b) Hash functions like SHA-1
c) Symmetric encryption
d) Public key cryptography

2) Which two modes are supported by IPsec for securing traffic?
a) Stream mode and block mode
b) Tunnel mode and transport mode
c) Authentication mode and encryption mode
d) Stateless mode and stateful mode

3) What is the purpose of combining SAs?
a) To improve packet transmission speed
b) To provide a mix of authentication and confidentiality
c) To enable secure DNS queries
d) To eliminate the need for encryption

4) S/MIME ensures email security through _____.
a) Symmetric encryption and hashing
b) Digital certificates and encryption
c) Asymmetric cryptography only
d) Hashing algorithms only

5) The Internet Key Exchange (IKE) protocol in IPsec is used for _____.
a) Generating random numbers
b) Establishing, negotiating, and maintaining Security Associations (SAs)
c) Encrypting IP packets directly
d) Authenticating email messages

6) Which of the following is a characteristic of trusted systems?
a) Mandatory access controls b) Only encryption
c) Redundancy in hardware d) Faster network communication

7) A buffer overflow attack occurs when _____.
a) A program terminates unexpectedly
b) More data is written to a buffer than it can hold
c) A memory address becomes invalid
d) The stack pointer is nullified

8) Sending fake messages to mislead a recipient falls under which category?
a) Interruption b) Interception
c) Fabrication d) Modification

9) A man-in-the-middle attack involves _____.
a) Intercepting communication between two parties
b) Overloading a network with traffic
c) Exploiting weak encryption
d) Redirecting DNS queries to a malicious server

10) The Diffie-Hellman algorithm is used for _____.
a) Encrypting messages b) Securely exchanging keys
c) Authenticating users d) Generating random numbers

11) Which of the following is a property of a secure hash function?
a) It must be invertible.
b) It must produce a fixed-length output for any input
c) It must use a symmetric key
d) It must encrypt data

12) Which factor enables TCP session hijacking?
a) Lack of encryption
b) Predictable sequence numbers
c) Absence of packet authentication
d) All of the above

13) Which of the following is an example of a public key cryptographic algorithm?
a) AES b) RSA
c) DES d) Blowfish

14) The private key in public key infrastructure (PKI) should be _____.
a) Kept confidential and never shared
b) Published in a certificate
c) Stored alongside the public key
d) Signed by the Certificate Authority

SLR-QH-513

Seat No.		Set	Q

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April - 2026
Network Security and Secure Coding (BTN06519)

Day & Date: Tuesday, 12-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt Any Four questions. **16**

a) Discuss the challenges in maintaining availability in the face of distributed denial-of- service (DDoS) attacks.

b) Explain the concept of format string vulnerabilities with an example.

c) Explain any two methods of key distribution in conventional encryption.

d) Describe the working of the CTR (Counter) mode and state its advantages over other modes.

e) List the main entities involved in the Kerberos authentication system.

Q.3 Attempt Any Two questions. **12**

a) Discuss in detail the various security services — confidentiality, authentication, integrity, nonrepudiation, access control, and availability.

b) Compare all cipher block modes (ECB, CBC, CFB, OFB, CTR) based on error propagation and parallelism.

c) Explain how Kerberos ensures mutual authentication between clients and servers.

SECTION – II

Q.4 Attempt Any Four questions. **16**

a) Differentiate between transport mode and tunnel mode in IPSec.

b) Explain how S/MIME provides authentication and confidentiality.

c) List the major improvements introduced in SNMPv3 over SNMPv1.

d) What is a *firewall?* State the main objectives of a firewall.

e) What is a *secure architecture?* List the main principles of secure architecture design.

Q.5 Attempt Any Two questions. **12**

a) Explain the architecture and working of Pretty Good Privacy (PGP) with a neat diagram.

b) Explain preventive measures and control mechanisms against malicious software.

c) Explain the importance of security by design and how it differs from security as an add-on.

Seat No.		Set	R

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April - 2026
Network Security and Secure Coding (BTN06519)

Day & Date: Tuesday, 12-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct option from the following. **14**

1) S/MIME ensures email security through _____.
a) Symmetric encryption and hashing
b) Digital certificates and encryption
c) Asymmetric cryptography only
d) Hashing algorithms only

2) The Internet Key Exchange (IKE) protocol in IPsec is used for _____.
a) Generating random numbers
b) Establishing, negotiating, and maintaining Security Associations (SAs)
c) Encrypting IP packets directly
d) Authenticating email messages

3) Which of the following is a characteristic of trusted systems?
a) Mandatory access controls b) Only encryption
c) Redundancy in hardware d) Faster network communication

4) A buffer overflow attack occurs when _____.
a) A program terminates unexpectedly
b) More data is written to a buffer than it can hold
c) A memory address becomes invalid
d) The stack pointer is nullified

5) Sending fake messages to mislead a recipient falls under which category?
a) Interruption b) Interception
c) Fabrication d) Modification

6) A man-in-the-middle attack involves _____.
   a) Intercepting communication between two parties
   b) Overloading a network with traffic
   c) Exploiting weak encryption
   d) Redirecting DNS queries to a malicious server

7) The Diffie-Hellman algorithm is used for _____.
   a) Encrypting messages
   b) Securely exchanging keys
   c) Authenticating users
   d) Generating random numbers

8) Which of the following is a property of a secure hash function?
   a) It must be invertible.
   b) It must produce a fixed-length output for any input
   c) It must use a symmetric key
   d) It must encrypt data

9) Which factor enables TCP session hijacking?
   a) Lack of encryption
   b) Predictable sequence numbers
   c) Absence of packet authentication
   d) All of the above

10) Which of the following is an example of a public key cryptographic algorithm?
   a) AES
   b) RSA
   c) DES
   d) Blowfish

11) The private key in public key infrastructure (PKI) should be _____.
   a) Kept confidential and never shared
   b) Published in a certificate
   c) Stored alongside the public key
   d) Signed by the Certificate Authority

12) PGP uses which mechanism to ensure message integrity?
   a) Digital certificates
   b) Hash functions like SHA-1
   c) Symmetric encryption
   d) Public key cryptography

13) Which two modes are supported by IPsec for securing traffic?
   a) Stream mode and block mode
   b) Tunnel mode and transport mode
   c) Authentication mode and encryption mode
   d) Stateless mode and stateful mode

14) What is the purpose of combining SAs?
   a) To improve packet transmission speed
   b) To provide a mix of authentication and confidentiality
   c) To enable secure DNS queries
   d) To eliminate the need for encryption

Seat No.		Set	R

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April - 2026
Network Security and Secure Coding (BTN06519)

Day & Date: Tuesday, 12-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt Any Four questions. **16**

a) Discuss the challenges in maintaining availability in the face of distributed denial-of- service (DDoS) attacks.

b) Explain the concept of format string vulnerabilities with an example.

c) Explain any two methods of key distribution in conventional encryption.

d) Describe the working of the CTR (Counter) mode and state its advantages over other modes.

e) List the main entities involved in the Kerberos authentication system.

Q.3 Attempt Any Two questions. **12**

a) Discuss in detail the various security services — confidentiality, authentication, integrity, nonrepudiation, access control, and availability.

b) Compare all cipher block modes (ECB, CBC, CFB, OFB, CTR) based on error propagation and parallelism.

c) Explain how Kerberos ensures mutual authentication between clients and servers.

SECTION – II

Q.4 Attempt Any Four questions. **16**

a) Differentiate between transport mode and tunnel mode in IPSec.

b) Explain how S/MIME provides authentication and confidentiality.

c) List the major improvements introduced in SNMPv3 over SNMPv1.

d) What is a *firewall?* State the main objectives of a firewall.

e) What is a *secure architecture?* List the main principles of secure architecture design.

Q.5 Attempt Any Two questions. **12**

a) Explain the architecture and working of Pretty Good Privacy (PGP) with a neat diagram.

b) Explain preventive measures and control mechanisms against malicious software.

c) Explain the importance of security by design and how it differs from security as an add-on.

Seat No.		Set	S

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April - 2026
Network Security and Secure Coding (BTN06519)

Day & Date: Tuesday, 12-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct option from the following. **14**

1) Which of the following is an example of a public key cryptographic algorithm?
a) AES b) RSA
c) DES d) Blowfish

2) The private key in public key infrastructure (PKI) should be _____.
a) Kept confidential and never shared
b) Published in a certificate
c) Stored alongside the public key
d) Signed by the Certificate Authority

3) PGP uses which mechanism to ensure message integrity?
a) Digital certificates b) Hash functions like SHA-1
c) Symmetric encryption d) Public key cryptography

4) Which two modes are supported by IPsec for securing traffic?
a) Stream mode and block mode
b) Tunnel mode and transport mode
c) Authentication mode and encryption mode
d) Stateless mode and stateful mode

5) What is the purpose of combining SAs?
a) To improve packet transmission speed
b) To provide a mix of authentication and confidentiality
c) To enable secure DNS queries
d) To eliminate the need for encryption

6) S/MIME ensures email security through _____.
   a) Symmetric encryption and hashing
   b) Digital certificates and encryption
   c) Asymmetric cryptography only
   d) Hashing algorithms only

7) The Internet Key Exchange (IKE) protocol in IPsec is used for _____.
   a) Generating random numbers
   b) Establishing, negotiating, and maintaining Security Associations (SAs)
   c) Encrypting IP packets directly
   d) Authenticating email messages

8) Which of the following is a characteristic of trusted systems?
   a) Mandatory access controls b) Only encryption
   c) Redundancy in hardware d) Faster network communication

9) A buffer overflow attack occurs when _____.
   a) A program terminates unexpectedly
   b) More data is written to a buffer than it can hold
   c) A memory address becomes invalid
   d) The stack pointer is nullified

10) Sending fake messages to mislead a recipient falls under which category?
   a) Interruption b) Interception
   c) Fabrication d) Modification

11) A man-in-the-middle attack involves _____.
   a) Intercepting communication between two parties
   b) Overloading a network with traffic
   c) Exploiting weak encryption
   d) Redirecting DNS queries to a malicious server

12) The Diffie-Hellman algorithm is used for _____.
   a) Encrypting messages b) Securely exchanging keys
   c) Authenticating users d) Generating random numbers

13) Which of the following is a property of a secure hash function?
   a) It must be invertible.
   b) It must produce a fixed-length output for any input
   c) It must use a symmetric key
   d) It must encrypt data

14) Which factor enables TCP session hijacking?
   a) Lack of encryption
   b) Predictable sequence numbers
   c) Absence of packet authentication
   d) All of the above

SLR-QH-513

Seat No.		Set	S

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April - 2026
Network Security and Secure Coding (BTN06519)

Day & Date: Tuesday, 12-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt Any Four questions. **16**

a) Discuss the challenges in maintaining availability in the face of distributed denial-of- service (DDoS) attacks.

b) Explain the concept of format string vulnerabilities with an example.

c) Explain any two methods of key distribution in conventional encryption.

d) Describe the working of the CTR (Counter) mode and state its advantages over other modes.

e) List the main entities involved in the Kerberos authentication system.

Q.3 Attempt Any Two questions. **12**

a) Discuss in detail the various security services — confidentiality, authentication, integrity, nonrepudiation, access control, and availability.

b) Compare all cipher block modes (ECB, CBC, CFB, OFB, CTR) based on error propagation and parallelism.

c) Explain how Kerberos ensures mutual authentication between clients and servers.

SECTION – II

Q.4 Attempt Any Four questions. **16**

a) Differentiate between transport mode and tunnel mode in IPSec.

b) Explain how S/MIME provides authentication and confidentiality.

c) List the major improvements introduced in SNMPv3 over SNMPv1.

d) What is a *firewall?* State the main objectives of a firewall.

e) What is a *secure architecture?* List the main principles of secure architecture design.

Q.5 Attempt Any Two questions. **12**

a) Explain the architecture and working of Pretty Good Privacy (PGP) with a neat diagram.

b) Explain preventive measures and control mechanisms against malicious software.

c) Explain the importance of security by design and how it differs from security as an add-on.

SLR-QH-519

Seat No.	

Set P

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026
Advanced Mobile Communication (ENTPCC-10)

Day & Date: Friday, 15-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) If the cluster size N = 12, then reuse ratio Q is _____.
a) 6 b) $\sqrt{12}$
c) $\sqrt{36}$ d) None of these

2) Grade of Service (GoS) is expressed as _____.
a) Signal power ratio b) Probability of call blocking
c) Delay time d) Throughput

3) If frequency doubles, free space path loss _____.
a) Decreases b) Remains same
c) Increases d) Becomes zero

4) Coherence bandwidth is inversely proportional to _____.
a) Delay spread b) Frequency
c) Power d) Distance

5) In MIMO-OFDM, OFDM handles _____.
a) Frequency selectivity b) Spatial diversity
c) Power control d) Antenna switching

6) Inter-carrier interference (ICI) in OFDM is caused by _____.
a) Perfect synchronization b) Loss of orthogonality
c) High bandwidth d) Low power

7) A 2×2 MIMO system ideally increases capacity by _____.
a) 2 times b) 4 times
c) No change d) 8 times

8) The channel bandwidth of IS-95 is _____.
a) 200 kHz b) 1.25 MHz
c) 5 MHz d) 20 MHz

9) LTE-Advanced is part of _____.
a) IMT-2000 b) IMT-Advanced
c) IMT-2020 d) GSM

10) LTE is based on which technology?
a) CDMA b) TDMA
c) OFDMA & SC-FDMA d) FDMA

11) 5G core is based on _____.
a) Service-based architecture (SBA)
b) Circuit switching
c) Analog switching
d) TDMA

12) Why is SC-FDMA used in uplink?
a) Increase interference b) Reduce PAPR
c) Increase bandwidth d) Reduce data rate

13) GSM signaling is based on _____.
a) TCP/IP b) FTP
c) HTTP d) SS7

14) GSM uses which speech coding technique?
a) PCM b) RPE-LTP
c) Delta modulation d) OFDM

Seat No.	

Set **P**

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026
Advanced Mobile Communication (ENTPCC-10)

Day & Date: Friday, 15-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

SECTION – I

Q.2 Solve Any Four. **16**

a) Explain different channel assignment strategies in cellular system.

b) What is small scale fading? What are its types? Explain in detail.

c) Explain the frequency reuse concept in cellular system.

d) What is diffraction? Explain knife edge diffraction.

e) Draw and explain working of MIMO in wireless communication system with advantages and disadvantages.

Q.3 Solve Any Two. **12**

a) What is OFDMA? What are its features? Explain in detail OFDMA with neat block diagram.

b) What are the different methods to improve the coverage and capacity of a cellular system? Explain in detail.

c) Explain two ray model in detail.

SECTION – II

Q.4 Solve Any Four. **16**

a) What is handoff? Explain different types of handoff in GSM.

b) Explain different channels & frame structure used in GSM.

c) Explain in detail forward channel of CDMA IS - 95.

d) What is E-UTRAN? Explain

e) Explain in detail radio interface, modulation, channels & features of 4G.

Q.5 Solve Any Two **12**

a) Give the detail comparison of IMT 2000, IMT Advanced and IMT 2020.

b) Explain the various services such as bearer services, tele services & supplementary services. Also features provided by GSM in detail.

c) Explain the features, advantages, disadvantages and applications of 5G.

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026
Advanced Mobile Communication (ENTPCC-10)

Day & Date: Friday, 15-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) The channel bandwidth of IS-95 is _____.
a) 200 kHz b) 1.25 MHz
c) 5 MHz d) 20 MHz

2) LTE-Advanced is part of _____.
a) IMT-2000 b) IMT-Advanced
c) IMT-2020 d) GSM

3) LTE is based on which technology?
a) CDMA b) TDMA
c) OFDMA & SC-FDMA d) FDMA

4) 5G core is based on _____.
a) Service-based architecture (SBA)
b) Circuit switching
c) Analog switching
d) TDMA

5) Why is SC-FDMA used in uplink?
a) Increase interference b) Reduce PAPR
c) Increase bandwidth d) Reduce data rate

6) GSM signaling is based on _____.
a) TCP/IP b) FTP
c) HTTP d) SS7

7) GSM uses which speech coding technique?
a) PCM b) RPE-LTP
c) Delta modulation d) OFDM

8) If the cluster size N = 12, then reuse ratio Q is _____.
a) 6 b) $\sqrt{12}$
c) $\sqrt{36}$ d) None of these

9) Grade of Service (GoS) is expressed as _____.
a) Signal power ratio b) Probability of call blocking
c) Delay time d) Throughput

10) If frequency doubles, free space path loss _____.
a) Decreases b) Remains same
c) Increases d) Becomes zero

11) Coherence bandwidth is inversely proportional to _____.
a) Delay spread b) Frequency
c) Power d) Distance

12) In MIMO-OFDM, OFDM handles _____.
a) Frequency selectivity b) Spatial diversity
c) Power control d) Antenna switching

13) Inter-carrier interference (ICI) in OFDM is caused by _____.
a) Perfect synchronization b) Loss of orthogonality
c) High bandwidth d) Low power

14) A 2×2 MIMO system ideally increases capacity by _____.
a) 2 times b) 4 times
c) No change d) 8 times

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026
Advanced Mobile Communication (ENTPCC-10)

Day & Date: Friday, 15-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

SECTION – I

Q.2 Solve Any Four. **16**

a) Explain different channel assignment strategies in cellular system.

b) What is small scale fading? What are its types? Explain in detail.

c) Explain the frequency reuse concept in cellular system.

d) What is diffraction? Explain knife edge diffraction.

e) Draw and explain working of MIMO in wireless communication system with advantages and disadvantages.

Q.3 Solve Any Two. **12**

a) What is OFDMA? What are its features? Explain in detail OFDMA with neat block diagram.

b) What are the different methods to improve the coverage and capacity of a cellular system? Explain in detail.

c) Explain two ray model in detail.

SECTION – II

Q.4 Solve Any Four. **16**

a) What is handoff? Explain different types of handoff in GSM.

b) Explain different channels & frame structure used in GSM.

c) Explain in detail forward channel of CDMA IS - 95.

d) What is E-UTRAN? Explain

e) Explain in detail radio interface, modulation, channels & features of 4G.

Q.5 Solve Any Two **12**

a) Give the detail comparison of IMT 2000, IMT Advanced and IMT 2020.

b) Explain the various services such as bearer services, tele services & supplementary services. Also features provided by GSM in detail.

c) Explain the features, advantages, disadvantages and applications of 5G.

Seat No.	

Set **R**

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026
Advanced Mobile Communication (ENTPCC-10)

Day & Date: Friday, 15-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) 5G core is based on _____.
a) Service-based architecture (SBA)
b) Circuit switching
c) Analog switching
d) TDMA

2) Why is SC-FDMA used in uplink?
a) Increase interference b) Reduce PAPR
c) Increase bandwidth d) Reduce data rate

3) GSM signaling is based on _____.
a) TCP/IP b) FTP
c) HTTP d) SS7

4) GSM uses which speech coding technique?
a) PCM b) RPE-LTP
c) Delta modulation d) OFDM

5) If the cluster size N = 12, then reuse ratio Q is _____.
a) 6 b) $\sqrt{12}$
c) $\sqrt{36}$ d) None of these

6) Grade of Service (GoS) is expressed as _____.
a) Signal power ratio b) Probability of call blocking
c) Delay time d) Throughput

7) If frequency doubles, free space path loss _____.
a) Decreases b) Remains same
c) Increases d) Becomes zero

8) Coherence bandwidth is inversely proportional to _____.
a) Delay spread b) Frequency
c) Power d) Distance

9) In MIMO-OFDM, OFDM handles _____.
a) Frequency selectivity b) Spatial diversity
c) Power control d) Antenna switching

10) Inter-carrier interference (ICI) in OFDM is caused by _____.
a) Perfect synchronization b) Loss of orthogonality
c) High bandwidth d) Low power

11) A 2×2 MIMO system ideally increases capacity by _____.
a) 2 times b) 4 times
c) No change d) 8 times

12) The channel bandwidth of IS-95 is _____.
a) 200 kHz b) 1.25 MHz
c) 5 MHz d) 20 MHz

13) LTE-Advanced is part of _____.
a) IMT-2000 b) IMT-Advanced
c) IMT-2020 d) GSM

14) LTE is based on which technology?
a) CDMA b) TDMA
c) OFDMA & SC-FDMA d) FDMA

Seat No.	

Set **R**

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026
Advanced Mobile Communication (ENTPCC-10)

Day & Date: Friday, 15-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

SECTION – I

Q.2 Solve Any Four. **16**

a) Explain different channel assignment strategies in cellular system.

b) What is small scale fading? What are its types? Explain in detail.

c) Explain the frequency reuse concept in cellular system.

d) What is diffraction? Explain knife edge diffraction.

e) Draw and explain working of MIMO in wireless communication system with advantages and disadvantages.

Q.3 Solve Any Two. **12**

a) What is OFDMA? What are its features? Explain in detail OFDMA with neat block diagram.

b) What are the different methods to improve the coverage and capacity of a cellular system? Explain in detail.

c) Explain two ray model in detail.

SECTION – II

Q.4 Solve Any Four. **16**

a) What is handoff? Explain different types of handoff in GSM.

b) Explain different channels & frame structure used in GSM.

c) Explain in detail forward channel of CDMA IS - 95.

d) What is E-UTRAN? Explain

e) Explain in detail radio interface, modulation, channels & features of 4G.

Q.5 Solve Any Two **12**

a) Give the detail comparison of IMT 2000, IMT Advanced and IMT 2020.

b) Explain the various services such as bearer services, tele services & supplementary services. Also features provided by GSM in detail.

c) Explain the features, advantages, disadvantages and applications of 5G.

Seat No.	

Set **S**

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026
Advanced Mobile Communication (ENTPCC-10)

Day & Date: Friday, 15-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Inter-carrier interference (ICI) in OFDM is caused by _____.
a) Perfect synchronization b) Loss of orthogonality
c) High bandwidth d) Low power

2) A 2×2 MIMO system ideally increases capacity by _____.
a) 2 times b) 4 times
c) No change d) 8 times

3) The channel bandwidth of IS-95 is _____.
a) 200 kHz b) 1.25 MHz
c) 5 MHz d) 20 MHz

4) LTE-Advanced is part of _____.
a) IMT-2000 b) IMT-Advanced
c) IMT-2020 d) GSM

5) LTE is based on which technology?
a) CDMA b) TDMA
c) OFDMA & SC-FDMA d) FDMA

6) 5G core is based on _____.
a) Service-based architecture (SBA)
b) Circuit switching
c) Analog switching
d) TDMA

7) Why is SC-FDMA used in uplink?
a) Increase interference b) Reduce PAPR
c) Increase bandwidth d) Reduce data rate

8) GSM signaling is based on _____.
a) TCP/IP b) FTP
c) HTTP d) SS7

9) GSM uses which speech coding technique?
a) PCM b) RPE-LTP
c) Delta modulation d) OFDM

10) If the cluster size N = 12, then reuse ratio Q is _____.
a) 6 b) $\sqrt{12}$
c) $\sqrt{36}$ d) None of these

11) Grade of Service (GoS) is expressed as _____.
a) Signal power ratio b) Probability of call blocking
c) Delay time d) Throughput

12) If frequency doubles, free space path loss _____.
a) Decreases b) Remains same
c) Increases d) Becomes zero

13) Coherence bandwidth is inversely proportional to _____.
a) Delay spread b) Frequency
c) Power d) Distance

14) In MIMO-OFDM, OFDM handles _____.
a) Frequency selectivity b) Spatial diversity
c) Power control d) Antenna switching

SLR-QH-519

Seat No.	

Set S

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026
Advanced Mobile Communication (ENTPCC-10)

Day & Date: Friday, 15-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

SECTION – I

Q.2 Solve Any Four. **16**

a) Explain different channel assignment strategies in cellular system.

b) What is small scale fading? What are its types? Explain in detail.

c) Explain the frequency reuse concept in cellular system.

d) What is diffraction? Explain knife edge diffraction.

e) Draw and explain working of MIMO in wireless communication system with advantages and disadvantages.

Q.3 Solve Any Two. **12**

a) What is OFDMA? What are its features? Explain in detail OFDMA with neat block diagram.

b) What are the different methods to improve the coverage and capacity of a cellular system? Explain in detail.

c) Explain two ray model in detail.

SECTION – II

Q.4 Solve Any Four. **16**

a) What is handoff? Explain different types of handoff in GSM.

b) Explain different channels & frame structure used in GSM.

c) Explain in detail forward channel of CDMA IS - 95.

d) What is E-UTRAN? Explain

e) Explain in detail radio interface, modulation, channels & features of 4G.

Q.5 Solve Any Two **12**

a) Give the detail comparison of IMT 2000, IMT Advanced and IMT 2020.

b) Explain the various services such as bearer services, tele services & supplementary services. Also features provided by GSM in detail.

c) Explain the features, advantages, disadvantages and applications of 5G.

SLR-QH-520

Seat No.	

Set P

T. Y. (B.Tech.) (Electronics &Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: Marh/April – 2026
Electronics System Design (ENTPCC-11)

Day & Date: Monday, 18-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data whenever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the given options. 14

1) For input voltage range $0 - 2V$, $t2 = 2000$, required DVM display is _____.
a) 2 digit b) 3 digit
c) 3 ½ digit d) 3 ¾ digit

2) In reverse blocking mode of a SCR, junction _____.
a) J2 reverse & J1, J3 forward bias
b) J3 forward bias & J1, J2 reverse bias
c) J1, J3 reverse & J2 forward bias
d) J1, J2 forward & J3 reverse bias

3) A step-down chopper gives output voltage 60 V from 120 V input. Find duty cycle.
a) 0.25 b) 0.5
c) 0.75 d) 1

4) With reference to DIAC, which statement is wrong ____.
a) DIAC is bidirectional device
b) It's current can be controlled
c) It has two terminals
d) It triggers with positive/negative voltage

5) IC 74C926 can be used for programming measurement of _____.
a) Frequency b) Time Period
c) Event d) All of these

6) The IC XR 2240 consist of _____.
a) 8 bit Counter
b) 4-bit Counter
c) 8-digit Counter
d) 4-digit Counter

7) Which of the following temperature sensor has sensitivity 10 mV/°C?
a) LM35
b) J - type thermocouple
c) PT 100
d) None of above

8) The programmable delays of XR-2240 is _____.
a) 2RC to 16 RC
b) 0 RC to 255 RC
c) 1 RC to 100 RC
d) 1RC to 255 R

9) A single phase fully controlled bridge converter supplies an Inductive load. If $\propto = 0°$, then average dc voltage is _____.
a) Vm / π
b) $2Vm / \pi$
c) $Vm / \sqrt{2}$
d) $0.95Vm$

10) In Type-B chopper, power flow is _____.
a) Source to load
b) Load to source
c) No power flow
d) Bidirectional

11) Chopper is widely used in which of the following?
a) Radio receivers
b) Oscillators
c) Audio amplifiers
d) DC motor speed control

12) Time Ratio Control (TRC) controls output by varying _____.
a) Input voltage
b) Load resistance
c) Duty cycle
d) Current

13) In ON - OFF controller, error voltage (V_e) is given by _____.
a) $V_e = V_SP + V_PV$
b) $V_e = V_PV - V_SP$
c) $V_e = V_SP - V_PV$
d) $V_e = V_PV + V_SP$

14) Which of the following PNPN devices are bidirectional?
a) TRIAC
b) DIAC
c) SCR
d) both a) & b)

Seat No.	

Set | P

T. Y. (B.Tech.) (Electronics &Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: Marh/April – 2026
Electronics System Design (ENTPCC-11)

Day & Date: Monday, 18-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All Questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of calculator and electronic component datasheet is allowed.

Section – I

Q.2 Attempt the following. (Any Four) **16**

a) Explain the working of IGBT with transfer characteristics.

b) Explain Turn ON & OFF methods of SCR.

c) Draw and explain AC power control using DIAC and TRIAC for lamp dimmer.

d) Define Chopper. Explain Control strategies of Chopper.

e) Sketch V-I characteristics of DIAC and explain its principal of working.

Q.3 Attempt the following. (Any Two) **12**

a) Draw VI characteristics of TRIAC and explain its working with mode of operations.

b) Draw and explain single phase controlled rectifier with centre tapped transformer and resistive load. Derive expression for average output voltage & rms load voltage.

c) Explain the operation of Class A & Class B type Chopper with waveform.

Section – II

Q.4 Attempt the following. (Any Four) **16**

a) Design a timer using XR 2240 to generate a delay of 15 seconds.

b) Design voltage to current converter to convert 0 to 10 V into 4 to 20 mA.

c) Explain the basics of a Programmable Logic Controller (PLC) with a neat block diagram.

d) Compare between ON - OFF controller and proportional controller.

e) Draw and explain ladder diagram for bottle filling plant system.

Q.5 Attempt the following. (Any Two) **12**

a) Design frequency measurement set up to measure frequency up to 100 KHz with 0.1 Hz accuracy. Use IC 74C926.

b) Design ON-OFF temperature controller to control temperature in range of 0 to 100 0 C. Set point is 60 0 C and required full scale output is 10 V.

c) Design 3 ½ digit DVM for measurement of $Vin = \pm 2V$. Use 1 MHz clock.

Seat No.	

Set **Q**

T. Y. (B.Tech.) (Electronics &Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: Marh/April – 2026
Electronics System Design (ENTPCC-11)

Day & Date: Monday, 18-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data whenever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the given options. 14

1) The programmable delays of XR-2240 is _____.
a) 2RC to 16 RC b) 0 RC to 255 RC
c) 1 RC to 100 RC d) 1RC to 255 R

2) A single phase fully controlled bridge converter supplies an Inductive load. If $\propto = 0°$, then average dc voltage is _____.
a) Vm / π b) $2Vm / \pi$
c) $Vm / \sqrt{2}$ d) $0.95Vm$

3) In Type-B chopper, power flow is _____.
a) Source to load b) Load to source
c) No power flow d) Bidirectional

4) Chopper is widely used in which of the following?
a) Radio receivers b) Oscillators
c) Audio amplifiers d) DC motor speed control

5) Time Ratio Control (TRC) controls output by varying _____.
a) Input voltage b) Load resistance
c) Duty cycle d) Current

6) In ON - OFF controller, error voltage (V_e) is given by _____.
a) $V_e = V_SP + V_PV$ b) $V_e = V_PV - V_SP$
c) $V_e = V_SP - V_PV$ d) $V_e = V_PV + V_SP$

7) Which of the following PNPN devices are bidirectional?
a) TRIAC b) DIAC
c) SCR d) both a) & b)

8) For input voltage range $0 - 2V$, $t2 = 2000$, required DVM display is _____.

a) 2 digit
b) 3 digit
c) 3 ½ digit
d) 3 ¾ digit

9) In reverse blocking mode of a SCR, junction _____.

a) J2 reverse & J1, J3 forward bias
b) J3 forward bias & J1, J2 reverse bias
c) J1, J3 reverse & J2 forward bias
d) J1, J2 forward & J3 reverse bias

10) A step-down chopper gives output voltage 60 V from 120 V input. Find duty cycle.

a) 0.25
b) 0.5
c) 0.75
d) 1

11) With reference to DIAC, which statement is wrong ____.

a) DIAC is bidirectional device
b) It's current can be controlled
c) It has two terminals
d) It triggers with positive/negative voltage

12) IC 74C926 can be used for programming measurement of _____.

a) Frequency
b) Time Period
c) Event
d) All of these

13) The IC XR 2240 consist of _____.

a) 8 bit Counter
b) 4-bit Counter
c) 8-digit Counter
d) 4-digit Counter

14) Which of the following temperature sensor has sensitivity 10 mV/°C?

a) LM35
b) J - type thermocouple
c) PT 100
d) None of above

Seat No.	

Set **Q**

T. Y. (B.Tech.) (Electronics &Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: Marh/April – 2026
Electronics System Design (ENTPCC-11)

Day & Date: Monday, 18-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All Questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of calculator and electronic component datasheet is allowed.

Section – I

Q.2 Attempt the following. (Any Four) **16**

a) Explain the working of IGBT with transfer characteristics.

b) Explain Turn ON & OFF methods of SCR.

c) Draw and explain AC power control using DIAC and TRIAC for lamp dimmer.

d) Define Chopper. Explain Control strategies of Chopper.

e) Sketch V-I characteristics of DIAC and explain its principal of working.

Q.3 Attempt the following. (Any Two) **12**

a) Draw VI characteristics of TRIAC and explain its working with mode of operations.

b) Draw and explain single phase controlled rectifier with centre tapped transformer and resistive load. Derive expression for average output voltage & rms load voltage.

c) Explain the operation of Class A & Class B type Chopper with waveform.

Section – II

Q.4 Attempt the following. (Any Four) **16**

a) Design a timer using XR 2240 to generate a delay of 15 seconds.

b) Design voltage to current converter to convert 0 to 10 V into 4 to 20 mA.

c) Explain the basics of a Programmable Logic Controller (PLC) with a neat block diagram.

d) Compare between ON - OFF controller and proportional controller.

e) Draw and explain ladder diagram for bottle filling plant system.

Q.5 Attempt the following. (Any Two) **12**

a) Design frequency measurement set up to measure frequency up to 100 KHz with 0.1 Hz accuracy. Use IC 74C926.

b) Design ON-OFF temperature controller to control temperature in range of 0 to 100 0 C. Set point is 60 0 C and required full scale output is 10 V.

c) Design 3 ½ digit DVM for measurement of $Vin = \pm 2V$. Use 1 MHz clock.

Seat No.	

Set R

T. Y. (B.Tech.) (Electronics &Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: Marh/April – 2026
Electronics System Design (ENTPCC-11)

Day & Date: Monday, 18-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data whenever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the given options. 14

1) Chopper is widely used in which of the following?
a) Radio receivers b) Oscillators
c) Audio amplifiers d) DC motor speed control

2) Time Ratio Control (TRC) controls output by varying _____.
a) Input voltage b) Load resistance
c) Duty cycle d) Current

3) In ON - OFF controller, error voltage (V_e) is given by _____.
a) $V_e = V_SP + V_PV$ b) $V_e = V_PV - V_SP$
c) $V_e = V_SP - V_PV$ d) $V_e = V_PV + V_SP$

4) Which of the following PNPN devices are bidirectional?
a) TRIAC b) DIAC
c) SCR d) both a) & b)

5) For input voltage range $0 - 2V$, $t2 = 2000$, required DVM display is _____.
a) 2 digit b) 3 digit
c) 3 ½ digit d) 3 ¾ digit

6) In reverse blocking mode of a SCR, junction _____.
a) J2 reverse & J1, J3 forward bias
b) J3 forward bias & J1, J2 reverse bias
c) J1, J3 reverse & J2 forward bias
d) J1, J2 forward & J3 reverse bias

7) A step-down chopper gives output voltage 60 V from 120 V input. Find duty cycle.
a) 0.25 b) 0.5
c) 0.75 d) 1

8) With reference to DIAC, which statement is wrong ____.
a) DIAC is bidirectional device
b) It's current can be controlled
c) It has two terminals
d) It triggers with positive/negative voltage

9) IC 74C926 can be used for programming measurement of _____.
a) Frequency b) Time Period
c) Event d) All of these

10) The IC XR 2240 consist of _____.
a) 8 bit Counter b) 4-bit Counter
c) 8-digit Counter d) 4-digit Counter

11) Which of the following temperature sensor has sensitivity 10 mV/°C?
a) LM35 b) J - type thermocouple
c) PT 100 d) None of above

12) The programmable delays of XR-2240 is _____.
a) 2RC to 16 RC b) 0 RC to 255 RC
c) 1 RC to 100 RC d) 1RC to 255 R

13) A single phase fully controlled bridge converter supplies an Inductive load. If $\propto = 0°$, then average dc voltage is _____.
a) Vm / π b) $2Vm / \pi$
c) $Vm / \sqrt{2}$ d) $0.95Vm$

14) In Type-B chopper, power flow is _____.
a) Source to load b) Load to source
c) No power flow d) Bidirectional

SLR-QH-520

Seat No.	

Set R

T. Y. (B.Tech.) (Electronics &Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: Marh/April – 2026
Electronics System Design (ENTPCC-11)

Day & Date: Monday, 18-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All Questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of calculator and electronic component datasheet is allowed.

Section – I

Q.2 Attempt the following. (Any Four) **16**

a) Explain the working of IGBT with transfer characteristics.

b) Explain Turn ON & OFF methods of SCR.

c) Draw and explain AC power control using DIAC and TRIAC for lamp dimmer.

d) Define Chopper. Explain Control strategies of Chopper.

e) Sketch V-I characteristics of DIAC and explain its principal of working.

Q.3 Attempt the following. (Any Two) **12**

a) Draw VI characteristics of TRIAC and explain its working with mode of operations.

b) Draw and explain single phase controlled rectifier with centre tapped transformer and resistive load. Derive expression for average output voltage & rms load voltage.

c) Explain the operation of Class A & Class B type Chopper with waveform.

Section – II

Q.4 Attempt the following. (Any Four) **16**

a) Design a timer using XR 2240 to generate a delay of 15 seconds.

b) Design voltage to current converter to convert 0 to 10 V into 4 to 20 mA.

c) Explain the basics of a Programmable Logic Controller (PLC) with a neat block diagram.

d) Compare between ON - OFF controller and proportional controller.

e) Draw and explain ladder diagram for bottle filling plant system.

Q.5 Attempt the following. (Any Two) **12**

a) Design frequency measurement set up to measure frequency up to 100 KHz with 0.1 Hz accuracy. Use IC 74C926.

b) Design ON-OFF temperature controller to control temperature in range of 0 to 100 0 C. Set point is 60 0 C and required full scale output is 10 V.

c) Design 3 ½ digit DVM for measurement of $Vin = \pm 2V$. Use 1 MHz clock.

SLR-QH-520

Seat No.	

Set S

T. Y. (B.Tech.) (Electronics &Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: Marh/April – 2026
Electronics System Design (ENTPCC-11)

Day & Date: Monday, 18-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data whenever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the given options. 14

1) The IC XR 2240 consist of _____.
a) 8 bit Counter b) 4-bit Counter
c) 8-digit Counter d) 4-digit Counter

2) Which of the following temperature sensor has sensitivity 10 mV/°C?
a) LM35 b) J - type thermocouple
c) PT 100 d) None of above

3) The programmable delays of XR-2240 is _____.
a) 2RC to 16 RC b) 0 RC to 255 RC
c) 1 RC to 100 RC d) 1RC to 255 R

4) A single phase fully controlled bridge converter supplies an Inductive load. If $\propto = 0°$, then average dc voltage is _____.
a) Vm / π b) $2Vm / \pi$
c) $Vm / \sqrt{2}$ d) $0.95Vm$

5) In Type-B chopper, power flow is _____.
a) Source to load b) Load to source
c) No power flow d) Bidirectional

6) Chopper is widely used in which of the following?
a) Radio receivers b) Oscillators
c) Audio amplifiers d) DC motor speed control

7) Time Ratio Control (TRC) controls output by varying _____.
a) Input voltage b) Load resistance
c) Duty cycle d) Current

8) In ON - OFF controller, error voltage (V_e) is given by _____.

a) $V_e = V_SP + V_PV$ b) $V_e = V_PV - V_SP$

c) $V_e = V_SP - V_PV$ d) $V_e = V_PV + V_SP$

9) Which of the following PNPN devices are bidirectional?

a) TRIAC b) DIAC

c) SCR d) both a) & b)

10) For input voltage range $0 - 2V$, $t2 = 2000$, required DVM display is _____.

a) 2 digit b) 3 digit

c) 3 ½ digit d) 3 ¾ digit

11) In reverse blocking mode of a SCR, junction _____.

a) J2 reverse & J1, J3 forward bias

b) J3 forward bias & J1, J2 reverse bias

c) J1, J3 reverse & J2 forward bias

d) J1, J2 forward & J3 reverse bias

12) A step-down chopper gives output voltage 60 V from 120 V input. Find duty cycle.

a) 0.25 b) 0.5

c) 0.75 d) 1

13) With reference to DIAC, which statement is wrong ____.

a) DIAC is bidirectional device

b) It's current can be controlled

c) It has two terminals

d) It triggers with positive/negative voltage

14) IC 74C926 can be used for programming measurement of _____.

a) Frequency b) Time Period

c) Event d) All of these

Seat No.	

Set **S**

T. Y. (B.Tech.) (Electronics &Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: Marh/April – 2026
Electronics System Design (ENTPCC-11)

Day & Date: Monday, 18-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All Questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of calculator and electronic component datasheet is allowed.

Section – I

Q.2 Attempt the following. (Any Four) **16**

a) Explain the working of IGBT with transfer characteristics.

b) Explain Turn ON & OFF methods of SCR.

c) Draw and explain AC power control using DIAC and TRIAC for lamp dimmer.

d) Define Chopper. Explain Control strategies of Chopper.

e) Sketch V-I characteristics of DIAC and explain its principal of working.

Q.3 Attempt the following. (Any Two) **12**

a) Draw VI characteristics of TRIAC and explain its working with mode of operations.

b) Draw and explain single phase controlled rectifier with centre tapped transformer and resistive load. Derive expression for average output voltage & rms load voltage.

c) Explain the operation of Class A & Class B type Chopper with waveform.

Section – II

Q.4 Attempt the following. (Any Four) **16**

a) Design a timer using XR 2240 to generate a delay of 15 seconds.

b) Design voltage to current converter to convert 0 to 10 V into 4 to 20 mA.

c) Explain the basics of a Programmable Logic Controller (PLC) with a neat block diagram.

d) Compare between ON - OFF controller and proportional controller.

e) Draw and explain ladder diagram for bottle filling plant system.

Q.5 Attempt the following. (Any Two) **12**

a) Design frequency measurement set up to measure frequency up to 100 KHz with 0.1 Hz accuracy. Use IC 74C926.

b) Design ON-OFF temperature controller to control temperature in range of 0 to 100 0 C. Set point is 60 0 C and required full scale output is 10 V.

c) Design 3 ½ digit DVM for measurement of $Vin = \pm 2V$. Use 1 MHz clock.

SLR-QH-521

Seat No.	

Set P

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Optical Communication (ENTPCC-12)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the given options. 14

1) Numerical Aperture (NA) of optical fiber is given by _____.
a) $\sqrt{({n_2}^2 - {n_1}^2)}$ b) $\sqrt{({n_1}^2 - {n_2}^2)}$
c) $n_1 + n_2$ d) none of these

2) Critical angle occurs when light travels from _____.
a) Air to glass b) Vacuum to air
c) Cladding to core d) Core to cladding

3) Mode theory deals with _____.
a) Power loss b) Frequency change
c) Light paths in fiber d) Voltage

4) Rayleigh scattering is _____.
a) Nonlinear b) Linear
c) Zero d) Infinite

5) Threshold current in laser depends on _____.
a) Temperature b) Pressure
c) Voltage only d) Frequency only

6) Absorption occurs when _____.
a) Photon energy > bandgap b) Photon energy < bandgap
c) Equal energy d) Zero energy

7) Cutoff wavelength is inversely proportional to _____.
a) Voltage b) Frequency
c) Power d) Bandgap

8) OTDM multiplexes signals in _____.
a) Frequency domain b) Time domain
c) Space domain d) Power domain

9) Topology used for FDDI is _____.
a) Bus b) Star
c) Ring d) Mesh

10) If core and cladding refractive indices become equal, fiber will _____.
a) Work normally b) Increase efficiency
c) Fail to guide light d) Become laser

11) If quantum efficiency = 1, then _____.
a) No electrons generated b) One electron per photon
c) Infinite electrons d) Zero photons

12) Attenuation is measured in _____.
a) Watt b) dB/km
c) Volt d) Ohm

13) Phototransistor gain is high due to _____.
a) Base amplification b) Collector action
c) Thermal effect d) Reflection

14) Noise in receiver mainly arises from _____.
a) Fiber b) Detector
c) Source d) Connector

Seat No.	

Set **P**

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Optical Communication (ENTPCC-12)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt Any Four. **16**

a) Differentiate between step index and graded index fiber.

b) What is dispersion? Explain intramodal dispersion.

c) Define LASER and explain concept of stimulated emission in details.

d) For a 30 km long fiber attenuation 0.8 dB/km at 1300 nm. If a 200 μ W power is launched into the fiber, find the output power.

e) With the help of neat sketch explain concept of semiconductor injection LASER.

Q.3 Attempt Any Two. **12**

a) Derive expression for Numerical Aperture and acceptance angle.

b) What is fiber bending loss? Explain types of fiber bending loss with neat sketch.

c) Explain LED structure and its characteristics in detail.

SECTION – II

Q.4 Attempt Any Four. **16**

a) Explain the principle of working of optical detectors in detail.

b) Write short note on Optical Ethernet

c) With the help of block diagram explain basic structure of optical receiver

d) Draw and explain the dual ring architecture of FDDI

e) Compare PN, PIN and APD photodiodes

Q.5 Attempt Any Two. **12**

a) Derive expression for responsivity and quantum efficiency.

b) Explain SONET/SDH architecture and its working with proper labeled diagram.

c) With the help of neat sketch describe working of WDM in detail. Also explain its advantages and applications.

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Optical Communication (ENTPCC-12)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the given options. 14

1) OTDM multiplexes signals in _____.
a) Frequency domain b) Time domain
c) Space domain d) Power domain

2) Topology used for FDDI is _____.
a) Bus b) Star
c) Ring d) Mesh

3) If core and cladding refractive indices become equal, fiber will _____.
a) Work normally b) Increase efficiency
c) Fail to guide light d) Become laser

4) If quantum efficiency = 1, then _____.
a) No electrons generated b) One electron per photon
c) Infinite electrons d) Zero photons

5) Attenuation is measured in _____.
a) Watt b) dB/km
c) Volt d) Ohm

6) Phototransistor gain is high due to _____.
a) Base amplification b) Collector action
c) Thermal effect d) Reflection

7) Noise in receiver mainly arises from _____.
a) Fiber b) Detector
c) Source d) Connector

8) Numerical Aperture (NA) of optical fiber is given by _____.
a) $\sqrt{({n_2}^2 - {n_1}^2)}$ b) $\sqrt{({n_1}^2 - {n_2}^2)}$
c) $n_1 + n_2$ d) none of these

9) Critical angle occurs when light travels from _____.
a) Air to glass b) Vacuum to air
c) Cladding to core d) Core to cladding

10) Mode theory deals with _____.
a) Power loss b) Frequency change
c) Light paths in fiber d) Voltage

11) Rayleigh scattering is _____.
a) Nonlinear b) Linear
c) Zero d) Infinite

12) Threshold current in laser depends on _____.
a) Temperature b) Pressure
c) Voltage only d) Frequency only

13) Absorption occurs when _____.
a) Photon energy > bandgap b) Photon energy < bandgap
c) Equal energy d) Zero energy

14) Cutoff wavelength is inversely proportional to _____.
a) Voltage b) Frequency
c) Power d) Bandgap

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Optical Communication (ENTPCC-12)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt Any Four. **16**

a) Differentiate between step index and graded index fiber.

b) What is dispersion? Explain intramodal dispersion.

c) Define LASER and explain concept of stimulated emission in details.

d) For a 30 km long fiber attenuation 0.8 dB/km at 1300 nm. If a 200 μ W power is launched into the fiber, find the output power.

e) With the help of neat sketch explain concept of semiconductor injection LASER.

Q.3 Attempt Any Two. **12**

a) Derive expression for Numerical Aperture and acceptance angle.

b) What is fiber bending loss? Explain types of fiber bending loss with neat sketch.

c) Explain LED structure and its characteristics in detail.

SECTION – II

Q.4 Attempt Any Four. **16**

a) Explain the principle of working of optical detectors in detail.

b) Write short note on Optical Ethernet

c) With the help of block diagram explain basic structure of optical receiver

d) Draw and explain the dual ring architecture of FDDI

e) Compare PN, PIN and APD photodiodes

Q.5 Attempt Any Two. **12**

a) Derive expression for responsivity and quantum efficiency.

b) Explain SONET/SDH architecture and its working with proper labeled diagram.

c) With the help of neat sketch describe working of WDM in detail. Also explain its advantages and applications.

Seat No.	

Set R

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Optical Communication (ENTPCC-12)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the given options. 14

1) If quantum efficiency = 1, then _____.
a) No electrons generated b) One electron per photon
c) Infinite electrons d) Zero photons

2) Attenuation is measured in _____.
a) Watt b) dB/km
c) Volt d) Ohm

3) Phototransistor gain is high due to _____.
a) Base amplification b) Collector action
c) Thermal effect d) Reflection

4) Noise in receiver mainly arises from _____.
a) Fiber b) Detector
c) Source d) Connector

5) Numerical Aperture (NA) of optical fiber is given by _____.
a) $\sqrt{(n_2{}^2 - n_1{}^2)}$ b) $\sqrt{(n_1{}^2 - n_2{}^2)}$
c) $n_1 + n_2$ d) none of these

6) Critical angle occurs when light travels from _____.
a) Air to glass b) Vacuum to air
c) Cladding to core d) Core to cladding

7) Mode theory deals with _____.
a) Power loss b) Frequency change
c) Light paths in fiber d) Voltage

8) Rayleigh scattering is _____.
a) Nonlinear b) Linear
c) Zero d) Infinite

9) Threshold current in laser depends on _____.
a) Temperature b) Pressure
c) Voltage only d) Frequency only

10) Absorption occurs when _____.
a) Photon energy > bandgap b) Photon energy < bandgap
c) Equal energy d) Zero energy

11) Cutoff wavelength is inversely proportional to _____.
a) Voltage b) Frequency
c) Power d) Bandgap

12) OTDM multiplexes signals in _____.
a) Frequency domain b) Time domain
c) Space domain d) Power domain

13) Topology used for FDDI is _____.
a) Bus b) Star
c) Ring d) Mesh

14) If core and cladding refractive indices become equal, fiber will _____.
a) Work normally b) Increase efficiency
c) Fail to guide light d) Become laser

Seat No.	

Set **R**

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Optical Communication (ENTPCC-12)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt Any Four. **16**

a) Differentiate between step index and graded index fiber.

b) What is dispersion? Explain intramodal dispersion.

c) Define LASER and explain concept of stimulated emission in details.

d) For a 30 km long fiber attenuation 0.8 dB/km at 1300 nm. If a 200 μ W power is launched into the fiber, find the output power.

e) With the help of neat sketch explain concept of semiconductor injection LASER.

Q.3 Attempt Any Two. **12**

a) Derive expression for Numerical Aperture and acceptance angle.

b) What is fiber bending loss? Explain types of fiber bending loss with neat sketch.

c) Explain LED structure and its characteristics in detail.

SECTION – II

Q.4 Attempt Any Four. **16**

a) Explain the principle of working of optical detectors in detail.

b) Write short note on Optical Ethernet

c) With the help of block diagram explain basic structure of optical receiver

d) Draw and explain the dual ring architecture of FDDI

e) Compare PN, PIN and APD photodiodes

Q.5 Attempt Any Two. **12**

a) Derive expression for responsivity and quantum efficiency.

b) Explain SONET/SDH architecture and its working with proper labeled diagram.

c) With the help of neat sketch describe working of WDM in detail. Also explain its advantages and applications.

Seat No.	

Set **S**

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Optical Communication (ENTPCC-12)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the given options. 14

1) Absorption occurs when _____.
a) Photon energy > bandgap b) Photon energy < bandgap
c) Equal energy d) Zero energy

2) Cutoff wavelength is inversely proportional to _____.
a) Voltage b) Frequency
c) Power d) Bandgap

3) OTDM multiplexes signals in _____.
a) Frequency domain b) Time domain
c) Space domain d) Power domain

4) Topology used for FDDI is _____.
a) Bus b) Star
c) Ring d) Mesh

5) If core and cladding refractive indices become equal, fiber will _____.
a) Work normally b) Increase efficiency
c) Fail to guide light d) Become laser

6) If quantum efficiency = 1, then _____.
a) No electrons generated b) One electron per photon
c) Infinite electrons d) Zero photons

7) Attenuation is measured in _____.
a) Watt b) dB/km
c) Volt d) Ohm

8) Phototransistor gain is high due to _____.
a) Base amplification b) Collector action
c) Thermal effect d) Reflection

9) Noise in receiver mainly arises from _____.
a) Fiber
b) Detector
c) Source
d) Connector

10) Numerical Aperture (NA) of optical fiber is given by _____.
a) $\sqrt{({n_2}^2 - {n_1}^2)}$
b) $\sqrt{({n_1}^2 - {n_2}^2)}$
c) $n_1 + n_2$
d) none of these

11) Critical angle occurs when light travels from _____.
a) Air to glass
b) Vacuum to air
c) Cladding to core
d) Core to cladding

12) Mode theory deals with _____.
a) Power loss
b) Frequency change
c) Light paths in fiber
d) Voltage

13) Rayleigh scattering is _____.
a) Nonlinear
b) Linear
c) Zero
d) Infinite

14) Threshold current in laser depends on _____.
a) Temperature
b) Pressure
c) Voltage only
d) Frequency only

Seat No.	

Set **S**

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Optical Communication (ENTPCC-12)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt Any Four. **16**

a) Differentiate between step index and graded index fiber.

b) What is dispersion? Explain intramodal dispersion.

c) Define LASER and explain concept of stimulated emission in details.

d) For a 30 km long fiber attenuation 0.8 dB/km at 1300 nm. If a 200 μ W power is launched into the fiber, find the output power.

e) With the help of neat sketch explain concept of semiconductor injection LASER.

Q.3 Attempt Any Two. **12**

a) Derive expression for Numerical Aperture and acceptance angle.

b) What is fiber bending loss? Explain types of fiber bending loss with neat sketch.

c) Explain LED structure and its characteristics in detail.

SECTION – II

Q.4 Attempt Any Four. **16**

a) Explain the principle of working of optical detectors in detail.

b) Write short note on Optical Ethernet

c) With the help of block diagram explain basic structure of optical receiver

d) Draw and explain the dual ring architecture of FDDI

e) Compare PN, PIN and APD photodiodes

Q.5 Attempt Any Two. **12**

a) Derive expression for responsivity and quantum efficiency.

b) Explain SONET/SDH architecture and its working with proper labeled diagram.

c) With the help of neat sketch describe working of WDM in detail. Also explain its advantages and applications.

SLR-QH-522

Seat No.	

Set P

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
VLSI Design (ENTPEC - 02A)

Day & Date: Friday, 22-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data whenever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct option from the following. **14**

1) Which block in verilog executes continuously?
a) initial b) always
c) begin d) fork

2) Rising edge in Verilog is represented by _____.
a) negedge b) posedge
c) level d) edge

3) Which block is used for combinational logic?
a) always @(posedge clk) b) always @(*)
c) initial d) fork

4) Full adder sum expression is _____.
a) $a \,\&\, b$ b) $a \mid b$
c) $a \wedge b \wedge$ cin d) $\sim(a + b)$

5) Which assignment is used in always block?
a) assign b) $=$
c) $<=$ d) wire

6) Which sensitivity list is correct for flip-flop?
a) always @(a or b) b) always @(*)
c) always @(posedge clk) d) always @(data)

7) Which code shows asynchronous reset?
a) always @(posedge clk)
b) always @(posedge clk or posedge rst)
c) always @(*)
d) always @(rst)

8) Which assignment is non-blocking?
a) = b) ==
c) <= d) =>

9) Gate of MOSFET is made of _____.
a) Metal/Polysilicon b) Silicon dioxide
c) Aluminum oxide d) Copper

10) Accumulation occurs when _____.
a) Positive voltage applied to nMOS gate
b) Negative voltage applied to nMOS gate
c) Zero voltage
d) High temperature

11) Channel length modulation is a _____.
a) First-order effect b) Second-order effect
c) Noise effect d) Thermal effect

12) Altera MAX7000 belongs to _____.
a) FPGA b) CPLD
c) ASIC d) DSP

13) Routing in FPGA is ____.
a) Fixed b) Programmable
c) Static d) Manual

14) In complementary CMOS, PMOS network is _____.
a) Pull-down network b) Pull-up network
c) Input network d) Output network

Seat No.	

Set **P**

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
VLSI Design (ENTPEC - 02A)

Day & Date: Friday, 22-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All Questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if required.

Section – I

Q.2 Attempt the following. (Any Four) **16**

a) Define a Verilog module and explain its basic structure.

b) List and explain different data types in Verilog.

c) Differentiate between blocking $(=)$ and non-blocking $(<=)$ assignments.

d) Write a behavioral Verilog code for a half adder.

e) Write the behavioral description of a JK flip-flop using an always block.

Q.3 Attempt the following. (Any Two) **12**

a) Discuss styles of description in Verilog with examples.

b) Write the behavioral model of 3:8 decoder.

c) Write the behavioral model of mod-10 counter.

Section – II

Q.4 Attempt the following. (Any Four) **16**

a) Explain the physical structure of a MOS transistor with neat labeling.

b) Explain CMOS implementation of NOR gate.

c) Explain power dissipation in dynamic CMOS.

d) Explain FPGA architecture in brief.

e) Explain ratioed logic and pass transistor logic in brief.

Q.5 Attempt the following. (Any Two) **12**

a) Explain MOS transistor operation in accumulation, depletion, and inversion modes with diagrams.

b) Explain implementation of Boolean expression $F = \overline{(A.B) + (C.D)}$ using CMOS.

c) Explain static behavior of CMOS inverter with voltage transfer characteristics.

SLR-QH-522

Seat No.	

Set Q

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
VLSI Design (ENTPEC - 02A)

Day & Date: Friday, 22-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data whenever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct option from the following. **14**

1) Which assignment is non-blocking?
a) = b) ==
c) <= d) =>

2) Gate of MOSFET is made of _____.
a) Metal/Polysilicon b) Silicon dioxide
c) Aluminum oxide d) Copper

3) Accumulation occurs when _____.
a) Positive voltage applied to nMOS gate
b) Negative voltage applied to nMOS gate
c) Zero voltage
d) High temperature

4) Channel length modulation is a _____.
a) First-order effect b) Second-order effect
c) Noise effect d) Thermal effect

5) Altera MAX7000 belongs to _____.
a) FPGA b) CPLD
c) ASIC d) DSP

6) Routing in FPGA is ____.
a) Fixed b) Programmable
c) Static d) Manual

7) In complementary CMOS, PMOS network is _____.
a) Pull-down network b) Pull-up network
c) Input network d) Output network

8) Which block in verilog executes continuously?
a) initial b) always
c) begin d) fork

9) Rising edge in Verilog is represented by _____.
a) negedge b) posedge
c) level d) edge

10) Which block is used for combinational logic?
a) always @(posedge clk) b) always @(*)
c) initial d) fork

11) Full adder sum expression is _____.
a) $a \,\&\, b$ b) $a \mid b$
c) $a \wedge b \wedge$ cin d) $\sim(a + b)$

12) Which assignment is used in always block?
a) assign b) $=$
c) $<=$ d) wire

13) Which sensitivity list is correct for flip-flop?
a) always @(a or b) b) always @(*)
c) always @(posedge clk) d) always @(data)

14) Which code shows asynchronous reset?
a) always @(posedge clk)
b) always @(posedge clk or posedge rst)
c) always @(*)
d) always @(rst)

Seat No.	

Set **Q**

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
VLSI Design (ENTPEC - 02A)

Day & Date: Friday, 22-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All Questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if required.

Section – I

Q.2 Attempt the following. (Any Four) **16**

a) Define a Verilog module and explain its basic structure.

b) List and explain different data types in Verilog.

c) Differentiate between blocking $(=)$ and non-blocking $(<=)$ assignments.

d) Write a behavioral Verilog code for a half adder.

e) Write the behavioral description of a JK flip-flop using an always block.

Q.3 Attempt the following. (Any Two) **12**

a) Discuss styles of description in Verilog with examples.

b) Write the behavioral model of 3:8 decoder.

c) Write the behavioral model of mod-10 counter.

Section – II

Q.4 Attempt the following. (Any Four) **16**

a) Explain the physical structure of a MOS transistor with neat labeling.

b) Explain CMOS implementation of NOR gate.

c) Explain power dissipation in dynamic CMOS.

d) Explain FPGA architecture in brief.

e) Explain ratioed logic and pass transistor logic in brief.

Q.5 Attempt the following. (Any Two) **12**

a) Explain MOS transistor operation in accumulation, depletion, and inversion modes with diagrams.

b) Explain implementation of Boolean expression $F = \overline{(A.B) + (C.D)}$ using CMOS.

c) Explain static behavior of CMOS inverter with voltage transfer characteristics.

SLR-QH-522

Seat No.	

Set R

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
VLSI Design (ENTPEC - 02A)

Day & Date: Friday, 22-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data whenever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct option from the following. **14**

1) Channel length modulation is a _____.
a) First-order effect b) Second-order effect
c) Noise effect d) Thermal effect

2) Altera MAX7000 belongs to _____.
a) FPGA b) CPLD
c) ASIC d) DSP

3) Routing in FPGA is ____.
a) Fixed b) Programmable
c) Static d) Manual

4) In complementary CMOS, PMOS network is _____.
a) Pull-down network b) Pull-up network
c) Input network d) Output network

5) Which block in verilog executes continuously?
a) initial b) always
c) begin d) fork

6) Rising edge in Verilog is represented by _____.
a) negedge b) posedge
c) level d) edge

7) Which block is used for combinational logic?
a) always @(posedge clk) b) always @(*)
c) initial d) fork

8) Full adder sum expression is _____.

a) $a \,\&\, b$ b) $a \mid b$

c) a^ b^ cin d) $\sim(a + b)$

9) Which assignment is used in always block?

a) assign b) =

c) <= d) wire

10) Which sensitivity list is correct for flip-flop?

a) always @(a or b) b) always @(*)

c) always @(posedge clk) d) always @(data)

11) Which code shows asynchronous reset?

a) always @(posedge clk)

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c) always @(*)

d) always @(rst)

12) Which assignment is non-blocking?

a) = b) ==

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13) Gate of MOSFET is made of _____.

a) Metal/Polysilicon b) Silicon dioxide

c) Aluminum oxide d) Copper

14) Accumulation occurs when _____.

a) Positive voltage applied to nMOS gate

b) Negative voltage applied to nMOS gate

c) Zero voltage

d) High temperature

Seat No.	

Set **R**

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
VLSI Design (ENTPEC - 02A)

Day & Date: Friday, 22-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All Questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if required.

Section – I

Q.2 Attempt the following. (Any Four) **16**

a) Define a Verilog module and explain its basic structure.

b) List and explain different data types in Verilog.

c) Differentiate between blocking $(=)$ and non-blocking $(<=)$ assignments.

d) Write a behavioral Verilog code for a half adder.

e) Write the behavioral description of a JK flip-flop using an always block.

Q.3 Attempt the following. (Any Two) **12**

a) Discuss styles of description in Verilog with examples.

b) Write the behavioral model of 3:8 decoder.

c) Write the behavioral model of mod-10 counter.

Section – II

Q.4 Attempt the following. (Any Four) **16**

a) Explain the physical structure of a MOS transistor with neat labeling.

b) Explain CMOS implementation of NOR gate.

c) Explain power dissipation in dynamic CMOS.

d) Explain FPGA architecture in brief.

e) Explain ratioed logic and pass transistor logic in brief.

Q.5 Attempt the following. (Any Two) **12**

a) Explain MOS transistor operation in accumulation, depletion, and inversion modes with diagrams.

b) Explain implementation of Boolean expression $F = \overline{(A.B) + (C.D)}$ using CMOS.

c) Explain static behavior of CMOS inverter with voltage transfer characteristics.

SLR-QH-522

Seat No.	

Set S

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
VLSI Design (ENTPEC - 02A)

Day & Date: Friday, 22-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data whenever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct option from the following. **14**

1) Which sensitivity list is correct for flip-flop?
a) always @(a or b) b) always @(*)
c) always @(posedge clk) d) always @(data)

2) Which code shows asynchronous reset?
a) always @(posedge clk)
b) always @(posedge clk or posedge rst)
c) always @(*)
d) always @(rst)

3) Which assignment is non-blocking?
a) = b) ==
c) <= d) =>

4) Gate of MOSFET is made of _____.
a) Metal/Polysilicon b) Silicon dioxide
c) Aluminum oxide d) Copper

5) Accumulation occurs when _____.
a) Positive voltage applied to nMOS gate
b) Negative voltage applied to nMOS gate
c) Zero voltage
d) High temperature

6) Channel length modulation is a _____.
a) First-order effect b) Second-order effect
c) Noise effect d) Thermal effect

7) Altera MAX7000 belongs to _____.
a) FPGA b) CPLD
c) ASIC d) DSP

8) Routing in FPGA is ____.
a) Fixed b) Programmable
c) Static d) Manual

9) In complementary CMOS, PMOS network is _____.
a) Pull-down network b) Pull-up network
c) Input network d) Output network

10) Which block in verilog executes continuously?
a) initial b) always
c) begin d) fork

11) Rising edge in Verilog is represented by _____.
a) negedge b) posedge
c) level d) edge

12) Which block is used for combinational logic?
a) always @(posedge clk) b) always @(*)
c) initial d) fork

13) Full adder sum expression is _____.
a) $a \,\&\, b$ b) $a \mid b$
c) $a^{\wedge}\ b^{\wedge}$ cin d) $\sim(a + b)$

14) Which assignment is used in always block?
a) assign b) $=$
c) $<=$ d) wire

SLR-QH-522

Seat No.	

Set | **S**

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
VLSI Design (ENTPEC - 02A)

Day & Date: Friday, 22-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All Questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if required.

Section – I

Q.2 Attempt the following. (Any Four) **16**

a) Define a Verilog module and explain its basic structure.

b) List and explain different data types in Verilog.

c) Differentiate between blocking $(=)$ and non-blocking $(<=)$ assignments.

d) Write a behavioral Verilog code for a half adder.

e) Write the behavioral description of a JK flip-flop using an always block.

Q.3 Attempt the following. (Any Two) **12**

a) Discuss styles of description in Verilog with examples.

b) Write the behavioral model of 3:8 decoder.

c) Write the behavioral model of mod-10 counter.

Section – II

Q.4 Attempt the following. (Any Four) **16**

a) Explain the physical structure of a MOS transistor with neat labeling.

b) Explain CMOS implementation of NOR gate.

c) Explain power dissipation in dynamic CMOS.

d) Explain FPGA architecture in brief.

e) Explain ratioed logic and pass transistor logic in brief.

Q.5 Attempt the following. (Any Two) **12**

a) Explain MOS transistor operation in accumulation, depletion, and inversion modes with diagrams.

b) Explain implementation of Boolean expression $F = \overline{(A.B) + (C.D)}$ using CMOS.

c) Explain static behavior of CMOS inverter with voltage transfer characteristics.

SLR-QH-524

Seat No.	

Set P

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026
Embedded Systems (ENTPEC – 03A)

Day & Date: Monday, 25-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.
4) Assume suitable data if required.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct option from the following: **14**

1) Which is NOT a design metric?
a) Cost b) Performance
c) Color d) Power

2) The ARM7TDMI-S supports _____, _____ and _____ data types.
a) char, int, float b) char, int, byte
c) byte, half-word, word d) int, char, word

3) When there is a failed attempt to memory access then processor enters _____ mode.
a) Abort b) Supervisor
c) User d) Fast Interrupt Request

4) Each instruction in ARM machine is encoded into _____.
a) 2 byte b) 3 byte
c) 4 byte d) 8 byte

5) In LPC2148 _____ pin select register is used to configure port pins P0.16 to P0.31.
a) PINSEL0 b) PINSEL1
c) PINSEL2 d) IO0DIR

6) The on-chip ADC'S of LPC 2148 has ____ bit resolution and _____ conversion time.
a) 8, 2.44 μ sec b) 10, 2.44 μ sec
c) 12, 1.14 μ sec d) 10, 1.44 μ sec

7) The sequence of three stage pipeline includes _____.
   a) Fetch, Execute, Decode
   b) Decode, Fetch, Execute
   c) Fetch, Write, Execute
   d) Fetch, Decode, Execute

8) The force logic '1' on port pin P0.15, _____ register is used in LPC 2148.
   a) IOSET0
   b) IOSET1
   c) IOCLR0
   d) IODIR3

9) Which of the following interrupt request has the highest priority?
   a) vectored interrupt request
   b) non-vectored interrupt request
   c) FIQ
   d) IRQ

10) If External frequency = 12 MHz, CCLK= 60MHz and PCLK = 60MHz then PLLCFG and VPBDIV values are _____.
   a) 0×23 and 0×01
   b) 0×24 and 0×02
   c) 0×24 and 0×01
   d) 0×24 and 0×00

11) Which is the core of OS?
   a) Kernel
   b) Semaphore
   c) Shell
   d) Scheduler

12) When the processor is executing in thumb state, then all instructions are _____ wide.
   a) 8 bits
   b) 16 bits
   c) 32 bits
   d) 64 bits

13) NRE cost can be defined by _____.
   a) The one-time monetary cost of designing the system
   b) Life time cost of system
   c) Depends upon embedded systems
   d) None of the these

14) Which embedded component is critical in digital cameras for image processing?
   a) ADC only
   b) DSP or image processor
   c) Timer
   d) UART

Seat No.	

Set **P**

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Embedded Systems (ENTPEC – 03A)

Day & Date: Monday, 25-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever necessary and mention it clearly.

Section – I

Q.2 Attempt Any Four of the following. **16**

a) Explain design challenges in embedded system design & how to meet these challenges?

b) Explain Time-to-Market design metrics in detail

c) Explain Bus architecture in ARM7.

d) Draw and explain CPSR format.

e) Explain the features of LPC2148.

Q.3 Attempt Any Two of the following. **12**

a) Draw and explain the data flow model of ARM core.

b) Describe the operation with example of following ARM instructions.
i) MOV
ii) ADC
iii) MLA
iv) BLX
v) STR
vi) MRS

c) Explain the following on chip peripherals of ARM 2148 in detail.
I/O ports, RTC, DAC

Section – II

Q.4 Answer Any Four of the following. **16**

a) What is Embedded C? Write an embedded C program to blink LED continuously.

b) Explain concept of semaphore with example.

c) Differentiate between RTOS and traditional operating systems with any two points.

d) Draw and explain the basic architecture of an RTOS.

e) Explain the basic working of a digital camera as an embedded system. Mention any two components used.

Q.5 Answer Any Two of the following. **12**

a) Write a program to interface a switch (push button) is interfaced with LPC 2148. Also describe the concept of pull-up and pull-down resistors.

b) Explain the concept of task scheduling in RTOS. Also define Thread, Process, and ISR with suitable examples.

c) Explain the architecture of a smart card-based ATM system. How does it improve security compared to traditional ATM systems?

Seat No.	

Set **Q**

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026
Embedded Systems (ENTPEC – 03A)

Day & Date: Monday, 25-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.
4) Assume suitable data if required.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct option from the following: **14**

1) The force logic '1' on port pin P0.15, _____ register is used in LPC 2148.
a) IOSET0 b) IOSET1
c) IOCLR0 d) IODIR3

2) Which of the following interrupt request has the highest priority?
a) vectored interrupt request
b) non-vectored interrupt request
c) FIQ
d) IRQ

3) If External frequency = 12 MHz, CCLK= 60MHz and PCLK = 60MHz then PLLCFG and VPBDIV values are _____.
a) 0×23 and 0×01 b) 0×24 and 0×02
c) 0×24 and 0×01 d) 0×24 and 0×00

4) Which is the core of OS?
a) Kernel b) Semaphore
c) Shell d) Scheduler

5) When the processor is executing in thumb state, then all instructions are _____ wide.
a) 8 bits b) 16 bits
c) 32 bits d) 64 bits

6) NRE cost can be defined by _____.
a) The one-time monetary cost of designing the system
b) Life time cost of system
c) Depends upon embedded systems
d) None of the these

7) Which embedded component is critical in digital cameras for image processing?
a) ADC only
b) DSP or image processor
c) Timer
d) UART

8) Which is NOT a design metric?
a) Cost
b) Performance
c) Color
d) Power

9) The ARM7TDMI-S supports _____, _____ and _____ data types.
a) char, int, float
b) char, int, byte
c) byte, half-word, word
d) int, char, word

10) When there is a failed attempt to memory access then processor enters _____ mode.
a) Abort
b) Supervisor
c) User
d) Fast Interrupt Request

11) Each instruction in ARM machine is encoded into _____.
a) 2 byte
b) 3 byte
c) 4 byte
d) 8 byte

12) In LPC2148 _____ pin select register is used to configure port pins P0.16 to P0.31.
a) PINSEL0
b) PINSEL1
c) PINSEL2
d) IO0DIR

13) The on-chip ADC'S of LPC 2148 has ____ bit resolution and _____ conversion time.
a) 8, 2.44 μ sec
b) 10, 2.44 μ sec
c) 12, 1.14 μ sec
d) 10, 1.44 μ sec

14) The sequence of three stage pipeline includes _____.
a) Fetch, Execute, Decode
b) Decode, Fetch, Execute
c) Fetch, Write, Execute
d) Fetch, Decode, Execute

Seat No.	

Set **Q**

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Embedded Systems (ENTPEC – 03A)

Day & Date: Monday, 25-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever necessary and mention it clearly.

Section – I

Q.2 Attempt Any Four of the following. **16**

a) Explain design challenges in embedded system design & how to meet these challenges?

b) Explain Time-to-Market design metrics in detail

c) Explain Bus architecture in ARM7.

d) Draw and explain CPSR format.

e) Explain the features of LPC2148.

Q.3 Attempt Any Two of the following. **12**

a) Draw and explain the data flow model of ARM core.

b) Describe the operation with example of following ARM instructions.
i) MOV
ii) ADC
iii) MLA
iv) BLX
v) STR
vi) MRS

c) Explain the following on chip peripherals of ARM 2148 in detail.
I/O ports, RTC, DAC

Section – II

Q.4 Answer Any Four of the following. **16**

a) What is Embedded C? Write an embedded C program to blink LED continuously.

b) Explain concept of semaphore with example.

c) Differentiate between RTOS and traditional operating systems with any two points.

d) Draw and explain the basic architecture of an RTOS.

e) Explain the basic working of a digital camera as an embedded system. Mention any two components used.

Q.5 Answer Any Two of the following. **12**

a) Write a program to interface a switch (push button) is interfaced with LPC 2148. Also describe the concept of pull-up and pull-down resistors.

b) Explain the concept of task scheduling in RTOS. Also define Thread, Process, and ISR with suitable examples.

c) Explain the architecture of a smart card-based ATM system. How does it improve security compared to traditional ATM systems?

Seat No.	

Set R

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026
Embedded Systems (ENTPEC – 03A)

Day & Date: Monday, 25-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.
4) Assume suitable data if required.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct option from the following: **14**

1) Which is the core of OS?
a) Kernel b) Semaphore
c) Shell d) Scheduler

2) When the processor is executing in thumb state, then all instructions are _____ wide.
a) 8 bits b) 16 bits
c) 32 bits d) 64 bits

3) NRE cost can be defined by _____.
a) The one-time monetary cost of designing the system
b) Life time cost of system
c) Depends upon embedded systems
d) None of the these

4) Which embedded component is critical in digital cameras for image processing?
a) ADC only b) DSP or image processor
c) Timer d) UART

5) Which is NOT a design metric?
a) Cost b) Performance
c) Color d) Power

6) The ARM7TDMI-S supports _____, _____ and _____ data types.
a) char, int, float b) char, int, byte
c) byte, half-word, word d) int, char, word

7) When there is a failed attempt to memory access then processor enters _____ mode.
   a) Abort
   b) Supervisor
   c) User
   d) Fast Interrupt Request

8) Each instruction in ARM machine is encoded into _____.
   a) 2 byte
   b) 3 byte
   c) 4 byte
   d) 8 byte

9) In LPC2148 _____ pin select register is used to configure port pins P0.16 to P0.31.
   a) PINSEL0
   b) PINSEL1
   c) PINSEL2
   d) IO0DIR

10) The on-chip ADC'S of LPC 2148 has ____ bit resolution and _____ conversion time.
   a) 8, 2.44 μ sec
   b) 10, 2.44 μ sec
   c) 12, 1.14 μ sec
   d) 10, 1.44 μ sec

11) The sequence of three stage pipeline includes _____.
   a) Fetch, Execute, Decode
   b) Decode, Fetch, Execute
   c) Fetch, Write, Execute
   d) Fetch, Decode, Execute

12) The force logic '1' on port pin P0.15, _____ register is used in LPC 2148.
   a) IOSET0
   b) IOSET1
   c) IOCLR0
   d) IODIR3

13) Which of the following interrupt request has the highest priority?
   a) vectored interrupt request
   b) non-vectored interrupt request
   c) FIQ
   d) IRQ

14) If External frequency = 12 MHz, CCLK= 60MHz and PCLK = 60MHz then PLLCFG and VPBDIV values are _____.
   a) 0×23 and 0×01
   b) 0×24 and 0×02
   c) 0×24 and 0×01
   d) 0×24 and 0×00

Seat No.	

Set **R**

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Embedded Systems (ENTPEC – 03A)

Day & Date: Monday, 25-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever necessary and mention it clearly.

Section – I

Q.2 Attempt Any Four of the following. **16**

a) Explain design challenges in embedded system design & how to meet these challenges?

b) Explain Time-to-Market design metrics in detail

c) Explain Bus architecture in ARM7.

d) Draw and explain CPSR format.

e) Explain the features of LPC2148.

Q.3 Attempt Any Two of the following. **12**

a) Draw and explain the data flow model of ARM core.

b) Describe the operation with example of following ARM instructions.
i) MOV
ii) ADC
iii) MLA
iv) BLX
v) STR
vi) MRS

c) Explain the following on chip peripherals of ARM 2148 in detail.
I/O ports, RTC, DAC

Section – II

Q.4 Answer Any Four of the following. **16**

a) What is Embedded C? Write an embedded C program to blink LED continuously.

b) Explain concept of semaphore with example.

c) Differentiate between RTOS and traditional operating systems with any two points.

d) Draw and explain the basic architecture of an RTOS.

e) Explain the basic working of a digital camera as an embedded system. Mention any two components used.

Q.5 Answer Any Two of the following. **12**

a) Write a program to interface a switch (push button) is interfaced with LPC 2148. Also describe the concept of pull-up and pull-down resistors.

b) Explain the concept of task scheduling in RTOS. Also define Thread, Process, and ISR with suitable examples.

c) Explain the architecture of a smart card-based ATM system. How does it improve security compared to traditional ATM systems?

Seat No.	

Set **S**

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026
Embedded Systems (ENTPEC – 03A)

Day & Date: Monday, 25-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.
4) Assume suitable data if required.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct option from the following: **14**

1) The on-chip ADC'S of LPC 2148 has ____ bit resolution and _____ conversion time.
a) 8, 2.44 μ sec
b) 10, 2.44 μ sec
c) 12, 1.14 μ sec
d) 10, 1.44 μ sec

2) The sequence of three stage pipeline includes _____.
a) Fetch, Execute, Decode
b) Decode, Fetch, Execute
c) Fetch, Write, Execute
d) Fetch, Decode, Execute

3) The force logic '1' on port pin P0.15, _____ register is used in LPC 2148.
a) IOSET0
b) IOSET1
c) IOCLR0
d) IODIR3

4) Which of the following interrupt request has the highest priority?
a) vectored interrupt request
b) non-vectored interrupt request
c) FIQ
d) IRQ

5) If External frequency = 12 MHz, CCLK= 60MHz and PCLK = 60MHz then PLLCFG and VPBDIV values are _____.
a) 0×23 and 0×01
b) 0×24 and 0×02
c) 0×24 and 0×01
d) 0×24 and 0×00

6) Which is the core of OS?
a) Kernel
b) Semaphore
c) Shell
d) Scheduler

7) When the processor is executing in thumb state, then all instructions are _____ wide.
a) 8 bits b) 16 bits
c) 32 bits d) 64 bits

8) NRE cost can be defined by _____.
a) The one-time monetary cost of designing the system
b) Life time cost of system
c) Depends upon embedded systems
d) None of the these

9) Which embedded component is critical in digital cameras for image processing?
a) ADC only b) DSP or image processor
c) Timer d) UART

10) Which is NOT a design metric?
a) Cost b) Performance
c) Color d) Power

11) The ARM7TDMI-S supports _____, _____ and _____ data types.
a) char, int, float b) char, int, byte
c) byte, half-word, word d) int, char, word

12) When there is a failed attempt to memory access then processor enters _____ mode.
a) Abort b) Supervisor
c) User d) Fast Interrupt Request

13) Each instruction in ARM machine is encoded into _____.
a) 2 byte b) 3 byte
c) 4 byte d) 8 byte

14) In LPC2148 _____ pin select register is used to configure port pins P0.16 to P0.31.
a) PINSEL0 b) PINSEL1
c) PINSEL2 d) IO0DIR

Seat No.		Set	S

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Embedded Systems (ENTPEC – 03A)

Day & Date: Monday, 25-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever necessary and mention it clearly.

Section – I

Q.2 Attempt Any Four of the following. **16**

a) Explain design challenges in embedded system design & how to meet these challenges?

b) Explain Time-to-Market design metrics in detail

c) Explain Bus architecture in ARM7.

d) Draw and explain CPSR format.

e) Explain the features of LPC2148.

Q.3 Attempt Any Two of the following. **12**

a) Draw and explain the data flow model of ARM core.

b) Describe the operation with example of following ARM instructions.
i) MOV
ii) ADC
iii) MLA
iv) BLX
v) STR
vi) MRS

c) Explain the following on chip peripherals of ARM 2148 in detail.
I/O ports, RTC, DAC

Section – II

Q.4 Answer Any Four of the following. **16**

a) What is Embedded C? Write an embedded C program to blink LED continuously.

b) Explain concept of semaphore with example.

c) Differentiate between RTOS and traditional operating systems with any two points.

d) Draw and explain the basic architecture of an RTOS.

e) Explain the basic working of a digital camera as an embedded system. Mention any two components used.

Q.5 Answer Any Two of the following. **12**

a) Write a program to interface a switch (push button) is interfaced with LPC 2148. Also describe the concept of pull-up and pull-down resistors.

b) Explain the concept of task scheduling in RTOS. Also define Thread, Process, and ISR with suitable examples.

c) Explain the architecture of a smart card-based ATM system. How does it improve security compared to traditional ATM systems?

SLR-QH-526

Seat No.	

Set P

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: Marh/April – 2026
Honors in Artificial Intelligence and Machine Learning
AI Applications (ENTHON-04A)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.
4) Assume suitable data whenever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct options. **14**

1) The main tasks of an Al agent are _____.
a) Input and Output
b) Moment and Humanly Actions
c) Perceiving, thinking, and acting on the environment
d) None of the above

2) The main function of problem-solving agent is to _____.
a) Solve the given problem and reach the goal
b) Find out which sequence of action will get it to the goal state
c) Both a) & b)
d) None of these

3) The inference engine works on _____.
a) Forward Chaining b) Backward Chaining
c) Both a) and b) d) None of these

4) Web Crawler is an example of _____.
a) Intelligent Agent b) Problem-solving Agent
c) Simple reflex Agent d) Model-based Agent

5) The component of an Expert system is _____.
a) Knowledge Base b) Inference Engine
c) User Interface d) All of these

6) Which of the given statement is true for Conditional Probability?
   a) Conditional Probability gives 100% accurate results.
   b) Conditional Probability can be applied to a single event.
   c) Conditional Probability has no effect or relevance on independent events.
   d) None of the above

7) The probabilistic reasoning depends upon _____.
   a) Estimation
   b) Observations
   c) Likelihood
   d) All of these

8) Who is known as the – "Father of Al"?
   a) Fisher Ada
   b) Alan Turing
   c) John McCarthy
   d) Allen Newell

9) Which term describes the common-sense of the judgmental part of problem-solving?
   a) Values-based
   b) Critical
   c) Analytical
   d) Heuristic

10) Artificial Intelligence is about _____.
   a) Playing a game on Computer
   b) Making a machine Intelligent
   c) Programming on Machine with your own Intelligence
   d) Putting your intelligence in Machine

11) An Al agent perceives and acts upon the environment using _____.
   a) Sensors
   b) Perceiver
   c) Actuators
   d) Both a) and c)

12) Which Al technique enables the computers to understand the associations and relationships between objects and events?
   a) Heuristic Processing
   b) Cognitive Science
   c) Relative Symbolism
   d) Pattern Matching

13) A technique that was developed to determine whether a machine could or could not demonstrate the artificial intelligence known as the _____.
   a) Boolean Algebra
   b) Turing Test
   c) Logarithm
   d) Algorithm

14) If a robot is able to change its own trajectory as per the external conditions, then the robot is considered as the _____.
   a) Mobile
   b) Non-Servo
   c) Open Loop
   d) Intelligent

SLR-QH-526

Seat No.	

Set | **P**

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: Marh/April – 2026
Honors in Artificial Intelligence and Machine Learning
AI Applications (ENTHON-04A)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All Questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt the following. (Any Four) **16**

a) State & explain different types of Intelligent Agents.

b) Explain Relaxation Labelling Methods in brief.

c) Explain Man Vs Computers in brief.

d) Explain in brief Computer Vision Representation.

e) Explain Model based object Recognition in brief.

Q.3 Attempt the following. (Any Two) **12**

a) Explain the major components of Intelligent System.

b) Explain the Features of an Expert System and Existing expert systems in brief.

c) Explain the Basic architecture of an Expert system.

Section – II

Q.4 Attempt the following. (Any Four) **16**

a) Explain the Language Models of NLP in brief.

b) Explain the Information Retrieval and Information Extraction in short.

c) Explain the Structure Grammars, Syntactic Analysis (Parsing) in short.

d) Discuss the Robotic Perception in brief.

e) Explain the Passive Reinforcement Learning in brief.

Q.5 Attempt the following. (Any Two) **12**

a) Explain the Speech Recognition and Machine Translation in NLP in detail.

b) Explain the Robotic Software Architectures in brief.

c) Discuss the Active Reinforcement in detail.

Seat No.	

Set **Q**

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: Marh/April – 2026
Honors in Artificial Intelligence and Machine Learning
AI Applications (ENTHON-04A)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.
4) Assume suitable data whenever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct options. **14**

1) Who is known as the – "Father of Al"?
a) Fisher Ada b) Alan Turing
c) John McCarthy d) Allen Newell

2) Which term describes the common-sense of the judgmental part of problem-solving?
a) Values-based b) Critical
c) Analytical d) Heuristic

3) Artificial Intelligence is about _____.
a) Playing a game on Computer
b) Making a machine Intelligent
c) Programming on Machine with your own Intelligence
d) Putting your intelligence in Machine

4) An Al agent perceives and acts upon the environment using _____.
a) Sensors b) Perceiver
c) Actuators d) Both a) and c)

5) Which Al technique enables the computers to understand the associations and relationships between objects and events?
a) Heuristic Processing b) Cognitive Science
c) Relative Symbolism d) Pattern Matching

6) A technique that was developed to determine whether a machine could or could not demonstrate the artificial intelligence known as the _____.
   a) Boolean Algebra
   b) Turing Test
   c) Logarithm
   d) Algorithm

7) If a robot is able to change its own trajectory as per the external conditions, then the robot is considered as the _____.
   a) Mobile
   b) Non-Servo
   c) Open Loop
   d) Intelligent

8) The main tasks of an Al agent are _____.
   a) Input and Output
   b) Moment and Humanly Actions
   c) Perceiving, thinking, and acting on the environment
   d) None of the above

9) The main function of problem-solving agent is to _____.
   a) Solve the given problem and reach the goal
   b) Find out which sequence of action will get it to the goal state
   c) Both a) & b)
   d) None of these

10) The inference engine works on _____.
   a) Forward Chaining
   b) Backward Chaining
   c) Both a) and b)
   d) None of these

11) Web Crawler is an example of _____.
   a) Intelligent Agent
   b) Problem-solving Agent
   c) Simple reflex Agent
   d) Model-based Agent

12) The component of an Expert system is _____.
   a) Knowledge Base
   b) Inference Engine
   c) User Interface
   d) All of these

13) Which of the given statement is true for Conditional Probability?
   a) Conditional Probability gives 100% accurate results.
   b) Conditional Probability can be applied to a single event.
   c) Conditional Probability has no effect or relevance on independent events.
   d) None of the above

14) The probabilistic reasoning depends upon _____.
   a) Estimation
   b) Observations
   c) Likelihood
   d) All of these

SLR-QH-526

Seat No.	

Set Q

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: Marh/April – 2026
Honors in Artificial Intelligence and Machine Learning
AI Applications (ENTHON-04A)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All Questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt the following. (Any Four) **16**

a) State & explain different types of Intelligent Agents.

b) Explain Relaxation Labelling Methods in brief.

c) Explain Man Vs Computers in brief.

d) Explain in brief Computer Vision Representation.

e) Explain Model based object Recognition in brief.

Q.3 Attempt the following. (Any Two) **12**

a) Explain the major components of Intelligent System.

b) Explain the Features of an Expert System and Existing expert systems in brief.

c) Explain the Basic architecture of an Expert system.

Section – II

Q.4 Attempt the following. (Any Four) **16**

a) Explain the Language Models of NLP in brief.

b) Explain the Information Retrieval and Information Extraction in short.

c) Explain the Structure Grammars, Syntactic Analysis (Parsing) in short.

d) Discuss the Robotic Perception in brief.

e) Explain the Passive Reinforcement Learning in brief.

Q.5 Attempt the following. (Any Two) **12**

a) Explain the Speech Recognition and Machine Translation in NLP in detail.

b) Explain the Robotic Software Architectures in brief.

c) Discuss the Active Reinforcement in detail.

SLR-QH-526

Seat No.	

Set R

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: Marh/April – 2026
Honors in Artificial Intelligence and Machine Learning
AI Applications (ENTHON-04A)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.
4) Assume suitable data whenever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct options. **14**

1) An Al agent perceives and acts upon the environment using _____.
a) Sensors b) Perceiver
c) Actuators d) Both a) and c)

2) Which Al technique enables the computers to understand the associations and relationships between objects and events?
a) Heuristic Processing b) Cognitive Science
c) Relative Symbolism d) Pattern Matching

3) A technique that was developed to determine whether a machine could or could not demonstrate the artificial intelligence known as the _____.
a) Boolean Algebra b) Turing Test
c) Logarithm d) Algorithm

4) If a robot is able to change its own trajectory as per the external conditions, then the robot is considered as the _____.
a) Mobile b) Non-Servo
c) Open Loop d) Intelligent

5) The main tasks of an Al agent are _____.
a) Input and Output
b) Moment and Humanly Actions
c) Perceiving, thinking, and acting on the environment
d) None of the above

6) The main function of problem-solving agent is to _____.
   a) Solve the given problem and reach the goal
   b) Find out which sequence of action will get it to the goal state
   c) Both a) & b)
   d) None of these

7) The inference engine works on _____.
   a) Forward Chaining
   b) Backward Chaining
   c) Both a) and b)
   d) None of these

8) Web Crawler is an example of _____.
   a) Intelligent Agent
   b) Problem-solving Agent
   c) Simple reflex Agent
   d) Model-based Agent

9) The component of an Expert system is _____.
   a) Knowledge Base
   b) Inference Engine
   c) User Interface
   d) All of these

10) Which of the given statement is true for Conditional Probability?
   a) Conditional Probability gives 100% accurate results.
   b) Conditional Probability can be applied to a single event.
   c) Conditional Probability has no effect or relevance on independent events.
   d) None of the above

11) The probabilistic reasoning depends upon _____.
   a) Estimation
   b) Observations
   c) Likelihood
   d) All of these

12) Who is known as the – “Father of Al”?
   a) Fisher Ada
   b) Alan Turing
   c) John McCarthy
   d) Allen Newell

13) Which term describes the common-sense of the judgmental part of problem-solving?
   a) Values-based
   b) Critical
   c) Analytical
   d) Heuristic

14) Artificial Intelligence is about _____.
   a) Playing a game on Computer
   b) Making a machine Intelligent
   c) Programming on Machine with your own Intelligence
   d) Putting your intelligence in Machine

SLR-QH-526

Seat No.	

Set | **R**

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: Marh/April – 2026
Honors in Artificial Intelligence and Machine Learning
AI Applications (ENTHON-04A)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All Questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt the following. (Any Four) **16**

a) State & explain different types of Intelligent Agents.

b) Explain Relaxation Labelling Methods in brief.

c) Explain Man Vs Computers in brief.

d) Explain in brief Computer Vision Representation.

e) Explain Model based object Recognition in brief.

Q.3 Attempt the following. (Any Two) **12**

a) Explain the major components of Intelligent System.

b) Explain the Features of an Expert System and Existing expert systems in brief.

c) Explain the Basic architecture of an Expert system.

Section – II

Q.4 Attempt the following. (Any Four) **16**

a) Explain the Language Models of NLP in brief.

b) Explain the Information Retrieval and Information Extraction in short.

c) Explain the Structure Grammars, Syntactic Analysis (Parsing) in short.

d) Discuss the Robotic Perception in brief.

e) Explain the Passive Reinforcement Learning in brief.

Q.5 Attempt the following. (Any Two) **12**

a) Explain the Speech Recognition and Machine Translation in NLP in detail.

b) Explain the Robotic Software Architectures in brief.

c) Discuss the Active Reinforcement in detail.

SLR-QH-526

Seat No.	

Set S

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: Marh/April – 2026
Honors in Artificial Intelligence and Machine Learning
AI Applications (ENTHON-04A)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.
4) Assume suitable data whenever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct options. 14

1) Which of the given statement is true for Conditional Probability?
a) Conditional Probability gives 100% accurate results.
b) Conditional Probability can be applied to a single event.
c) Conditional Probability has no effect or relevance on independent events.
d) None of the above

2) The probabilistic reasoning depends upon _____.
a) Estimation b) Observations
c) Likelihood d) All of these

3) Who is known as the – "Father of Al"?
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c) John McCarthy d) Allen Newell

4) Which term describes the common-sense of the judgmental part of problem-solving?
a) Values-based b) Critical
c) Analytical d) Heuristic

5) Artificial Intelligence is about _____.
a) Playing a game on Computer
b) Making a machine Intelligent
c) Programming on Machine with your own Intelligence
d) Putting your intelligence in Machine

6) An Al agent perceives and acts upon the environment using _____.
a) Sensors b) Perceiver
c) Actuators d) Both a) and c)

7) Which Al technique enables the computers to understand the associations and relationships between objects and events?
a) Heuristic Processing b) Cognitive Science
c) Relative Symbolism d) Pattern Matching

8) A technique that was developed to determine whether a machine could or could not demonstrate the artificial intelligence known as the _____.
a) Boolean Algebra b) Turing Test
c) Logarithm d) Algorithm

9) If a robot is able to change its own trajectory as per the external conditions, then the robot is considered as the _____.
a) Mobile b) Non-Servo
c) Open Loop d) Intelligent

10) The main tasks of an Al agent are _____.
a) Input and Output
b) Moment and Humanly Actions
c) Perceiving, thinking, and acting on the environment
d) None of the above

11) The main function of problem-solving agent is to _____.
a) Solve the given problem and reach the goal
b) Find out which sequence of action will get it to the goal state
c) Both a) & b)
d) None of these

12) The inference engine works on _____.
a) Forward Chaining b) Backward Chaining
c) Both a) and b) d) None of these

13) Web Crawler is an example of _____.
a) Intelligent Agent b) Problem-solving Agent
c) Simple reflex Agent d) Model-based Agent

14) The component of an Expert system is _____.
a) Knowledge Base b) Inference Engine
c) User Interface d) All of these

SLR-QH-526

Seat No.	

Set | **S**

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: Marh/April – 2026
Honors in Artificial Intelligence and Machine Learning
AI Applications (ENTHON-04A)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All Questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt the following. (Any Four) **16**

a) State & explain different types of Intelligent Agents.

b) Explain Relaxation Labelling Methods in brief.

c) Explain Man Vs Computers in brief.

d) Explain in brief Computer Vision Representation.

e) Explain Model based object Recognition in brief.

Q.3 Attempt the following. (Any Two) **12**

a) Explain the major components of Intelligent System.

b) Explain the Features of an Expert System and Existing expert systems in brief.

c) Explain the Basic architecture of an Expert system.

Section – II

Q.4 Attempt the following. (Any Four) **16**

a) Explain the Language Models of NLP in brief.

b) Explain the Information Retrieval and Information Extraction in short.

c) Explain the Structure Grammars, Syntactic Analysis (Parsing) in short.

d) Discuss the Robotic Perception in brief.

e) Explain the Passive Reinforcement Learning in brief.

Q.5 Attempt the following. (Any Two) **12**

a) Explain the Speech Recognition and Machine Translation in NLP in detail.

b) Explain the Robotic Software Architectures in brief.

c) Discuss the Active Reinforcement in detail.

SLR-QH-529

Seat No.	

Set P

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
Antenna & Wave Propagation (BTN06601)

Day & Date: Friday, 15-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) To create radiation there must be a _____.
a) Direct current b) Time Varying current
c) Induced current d) all of above

2) A radiator having equal radiation in all direction is referred to as _____ radiator.
a) Directional b) isotropic
c) guided d) non-directional

3) The ratio of 4 Pi over the beam solid angle is defined the _____.
a) Gain b) Directivity
c) Efficiency d) Aperture

4) The input impedance of Lambda/2 dipole, with an idealized sinusoidal current distribution _____.
a) $73 + j42.5$ b) $50 + j100$
c) $25 + j50$ d) $36 + j42.5$

5) To achieve Broadside radiation from a uniform linear array, the phasing between elements must be _____.
a) 90 b) 45
c) 0 d) 120

6) A monopole antenna is considered as _____.
a) Traveling wave b) surface wave
c) sky wave d) Resonant

7) Primary modes of radiation of helical antenna are _____.
a) Normal mode only b) Axial mode only
c) Both normal and axial mode d) none

8) As the number of turns in helical antenna approaches to infinity then the axial ration become _____.
a) Unity b) infinity
c) two d) four

9) For a dipole Log Periodic Antenna all the dimensions change by the _____.
a) same scaling factor b) Log of scaling factor
c) Tangent of scaling factor d) None

10) Horn antennas are derivatives of _____.
a) coaxial lines b) slots
c) microstrips d) waveguides

11) A microstrip antenna usually classified as _____.
a) Narrow band b) medium band
c) Broadband d) base band

12) Smart antenna is combining _____ technology.
a) Digital signal processing b) smart technology
c) android d) All of above

13) Space wave propagation is the type of _____.
a) Surface wave propagation b) Ground wave propagation
c) Sky wave propagation d) Radio wave propagation

14) Product of frequency and wavelength is called as _____.
a) speed of light b) constant
c) variable d) does not having meaning

SLR-QH-529

Seat No.	

Set P

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
Antenna & Wave Propagation (BTN06601)

Day & Date: Friday, 15-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt (Any Three). **12**

a) What is antenna. Explain about radiation mechanism of antenna.

b) Draw the current distribution for short dipole, half dipole, monopoledipole antenna.

c) Explain the microstrip antenna and it's any four applications.

d) What is array factor and explain significance of it?

Q.3 Attempt (Any Two). **16**

a) Define antenna beam width, antenna bandwidth, antenna beam efficiency, antenna beam area, polarization with one example.

b) Using pattern multiplication find the radiation pattern for the broadside array of 4 elements, spacing between each element is lambda/2.

c) Compare half wave dipole antenna and quarter wave dipole antenna with an example.

SECTION – II

Q.4 Attempt (Any Three). **12**

a) Explain the different types of Horn antenna.

b) Explain the concept of Smart antenna with analogy.

c) What is duct propagation and multi hope propagation?

d) Explain the concept of Active antenna with the help of block diagram.

Q.5 Attempt (Any Two). **16**

a) Explain the working of Spiral and log periodic antenna with the help of suitable diagrams.

b) Explain the concept of reconfigurable antennas in detail.

c) What is the structure of atmosphere? explain each layer, significance of all.

Seat No.	

Set **Q**

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
Antenna & Wave Propagation (BTN06601)

Day & Date: Friday, 15-05-2026 Max. Marks: 70
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Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) As the number of turns in helical antenna approaches to infinity then the axial ration become _____.
a) Unity b) infinity
c) two d) four

2) For a dipole Log Periodic Antenna all the dimensions change by the _____.
a) same scaling factor b) Log of scaling factor
c) Tangent of scaling factor d) None

3) Horn antennas are derivatives of _____.
a) coaxial lines b) slots
c) microstrips d) waveguides

4) A microstrip antenna usually classified as _____.
a) Narrow band b) medium band
c) Broadband d) base band

5) Smart antenna is combining _____ technology.
a) Digital signal processing b) smart technology
c) android d) All of above

6) Space wave propagation is the type of _____.
a) Surface wave propagation b) Ground wave propagation
c) Sky wave propagation d) Radio wave propagation

7) Product of frequency and wavelength is called as _____.
a) speed of light b) constant
c) variable d) does not having meaning

8) To create radiation there must be a _____.
a) Direct current b) Time Varying current
c) Induced current d) all of above

9) A radiator having equal radiation in all direction is referred to as _____ radiator.
a) Directional b) isotropic
c) guided d) non-directional

10) The ratio of 4 Pi over the beam solid angle is defined the _____.
a) Gain b) Directivity
c) Efficiency d) Aperture

11) The input impedance of Lambda/2 dipole, with an idealized sinusoidal current distribution _____.
a) $73 + \mathrm{j}42.5$ b) $50 + \mathrm{j}100$
c) $25 + \mathrm{j}50$ d) $36 + \mathrm{j}42.5$

12) To achieve Broadside radiation from a uniform linear array, the phasing between elements must be _____.
a) 90 b) 45
c) 0 d) 120

13) A monopole antenna is considered as _____.
a) Traveling wave b) surface wave
c) sky wave d) Resonant

14) Primary modes of radiation of helical antenna are _____.
a) Normal mode only b) Axial mode only
c) Both normal and axial mode d) none

SLR-QH-529

Seat No.	

Set Q

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026 Antenna & Wave Propagation (BTN06601)

Day & Date: Friday, 15-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
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SECTION – I

Q.2 Attempt (Any Three). **12**

a) What is antenna. Explain about radiation mechanism of antenna.

b) Draw the current distribution for short dipole, half dipole, monopoledipole antenna.

c) Explain the microstrip antenna and it's any four applications.

d) What is array factor and explain significance of it?

Q.3 Attempt (Any Two). **16**

a) Define antenna beam width, antenna bandwidth, antenna beam efficiency, antenna beam area, polarization with one example.

b) Using pattern multiplication find the radiation pattern for the broadside array of 4 elements, spacing between each element is lambda/2.

c) Compare half wave dipole antenna and quarter wave dipole antenna with an example.

SECTION – II

Q.4 Attempt (Any Three). **12**

a) Explain the different types of Horn antenna.

b) Explain the concept of Smart antenna with analogy.

c) What is duct propagation and multi hope propagation?

d) Explain the concept of Active antenna with the help of block diagram.

Q.5 Attempt (Any Two). **16**

a) Explain the working of Spiral and log periodic antenna with the help of suitable diagrams.

b) Explain the concept of reconfigurable antennas in detail.

c) What is the structure of atmosphere? explain each layer, significance of all.

SLR-QH-529

Seat No.	

Set R

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
Antenna & Wave Propagation (BTN06601)

Day & Date: Friday, 15-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) A microstrip antenna usually classified as _____.
a) Narrow band b) medium band
c) Broadband d) base band

2) Smart antenna is combining _____ technology.
a) Digital signal processing b) smart technology
c) android d) All of above

3) Space wave propagation is the type of _____.
a) Surface wave propagation b) Ground wave propagation
c) Sky wave propagation d) Radio wave propagation

4) Product of frequency and wavelength is called as _____.
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a) same scaling factor b) Log of scaling factor
c) Tangent of scaling factor d) None

14) Horn antennas are derivatives of _____.

a) coaxial lines b) slots
c) microstrips d) waveguides

SLR-QH-529

Seat No.	

Set R

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
Antenna & Wave Propagation (BTN06601)

Day & Date: Friday, 15-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt (Any Three). **12**

a) What is antenna. Explain about radiation mechanism of antenna.

b) Draw the current distribution for short dipole, half dipole, monopoledipole antenna.

c) Explain the microstrip antenna and it's any four applications.

d) What is array factor and explain significance of it?

Q.3 Attempt (Any Two). **16**

a) Define antenna beam width, antenna bandwidth, antenna beam efficiency, antenna beam area, polarization with one example.

b) Using pattern multiplication find the radiation pattern for the broadside array of 4 elements, spacing between each element is lambda/2.

c) Compare half wave dipole antenna and quarter wave dipole antenna with an example.

SECTION – II

Q.4 Attempt (Any Three). **12**

a) Explain the different types of Horn antenna.

b) Explain the concept of Smart antenna with analogy.

c) What is duct propagation and multi hope propagation?

d) Explain the concept of Active antenna with the help of block diagram.

Q.5 Attempt (Any Two). **16**

a) Explain the working of Spiral and log periodic antenna with the help of suitable diagrams.

b) Explain the concept of reconfigurable antennas in detail.

c) What is the structure of atmosphere? explain each layer, significance of all.

Seat No.	

Set **S**

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
Antenna & Wave Propagation (BTN06601)

Day & Date: Friday, 15-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) A monopole antenna is considered as _____.
a) Traveling wave b) surface wave
c) sky wave d) Resonant

2) Primary modes of radiation of helical antenna are _____.
a) Normal mode only b) Axial mode only
c) Both normal and axial mode d) none

3) As the number of turns in helical antenna approaches to infinity then the axial ration become _____.
a) Unity b) infinity
c) two d) four

4) For a dipole Log Periodic Antenna all the dimensions change by the _____.
a) same scaling factor b) Log of scaling factor
c) Tangent of scaling factor d) None

5) Horn antennas are derivatives of _____.
a) coaxial lines b) slots
c) microstrips d) waveguides

6) A microstrip antenna usually classified as _____.
a) Narrow band b) medium band
c) Broadband d) base band

7) Smart antenna is combining _____ technology.
a) Digital signal processing b) smart technology
c) android d) All of above

8) Space wave propagation is the type of _____.
a) Surface wave propagation b) Ground wave propagation
c) Sky wave propagation d) Radio wave propagation

9) Product of frequency and wavelength is called as _____.
a) speed of light b) constant
c) variable d) does not having meaning

10) To create radiation there must be a _____.
a) Direct current b) Time Varying current
c) Induced current d) all of above

11) A radiator having equal radiation in all direction is referred to as _____ radiator.
a) Directional b) isotropic
c) guided d) non-directional

12) The ratio of 4 Pi over the beam solid angle is defined the _____.
a) Gain b) Directivity
c) Efficiency d) Aperture

13) The input impedance of Lambda/2 dipole, with an idealized sinusoidal current distribution _____.
a) $73 + \mathrm{j}42.5$ b) $50 + \mathrm{j}100$
c) $25 + \mathrm{j}50$ d) $36 + \mathrm{j}42.5$

14) To achieve Broadside radiation from a uniform linear array, the phasing between elements must be _____.
a) 90 b) 45
c) 0 d) 120

SLR-QH-529

Seat No.	

Set S

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
Antenna & Wave Propagation (BTN06601)

Day & Date: Friday, 15-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt (Any Three). **12**

a) What is antenna. Explain about radiation mechanism of antenna.

b) Draw the current distribution for short dipole, half dipole, monopoledipole antenna.

c) Explain the microstrip antenna and it's any four applications.

d) What is array factor and explain significance of it?

Q.3 Attempt (Any Two). **16**

a) Define antenna beam width, antenna bandwidth, antenna beam efficiency, antenna beam area, polarization with one example.

b) Using pattern multiplication find the radiation pattern for the broadside array of 4 elements, spacing between each element is lambda/2.

c) Compare half wave dipole antenna and quarter wave dipole antenna with an example.

SECTION – II

Q.4 Attempt (Any Three). **12**

a) Explain the different types of Horn antenna.

b) Explain the concept of Smart antenna with analogy.

c) What is duct propagation and multi hope propagation?

d) Explain the concept of Active antenna with the help of block diagram.

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a) Explain the working of Spiral and log periodic antenna with the help of suitable diagrams.

b) Explain the concept of reconfigurable antennas in detail.

c) What is the structure of atmosphere? explain each layer, significance of all.

SLR-QH-530

Seat No.	

Set P

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
Embedded System (BTN06602)

Day & Date: Monday, 18-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to right indicates full marks.
4) Assume suitable data if required.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct option from the following. 14

1) ARM7 has _____ type of architecture.
a) CISC (Complex Instruction Set Computing)
b) RISC (Reduced Instruction Set Computing)
c) VLIW (Very Long Instruction Word)
d) EPIC (Explicitly Parallel Instruction Computing)

2) Which ARM instruction is used for subtracting one register from another and updating the condition codes?
a) SUB b) SBC
c) CMP d) MUL

3) Which type of memory is used for data storage in the LPC2148?
a) SRAM b) Flash
c) EEPROM d) ROM

4) An embedded system must have _____.
a) hard disk
b) processor and memory
c) operating system
d) processor and input-output unit

5) What is the resolution of the ADC in LPC2148?
a) 8-bit b) 10-bit
c) 12-bit d) 16-bit

6) How many UART modules are present in LPC2148?
a) 1 b) 2
c) 3 d) 4

7) What is the function of the RTC in LPC2148?
a) Communication with external devices
b) Power management
c) Keeping track of real-time clock and calendar
d) Generating high-frequency signals

8) In LPC2148 _____ pin select register is used to configure port pins P0.0 to P0.15.
a) PINSEL0 b) PINSEL1
c) PINSEL2 d) IOθDIR

9) What does the 'MSR' instruction do in the ARM7 instruction set?
a) Move a value to the status register
b) Move a value to a special register
c) Multiply and store the result in memory
d) Modify stack registers

10) If External frequency = 12 MHz, CCLK=60MHz and PCLK=30MHz then PLLCFG and VPBDIV values are _____.
a) 0x23 and 0x01 b) 0x24 and 0x02
c) 0x23 and 0x02 d) 0x24 and 0x00

11) How would you interface an analog sensor with LPC2148?
a) Through UART b) Using the ADC pins
c) Through GPIO pins d) Using PWM

12) Which of the following is a key advantage of using an RTOS?
a) Reduced power consumption
b) Faster hardware access
c) Predictable timing behaviour
d) Increased data throughput

13) What does the term "context switching" mean in RTOS?
a) Switching between kernel modes
b) Saving and restoring the state of a task
c) Executing tasks simultaneously
d) Switching between memory banks

14) The _____ is the part of the kernel responsible for determining which task will run next.
a) Scheduler b) Semaphore
c) Mailbox d) Mutex

SLR-QH-530

Seat No.	

Set P

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
Embedded System (BTN06602)

Day & Date: Monday, 18-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if required.

Section – I

Q.2 Attempt Any Four questions. **16**

a) What are the challenges in embedded system design & how to meet these challenges?

b) Explain time-to-Market design metrics in detail.

c) Explain the features of LPC 2148?

d) Explain three stage pipeline of ARM7 in detail.

e) With the suitable diagram explain ARM core data flow model.

Q.3 Attempt Any Two questions. **12**

a) Define embedded system. What are the components of embedded system Hardware? Explain with neat block diagram.

b) Explain the following on chip peripherals of ARM 2148 in detail.
I/O ports, PLL, timers / counters.

c) Explain with examples load- store multiple instructions of ARM 7 along with its addressing modes.

Section – II

Q.4 Attempt Any Four questions. **16**

a) Write different features of RTOS.

b) Explain task states associated with RTOS.

c) Explain concept of semaphore with example.

d) Draw and explain the block diagram of Smart Card System based ATM.

e) Draw Interfacing diagram of LED to LPC2148 and write an embedded C program to blink LED continuously.

Q.5 Attempt Any Two questions. **12**

a) Explain the following kernel objects in RTOS.
   i) Thread
   ii) Mailbox
   iii) Events

b) List the types of scheduling algorithm. Explain any two types of scheduling algorithm in RTOS.

c) Draw interfacing diagram of 7 segment with LPC2148. Write an embedded C program to display 0 to 9 number on 7 segment.

SLR-QH-530

Seat No.	

Set Q

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
Embedded System (BTN06602)

Day & Date: Monday, 18-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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3) Figures to right indicates full marks.
4) Assume suitable data if required.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct option from the following. 14

1) In LPC2148 _____ pin select register is used to configure port pins P0.0 to P0.15.
a) PINSEL0 b) PINSEL1
c) PINSEL2 d) IOθDIR

2) What does the 'MSR' instruction do in the ARM7 instruction set?
a) Move a value to the status register
b) Move a value to a special register
c) Multiply and store the result in memory
d) Modify stack registers

3) If External frequency = 12 MHz, CCLK=60MHz and PCLK=30MHz then PLLCFG and VPBDIV values are _____.
a) 0x23 and 0x01 b) 0x24 and 0x02
c) 0x23 and 0x02 d) 0x24 and 0x00

4) How would you interface an analog sensor with LPC2148?
a) Through UART b) Using the ADC pins
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8) ARM7 has _____ type of architecture.
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9) Which ARM instruction is used for subtracting one register from another and updating the condition codes?
a) SUB
b) SBC
c) CMP
d) MUL

10) Which type of memory is used for data storage in the LPC2148?
a) SRAM
b) Flash
c) EEPROM
d) ROM

11) An embedded system must have _____.
a) hard disk
b) processor and memory
c) operating system
d) processor and input-output unit

12) What is the resolution of the ADC in LPC2148?
a) 8-bit
b) 10-bit
c) 12-bit
d) 16-bit

13) How many UART modules are present in LPC2148?
a) 1
b) 2
c) 3
d) 4

14) What is the function of the RTC in LPC2148?
a) Communication with external devices
b) Power management
c) Keeping track of real-time clock and calendar
d) Generating high-frequency signals

Seat No.	

Set **Q**

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
Embedded System (BTN06602)

Day & Date: Monday, 18-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if required.

Section – I

Q.2 Attempt Any Four questions. **16**

a) What are the challenges in embedded system design & how to meet these challenges?

b) Explain time-to-Market design metrics in detail.

c) Explain the features of LPC 2148?

d) Explain three stage pipeline of ARM7 in detail.

e) With the suitable diagram explain ARM core data flow model.

Q.3 Attempt Any Two questions. **12**

a) Define embedded system. What are the components of embedded system Hardware? Explain with neat block diagram.

b) Explain the following on chip peripherals of ARM 2148 in detail.
I/O ports, PLL, timers / counters.

c) Explain with examples load- store multiple instructions of ARM 7 along with its addressing modes.

Section – II

Q.4 Attempt Any Four questions. **16**

a) Write different features of RTOS.

b) Explain task states associated with RTOS.

c) Explain concept of semaphore with example.

d) Draw and explain the block diagram of Smart Card System based ATM.

e) Draw Interfacing diagram of LED to LPC2148 and write an embedded C program to blink LED continuously.

Q.5 Attempt Any Two questions. **12**

a) Explain the following kernel objects in RTOS.
   i) Thread
   ii) Mailbox
   iii) Events

b) List the types of scheduling algorithm. Explain any two types of scheduling algorithm in RTOS.

c) Draw interfacing diagram of 7 segment with LPC2148. Write an embedded C program to display 0 to 9 number on 7 segment.

Seat No.	

Set | R

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
Embedded System (BTN06602)

Day & Date: Monday, 18-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to right indicates full marks.
4) Assume suitable data if required.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct option from the following. **14**

1) How would you interface an analog sensor with LPC2148?
a) Through UART b) Using the ADC pins
c) Through GPIO pins d) Using PWM

2) Which of the following is a key advantage of using an RTOS?
a) Reduced power consumption
b) Faster hardware access
c) Predictable timing behaviour
d) Increased data throughput

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a) Switching between kernel modes
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7) Which type of memory is used for data storage in the LPC2148?
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8) An embedded system must have _____.
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d) processor and input-output unit

9) What is the resolution of the ADC in LPC2148?
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13) What does the 'MSR' instruction do in the ARM7 instruction set?
a) Move a value to the status register
b) Move a value to a special register
c) Multiply and store the result in memory
d) Modify stack registers

14) If External frequency = 12 MHz, CCLK=60MHz and PCLK=30MHz then PLLCFG and VPBDIV values are _____.
a) 0x23 and 0x01 b) 0x24 and 0x02
c) 0x23 and 0x02 d) 0x24 and 0x00

SLR-QH-530

Seat No.	

Set R

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
Embedded System (BTN06602)

Day & Date: Monday, 18-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if required.

Section – I

Q.2 Attempt Any Four questions. **16**

a) What are the challenges in embedded system design & how to meet these challenges?

b) Explain time-to-Market design metrics in detail.

c) Explain the features of LPC 2148?

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e) With the suitable diagram explain ARM core data flow model.

Q.3 Attempt Any Two questions. **12**

a) Define embedded system. What are the components of embedded system Hardware? Explain with neat block diagram.

b) Explain the following on chip peripherals of ARM 2148 in detail.
I/O ports, PLL, timers / counters.

c) Explain with examples load- store multiple instructions of ARM 7 along with its addressing modes.

Section – II

Q.4 Attempt Any Four questions. **16**

a) Write different features of RTOS.

b) Explain task states associated with RTOS.

c) Explain concept of semaphore with example.

d) Draw and explain the block diagram of Smart Card System based ATM.

e) Draw Interfacing diagram of LED to LPC2148 and write an embedded C program to blink LED continuously.

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   i) Thread
   ii) Mailbox
   iii) Events

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c) Draw interfacing diagram of 7 segment with LPC2148. Write an embedded C program to display 0 to 9 number on 7 segment.

SLR-QH-530

Seat No.		Set	S

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
Embedded System (BTN06602)

Day & Date: Monday, 18-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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3) Figures to right indicates full marks.
4) Assume suitable data if required.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct option from the following. 14

1) How many UART modules are present in LPC2148?
a) 1 b) 2
c) 3 d) 4

2) What is the function of the RTC in LPC2148?
a) Communication with external devices
b) Power management
c) Keeping track of real-time clock and calendar
d) Generating high-frequency signals

3) In LPC2148 _____ pin select register is used to configure port pins P0.0 to P0.15.
a) PINSEL0 b) PINSEL1
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a) Move a value to the status register
b) Move a value to a special register
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5) If External frequency = 12 MHz, CCLK=60MHz and PCLK=30MHz then PLLCFG and VPBDIV values are _____.
a) 0x23 and 0x01 b) 0x24 and 0x02
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6) How would you interface an analog sensor with LPC2148?
a) Through UART
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b) SBC
c) CMP
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12) Which type of memory is used for data storage in the LPC2148?
a) SRAM
b) Flash
c) EEPROM
d) ROM

13) An embedded system must have _____.
a) hard disk
b) processor and memory
c) operating system
d) processor and input-output unit

14) What is the resolution of the ADC in LPC2148?
a) 8-bit
b) 10-bit
c) 12-bit
d) 16-bit

SLR-QH-530

Seat No.		Set	S

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
Embedded System (BTN06602)

Day & Date: Monday, 18-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if required.

Section – I

Q.2 Attempt Any Four questions. **16**

a) What are the challenges in embedded system design & how to meet these challenges?

b) Explain time-to-Market design metrics in detail.

c) Explain the features of LPC 2148?

d) Explain three stage pipeline of ARM7 in detail.

e) With the suitable diagram explain ARM core data flow model.

Q.3 Attempt Any Two questions. **12**

a) Define embedded system. What are the components of embedded system Hardware? Explain with neat block diagram.

b) Explain the following on chip peripherals of ARM 2148 in detail.
I/O ports, PLL, timers / counters.

c) Explain with examples load- store multiple instructions of ARM 7 along with its addressing modes.

Section – II

Q.4 Attempt Any Four questions. **16**

a) Write different features of RTOS.

b) Explain task states associated with RTOS.

c) Explain concept of semaphore with example.

d) Draw and explain the block diagram of Smart Card System based ATM.

e) Draw Interfacing diagram of LED to LPC2148 and write an embedded C program to blink LED continuously.

Q.5 Attempt Any Two questions. **12**

a) Explain the following kernel objects in RTOS.
   i) Thread
   ii) Mailbox
   iii) Events

b) List the types of scheduling algorithm. Explain any two types of scheduling algorithm in RTOS.

c) Draw interfacing diagram of 7 segment with LPC2148. Write an embedded C program to display 0 to 9 number on 7 segment.

SLR-QH-531

Seat No.	

Set P

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
Electronic System Design (BTN06603)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if required.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Select the appropriate option: **14**

1) The time period of IC 2240 is given as _____.
a) T = RC b) T = 0.67 RC
c) T = 0.7 RC d) None of the above

2) 3 1/2 digit DVM required _____.
a) 12 bit ADC b) 13 bit ADC
c) 10 bit ADC d) 11 bit ADC

3) Instrumentation amplifier is used in controller to give _____.
a) High level Amplification b) LOW CMRR
c) Low input impedance d) Low level amplification

4) Resistance of PT 100 at 100°C is _____.
a) $100\ \Omega$ b) $200\ \Omega$
c) $138.5\ \Omega$ d) $50\ \Omega$

5) The system having steady state error are removed by _____.
a) Integral Controller b) Derivative Controller
c) Pro. Controller d) ALL

6) Cycling in ON-OFF controller decreases as _____.
a) Decrease in deadband b) Increase in deadband
c) Increase in setpoint d) Decrease in set point

7) In PLC Which of the following provides the connections to the equipment to be controlled?
a) Relay b) Input/ Output Module
c) Power Supply Unit d) Moderator

8) _____ is an efficient method of turning ON of SCR.
a) Gate Triggering
b) Application of High Voltage
c) Temperature rise
d) High dv/dt

9) TRIAC and SCR both are controlled devices.
a) True
b) False

10) The turn ON time of SCR is consisting of _____.
a) Delay time, Rise time
b) Delay time, rise time, spread time
c) Rise time, Spread Time
d) Delay time, Spread Time

11) To transfer the power from load to source in case of inductive load, what should be the firing angle _____.
a) equal to 45°
b) equal to 90°
c) less than 90°
d) greater than 90°

12) For single phase Half wave-controlled rectifier with resistive load V_{DCmax} is _____.
a) V_m/π
b) V_m
c) $V_m/2\pi$
d) $V_m/3\pi$

13) Determine capture range Fc of the VCO in PLL565, if free running frequency is 500KHZ and supply voltage is+/-10V _____.
a) $+/-200\text{KHz}$
b) $+/-500\text{KHz}$
c) $+/-250\text{KHz}$
d) $+/-1000\text{KHz}$

14) IC 1596 can be used as _____.
a) Amplitude Modulator
b) As a Double balanced Modulator
c) High Frequency Mixer
d) All of these

Seat No.	

Set | P

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
Electronic System Design (BTN06603)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if required.
4) Use of calculator and electronic component datasheet is allowed.

SECTION – I

Q.2 Attempt the following. (Any Four) **16**

a) Describe Turn ON time of SCR with the help of waveforms in detail.

b) Explain TRIAC construction & V-I characteristics of it.

c) Explain the application of PLL as FSK demodulator.

d) Explain AC power control circuit using TRIAC.

e) Explain with circuit diagram the AM modulator using IC1596.

Q.3 Attempt the following. (Any Two) **12**

a) Explain internal block diagram of PLL 565. Also explain the design steps to determine Centre frequency, capture range and lock range.

b) Explain Bridge full wave controlled rectifier with resistive load. Derive the expression for DC voltage, RMS voltage.

c) Differentiate between SCR and BJT. Explain the following terms. Latching current, Holding current, Commutation Circuit, Breakover voltage.

SECTION – II

Q.4 Attempt the following. (Any Four) **16**

a) Draw and explain block diagram of PLC.

b) Explain advantages and disadvantages of thermocouple.

c) What is dead band and why dead band is require in ON-OFF controller.

d) Design floating load I to V converter where input current range is 4 mA to 20 mA and output voltage required is 0 to 10V.

e) Draw and explain block diagram of IC74926.

Q.5 Attempt the following. (Any Two) **12**

a) Design timer using XR2240 to generate a delay of 1hr in section.

b) What is ladder diagram? Design ladder diagram for elevator controlling.

c) Design ON-OFF controller to control temperature in the range of 0°C to 100°C. Set point is 40°C.

SLR-QH-531

Seat No.	

Set Q

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
Electronic System Design (BTN06603)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if required.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Select the appropriate option: **14**

1) _____ is an efficient method of turning ON of SCR.
a) Gate Triggering b) Application of High Voltage
c) Temperature rise d) High dv/dt

2) TRIAC and SCR both are controlled devices.
a) True b) False

3) The turn ON time of SCR is consisting of _____.
a) Delay time, Rise time
b) Delay time, rise time, spread time
c) Rise time, Spread Time
d) Delay time, Spread Time

4) To transfer the power from load to source in case of inductive load, what should be the firing angle _____.
a) equal to 45° b) equal to 90°
c) less than 90° d) greater than 90°

5) For single phase Half wave-controlled rectifier with resistive load V_{DCmax} is _____.
a) V_m/π b) V_m
c) $V_m/2\pi$ d) $V_m/3\pi$

6) Determine capture range Fc of the VCO in PLL565, if free running frequency is 500KHZ and supply voltage is+/-10V _____.
a) $+/-200\text{KHz}$ b) $+/-500\text{KHz}$
c) $+/-250\text{KHz}$ d) $+/-1000\text{KHz}$

7) IC 1596 can be used as _____.
   a) Amplitude Modulator
   b) As a Double balanced Modulator
   c) High Frequency Mixer
   d) All of these

8) The time period of IC 2240 is given as _____.
   a) T = RC
   b) T = 0.67 RC
   c) T = 0.7 RC
   d) None of the above

9) 3 1/2 digit DVM required _____.
   a) 12 bit ADC
   b) 13 bit ADC
   c) 10 bit ADC
   d) 11 bit ADC

10) Instrumentation amplifier is used in controller to give _____.
   a) High level Amplification
   b) LOW CMRR
   c) Low input impedance
   d) Low level amplification

11) Resistance of PT 100 at 100°C is _____.
   a) $100\ \Omega$
   b) $200\ \Omega$
   c) $138.5\ \Omega$
   d) $50\ \Omega$

12) The system having steady state error are removed by _____.
   a) Integral Controller
   b) Derivative Controller
   c) Pro. Controller
   d) ALL

13) Cycling in ON-OFF controller decreases as _____.
   a) Decrease in deadband
   b) Increase in deadband
   c) Increase in setpoint
   d) Decrease in set point

14) In PLC Which of the following provides the connections to the equipment to be controlled?
   a) Relay
   b) Input/ Output Module
   c) Power Supply Unit
   d) Moderator

SLR-QH-531

Seat No.	

Set Q

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
Electronic System Design (BTN06603)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if required.
4) Use of calculator and electronic component datasheet is allowed.

SECTION – I

Q.2 Attempt the following. (Any Four) **16**

a) Describe Turn ON time of SCR with the help of waveforms in detail.

b) Explain TRIAC construction & V-I characteristics of it.

c) Explain the application of PLL as FSK demodulator.

d) Explain AC power control circuit using TRIAC.

e) Explain with circuit diagram the AM modulator using IC1596.

Q.3 Attempt the following. (Any Two) **12**

a) Explain internal block diagram of PLL 565. Also explain the design steps to determine Centre frequency, capture range and lock range.

b) Explain Bridge full wave controlled rectifier with resistive load. Derive the expression for DC voltage, RMS voltage.

c) Differentiate between SCR and BJT. Explain the following terms. Latching current, Holding current, Commutation Circuit, Breakover voltage.

SECTION – II

Q.4 Attempt the following. (Any Four) **16**

a) Draw and explain block diagram of PLC.

b) Explain advantages and disadvantages of thermocouple.

c) What is dead band and why dead band is require in ON-OFF controller.

d) Design floating load I to V converter where input current range is 4 mA to 20 mA and output voltage required is 0 to 10V.

e) Draw and explain block diagram of IC74926.

Q.5 Attempt the following. (Any Two) **12**

a) Design timer using XR2240 to generate a delay of 1hr in section.

b) What is ladder diagram? Design ladder diagram for elevator controlling.

c) Design ON-OFF controller to control temperature in the range of 0°C to 100°C. Set point is 40°C.

SLR-QH-531

Seat No.	

Set R

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
Electronic System Design (BTN06603)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if required.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Select the appropriate option: **14**

1) To transfer the power from load to source in case of inductive load, what should be the firing angle _____.
a) equal to 45° b) equal to 90°
c) less than 90° d) greater than 90°

2) For single phase Half wave-controlled rectifier with resistive load V_{DCmax} is _____.
a) V_m/π b) V_m
c) $V_m/2\pi$ d) $V_m/3\pi$

3) Determine capture range Fc of the VCO in PLL565, if free running frequency is 500KHZ and supply voltage is+/-10V _____.
a) $+/-200\text{KHz}$ b) $+/-500\text{KHz}$
c) $+/-250\text{KHz}$ d) $+/-1000\text{KHz}$

4) IC 1596 can be used as _____.
a) Amplitude Modulator
b) As a Double balanced Modulator
c) High Frequency Mixer
d) All of these

5) The time period of IC 2240 is given as _____.
a) T = RC b) T = 0.67 RC
c) T = 0.7 RC d) None of the above

6) 3 1/2 digit DVM required _____.
a) 12 bit ADC b) 13 bit ADC
c) 10 bit ADC d) 11 bit ADC

7) Instrumentation amplifier is used in controller to give _____.
   a) High level Amplification
   b) LOW CMRR
   c) Low input impedance
   d) Low level amplification

8) Resistance of PT 100 at 100°C is _____.
   a) $100\ \Omega$
   b) $200\ \Omega$
   c) $138.5\ \Omega$
   d) $50\ \Omega$

9) The system having steady state error are removed by _____.
   a) Integral Controller
   b) Derivative Controller
   c) Pro. Controller
   d) ALL

10) Cycling in ON-OFF controller decreases as _____.
   a) Decrease in deadband
   b) Increase in deadband
   c) Increase in setpoint
   d) Decrease in set point

11) In PLC Which of the following provides the connections to the equipment to be controlled?
   a) Relay
   b) Input/ Output Module
   c) Power Supply Unit
   d) Moderator

12) _____ is an efficient method of turning ON of SCR.
   a) Gate Triggering
   b) Application of High Voltage
   c) Temperature rise
   d) High dv/dt

13) TRIAC and SCR both are controlled devices.
   a) True
   b) False

14) The turn ON time of SCR is consisting of _____.
   a) Delay time, Rise time
   b) Delay time, rise time, spread time
   c) Rise time, Spread Time
   d) Delay time, Spread Time

Seat No.	

Set **R**

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
Electronic System Design (BTN06603)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if required.
4) Use of calculator and electronic component datasheet is allowed.

SECTION – I

Q.2 Attempt the following. (Any Four) **16**

a) Describe Turn ON time of SCR with the help of waveforms in detail.

b) Explain TRIAC construction & V-I characteristics of it.

c) Explain the application of PLL as FSK demodulator.

d) Explain AC power control circuit using TRIAC.

e) Explain with circuit diagram the AM modulator using IC1596.

Q.3 Attempt the following. (Any Two) **12**

a) Explain internal block diagram of PLL 565. Also explain the design steps to determine Centre frequency, capture range and lock range.

b) Explain Bridge full wave controlled rectifier with resistive load. Derive the expression for DC voltage, RMS voltage.

c) Differentiate between SCR and BJT. Explain the following terms. Latching current, Holding current, Commutation Circuit, Breakover voltage.

SECTION – II

Q.4 Attempt the following. (Any Four) **16**

a) Draw and explain block diagram of PLC.

b) Explain advantages and disadvantages of thermocouple.

c) What is dead band and why dead band is require in ON-OFF controller.

d) Design floating load I to V converter where input current range is 4 mA to 20 mA and output voltage required is 0 to 10V.

e) Draw and explain block diagram of IC74926.

Q.5 Attempt the following. (Any Two) **12**

a) Design timer using XR2240 to generate a delay of 1hr in section.

b) What is ladder diagram? Design ladder diagram for elevator controlling.

c) Design ON-OFF controller to control temperature in the range of 0°C to 100°C. Set point is 40°C.

SLR-QH-531

Seat No.	

Set S

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
Electronic System Design (BTN06603)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if required.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Select the appropriate option: **14**

1) Cycling in ON-OFF controller decreases as _____.
a) Decrease in deadband b) Increase in deadband
c) Increase in setpoint d) Decrease in set point

2) In PLC Which of the following provides the connections to the equipment to be controlled?
a) Relay b) Input/ Output Module
c) Power Supply Unit d) Moderator

3) _____ is an efficient method of turning ON of SCR.
a) Gate Triggering b) Application of High Voltage
c) Temperature rise d) High dv/dt

4) TRIAC and SCR both are controlled devices.
a) True b) False

5) The turn ON time of SCR is consisting of _____.
a) Delay time, Rise time
b) Delay time, rise time, spread time
c) Rise time, Spread Time
d) Delay time, Spread Time

6) To transfer the power from load to source in case of inductive load, what should be the firing angle _____.
a) equal to 45° b) equal to 90°
c) less than 90° d) greater than 90°

7) For single phase Half wave-controlled rectifier with resistive load V_{DCmax} is _____.

a) V_m/π b) V_m

c) $V_m/2\pi$ d) $V_m/3\pi$

8) Determine capture range Fc of the VCO in PLL565, if free running frequency is 500KHZ and supply voltage is+/-10V _____.

a) $+/-200\text{KHz}$ b) $+/-500\text{KHz}$

c) $+/-250\text{KHz}$ d) $+/-1000\text{KHz}$

9) IC 1596 can be used as _____.

a) Amplitude Modulator
b) As a Double balanced Modulator
c) High Frequency Mixer
d) All of these

10) The time period of IC 2240 is given as _____.

a) T = RC b) T = 0.67 RC

c) T = 0.7 RC d) None of the above

11) 3 1/2 digit DVM required _____.

a) 12 bit ADC b) 13 bit ADC

c) 10 bit ADC d) 11 bit ADC

12) Instrumentation amplifier is used in controller to give _____.

a) High level Amplification b) LOW CMRR

c) Low input impedance d) Low level amplification

13) Resistance of PT 100 at 100°C is _____.

a) $100\ \Omega$ b) $200\ \Omega$

c) $138.5\ \Omega$ d) $50\ \Omega$

14) The system having steady state error are removed by _____.

a) Integral Controller b) Derivative Controller

c) Pro. Controller d) ALL

SLR-QH-531

Seat No.	

Set S

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
Electronic System Design (BTN06603)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if required.
4) Use of calculator and electronic component datasheet is allowed.

SECTION – I

Q.2 Attempt the following. (Any Four) **16**

a) Describe Turn ON time of SCR with the help of waveforms in detail.

b) Explain TRIAC construction & V-I characteristics of it.

c) Explain the application of PLL as FSK demodulator.

d) Explain AC power control circuit using TRIAC.

e) Explain with circuit diagram the AM modulator using IC1596.

Q.3 Attempt the following. (Any Two) **12**

a) Explain internal block diagram of PLL 565. Also explain the design steps to determine Centre frequency, capture range and lock range.

b) Explain Bridge full wave controlled rectifier with resistive load. Derive the expression for DC voltage, RMS voltage.

c) Differentiate between SCR and BJT. Explain the following terms. Latching current, Holding current, Commutation Circuit, Breakover voltage.

SECTION – II

Q.4 Attempt the following. (Any Four) **16**

a) Draw and explain block diagram of PLC.

b) Explain advantages and disadvantages of thermocouple.

c) What is dead band and why dead band is require in ON-OFF controller.

d) Design floating load I to V converter where input current range is 4 mA to 20 mA and output voltage required is 0 to 10V.

e) Draw and explain block diagram of IC74926.

Q.5 Attempt the following. (Any Two) **12**

a) Design timer using XR2240 to generate a delay of 1hr in section.

b) What is ladder diagram? Design ladder diagram for elevator controlling.

c) Design ON-OFF controller to control temperature in the range of 0°C to 100°C. Set point is 40°C.

SLR-QH-532

Seat No.	

Set P

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
Optical Fiber Communication (BTN06609)

Day & Date: Friday, 22-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if required.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the given options. 14

1) Which is an advantage of optical communication links over using transmission lines or waveguides?
a) Small size
b) Extremely wide bandwidths
c) Immunity to Electromagnetic Interference (EMI)
d) All of above

2) In an optical fibre, the inner core is _____ the cladding.
a) Denser than b) Less dense than
c) Both have same density d) None of above

3) LASER works on _____ principle.
a) Absorption b) Stimulated emission
c) Spontaneous emission d) Both b) and c)

4) Attenuation is expressed in _____.
a) Decibel b) Ampere
c) Watts d) None of these

5) Edge emitting LED has _____ temperature dependence then surface emitting LED.
a) Greater b) Lesser
c) Equal d) None of above

6) Insertion loss technique is to measure _____.
a) Diameter b) Dispersion
c) Field d) Attenuation

7) The requirements of detector is _____.
a) High fidelity b) Larger size
c) More numerical aperture d) All of above

8) _____ is the semiconductor photodiode with internal gain.
a) PN photodiode b) PIN photodiode
c) Avalanche photodiode d) Ge photodiode

9) A photodiode has a quantum efficiency of 65% when photons of energy 1.5×10^{-19}J are incident upon it, then the responsivity of the photodiode is _____.
a) 0.69 b) 0.72
c) 0.75 d) 0.55

10) The output from Laser is monochromatic, this mean that it is____.
a) Polarized b) Single frequency
c) Narrow Beam d) None of above

11) SONET stands for _____.
a) synchronous optical network
b) synchronous operational network
c) stream optical network
d) shell operational network

12) SONET sends _____ frames per second.
a) 1000 b) 2000
c) 4000 d) 8000

13) FDDI stands for _____.
a) Fiber distributed date interface
b) Fiber derived data interface
c) Fiber Distributed data interface
d) None of above

14) _____ is the advantages of DWDM.
a) Handling higher data rate
b) Increasing the channel bandwidth capacity
c) Both a) & b)
d) None of above

SLR-QH-532

Seat No.	

Set P

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
Optical Fiber Communication (BTN06609)

Day & Date: Friday, 22-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figure to the right indicate full marks.
3) Assume suitable data if required.

SECTION – I

Q.2 Attempt the following. (Any Four) **16**

a) With Block diagram, Explain optical fiber communication system briefly.

b) With energy state diagram explain working of laser.

c) Explain the following terms:
i) Quantum Efficiency
ii) Responsivity

d) Comparison between step index fiber and graded index fiber.

e) An optical fiber has a numerical aperture of 0.20 and a cladding refractive index of 1.59.
Determine
i) The acceptance angle for the fiber in water which has a refractive index of 1.33
ii) The critical angle at the core-cladding interface.

Q.3 Attempt the following. (Any Two) **12**

a) Write a note on Edge emitting LED.

b) Explain the principle of p-i-n photodiode.

c) Explain extrinsic absorption mechanism in fiber optic.

SECTION – II

Q.4 Attempt the following. (Any Four) **16**

a) Explain OTDM.

b) The phototransistor has a collector current 15 mA when the incident optical power at wavelength of 1.26 μm is 125 μW. Estimate optical gain of device, the common emitter current gain if the quantum efficiency of the base-collector photodiode at a wavelength of 1.26 μm is 40%.

c) Explain the concept of silicon reach through Avalanche Photodiode.

d) Explain the various parameters affecting the speed of response of detectors.

e) Write a short note on WDM.

Q.5 Solve Any Two. **12**

a) The radiative and non-radiative recombination lifetimes of the minority carriers in the active region of a double-heterojunction LED are 60 ns and 100 ns respectively. Determine the total carrier recombination lifetime and the power internally generated within the device when the peak emission wavelength is 0.87 μm at a drive current of 40 mA.?

b) Explain the Noise equivalent model of receiver.

c) Explain types of Optical Amplifiers.

Seat No.	

Set **Q**

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
Optical Fiber Communication (BTN06609)

Day & Date: Friday, 22-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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4) Assume suitable data if required.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the given options. 14

1) _____ is the semiconductor photodiode with internal gain.
a) PN photodiode b) PIN photodiode
c) Avalanche photodiode d) Ge photodiode

2) A photodiode has a quantum efficiency of 65% when photons of energy 1.5×10^{-19}J are incident upon it, then the responsivity of the photodiode is _____.
a) 0.69 b) 0.72
c) 0.75 d) 0.55

3) The output from Laser is monochromatic, this mean that it is____.
a) Polarized b) Single frequency
c) Narrow Beam d) None of above

4) SONET stands for _____.
a) synchronous optical network
b) synchronous operational network
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5) SONET sends _____ frames per second.
a) 1000 b) 2000
c) 4000 d) 8000

6) FDDI stands for _____.
   a) Fiber distributed date interface
   b) Fiber derived data interface
   c) Fiber Distributed data interface
   d) None of above

7) _____ is the advantages of DWDM.
   a) Handling higher data rate
   b) Increasing the channel bandwidth capacity
   c) Both a) & b)
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8) Which is an advantage of optical communication links over using transmission lines or waveguides?
   a) Small size
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   c) Immunity to Electromagnetic Interference (EMI)
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9) In an optical fibre, the inner core is _____ the cladding.
   a) Denser than
   b) Less dense than
   c) Both have same density
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10) LASER works on _____ principle.
   a) Absorption
   b) Stimulated emission
   c) Spontaneous emission
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11) Attenuation is expressed in _____.
   a) Decibel
   b) Ampere
   c) Watts
   d) None of these

12) Edge emitting LED has _____ temperature dependence then surface emitting LED.
   a) Greater
   b) Lesser
   c) Equal
   d) None of above

13) Insertion loss technique is to measure _____.
   a) Diameter
   b) Dispersion
   c) Field
   d) Attenuation

14) The requirements of detector is _____.
   a) High fidelity
   b) Larger size
   c) More numerical aperture
   d) All of above

Seat No.	

Set **Q**

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
Optical Fiber Communication (BTN06609)

Day & Date: Friday, 22-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figure to the right indicate full marks.
3) Assume suitable data if required.

SECTION – I

Q.2 Attempt the following. (Any Four) **16**

a) With Block diagram, Explain optical fiber communication system briefly.

b) With energy state diagram explain working of laser.

c) Explain the following terms:
i) Quantum Efficiency
ii) Responsivity

d) Comparison between step index fiber and graded index fiber.

e) An optical fiber has a numerical aperture of 0.20 and a cladding refractive index of 1.59.
Determine
i) The acceptance angle for the fiber in water which has a refractive index of 1.33
ii) The critical angle at the core-cladding interface.

Q.3 Attempt the following. (Any Two) **12**

a) Write a note on Edge emitting LED.

b) Explain the principle of p-i-n photodiode.

c) Explain extrinsic absorption mechanism in fiber optic.

SECTION – II

Q.4 Attempt the following. (Any Four) **16**

a) Explain OTDM.

b) The phototransistor has a collector current 15 mA when the incident optical power at wavelength of 1.26 μm is 125 μW. Estimate optical gain of device, the common emitter current gain if the quantum efficiency of the base-collector photodiode at a wavelength of 1.26 μm is 40%.

c) Explain the concept of silicon reach through Avalanche Photodiode.

d) Explain the various parameters affecting the speed of response of detectors.

e) Write a short note on WDM.

Q.5 Solve Any Two. **12**

a) The radiative and non-radiative recombination lifetimes of the minority carriers in the active region of a double-heterojunction LED are 60 ns and 100 ns respectively. Determine the total carrier recombination lifetime and the power internally generated within the device when the peak emission wavelength is 0.87 μm at a drive current of 40 mA.?

b) Explain the Noise equivalent model of receiver.

c) Explain types of Optical Amplifiers.

Seat No.	

Set R

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
Optical Fiber Communication (BTN06609)

Day & Date: Friday, 22-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if required.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the given options. 14

1) SONET stands for _____.
a) synchronous optical network
b) synchronous operational network
c) stream optical network
d) shell operational network

2) SONET sends _____ frames per second.
a) 1000 b) 2000
c) 4000 d) 8000

3) FDDI stands for _____.
a) Fiber distributed date interface
b) Fiber derived data interface
c) Fiber Distributed data interface
d) None of above

4) _____ is the advantages of DWDM.
a) Handling higher data rate
b) Increasing the channel bandwidth capacity
c) Both a) & b)
d) None of above

5) Which is an advantage of optical communication links over using transmission lines or waveguides?
a) Small size
b) Extremely wide bandwidths
c) Immunity to Electromagnetic Interference (EMI)
d) All of above

6) In an optical fibre, the inner core is _____ the cladding.
a) Denser than b) Less dense than
c) Both have same density d) None of above

7) LASER works on _____ principle.
a) Absorption b) Stimulated emission
c) Spontaneous emission d) Both b) and c)

8) Attenuation is expressed in _____.
a) Decibel b) Ampere
c) Watts d) None of these

9) Edge emitting LED has _____ temperature dependence then surface emitting LED.
a) Greater b) Lesser
c) Equal d) None of above

10) Insertion loss technique is to measure _____.
a) Diameter b) Dispersion
c) Field d) Attenuation

11) The requirements of detector is _____.
a) High fidelity b) Larger size
c) More numerical aperture d) All of above

12) _____ is the semiconductor photodiode with internal gain.
a) PN photodiode b) PIN photodiode
c) Avalanche photodiode d) Ge photodiode

13) A photodiode has a quantum efficiency of 65% when photons of energy 1.5×10^{-19}J are incident upon it, then the responsivity of the photodiode is _____.
a) 0.69 b) 0.72
c) 0.75 d) 0.55

14) The output from Laser is monochromatic, this mean that it is____.
a) Polarized b) Single frequency
c) Narrow Beam d) None of above

SLR-QH-532

Seat No.	

Set R

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
Optical Fiber Communication (BTN06609)

Day & Date: Friday, 22-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figure to the right indicate full marks.
3) Assume suitable data if required.

SECTION – I

Q.2 Attempt the following. (Any Four) **16**

a) With Block diagram, Explain optical fiber communication system briefly.

b) With energy state diagram explain working of laser.

c) Explain the following terms:
i) Quantum Efficiency
ii) Responsivity

d) Comparison between step index fiber and graded index fiber.

e) An optical fiber has a numerical aperture of 0.20 and a cladding refractive index of 1.59.
Determine
i) The acceptance angle for the fiber in water which has a refractive index of 1.33
ii) The critical angle at the core-cladding interface.

Q.3 Attempt the following. (Any Two) **12**

a) Write a note on Edge emitting LED.

b) Explain the principle of p-i-n photodiode.

c) Explain extrinsic absorption mechanism in fiber optic.

SECTION – II

Q.4 Attempt the following. (Any Four) **16**

a) Explain OTDM.

b) The phototransistor has a collector current 15 mA when the incident optical power at wavelength of 1.26 μm is 125 μW. Estimate optical gain of device, the common emitter current gain if the quantum efficiency of the base-collector photodiode at a wavelength of 1.26 μm is 40%.

c) Explain the concept of silicon reach through Avalanche Photodiode.

d) Explain the various parameters affecting the speed of response of detectors.

e) Write a short note on WDM.

Q.5 Solve Any Two. **12**

a) The radiative and non-radiative recombination lifetimes of the minority carriers in the active region of a double-heterojunction LED are 60 ns and 100 ns respectively. Determine the total carrier recombination lifetime and the power internally generated within the device when the peak emission wavelength is 0.87 μm at a drive current of 40 mA.?

b) Explain the Noise equivalent model of receiver.

c) Explain types of Optical Amplifiers.

Seat No.	

Set **S**

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
Optical Fiber Communication (BTN06609)

Day & Date: Friday, 22-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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1) Insertion loss technique is to measure _____.
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13) Attenuation is expressed in _____.
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c) Watts d) None of these

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SLR-QH-532

Seat No.	

Set S

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
Optical Fiber Communication (BTN06609)

Day & Date: Friday, 22-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
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SECTION – I

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b) With energy state diagram explain working of laser.

c) Explain the following terms:
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ii) Responsivity

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SECTION – II

Q.4 Attempt the following. (Any Four) **16**

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c) Explain types of Optical Amplifiers.

SLR-QH-533

Seat No.	

Set P

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Image and Video Processing (BTN06610)

Day & Date: Friday, 22-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.
4) Assume suitable data whenever needed and mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives. **14**

1) In 4-neighbours of a pixel p, how far are each of the neighbours located from p?
a) one pixel apart b) four pixels apart
c) alternating pixels d) none of the Mentioned

2) Which of the following image processing approaches is the fastest, most accurate, and flexible?
a) Photographic b) Electronic
c) Digital d) Optical

3) Which of the following is the abbreviation of JPEG?
a) Joint Photographic Experts Group
b) Joint Photographs Expansion Group
c) Joint Photographic Expanded Group
d) Joint Photographic Expansion Group

4) Which of the following is/are considered as type(s) of lowpass filters?
a) Ideal b) Butterworth
c) Gaussian d) All of the mentioned

5) Which of the following operation is done on the pixels in sharpening the image, in the spatial domain?
a) Differentiation b) Median
c) Integration d) Average

6) Dilation followed by erosion is called _____.
a) opening b) Closing
c) blurring d) Translation

7) (A.B).B is equal to _____.
a) A .B b) A+B
c) A o B d) A*B

8) Gaussian noise is referred to as _____.
a) red noise b) Blacknoise
c) White noise d) Normal Noise

9) Streaming stored audio/video, files are compressed and stored on _____.
a) IP b) Server
c) Domain d) Internet

10) What are the method for estimation of optical flow?
a) Bayesian method
b) Gibbs random field motion estimation
c) Optical flow equation and Second order derivatives of optical flow field
d) All of above

11) Scanner incorporates a special sort of camera which is made up of _____.
a) sensor b) chip
c) laser light d) charged coupled device

12) Purpose of restoration is to gain _____.
a) degraded image b) original image
c) pixels d) coordinates

13) In geometric mean filters when alpha is equal to 1 then it works as _____.
a) notch filter b) bandpass filter
c) Weiner filter d) inverse filter

14) 2-D motion, also called _____.
a) Rejected motion b) Projected motion
c) Optical flow motion d) None

SLR-QH-533

Seat No.	

Set P

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Image and Video Processing (BTN06610)

Day & Date: Friday, 22-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figure to the right indicate full marks.
3) Assume suitable data whenever needed and mention it clearly.

SECTION – I

Q.2 Attempt the following. (Any Four) **16**

a) Explain in detail sampling and quantization.

b) Explain with neat diagram contrast stretching & thresholding.

c) Explain hit or miss transform, thinning and thickening with Example.

d) Explain Discrete Cosine Transform.

e) Explain Point, line and edge detection.

Q.3 Attempt the following. (Any Two) **12**

a) Explain high pass filters and high boost filters.

b) Explain boundary extraction on binary images with example.

c) Explain Histogram equalization and histogram specification in detail.

SECTION – II

Q.4 Attempt the following. (Any Four) **16**

a) What are the types of noise models?

b) Explain method of Digital video quality measure.

c) Explain optimization method.

d) Draw General formulation in Multi resolution Motion Estimation and explain.

e) Explain in detail Required sampling rates.

Q.5 Attempt the following. (Any Two) **12**

a) Explain restoration using Weiner filters and Inverse filters.

b) Explain in detail with one example sampling in two dimensions and three dimensions.

c) Difference between 2-D motion Vs optical flow.

SLR-QH-533

Seat No.	

Set Q

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Image and Video Processing (BTN06610)

Day & Date: Friday, 22-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives. **14**

1) Gaussian noise is referred to as _____.
a) red noise b) Blacknoise
c) White noise d) Normal Noise

2) Streaming stored audio/video, files are compressed and stored on _____.
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b) Projected motion
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9) Which of the following image processing approaches is the fastest, most accurate, and flexible?

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12) Which of the following operation is done on the pixels in sharpening the image, in the spatial domain?

a) Differentiation
b) Median
c) Integration
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13) Dilation followed by erosion is called _____.

a) opening
b) Closing
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14) (A.B).B is equal to _____.

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d) A*B

SLR-QH-533

Seat No.	

Set Q

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Image and Video Processing (BTN06610)

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d) Explain Discrete Cosine Transform.

e) Explain Point, line and edge detection.

Q.3 Attempt the following. (Any Two) **12**

a) Explain high pass filters and high boost filters.

b) Explain boundary extraction on binary images with example.

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SECTION – II

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a) What are the types of noise models?

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c) Difference between 2-D motion Vs optical flow.

SLR-QH-533

Seat No.	

Set R

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Image and Video Processing (BTN06610)

Day & Date: Friday, 22-05-2026 Max. Marks: 70
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MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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SLR-QH-533

Seat No.	

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SLR-QH-533

Seat No.	

Set S

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Image and Video Processing (BTN06610)

Day & Date: Friday, 22-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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c) Integration d) Average

SLR-QH-533

Seat No.		Set	S

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Image and Video Processing (BTN06610)

Day & Date: Friday, 22-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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b) Explain in detail with one example sampling in two dimensions and three dimensions.

c) Difference between 2-D motion Vs optical flow.

SLR-QH-534

Seat No.	

Set P

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
Multimedia Communication Technology (BTN06611)

Day & Date: Friday, 22-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Highest capacity in an optical disc can be obtained by using laser beam of _____ Light.
a) Green b) Red
c) Blue d) Infrared

2) From where is the laser beam not reflected in video disc?
a) From a flat b) From a pit
c) From a land d) From a glass

3) The most common compression technique that is used to create CD quality audio is based on perceptual encoding technique is called _____.
a) JPEG b) H.323
c) SIP d) Predictive encoding

4) In Audio and Video compression, each frame is divided into small grids called picture element or _____.
a) Frame b) Packet
c) Pixel d) Mega pixel

5) Encoding of colour and modulation of audio carrier use the following modulation techniques in SECAM system of France _____.
a) A.M. for both
b) F.M. for both
c) F.M. for colour and A.M. for audio
d) A.M. for colour and F.M. for audio

6) Value of sub carrier in PAL system is _____.
a) 3.58 MHz b) 4.43 MHz
c) 5 MHz d) 7 MHz

7) What is the number of fields per second in India?
a) 25 b) 50
c) 625 d) 15625

8) The value of Kell factor is about _____.
a) 0.3 b) 0.5
c) 0.7 d) 0.9

9) Moving Picture Experts Group (MPEG) is used to compress _____.
a) Frames b) Images
c) Audio d) Video

10) The outdoor unit is connected to indoor DTH received by _____.
a) Wave Guide b) Coaxial cable
c) Twin flat feeder d) Optical fiber

11) Which of the following TV uses CCFL as back lighting?
a) LCD b) LED
c) OLED d) CRT

12) Compact disc surface doesn't wear out because the sensor is _____.
a) Electric b) Magnetic
c) Mechanical d) Optical

13) What is the rotational speed (rpm) of the compact disc at the Center?
a) 200 b) 500
c) 800 d) 100

14) I signal in NTSC colour TV system is located at 57° with respect to _____.
a) Colour burst b) R – Y
c) B – Y d) G – Y

SLR-QH-534

Seat No.	

Set P

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
Multimedia Communication Technology (BTN06611)

Day & Date: Friday, 22-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
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SECTION – I

Q.2 Attempt the following. (Any Four) **16**

a) Explain working of video detector stage in T.V. receiver.

b) Explain MPEG 2 in detail.

c) Explain the term Kell factor and aspect ratio.

d) What is interlaced scanning? What are its advantages?

e) Compare LCD Vs LED.

Q.3 Attempt the following. (Any Two) **12**

a) Draw a block diagram of SECAM transmitter and explain function of each block.

b) What is DTH (Direct to Home) & what are the specifications of DTH trainer.

c) Explain Video IF amplifier and video detector of color TV system.

SECTION – II

Q.4 Attempt the following. (Any Four) **16**

a) Compare between DVD and CD.

b) What is DVD? State its advantages and types.

c) What is Nyquist Theorem?

d) What is Arithmetic Coding? Explain it in detail.

e) State the various audio video standards.

Q.5 Attempt the following. (Any Two) **12**

a) What do you mean by lossy and lossless compression?

b) Explain digital video 4: 2: 2 format and 4: 2: 0 format in detail.

c) What are different video compression techniques? Compare between them.

Seat No.	

Set **Q**

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
Multimedia Communication Technology (BTN06611)

Day & Date: Friday, 22-05-2026 Max. Marks: 70
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MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) The value of Kell factor is about _____.
a) 0.3 b) 0.5
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13) Value of sub carrier in PAL system is _____.

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SLR-QH-534

Seat No.	

Set Q

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
Multimedia Communication Technology (BTN06611)

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c) Explain Video IF amplifier and video detector of color TV system.

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c) What are different video compression techniques? Compare between them.

Seat No.	

Set **R**

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
Multimedia Communication Technology (BTN06611)

Day & Date: Friday, 22-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which of the following TV uses CCFL as back lighting?
a) LCD b) LED
c) OLED d) CRT

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13) Moving Picture Experts Group (MPEG) is used to compress _____.

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c) Twin flat feeder d) Optical fiber

SLR-QH-534

Seat No.	

Set R

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
Multimedia Communication Technology (BTN06611)

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SLR-QH-534

Seat No.	

Set S

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
Multimedia Communication Technology (BTN06611)

Day & Date: Friday, 22-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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SLR-QH-534

Seat No.	

Set S

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
Multimedia Communication Technology (BTN06611)

Day & Date: Friday, 22-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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SECTION – I

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a) Compare between DVD and CD.

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d) What is Arithmetic Coding? Explain it in detail.

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Q.5 Attempt the following. (Any Two) **12**

a) What do you mean by lossy and lossless compression?

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SLR-QH-535

Seat No.	

Set P

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
Sensors and Applications (BTN06605)

Day & Date: Monday, 25-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minuets in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the given options. 14

1) The water contents in any material are called as ____.
a) Conductivity b) Sensitivity
c) Moisture d) Dryness

2) The resistance range measured by the Wheatstone bridge is?
a) 10 kΩ to a few mega ohms b) 1MΩ to 100 mega ohms
c) 1Ω to few mega ohms d) None of these

3) _____ is the ability of the sensor to indicate the same output over a period of time for a constant input.
a) Stability b) Rectification
c) Impedance d) Dead Zone

4) Why is digital data not easily affected by noise?
a) High power transmission
b) High frequency transmission
c) Low frequency transmission
d) Cannot easily change binary 1 to 0

5) _____ does not requires any additional energy source and directly generates an electrical signal in response to an input stimulus.
a) Active Sensor b) Dead Sensor
c) Passive Sensor d) None of the mentioned

6) The initial response when tune output is not equal to input is called _____.
a) Transient response b) Error response
c) Dynamic response d) None of these

7) Capacitance of a parallel plate air capacitor depends on _____.
   a) Charge on the conducting plates
   b) Area of the conducting plates
   c) Distance of separation between the conducting plates
   d) All of these

8) What is Raspberry Pi?
   a) A Mobile phone
   b) A Gaming Console
   c) A Single Board Computer (CPU)
   d) None of these

9) What is Arduino?
   a) PCB Layout software
   b) Image Editing Software
   c) Open-Source Electronics platform
   d) Text Editor

10) Arduino Mega uses _____ microcontroller.
   a) 8051 b) PIC16F877
   c) Atmega 2560 d) LPC2148

11) Which component of Raspberry Pi allows it to connect to the internet wirelessly?
   a) Ethernet Port b) Wi-Fi Module
   c) Bluetooth Module d) USB Port

12) Raspberry Pi-3 supports inbuild _____.
   a) HDMI connector b) USB Connectors
   c) Micro SD Slot d) All of the mentioned

13) What is the purpose of the Raspberry Pi GPIO pins?
   a) To control external devices and sensors
   b) To connect to the internet
   c) To provide power to the Raspberry Pi
   d) None of these

14) Which programming language is commonly used with Raspberry Pi?
   a) C Programming b) Keil
   c) Python d) Assembly

Seat No.	

Set **P**

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
Sensors and Applications (BTN06605)

Day & Date: Monday, 25-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt the following. (Any Four) **16**

a) Define Transducer. Explain various types of transducers with examples.

b) Compare Analog sensors with Digital sensors.

c) Describe various types of batteries used in embedded products.

d) Explain dynamic characteristics of sensor.

e) Explain fundamental properties of capacitor with necessary diagrams. How capacitor is capable to measure physical quantity?

Q.3 Attempt the following. (Any Two) **12**

a) How data transmission carried out using
i) Two-Wire Sensing
ii) Four-Wire Sensing
iii) Six-Wire Sensing

b) Explain Temperature sensitivity, Moisture sensitivity & Strain sensitivity. Define specific resistivity of material with formula.

c) Describe Hall effect and Piezoelectric effect with necessary diagrams.

Section – II

Q.4 Attempt the following. (Any Four) **16**

a) Compare Arduino with Raspberry Pi. State various features associated with Arduino UNO board.

b) Draw pin diagram of Raspberry Pi board. State functions of various pins associated with Raspberry Pi.

c) Write a code to interface alcohol sensor with Arduino. Draw necessary connection diagram.

d) Write a code to blink two LED's alternatively using Raspberry Pi. Draw appropriate interfacing diagram with input output pins.

e) Write sort note on temperature sensor, capacitive sensor & gas sensor with their output format.

Q.5 Attempt the following. (Any Two) **12**

a) Write a program to indicate high temperature above set value with indicating LED and draw connection diagram to interface temperature sensor with Arduino/Raspberry Pi board. State ADC resolution in Arduino.

b) Design circuit and write a program to detect obstacle using Arduino/Raspberry Pi. Compare Arduino w.r.t. microcontrollers.

c) Define pressure. Design a circuit and write a code to interface pressure sensor with Arduino/Raspberry Pi.

Seat No.	

Set **Q**

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
Sensors and Applications (BTN06605)

Day & Date: Monday, 25-05-2026 Max. Marks: 70
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MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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Seat No.	

Set **Q**

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
Sensors and Applications (BTN06605)

Day & Date: Monday, 25-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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c) Describe Hall effect and Piezoelectric effect with necessary diagrams.

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c) Define pressure. Design a circuit and write a code to interface pressure sensor with Arduino/Raspberry Pi.

SLR-QH-535

Seat No.	

Set R

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
Sensors and Applications (BTN06605)

Day & Date: Monday, 25-05-2026 Max. Marks: 70
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MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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a) To control external devices and sensors
b) To connect to the internet
c) To provide power to the Raspberry Pi
d) None of these

4) Which programming language is commonly used with Raspberry Pi?
a) C Programming b) Keil
c) Python d) Assembly

5) The water contents in any material are called as ____.
a) Conductivity b) Sensitivity
c) Moisture d) Dryness

6) The resistance range measured by the Wheatstone bridge is?
a) 10 kΩ to a few mega ohms b) 1MΩ to 100 mega ohms
c) 1Ω to few mega ohms d) None of these

7) _____ is the ability of the sensor to indicate the same output over a period of time for a constant input.
a) Stability b) Rectification
c) Impedance d) Dead Zone

8) Why is digital data not easily affected by noise?
a) High power transmission
b) High frequency transmission
c) Low frequency transmission
d) Cannot easily change binary 1 to 0

9) _____ does not requires any additional energy source and directly generates an electrical signal in response to an input stimulus.
a) Active Sensor b) Dead Sensor
c) Passive Sensor d) None of the mentioned

10) The initial response when tune output is not equal to input is called _____.
a) Transient response b) Error response
c) Dynamic response d) None of these

11) Capacitance of a parallel plate air capacitor depends on _____.
a) Charge on the conducting plates
b) Area of the conducting plates
c) Distance of separation between the conducting plates
d) All of these

12) What is Raspberry Pi?
a) A Mobile phone
b) A Gaming Console
c) A Single Board Computer (CPU)
d) None of these

13) What is Arduino?
a) PCB Layout software
b) Image Editing Software
c) Open-Source Electronics platform
d) Text Editor

14) Arduino Mega uses _____ microcontroller.
a) 8051 b) PIC16F877
c) Atmega 2560 d) LPC2148

Seat No.	

Set **R**

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
Sensors and Applications (BTN06605)

Day & Date: Monday, 25-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt the following. (Any Four) **16**

a) Define Transducer. Explain various types of transducers with examples.

b) Compare Analog sensors with Digital sensors.

c) Describe various types of batteries used in embedded products.

d) Explain dynamic characteristics of sensor.

e) Explain fundamental properties of capacitor with necessary diagrams. How capacitor is capable to measure physical quantity?

Q.3 Attempt the following. (Any Two) **12**

a) How data transmission carried out using
i) Two-Wire Sensing
ii) Four-Wire Sensing
iii) Six-Wire Sensing

b) Explain Temperature sensitivity, Moisture sensitivity & Strain sensitivity. Define specific resistivity of material with formula.

c) Describe Hall effect and Piezoelectric effect with necessary diagrams.

Section – II

Q.4 Attempt the following. (Any Four) **16**

a) Compare Arduino with Raspberry Pi. State various features associated with Arduino UNO board.

b) Draw pin diagram of Raspberry Pi board. State functions of various pins associated with Raspberry Pi.

c) Write a code to interface alcohol sensor with Arduino. Draw necessary connection diagram.

d) Write a code to blink two LED's alternatively using Raspberry Pi. Draw appropriate interfacing diagram with input output pins.

e) Write sort note on temperature sensor, capacitive sensor & gas sensor with their output format.

Q.5 Attempt the following. (Any Two) **12**

a) Write a program to indicate high temperature above set value with indicating LED and draw connection diagram to interface temperature sensor with Arduino/Raspberry Pi board. State ADC resolution in Arduino.

b) Design circuit and write a program to detect obstacle using Arduino/Raspberry Pi. Compare Arduino w.r.t. microcontrollers.

c) Define pressure. Design a circuit and write a code to interface pressure sensor with Arduino/Raspberry Pi.

SLR-QH-535

Seat No.	

Set S

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
Sensors and Applications (BTN06605)

Day & Date: Monday, 25-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minuets in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the given options. 14

1) The initial response when tune output is not equal to input is called _____.
a) Transient response b) Error response
c) Dynamic response d) None of these

2) Capacitance of a parallel plate air capacitor depends on _____.
a) Charge on the conducting plates
b) Area of the conducting plates
c) Distance of separation between the conducting plates
d) All of these

3) What is Raspberry Pi?
a) A Mobile phone
b) A Gaming Console
c) A Single Board Computer (CPU)
d) None of these

4) What is Arduino?
a) PCB Layout software
b) Image Editing Software
c) Open-Source Electronics platform
d) Text Editor

5) Arduino Mega uses _____ microcontroller.
a) 8051 b) PIC16F877
c) Atmega 2560 d) LPC2148

6) Which component of Raspberry Pi allows it to connect to the internet wirelessly?
a) Ethernet Port
b) Wi-Fi Module
c) Bluetooth Module
d) USB Port

7) Raspberry Pi-3 supports inbuild _____.
a) HDMI connector
b) USB Connectors
c) Micro SD Slot
d) All of the mentioned

8) What is the purpose of the Raspberry Pi GPIO pins?
a) To control external devices and sensors
b) To connect to the internet
c) To provide power to the Raspberry Pi
d) None of these

9) Which programming language is commonly used with Raspberry Pi?
a) C Programming
b) Keil
c) Python
d) Assembly

10) The water contents in any material are called as ____.
a) Conductivity
b) Sensitivity
c) Moisture
d) Dryness

11) The resistance range measured by the Wheatstone bridge is?
a) 10 kΩ to a few mega ohms
b) 1MΩ to 100 mega ohms
c) 1Ω to few mega ohms
d) None of these

12) _____ is the ability of the sensor to indicate the same output over a period of time for a constant input.
a) Stability
b) Rectification
c) Impedance
d) Dead Zone

13) Why is digital data not easily affected by noise?
a) High power transmission
b) High frequency transmission
c) Low frequency transmission
d) Cannot easily change binary 1 to 0

14) _____ does not requires any additional energy source and directly generates an electrical signal in response to an input stimulus.
a) Active Sensor
b) Dead Sensor
c) Passive Sensor
d) None of the mentioned

SLR-QH-535

Seat No.	

Set S

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
Sensors and Applications (BTN06605)

Day & Date: Monday, 25-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt the following. (Any Four) **16**

a) Define Transducer. Explain various types of transducers with examples.

b) Compare Analog sensors with Digital sensors.

c) Describe various types of batteries used in embedded products.

d) Explain dynamic characteristics of sensor.

e) Explain fundamental properties of capacitor with necessary diagrams. How capacitor is capable to measure physical quantity?

Q.3 Attempt the following. (Any Two) **12**

a) How data transmission carried out using
i) Two-Wire Sensing
ii) Four-Wire Sensing
iii) Six-Wire Sensing

b) Explain Temperature sensitivity, Moisture sensitivity & Strain sensitivity. Define specific resistivity of material with formula.

c) Describe Hall effect and Piezoelectric effect with necessary diagrams.

Section – II

Q.4 Attempt the following. (Any Four) **16**

a) Compare Arduino with Raspberry Pi. State various features associated with Arduino UNO board.

b) Draw pin diagram of Raspberry Pi board. State functions of various pins associated with Raspberry Pi.

c) Write a code to interface alcohol sensor with Arduino. Draw necessary connection diagram.

d) Write a code to blink two LED's alternatively using Raspberry Pi. Draw appropriate interfacing diagram with input output pins.

e) Write sort note on temperature sensor, capacitive sensor & gas sensor with their output format.

Q.5 Attempt the following. (Any Two) **12**

a) Write a program to indicate high temperature above set value with indicating LED and draw connection diagram to interface temperature sensor with Arduino/Raspberry Pi board. State ADC resolution in Arduino.

b) Design circuit and write a program to detect obstacle using Arduino/Raspberry Pi. Compare Arduino w.r.t. microcontrollers.

c) Define pressure. Design a circuit and write a code to interface pressure sensor with Arduino/Raspberry Pi.

SLR-QH-536

Seat No.		Set	P

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
Open Source Technologies (BTN06606)

Day & Date: Monday, 25-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) What is the role of system administrators in managing the operating system software?
a) Developing new software applications
b) Testing hardware compatibility
c) Ensuring software updates and patches are applied
d) Designing user interfaces

2) What are common kernel management tasks performed by system administrators?
a) Managing user accounts
b) Installing software packages
c) Monitoring system performance
d) Configuring network settings

3) Which open source software license is known for its permissive nature and allows for more flexibility in using and distributing the software?
a) BSD License
b) GNU Lesser General Public License (LGPL)
c) Eclipse Public License
d) Mozilla Public License

4) Which task is primarily associated with system administrators in managing jobs in an open source operating system?
a) Installing new software
b) Managing user accounts
c) Monitoring system performance
d) Scheduling and controlling the execution of processes

5) Which of the following best describes the concept of open source software?
a) Software that can only be used for non-commercial purposes
b) Software that is freely available and allows users to view, modify, and distribute its source code
c) Software that is developed exclusively by large corporations
d) Software that is restricted to a specific operating system

6) Which widely used open source software license is commonly associated with the Apache Software Foundation?
a) Apache License
b) GNU General Public License (GPL)
c) MIT License
d) Eclipse Public License

7) Which command-line utility is commonly used for basic file system management tasks in Linux?
a) ls
b) cp
c) mv
d) fdisk

8) Which directory in the Linux file system hierarchy contains user home directories?
a) /var
b) /usr
c) /home
d) /root

9) Which server is responsible for translating domain names into IP addresses in a network?
a) DNS server
b) DHCP server
c) FTP server
d) Mail server

10) Which utility is commonly used for managing IP tables and configuring firewall rules in an open source operating system?
a) iptables
b) ifconfig
c) netstat
d) ping

11) What is the main function of the GNU Privacy Guard (GPG) in an open source operating system?
a) Configuring network services
b) Managing cryptographic keys and encryption
c) Monitoring system performance
d) Hosting web applications

12) What is the primary purpose of executing a shell script in an open source operating system?
a) To compile source code
b) To run system commands
c) To create user accounts
d) To configure network settings

13) In shell scripting, how can data be parsed from a downloaded web page?

a) Using regular expressions
b) Using JSON parsing libraries
c) Using SQL queries
d) Using XML processing tools

14) Which of the following is a cloud-based solution for Git repositories?

a) Github
b) Gitlab
c) BitBucket
d) All of the above

Seat No.	

Set **P**

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
Open Source Technologies (BTN06606)

Day & Date: Monday, 25-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Answer the following. (Any Four) **16**

a) List and explain the advantages of using open source software.

b) Discuss the VI editor in Linux, including its basic usage, navigation, and editing commands.

c) Explain the concept of sed (stream editor) in Linux and how it can be used for text manipulation tasks.

d) What is FTP? How can FTP servers be configured in Linux? Discuss key FTP server software options and their security implications.

e) What is a DNS server? How can DNS servers be configured in Linux? Discuss different DNS server software options and their key features.

Q.3 Answer the following. (Any Two) **12**

a) Explain the importance of community involvement and collaboration in the development and maintenance of open source software projects.

b) What is a DHCP server? How can DHCP servers be configured in Linux? Explain how DHCP can be used to automate IP address assignment and configuration for network devices.

c) How can user, group, and permission settings be managed in Linux? Discuss key commands and tools for creating, modifying, and deleting user accounts, groups, and file permissions.

Section – II

Q.4 Answer the following. (Any Four) **16**

a) What are control structures in Bash shell scripts? How can if statements, for loops, and while loops be used to control program flow?

b) What are the steps involved in obtaining and installing Git on your system? Are there any specific requirements or considerations?

c) What are the different ways to remove files in Git? How does “git reset” remove staged files, and how does “git rm” remove committed files?

d) How can you list and view existing branches in a Git repository? What is the command used to accomplish this?

e) Explain the process of committing files in Git. What does the “git commit” command do, and why is it important in version control?

Q.5 Answer the following. (Any Two) **12**

a) Define and explain the key terminology associated with Git, such as clone, working tree, checkout, staging area, add, commit, push, pull, and stash?

b) How can functions be created and used in Bash shell scripts? Discuss different types of functions, including library functions and user-defined functions.

c) What is the process of checking out a branch in Git? How does it switch the working directory to a different branch and what are the implications of this action?

Seat No.	

Set **Q**

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
Open Source Technologies (BTN06606)

Day & Date: Monday, 25-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) Which directory in the Linux file system hierarchy contains user home directories?
a) /var b) /usr
c) /home d) /root

2) Which server is responsible for translating domain names into IP addresses in a network?
a) DNS server b) DHCP server
c) FTP server d) Mail server

3) Which utility is commonly used for managing IP tables and configuring firewall rules in an open source operating system?
a) iptables b) ifconfig
c) netstat d) ping

4) What is the main function of the GNU Privacy Guard (GPG) in an open source operating system?
a) Configuring network services
b) Managing cryptographic keys and encryption
c) Monitoring system performance
d) Hosting web applications

5) What is the primary purpose of executing a shell script in an open source operating system?
a) To compile source code
b) To run system commands
c) To create user accounts
d) To configure network settings

6) In shell scripting, how can data be parsed from a downloaded web page?
   a) Using regular expressions
   b) Using JSON parsing libraries
   c) Using SQL queries
   d) Using XML processing tools

7) Which of the following is a cloud-based solution for Git repositories?
   a) Github
   b) Gitlab
   c) BitBucket
   d) All of the above

8) What is the role of system administrators in managing the operating system software?
   a) Developing new software applications
   b) Testing hardware compatibility
   c) Ensuring software updates and patches are applied
   d) Designing user interfaces

9) What are common kernel management tasks performed by system administrators?
   a) Managing user accounts
   b) Installing software packages
   c) Monitoring system performance
   d) Configuring network settings

10) Which open source software license is known for its permissive nature and allows for more flexibility in using and distributing the software?
   a) BSD License
   b) GNU Lesser General Public License (LGPL)
   c) Eclipse Public License
   d) Mozilla Public License

11) Which task is primarily associated with system administrators in managing jobs in an open source operating system?
   a) Installing new software
   b) Managing user accounts
   c) Monitoring system performance
   d) Scheduling and controlling the execution of processes

12) Which of the following best describes the concept of open source software?
   a) Software that can only be used for non-commercial purposes
   b) Software that is freely available and allows users to view, modify, and distribute its source code
   c) Software that is developed exclusively by large corporations
   d) Software that is restricted to a specific operating system

13) Which widely used open source software license is commonly associated with the Apache Software Foundation?

a) Apache License
b) GNU General Public License (GPL)
c) MIT License
d) Eclipse Public License

14) Which command-line utility is commonly used for basic file system management tasks in Linux?

a) ls
b) cp
c) mv
d) fdisk

Seat No.	

Set **Q**

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
Open Source Technologies (BTN06606)

Day & Date: Monday, 25-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Answer the following. (Any Four) **16**

a) List and explain the advantages of using open source software.

b) Discuss the VI editor in Linux, including its basic usage, navigation, and editing commands.

c) Explain the concept of sed (stream editor) in Linux and how it can be used for text manipulation tasks.

d) What is FTP? How can FTP servers be configured in Linux? Discuss key FTP server software options and their security implications.

e) What is a DNS server? How can DNS servers be configured in Linux? Discuss different DNS server software options and their key features.

Q.3 Answer the following. (Any Two) **12**

a) Explain the importance of community involvement and collaboration in the development and maintenance of open source software projects.

b) What is a DHCP server? How can DHCP servers be configured in Linux? Explain how DHCP can be used to automate IP address assignment and configuration for network devices.

c) How can user, group, and permission settings be managed in Linux? Discuss key commands and tools for creating, modifying, and deleting user accounts, groups, and file permissions.

Section – II

Q.4 Answer the following. (Any Four) **16**

a) What are control structures in Bash shell scripts? How can if statements, for loops, and while loops be used to control program flow?

b) What are the steps involved in obtaining and installing Git on your system? Are there any specific requirements or considerations?

c) What are the different ways to remove files in Git? How does “git reset” remove staged files, and how does “git rm” remove committed files?

d) How can you list and view existing branches in a Git repository? What is the command used to accomplish this?

e) Explain the process of committing files in Git. What does the “git commit” command do, and why is it important in version control?

Q.5 Answer the following. (Any Two) **12**

a) Define and explain the key terminology associated with Git, such as clone, working tree, checkout, staging area, add, commit, push, pull, and stash?

b) How can functions be created and used in Bash shell scripts? Discuss different types of functions, including library functions and user-defined functions.

c) What is the process of checking out a branch in Git? How does it switch the working directory to a different branch and what are the implications of this action?

SLR-QH-536

Seat No.	

Set R

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
Open Source Technologies (BTN06606)

Day & Date: Monday, 25-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. 14

1) What is the main function of the GNU Privacy Guard (GPG) in an open source operating system?
a) Configuring network services
b) Managing cryptographic keys and encryption
c) Monitoring system performance
d) Hosting web applications

2) What is the primary purpose of executing a shell script in an open source operating system?
a) To compile source code
b) To run system commands
c) To create user accounts
d) To configure network settings

3) In shell scripting, how can data be parsed from a downloaded web page?
a) Using regular expressions
b) Using JSON parsing libraries
c) Using SQL queries
d) Using XML processing tools

4) Which of the following is a cloud-based solution for Git repositories?
a) Github b) Gitlab
c) BitBucket d) All of the above

5) What is the role of system administrators in managing the operating system software?
   a) Developing new software applications
   b) Testing hardware compatibility
   c) Ensuring software updates and patches are applied
   d) Designing user interfaces

6) What are common kernel management tasks performed by system administrators?
   a) Managing user accounts
   b) Installing software packages
   c) Monitoring system performance
   d) Configuring network settings

7) Which open source software license is known for its permissive nature and allows for more flexibility in using and distributing the software?
   a) BSD License
   b) GNU Lesser General Public License (LGPL)
   c) Eclipse Public License
   d) Mozilla Public License

8) Which task is primarily associated with system administrators in managing jobs in an open source operating system?
   a) Installing new software
   b) Managing user accounts
   c) Monitoring system performance
   d) Scheduling and controlling the execution of processes

9) Which of the following best describes the concept of open source software?
   a) Software that can only be used for non-commercial purposes
   b) Software that is freely available and allows users to view, modify, and distribute its source code
   c) Software that is developed exclusively by large corporations
   d) Software that is restricted to a specific operating system

10) Which widely used open source software license is commonly associated with the Apache Software Foundation?
   a) Apache License
   b) GNU General Public License (GPL)
   c) MIT License
   d) Eclipse Public License

11) Which command-line utility is commonly used for basic file system management tasks in Linux?
   a) ls
   b) cp
   c) mv
   d) fdisk

12) Which directory in the Linux file system hierarchy contains user home directories?

a) /var
b) /usr
c) /home
d) /root

13) Which server is responsible for translating domain names into IP addresses in a network?

a) DNS server
b) DHCP server
c) FTP server
d) Mail server

14) Which utility is commonly used for managing IP tables and configuring firewall rules in an open source operating system?

a) iptables
b) ifconfig
c) netstat
d) ping

Seat No.	

Set **R**

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
Open Source Technologies (BTN06606)

Day & Date: Monday, 25-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Answer the following. (Any Four) **16**

a) List and explain the advantages of using open source software.

b) Discuss the VI editor in Linux, including its basic usage, navigation, and editing commands.

c) Explain the concept of sed (stream editor) in Linux and how it can be used for text manipulation tasks.

d) What is FTP? How can FTP servers be configured in Linux? Discuss key FTP server software options and their security implications.

e) What is a DNS server? How can DNS servers be configured in Linux? Discuss different DNS server software options and their key features.

Q.3 Answer the following. (Any Two) **12**

a) Explain the importance of community involvement and collaboration in the development and maintenance of open source software projects.

b) What is a DHCP server? How can DHCP servers be configured in Linux? Explain how DHCP can be used to automate IP address assignment and configuration for network devices.

c) How can user, group, and permission settings be managed in Linux? Discuss key commands and tools for creating, modifying, and deleting user accounts, groups, and file permissions.

Section – II

Q.4 Answer the following. (Any Four) **16**

a) What are control structures in Bash shell scripts? How can if statements, for loops, and while loops be used to control program flow?

b) What are the steps involved in obtaining and installing Git on your system? Are there any specific requirements or considerations?

c) What are the different ways to remove files in Git? How does “git reset” remove staged files, and how does “git rm” remove committed files?

d) How can you list and view existing branches in a Git repository? What is the command used to accomplish this?

e) Explain the process of committing files in Git. What does the “git commit” command do, and why is it important in version control?

Q.5 Answer the following. (Any Two) **12**

a) Define and explain the key terminology associated with Git, such as clone, working tree, checkout, staging area, add, commit, push, pull, and stash?

b) How can functions be created and used in Bash shell scripts? Discuss different types of functions, including library functions and user-defined functions.

c) What is the process of checking out a branch in Git? How does it switch the working directory to a different branch and what are the implications of this action?

SLR-QH-536

Seat No.		Set	S

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
Open Source Technologies (BTN06606)

Day & Date: Monday, 25-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) Which widely used open source software license is commonly associated with the Apache Software Foundation?
a) Apache License
b) GNU General Public License (GPL)
c) MIT License
d) Eclipse Public License

2) Which command-line utility is commonly used for basic file system management tasks in Linux?
a) ls b) cp
c) mv d) fdisk

3) Which directory in the Linux file system hierarchy contains user home directories?
a) /var b) /usr
c) /home d) /root

4) Which server is responsible for translating domain names into IP addresses in a network?
a) DNS server b) DHCP server
c) FTP server d) Mail server

5) Which utility is commonly used for managing IP tables and configuring firewall rules in an open source operating system?
a) iptables b) ifconfig
c) netstat d) ping

6) What is the main function of the GNU Privacy Guard (GPG) in an open source operating system?
   a) Configuring network services
   b) Managing cryptographic keys and encryption
   c) Monitoring system performance
   d) Hosting web applications

7) What is the primary purpose of executing a shell script in an open source operating system?
   a) To compile source code
   b) To run system commands
   c) To create user accounts
   d) To configure network settings

8) In shell scripting, how can data be parsed from a downloaded web page?
   a) Using regular expressions
   b) Using JSON parsing libraries
   c) Using SQL queries
   d) Using XML processing tools

9) Which of the following is a cloud-based solution for Git repositories?
   a) Github
   b) Gitlab
   c) BitBucket
   d) All of the above

10) What is the role of system administrators in managing the operating system software?
   a) Developing new software applications
   b) Testing hardware compatibility
   c) Ensuring software updates and patches are applied
   d) Designing user interfaces

11) What are common kernel management tasks performed by system administrators?
   a) Managing user accounts
   b) Installing software packages
   c) Monitoring system performance
   d) Configuring network settings

12) Which open source software license is known for its permissive nature and allows for more flexibility in using and distributing the software?
   a) BSD License
   b) GNU Lesser General Public License (LGPL)
   c) Eclipse Public License
   d) Mozilla Public License

13) Which task is primarily associated with system administrators in managing jobs in an open source operating system?

a) Installing new software
b) Managing user accounts
c) Monitoring system performance
d) Scheduling and controlling the execution of processes

14) Which of the following best describes the concept of open source software?

a) Software that can only be used for non-commercial purposes
b) Software that is freely available and allows users to view, modify, and distribute its source code
c) Software that is developed exclusively by large corporations
d) Software that is restricted to a specific operating system

Seat No.	

Set **S**

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
Open Source Technologies (BTN06606)

Day & Date: Monday, 25-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Answer the following. (Any Four) **16**

a) List and explain the advantages of using open source software.

b) Discuss the VI editor in Linux, including its basic usage, navigation, and editing commands.

c) Explain the concept of sed (stream editor) in Linux and how it can be used for text manipulation tasks.

d) What is FTP? How can FTP servers be configured in Linux? Discuss key FTP server software options and their security implications.

e) What is a DNS server? How can DNS servers be configured in Linux? Discuss different DNS server software options and their key features.

Q.3 Answer the following. (Any Two) **12**

a) Explain the importance of community involvement and collaboration in the development and maintenance of open source software projects.

b) What is a DHCP server? How can DHCP servers be configured in Linux? Explain how DHCP can be used to automate IP address assignment and configuration for network devices.

c) How can user, group, and permission settings be managed in Linux? Discuss key commands and tools for creating, modifying, and deleting user accounts, groups, and file permissions.

Section – II

Q.4 Answer the following. (Any Four) **16**

a) What are control structures in Bash shell scripts? How can if statements, for loops, and while loops be used to control program flow?

b) What are the steps involved in obtaining and installing Git on your system? Are there any specific requirements or considerations?

c) What are the different ways to remove files in Git? How does “git reset” remove staged files, and how does “git rm” remove committed files?

d) How can you list and view existing branches in a Git repository? What is the command used to accomplish this?

e) Explain the process of committing files in Git. What does the “git commit” command do, and why is it important in version control?

Q.5 Answer the following. (Any Two) **12**

a) Define and explain the key terminology associated with Git, such as clone, working tree, checkout, staging area, add, commit, push, pull, and stash?

b) How can functions be created and used in Bash shell scripts? Discuss different types of functions, including library functions and user-defined functions.

c) What is the process of checking out a branch in Git? How does it switch the working directory to a different branch and what are the implications of this action?

SLR-QH-539

Seat No.	

Set P

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
AI/MI - Machine Learning (BTN06612)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the given options. 14

1) The term machine learning was coined by _____.
a) James Gosling b) Arthur Samuel
c) Guido van Rossum d) None of the above

2) Which of the following is not a supervised learning?
a) PCA b) Naive Bayesian
c) Linear Regression d) Decision Tree

3) Real-Time decisions, Game Al, Learning Tasks, Skill acquisition, and Robot Navigation are applications of _____.
a) Reinforcement Learning
b) Supervised Learning: Classification
c) Unsupervised Learning: Regression
d) None of the above

4) _____ is a disadvantage of decision trees.
a) Decision trees are robust to outliers
b) Decision trees are prone to be overfit
c) Both a) and b)
d) None of the above

5) _____ is a part of machine learning that works with neural networks.
a) Artificial intelligence b) Deep learning
c) Both a) and b) d) None of the above

6) Which machine learning models are trained to make a series of decisions based on the rewards and feedback they receive for their actions?
a) Supervised learning b) Unsupervised learning
c) Reinforcement learning d) All of the above

7) The most common issue when using ML is _____.
a) Lack of skilled resources b) Inadequate Infrastructure
c) Poor Data Quality d) None of the above

8) _____ is a widely used and effective machine learning algorithm based on the idea of bagging.
a) Regression b) Classification
c) Decision Tree d) Random Forest

9) What is machine learning?
a) Selective acquisition of knowledge through the use of manual programs
b) Selective acquisition of knowledge through the use of computer programs
c) Autonomous acquisition of knowledge through the use of manual programs
d) Autonomous acquisition of knowledge through the use of computer programs

10) How can you handle missing or corrupted data in a dataset?
a) Drop missing rows or columns
b) Assign a unique category to missing values
c) Replace missing values with mean/median/mode
d) All of the above

11) Machine learning algorithms build a model based on sample data, known as _____.
a) Training Data b) Transfer Data
c) Data Training d) None of the above

12) _____ is the machine learning algorithms that can be used with labeled data.
a) Regression algorithms b) Clustering algorithms
c) Association algorithms d) All of the above

13) _____ is used as an input to the machine learning model for training and prediction purposes.
a) Feature b) Feature Vector
c) Both a) and b) d) None of the above

14) _____ is the scenario when the model fails to decipher the underlying trend in the input data.
a) Overfitting b) Underfitting
c) Both a) and b) d) None of the above

SLR-QH-539

Seat No.	

Set P

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
AI/MI - Machine Learning (BTN06612)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt Any Four. **16**

a) Explain feature construction and transformation in brief.

b) Explain Multiclass Classification with examples.

c) Explain concept of perceptron with neat diagram.

d) Explain Unsupervised type of learning with examples.

e) Explain regression. Illustrate K means clustering algorithm with an example.

Q.3 Attempt Any Two. **12**

a) Distinguish between supervised learning and Reinforcement learning. Illustrate with real life examples.

b) Compare Classification with regression with an example.

c) Distinguish between overfitting and underfitting. How it can affect model generalization?

SECTION – II

Q.4 Attempt Any Four. **16**

a) Explain Feed Forward Network & Back Propagation Algorithm.

b) Explain naïve bayes classification in brief.

c) Describe activation function. Explain different types of activation functions in brief.

d) Describe the Decision Tree algorithm in brief.

e) What is ANN? Explain architecture of ANN in brief.

Q.5 Attempt Any Two. **12**

a) Explain Self driving cars as Machine Learning application in brief.

b) Discuss Random Forest algorithm with example. Mention its advantages and disadvantages.

c) Differentiate between Deep learning vs Machine Learning.

Seat No.	

Set **Q**

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
AI/MI - Machine Learning (BTN06612)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the given options. 14

1) _____ is a widely used and effective machine learning algorithm based on the idea of bagging.
a) Regression b) Classification
c) Decision Tree d) Random Forest

2) What is machine learning?
a) Selective acquisition of knowledge through the use of manual programs
b) Selective acquisition of knowledge through the use of computer programs
c) Autonomous acquisition of knowledge through the use of manual programs
d) Autonomous acquisition of knowledge through the use of computer programs

3) How can you handle missing or corrupted data in a dataset?
a) Drop missing rows or columns
b) Assign a unique category to missing values
c) Replace missing values with mean/median/mode
d) All of the above

4) Machine learning algorithms build a model based on sample data, known as _____.
a) Training Data b) Transfer Data
c) Data Training d) None of the above

5) _____ is the machine learning algorithms that can be used with labeled data.
a) Regression algorithms b) Clustering algorithms
c) Association algorithms d) All of the above

6) _____ is used as an input to the machine learning model for training and prediction purposes.
a) Feature
b) Feature Vector
c) Both a) and b)
d) None of the above

7) _____ is the scenario when the model fails to decipher the underlying trend in the input data.
a) Overfitting
b) Underfitting
c) Both a) and b)
d) None of the above

8) The term machine learning was coined by _____.
a) James Gosling
b) Arthur Samuel
c) Guido van Rossum
d) None of the above

9) Which of the following is not a supervised learning?
a) PCA
b) Naive Bayesian
c) Linear Regression
d) Decision Tree

10) Real-Time decisions, Game Al, Learning Tasks, Skill acquisition, and Robot Navigation are applications of _____.
a) Reinforcement Learning
b) Supervised Learning: Classification
c) Unsupervised Learning: Regression
d) None of the above

11) _____ is a disadvantage of decision trees.
a) Decision trees are robust to outliers
b) Decision trees are prone to be overfit
c) Both a) and b)
d) None of the above

12) _____ is a part of machine learning that works with neural networks.
a) Artificial intelligence
b) Deep learning
c) Both a) and b)
d) None of the above

13) Which machine learning models are trained to make a series of decisions based on the rewards and feedback they receive for their actions?
a) Supervised learning
b) Unsupervised learning
c) Reinforcement learning
d) All of the above

14) The most common issue when using ML is _____.
a) Lack of skilled resources
b) Inadequate Infrastructure
c) Poor Data Quality
d) None of the above

SLR-QH-539

Seat No.	

Set Q

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
AI/MI - Machine Learning (BTN06612)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt Any Four. **16**

a) Explain feature construction and transformation in brief.

b) Explain Multiclass Classification with examples.

c) Explain concept of perceptron with neat diagram.

d) Explain Unsupervised type of learning with examples.

e) Explain regression. Illustrate K means clustering algorithm with an example.

Q.3 Attempt Any Two. **12**

a) Distinguish between supervised learning and Reinforcement learning. Illustrate with real life examples.

b) Compare Classification with regression with an example.

c) Distinguish between overfitting and underfitting. How it can affect model generalization?

SECTION – II

Q.4 Attempt Any Four. **16**

a) Explain Feed Forward Network & Back Propagation Algorithm.

b) Explain naïve bayes classification in brief.

c) Describe activation function. Explain different types of activation functions in brief.

d) Describe the Decision Tree algorithm in brief.

e) What is ANN? Explain architecture of ANN in brief.

Q.5 Attempt Any Two. **12**

a) Explain Self driving cars as Machine Learning application in brief.

b) Discuss Random Forest algorithm with example. Mention its advantages and disadvantages.

c) Differentiate between Deep learning vs Machine Learning.

Seat No.	

Set **R**

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
AI/MI - Machine Learning (BTN06612)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the given options. 14

1) Machine learning algorithms build a model based on sample data, known as _____.
a) Training Data b) Transfer Data
c) Data Training d) None of the above

2) _____ is the machine learning algorithms that can be used with labeled data.
a) Regression algorithms b) Clustering algorithms
c) Association algorithms d) All of the above

3) _____ is used as an input to the machine learning model for training and prediction purposes.
a) Feature b) Feature Vector
c) Both a) and b) d) None of the above

4) _____ is the scenario when the model fails to decipher the underlying trend in the input data.
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c) Both a) and b) d) None of the above

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a) PCA b) Naive Bayesian
c) Linear Regression d) Decision Tree

7) Real-Time decisions, Game AI, Learning Tasks, Skill acquisition, and Robot Navigation are applications of _____.
a) Reinforcement Learning
b) Supervised Learning: Classification
c) Unsupervised Learning: Regression
d) None of the above

8) _____ is a disadvantage of decision trees.
a) Decision trees are robust to outliers
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b) Unsupervised learning
c) Reinforcement learning
d) All of the above

11) The most common issue when using ML is _____.
a) Lack of skilled resources
b) Inadequate Infrastructure
c) Poor Data Quality
d) None of the above

12) _____ is a widely used and effective machine learning algorithm based on the idea of bagging.
a) Regression
b) Classification
c) Decision Tree
d) Random Forest

13) What is machine learning?
a) Selective acquisition of knowledge through the use of manual programs
b) Selective acquisition of knowledge through the use of computer programs
c) Autonomous acquisition of knowledge through the use of manual programs
d) Autonomous acquisition of knowledge through the use of computer programs

14) How can you handle missing or corrupted data in a dataset?
a) Drop missing rows or columns
b) Assign a unique category to missing values
c) Replace missing values with mean/median/mode
d) All of the above

SLR-QH-539

Seat No.	

Set R

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
AI/MI - Machine Learning (BTN06612)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt Any Four. **16**

a) Explain feature construction and transformation in brief.

b) Explain Multiclass Classification with examples.

c) Explain concept of perceptron with neat diagram.

d) Explain Unsupervised type of learning with examples.

e) Explain regression. Illustrate K means clustering algorithm with an example.

Q.3 Attempt Any Two. **12**

a) Distinguish between supervised learning and Reinforcement learning. Illustrate with real life examples.

b) Compare Classification with regression with an example.

c) Distinguish between overfitting and underfitting. How it can affect model generalization?

SECTION – II

Q.4 Attempt Any Four. **16**

a) Explain Feed Forward Network & Back Propagation Algorithm.

b) Explain naïve bayes classification in brief.

c) Describe activation function. Explain different types of activation functions in brief.

d) Describe the Decision Tree algorithm in brief.

e) What is ANN? Explain architecture of ANN in brief.

Q.5 Attempt Any Two. **12**

a) Explain Self driving cars as Machine Learning application in brief.

b) Discuss Random Forest algorithm with example. Mention its advantages and disadvantages.

c) Differentiate between Deep learning vs Machine Learning.

SLR-QH-539

Seat No.	

Set S

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
AI/MI - Machine Learning (BTN06612)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the given options. 14

1) Which machine learning models are trained to make a series of decisions based on the rewards and feedback they receive for their actions?
a) Supervised learning b) Unsupervised learning
c) Reinforcement learning d) All of the above

2) The most common issue when using ML is _____.
a) Lack of skilled resources b) Inadequate Infrastructure
c) Poor Data Quality d) None of the above

3) _____ is a widely used and effective machine learning algorithm based on the idea of bagging.
a) Regression b) Classification
c) Decision Tree d) Random Forest

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c) Data Training d) None of the above

7) _____ is the machine learning algorithms that can be used with labeled data.
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a) Feature b) Feature Vector
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9) _____ is the scenario when the model fails to decipher the underlying trend in the input data.
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c) Both a) and b) d) None of the above

10) The term machine learning was coined by _____.
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c) Guido van Rossum d) None of the above

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a) PCA b) Naive Bayesian
c) Linear Regression d) Decision Tree

12) Real-Time decisions, Game Al, Learning Tasks, Skill acquisition, and Robot Navigation are applications of _____.
a) Reinforcement Learning
b) Supervised Learning: Classification
c) Unsupervised Learning: Regression
d) None of the above

13) _____ is a disadvantage of decision trees.
a) Decision trees are robust to outliers
b) Decision trees are prone to be overfit
c) Both a) and b)
d) None of the above

14) _____ is a part of machine learning that works with neural networks.
a) Artificial intelligence b) Deep learning
c) Both a) and b) d) None of the above

SLR-QH-539

Seat No.	

Set S

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
AI/MI - Machine Learning (BTN06612)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt Any Four. **16**

a) Explain feature construction and transformation in brief.

b) Explain Multiclass Classification with examples.

c) Explain concept of perceptron with neat diagram.

d) Explain Unsupervised type of learning with examples.

e) Explain regression. Illustrate K means clustering algorithm with an example.

Q.3 Attempt Any Two. **12**

a) Distinguish between supervised learning and Reinforcement learning. Illustrate with real life examples.

b) Compare Classification with regression with an example.

c) Distinguish between overfitting and underfitting. How it can affect model generalization?

SECTION – II

Q.4 Attempt Any Four. **16**

a) Explain Feed Forward Network & Back Propagation Algorithm.

b) Explain naïve bayes classification in brief.

c) Describe activation function. Explain different types of activation functions in brief.

d) Describe the Decision Tree algorithm in brief.

e) What is ANN? Explain architecture of ANN in brief.

Q.5 Attempt Any Two. **12**

a) Explain Self driving cars as Machine Learning application in brief.

b) Discuss Random Forest algorithm with example. Mention its advantages and disadvantages.

c) Differentiate between Deep learning vs Machine Learning.

SLR-QH-541

Seat No.	

Set P

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April- 2026 Applications of IT and Control Engineering in Railway (BTN06615)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no. 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of Page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) India's first passenger train from Bori Bunder (Mumbai) to Thane was run on which of the following gauge?
a) Meter gauge b) Standard gauge
c) Broad gauge d) Narrow gauge

2) Which signal gives permission to the train for leaving the platform?
a) Semaphore Signal b) Warner Signal
c) Starter signal d) None of these

3) In locomotives Faults are logged in _____.
a) Non-Volatile Memory b) Volatile Memory
c) Flash Memory d) Stack

4) India uses ____ AC traction on its electrified tracks.
a) 25 kV 50 Hz b) 30 kV 50 Hz
c) 26 kV 50 Hz d) 230V 50 Hz

5) Which of the following is the most important strategic reason for the construction of a new railway line?
a) For creating jobs
b) Because of absence of a railway line
c) To increase tourists
d) To make movement of defense forces easier in case of emergency

6) Which of following is function of Data loggers?
a) Monitor and record b) Documentation
c) Analyze and validate d) All of the Above

7) Which of the following element is not used in an automatic control system?
   a) Final control element
   b) Sensor
   c) Oscillator
   d) Error detector

8) Liquid level control system is the example of _____.
   a) Open loop
   b) Closed loop
   c) SISO
   d) MIMO

9) What is Control System?
   a) Control system is a system in which the output is controlled by varying the input
   b) Control system is a device that will not manage or regulate the behaviour of other devices using control loops.
   c) Control system is a feedback system that can be both positive and negative
   d) Control System is a system in which the input is controlled by varying the output

10) Which of the following is not the feature of a modern control system?
   a) Correct power level
   b) No oscillation
   c) Quick response
   d) Accuracy

11) Indian Railways National Train Enquiry System (NTES) NOT provides information v about _____.
   a) Train schedule
   b) Live stations
   c) Trains B/W stations
   d) Reservations

12) What should be the nature of bandwidth for a good control system?
   a) Small
   b) Medium
   c) Large
   d) All of the mentioned

13) In a stable control system backlash can cause which of the following?
   a) Overdamping
   b) Low-level oscillations
   c) Underdamping
   d) Poor stability at reduced values of open loop gain

14) The input signals to control systems are not known fully ahead of time, the characteristics of control system which suddenly strain a control system are _____.
   a) Constant velocity and acceleration
   b) Sudden shock
   c) Sudden change
   d) All of the mentioned

SLR-QH-541

Seat No.	

Set P

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April- 2026
Applications of IT and Control Engineering in Railway (BTN06615)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt Any Four. **16**

a) What is FOIS? Give Details

b) What is typical arrangement of PRS Terminals?

c) What are Basic requirements of UTS Network?

d) What is mean by freight operations? Explain.

e) Which Network topologies used in FOIS? Give Details.

Q.3 Attempt Any Two. **12**

a) Explain RMS and TMS.

b) Give Application of Information Technology in Railways.

c) What is Public Address System? Explain

SECTION – II

Q.4 Attempt Any Four. **16**

a) Write a short note on Auxiliary Warning System.

b) Explain application of control system in Liquid Level system.

c) Give Any four rules of block diagram reduction.

d) Give the transfer function of a closed-loop system with proper equation.

e) What is Train Protection & Warning System (TPWS)? Explain.

Q.5 Attempt Any Two. **12**

a) What is mean by data logger? Give its applications.

b) Explain Train Traffic Control Data Communications and Networking.

c) Write note on Robotic control system.

SLR-QH-541

Seat No.	

Set Q

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April- 2026 Applications of IT and Control Engineering in Railway (BTN06615)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no. 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of Page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) Liquid level control system is the example of _____.
a) Open loop b) Closed loop
c) SISO d) MIMO

2) What is Control System?
a) Control system is a system in which the output is controlled by varying the input
b) Control system is a device that will not manage or regulate the behaviour of other devices using control loops.
c) Control system is a feedback system that can be both positive and negative
d) Control System is a system in which the input is controlled by varying the output

3) Which of the following is not the feature of a modern control system?
a) Correct power level b) No oscillation
c) Quick response d) Accuracy

4) Indian Railways National Train Enquiry System (NTES) NOT provides information v about _____.
a) Train schedule b) Live stations
c) Trains B/W stations d) Reservations

5) What should be the nature of bandwidth for a good control system?
a) Small b) Medium
c) Large d) All of the mentioned

6) In a stable control system backlash can cause which of the following?
a) Overdamping
b) Low-level oscillations
c) Underdamping
d) Poor stability at reduced values of open loop gain

7) The input signals to control systems are not known fully ahead of time, the characteristics of control system which suddenly strain a control system are _____.
a) Constant velocity and acceleration
b) Sudden shock
c) Sudden change
d) All of the mentioned

8) India's first passenger train from Bori Bunder (Mumbai) to Thane was run on which of the following gauge?
a) Meter gauge
b) Standard gauge
c) Broad gauge
d) Narrow gauge

9) Which signal gives permission to the train for leaving the platform?
a) Semaphore Signal
b) Warner Signal
c) Starter signal
d) None of these

10) In locomotives Faults are logged in _____.
a) Non-Volatile Memory
b) Volatile Memory
c) Flash Memory
d) Stack

11) India uses ____ AC traction on its electrified tracks.
a) 25 kV 50 Hz
b) 30 kV 50 Hz
c) 26 kV 50 Hz
d) 230V 50 Hz

12) Which of the following is the most important strategic reason for the construction of a new railway line?
a) For creating jobs
b) Because of absence of a railway line
c) To increase tourists
d) To make movement of defense forces easier in case of emergency

13) Which of following is function of Data loggers?
a) Monitor and record
b) Documentation
c) Analyze and validate
d) All of the Above

14) Which of the following element is not used in an automatic control system?
a) Final control element
b) Sensor
c) Oscillator
d) Error detector

SLR-QH-541

Seat No.	

Set Q

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April- 2026
Applications of IT and Control Engineering in Railway (BTN06615)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt Any Four. **16**

a) What is FOIS? Give Details

b) What is typical arrangement of PRS Terminals?

c) What are Basic requirements of UTS Network?

d) What is mean by freight operations? Explain.

e) Which Network topologies used in FOIS? Give Details.

Q.3 Attempt Any Two. **12**

a) Explain RMS and TMS.

b) Give Application of Information Technology in Railways.

c) What is Public Address System? Explain

SECTION – II

Q.4 Attempt Any Four. **16**

a) Write a short note on Auxiliary Warning System.

b) Explain application of control system in Liquid Level system.

c) Give Any four rules of block diagram reduction.

d) Give the transfer function of a closed-loop system with proper equation.

e) What is Train Protection & Warning System (TPWS)? Explain.

Q.5 Attempt Any Two. **12**

a) What is mean by data logger? Give its applications.

b) Explain Train Traffic Control Data Communications and Networking.

c) Write note on Robotic control system.

SLR-QH-541

Seat No.	

Set R

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April- 2026
Applications of IT and Control Engineering in Railway (BTN06615)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no. 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of Page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) Indian Railways National Train Enquiry System (NTES) NOT provides information v about _____.
a) Train schedule b) Live stations
c) Trains B/W stations d) Reservations

2) What should be the nature of bandwidth for a good control system?
a) Small b) Medium
c) Large d) All of the mentioned

3) In a stable control system backlash can cause which of the following?
a) Overdamping
b) Low-level oscillations
c) Underdamping
d) Poor stability at reduced values of open loop gain

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d) All of the Above

11) Which of the following element is not used in an automatic control system?
a) Final control element
b) Sensor
c) Oscillator
d) Error detector

12) Liquid level control system is the example of _____.
a) Open loop
b) Closed loop
c) SISO
d) MIMO

13) What is Control System?
a) Control system is a system in which the output is controlled by varying the input
b) Control system is a device that will not manage or regulate the behaviour of other devices using control loops.
c) Control system is a feedback system that can be both positive and negative
d) Control System is a system in which the input is controlled by varying the output

14) Which of the following is not the feature of a modern control system?
a) Correct power level
b) No oscillation
c) Quick response
d) Accuracy

SLR-QH-541

Seat No.	

Set R

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April- 2026
Applications of IT and Control Engineering in Railway (BTN06615)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt Any Four. **16**

a) What is FOIS? Give Details

b) What is typical arrangement of PRS Terminals?

c) What are Basic requirements of UTS Network?

d) What is mean by freight operations? Explain.

e) Which Network topologies used in FOIS? Give Details.

Q.3 Attempt Any Two. **12**

a) Explain RMS and TMS.

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c) What is Public Address System? Explain

SECTION – II

Q.4 Attempt Any Four. **16**

a) Write a short note on Auxiliary Warning System.

b) Explain application of control system in Liquid Level system.

c) Give Any four rules of block diagram reduction.

d) Give the transfer function of a closed-loop system with proper equation.

e) What is Train Protection & Warning System (TPWS)? Explain.

Q.5 Attempt Any Two. **12**

a) What is mean by data logger? Give its applications.

b) Explain Train Traffic Control Data Communications and Networking.

c) Write note on Robotic control system.

Seat No.	

Set | S

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April- 2026
Applications of IT and Control Engineering in Railway (BTN06615)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no. 03 (Starting page of the Answer Book). Each question carries one mark.
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3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

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c) Analyze and validate d) All of the Above

2) Which of the following element is not used in an automatic control system?
a) Final control element b) Sensor
c) Oscillator d) Error detector

3) Liquid level control system is the example of _____.
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b) Because of absence of a railway line
c) To increase tourists
d) To make movement of defense forces easier in case of emergency

SLR-QH-541

Seat No.	

Set S

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April- 2026
Applications of IT and Control Engineering in Railway (BTN06615)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt Any Four. **16**

a) What is FOIS? Give Details

b) What is typical arrangement of PRS Terminals?

c) What are Basic requirements of UTS Network?

d) What is mean by freight operations? Explain.

e) Which Network topologies used in FOIS? Give Details.

Q.3 Attempt Any Two. **12**

a) Explain RMS and TMS.

b) Give Application of Information Technology in Railways.

c) What is Public Address System? Explain

SECTION – II

Q.4 Attempt Any Four. **16**

a) Write a short note on Auxiliary Warning System.

b) Explain application of control system in Liquid Level system.

c) Give Any four rules of block diagram reduction.

d) Give the transfer function of a closed-loop system with proper equation.

e) What is Train Protection & Warning System (TPWS)? Explain.

Q.5 Attempt Any Two. **12**

a) What is mean by data logger? Give its applications.

b) Explain Train Traffic Control Data Communications and Networking.

c) Write note on Robotic control system.

SLR-QH-542

Seat No.	

Set P

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
Cyber Security - Cyber Forensic (BTN06616)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of Page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the given options. 14

1) What does cyber security protect?
a) Cyber security protects criminals
b) Cyber security protects internet-connected systems
c) Cyber security protects hackers
d) None of the mentioned

2) Which of the following do cyber attackers commonly target for fetching the IP address of a victim user?
a) IP tracker b) Emails
c) Websites d) Web pages

3) Password cracking is a major part of which hacking methodology?
a) System hacking b) Social engineering
c) Network mapping d) Data mining

4) Which of the following is true about Trojan horse?
a) They replicate themselves
b) They disguise themselves as legitimate software to perform malicious actions
c) They are always detected by antivirus software
d) They only affect mobile devices

5) What is an SQL Injection attack?
a) Injecting viruses into a database
b) Inserting malicious SQL statements into an entry field to manipulate a database
c) Encrypting SQL databases
d) Deleting all SQL databases

6) What is the primary reason cybercrime poses a unique challenge for law enforcement?
   a) It is always committed by minors
   b) it requires no technical knowledge
   c) It often crosses international borders and involves complex technology
   d) It only happens in developed countries

7) What is the purpose of a digital signature under the Indian IT Act?
   a) To encrypt emails only
   b) To authenticate the origin and ensure the integrity of electronic documents
   c) To block websites
   d) To create viruses

8) Which of the following best describes digital forensics science?
   a) The study of computer programming languages
   b) The process of identifying, preserving, analyzing, and documenting digital evidence
   c) The creation of new encryption algorithms
   d) The management of physical crime scenes

9) Which of the following is the correct order of the digital forensics life cycle?
   a) Identification, Preservation, Collection, Examination, Analysis, Presentation, Documentation
   b) Collection, Analysis, Identification, Preservation, Documentation, Presentation, Examination
   c) Documentation, Collection, Identification, Analysis, Examination, Preservation, Presentation
   d) Analysis, Collection, Documentation, Examination, Identification, Presentation, Preservation

10) Why is preparation and authorization important before starting a network forensic investigation?
   a) To ensure legal compliance and proper access to data
   b) To speed up the process
   c) To avoid documentation
   d) To delete irrelevant logs

11) What are “class characteristics” in network forensic evidence?
   a) Features unique to a single device
   b) General attributes shared by a group of devices or data packets
   c) Only timestamps
   d) Passwords

12) Which of the following is NOT typically included in mobile device forensics?
a) Acquiring deleted SMS messages
b) Recovering call logs
c) Designing new mobile operating systems
d) Extracting geolocation data

13) Why is mobile forensics increasingly important for investigators?
a) Mobile devices rarely store user data
b) Mobile devices are now central to communication and often contain critical evidence
c) Mobile devices are not used in crimes
d) Mobile devices cannot be analyzed

14) What is a major technical challenge in mobile device forensics?
a) All devices use the same file system and connectors
b) Rapidly changing device models, operating systems, and storage methods
c) Devices are never encrypted
d) All data is always accessible

SLR-QH-542

Seat No.	

Set P

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
Cyber Security - Cyber Forensic (BTN06616)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt Any Four. **16**

a) Differentiate between cyber-dependent and cyber-enabled crimes.

b) What is social engineering, and how is it used in planning cybercrimes?

c) What is a proxy server? State two uses of proxy servers in cyber security.

d) What is a keylogger? How can it be used in cybercrime?

e) Briefly describe the role of international legal frameworks in combating cybercrime.

Q.3 Attempt Any Two. **12**

a) Analyze the evolution of cybercriminal profiles from early hackers to modern cybercrime syndicates.

b) Explain the role of backdoors in targeted attacks and discuss methods to detect and prevent them.

c) Discuss with examples how cyber law protects individuals and organizations in India.

SECTION – II

Q.4 Attempt Any Four. **16**

a) State the motivations for computer intrusion or theft of information in contemporary society.

b) What is digital evidence? Give two examples.

c) List any two challenges faced by forensic investigators when handling digital evidence.

d) Differentiate between class and individual characteristics in network evidence.

e) List any four key hardware or software characteristics of modern cell phones relevant to forensics.

Q.5 Attempt Any Two. **12**

a) Explain the need for computer forensics in combating cybercrime, with examples.

b) Explain the differences between computer forensics and network forensics in terms of data focus and investigation approach.

c) Discuss how the proliferation of smartphones has influenced the field of digital forensics.

Seat No.	

Set **Q**

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
Cyber Security - Cyber Forensic (BTN06616)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the given options. 14

1) Which of the following best describes digital forensics science?
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b) Collection, Analysis, Identification, Preservation, Documentation, Presentation, Examination
c) Documentation, Collection, Identification, Analysis, Examination, Preservation, Presentation
d) Analysis, Collection, Documentation, Examination, Identification, Presentation, Preservation

3) Why is preparation and authorization important before starting a network forensic investigation?
a) To ensure legal compliance and proper access to data
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c) To avoid documentation
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12) What is an SQL Injection attack?
   a) Injecting viruses into a database
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13) What is the primary reason cybercrime poses a unique challenge for law enforcement?
   a) It is always committed by minors
   b) it requires no technical knowledge
   c) It often crosses international borders and involves complex technology
   d) It only happens in developed countries

14) What is the purpose of a digital signature under the Indian IT Act?
   a) To encrypt emails only
   b) To authenticate the origin and ensure the integrity of electronic documents
   c) To block websites
   d) To create viruses

SLR-QH-542

Seat No.	

Set Q

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
Cyber Security - Cyber Forensic (BTN06616)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt Any Four. **16**

a) Differentiate between cyber-dependent and cyber-enabled crimes.

b) What is social engineering, and how is it used in planning cybercrimes?

c) What is a proxy server? State two uses of proxy servers in cyber security.

d) What is a keylogger? How can it be used in cybercrime?

e) Briefly describe the role of international legal frameworks in combating cybercrime.

Q.3 Attempt Any Two. **12**

a) Analyze the evolution of cybercriminal profiles from early hackers to modern cybercrime syndicates.

b) Explain the role of backdoors in targeted attacks and discuss methods to detect and prevent them.

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SECTION – II

Q.4 Attempt Any Four. **16**

a) State the motivations for computer intrusion or theft of information in contemporary society.

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e) List any four key hardware or software characteristics of modern cell phones relevant to forensics.

Q.5 Attempt Any Two. **12**

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Seat No.	

Set **R**

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
Cyber Security - Cyber Forensic (BTN06616)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the given options. 14

1) What are "class characteristics" in network forensic evidence?
a) Features unique to a single device
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c) Only timestamps
d) Passwords

2) Which of the following is NOT typically included in mobile device forensics?
a) Acquiring deleted SMS messages
b) Recovering call logs
c) Designing new mobile operating systems
d) Extracting geolocation data

3) Why is mobile forensics increasingly important for investigators?
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c) Documentation, Collection, Identification, Analysis, Examination, Preservation, Presentation
d) Analysis, Collection, Documentation, Examination, Identification, Presentation, Preservation

14) Why is preparation and authorization important before starting a network forensic investigation?

a) To ensure legal compliance and proper access to data
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c) To avoid documentation
d) To delete irrelevant logs

SLR-QH-542

Seat No.	

Set R

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
Cyber Security - Cyber Forensic (BTN06616)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

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b) Explain the role of backdoors in targeted attacks and discuss methods to detect and prevent them.

c) Discuss with examples how cyber law protects individuals and organizations in India.

SECTION – II

Q.4 Attempt Any Four. **16**

a) State the motivations for computer intrusion or theft of information in contemporary society.

b) What is digital evidence? Give two examples.

c) List any two challenges faced by forensic investigators when handling digital evidence.

d) Differentiate between class and individual characteristics in network evidence.

e) List any four key hardware or software characteristics of modern cell phones relevant to forensics.

Q.5 Attempt Any Two. **12**

a) Explain the need for computer forensics in combating cybercrime, with examples.

b) Explain the differences between computer forensics and network forensics in terms of data focus and investigation approach.

c) Discuss how the proliferation of smartphones has influenced the field of digital forensics.

SLR-QH-542

Seat No.	

Set S

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
Cyber Security - Cyber Forensic (BTN06616)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of Page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the given options. 14

1) What is the primary reason cybercrime poses a unique challenge for law enforcement?
a) It is always committed by minors
b) it requires no technical knowledge
c) It often crosses international borders and involves complex technology
d) It only happens in developed countries

2) What is the purpose of a digital signature under the Indian IT Act?
a) To encrypt emails only
b) To authenticate the origin and ensure the integrity of electronic documents
c) To block websites
d) To create viruses

3) Which of the following best describes digital forensics science?
a) The study of computer programming languages
b) The process of identifying, preserving, analyzing, and documenting digital evidence
c) The creation of new encryption algorithms
d) The management of physical crime scenes

4) Which of the following is the correct order of the digital forensics life cycle?
   a) Identification, Preservation, Collection, Examination, Analysis, Presentation, Documentation
   b) Collection, Analysis, Identification, Preservation, Documentation, Presentation, Examination
   c) Documentation, Collection, Identification, Analysis, Examination, Preservation, Presentation
   d) Analysis, Collection, Documentation, Examination, Identification, Presentation, Preservation

5) Why is preparation and authorization important before starting a network forensic investigation?
   a) To ensure legal compliance and proper access to data
   b) To speed up the process
   c) To avoid documentation
   d) To delete irrelevant logs

6) What are “class characteristics” in network forensic evidence?
   a) Features unique to a single device
   b) General attributes shared by a group of devices or data packets
   c) Only timestamps
   d) Passwords

7) Which of the following is NOT typically included in mobile device forensics?
   a) Acquiring deleted SMS messages
   b) Recovering call logs
   c) Designing new mobile operating systems
   d) Extracting geolocation data

8) Why is mobile forensics increasingly important for investigators?
   a) Mobile devices rarely store user data
   b) Mobile devices are now central to communication and often contain critical evidence
   c) Mobile devices are not used in crimes
   d) Mobile devices cannot be analyzed

9) What is a major technical challenge in mobile device forensics?
   a) All devices use the same file system and connectors
   b) Rapidly changing device models, operating systems, and storage methods
   c) Devices are never encrypted
   d) All data is always accessible

10) What does cyber security protect?
a) Cyber security protects criminals
b) Cyber security protects internet-connected systems
c) Cyber security protects hackers
d) None of the mentioned

11) Which of the following do cyber attackers commonly target for fetching the IP address of a victim user?
a) IP tracker
b) Emails
c) Websites
d) Web pages

12) Password cracking is a major part of which hacking methodology?
a) System hacking
b) Social engineering
c) Network mapping
d) Data mining

13) Which of the following is true about Trojan horse?
a) They replicate themselves
b) They disguise themselves as legitimate software to perform malicious actions
c) They are always detected by antivirus software
d) They only affect mobile devices

14) What is an SQL Injection attack?
a) Injecting viruses into a database
b) Inserting malicious SQL statements into an entry field to manipulate a database
c) Encrypting SQL databases
d) Deleting all SQL databases

SLR-QH-542

Seat No.		Set	S

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
Cyber Security - Cyber Forensic (BTN06616)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt Any Four. **16**

a) Differentiate between cyber-dependent and cyber-enabled crimes.

b) What is social engineering, and how is it used in planning cybercrimes?

c) What is a proxy server? State two uses of proxy servers in cyber security.

d) What is a keylogger? How can it be used in cybercrime?

e) Briefly describe the role of international legal frameworks in combating cybercrime.

Q.3 Attempt Any Two. **12**

a) Analyze the evolution of cybercriminal profiles from early hackers to modern cybercrime syndicates.

b) Explain the role of backdoors in targeted attacks and discuss methods to detect and prevent them.

c) Discuss with examples how cyber law protects individuals and organizations in India.

SECTION – II

Q.4 Attempt Any Four. **16**

a) State the motivations for computer intrusion or theft of information in contemporary society.

b) What is digital evidence? Give two examples.

c) List any two challenges faced by forensic investigators when handling digital evidence.

d) Differentiate between class and individual characteristics in network evidence.

e) List any four key hardware or software characteristics of modern cell phones relevant to forensics.

Q.5 Attempt Any Two. **12**

a) Explain the need for computer forensics in combating cybercrime, with examples.

b) Explain the differences between computer forensics and network forensics in terms of data focus and investigation approach.

c) Discuss how the proliferation of smartphones has influenced the field of digital forensics.

SLR-QH-543

Seat No.	

Set P

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
Data Science Machine Learning (BTN06613)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose correct option. **14**

1) What is the term known as on which the machine learning algorithms build a model based on sample data?
a) Data training b) Training data
c) Transfer data d) None of the above

2) Which of the following machine learning algorithm is based upon the idea of bagging?
a) Decision tree b) Classification
c) Regression d) Random Forest

3) What is called the average squared difference between classifier predicted output and actual output?
a) Mean relative error b) Mean squared error
c) Mean absolute error d) Root mean squared error

4) In following type of feature selection method we start with empty feature set _____.
a) Forward feature selection b) Backward feature selection
c) Both a) and b) d) None of the above

5) A feature F1 can take certain value: A, B, C, D, E, & F and represents grade of students from a college. Here feature type is _____.
a) Nominal b) Ordinal
c) Categorical d) Boolean

6) _____ is the machine learning algorithms that can be used with labeled data.
a) Regression algorithms b) Clustering algorithms
c) Association algorithms d) All of the above

7) Which of the following is FALSE about Deep Learning and Machine Learning algorithms?
   a) Deep learning algorithms work efficiently on a high amount of data
   b) Feature Extraction needs to be done manually in both ML and DL algorithms
   c) Deep Learning algorithms are best suited for unstructured data
   d) Deep Learning algorithms require high computational power

8) When performing regression or classification which of the following is the correct way to preprocess the data?
   a) Normalize the data ---PCA ---Training
   b) PCA --- Normalize PCA output ---Training
   c) Normalize the data --- PCA --- Normalize PCA output ---Training
   d) None of the Above

9) The most widely used metrics and tools to access a classification model are _____.
   a) Confusion Matrix
   b) Cost Sensitive accuracy
   c) Area under the ROC curve
   d) All of the above

10) What is over fitting?
   a) Poor result in Training and poor result in test
   b) Great result in Training and poor result in test
   c) Great result in Training and Great result in test
   d) Poor result in Training and Great result in test

11) What is Perceptron?
   a) A single layer feed-forward neural network with pre-processing
   b) A neural network that contains feedback
   c) A double layer auto-associative neural network
   d) An auto-associative neural network

12) What is back propagation?
   a) It is another name given to the curvy function in the Perceptron
   b) It is the transmission of error back through the network to allow weights to be adjusted so that the network can learn
   c) Both a) and b)
   d) None of the above

13) Which of the following is the disadvantage of Decision Tree?
   a) Factor Analysis
   b) Decision tree are robust to outliers
   c) Decision tree are prone to be over fit
   d) None of the above

14) Disadvantages of Naïve Bayes Classifier _____.

a) Naive Bayes assumes that all features are independent or unrelated, so it cannot learn the relationship between
b) It performs well in Multi-class predictions as compared to the other
c) Naïve Bayes is one of the fast and easy ML algorithms to predict a class of
d) It is the most popular choice for text classification problems

SLR-QH-543

Seat No.	

Set P

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Data Science Machine Learning (BTN06613)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Solve Any Four of the following. **16**

a) What is Machine Learning? Give examples of Machine Learning Problem.

b) Explain Predictive and descriptive tasks.

c) Explain Reinforcement learning with examples.

d) Explain Feature construction and Transformation.

e) What is hypothesis space and inductive bias?

Q.3 Solve Any Two of the following. **12**

a) Differentiate between Machine Learning and Deep Learning.

b) Explain in detail about accessing Performance of Regression and Classification.

c) What is the Linear Regression Algorithm? How does Linear Regression work?

SECTION – II

Q.4 Solve Any Four of the following. **16**

a) What are Neural network Elements? Explain Basic Perceptron.

b) Explain the types of activation functions in ANN.

c) What is Deep learning? Explain about it.

d) Explain nearest neighbor classification with Examples.

e) What is the Association rule in ML explain with an example?

Q.5 Solve Any Two of the following. **12**

a) Explain Feed forward Network and Back Propagation Algorithm with examples.

b) Explain Image and Speech Recognition.

c) Explain the two Hierarchical Clustering techniques.

SLR-QH-543

Seat No.	

Set Q

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
Data Science Machine Learning (BTN06613)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose correct option. **14**

1) When performing regression or classification which of the following is the correct way to preprocess the data?
a) Normalize the data ---PCA ---Training
b) PCA --- Normalize PCA output ---Training
c) Normalize the data --- PCA --- Normalize PCA output ---Training
d) None of the Above

2) The most widely used metrics and tools to access a classification model are _____.
a) Confusion Matrix b) Cost Sensitive accuracy
c) Area under the ROC curve d) All of the above

3) What is over fitting?
a) Poor result in Training and poor result in test
b) Great result in Training and poor result in test
c) Great result in Training and Great result in test
d) Poor result in Training and Great result in test

4) What is Perceptron?
a) A single layer feed-forward neural network with pre-processing
b) A neural network that contains feedback
c) A double layer auto-associative neural network
d) An auto-associative neural network

5) What is back propagation?
a) It is another name given to the curvy function in the Perceptron
b) It is the transmission of error back through the network to allow weights to be adjusted so that the network can learn
c) Both a) and b)
d) None of the above

6) Which of the following is the disadvantage of Decision Tree?
   a) Factor Analysis
   b) Decision tree are robust to outliers
   c) Decision tree are prone to be over fit
   d) None of the above

7) Disadvantages of Naïve Bayes Classifier _____.
   a) Naive Bayes assumes that all features are independent or unrelated, so it cannot learn the relationship between
   b) It performs well in Multi-class predictions as compared to the other
   c) Naïve Bayes is one of the fast and easy ML algorithms to predict a class of
   d) It is the most popular choice for text classification problems

8) What is the term known as on which the machine learning algorithms build a model based on sample data?
   a) Data training
   b) Training data
   c) Transfer data
   d) None of the above

9) Which of the following machine learning algorithm is based upon the idea of bagging?
   a) Decision tree
   b) Classification
   c) Regression
   d) Random Forest

10) What is called the average squared difference between classifier predicted output and actual output?
   a) Mean relative error
   b) Mean squared error
   c) Mean absolute error
   d) Root mean squared error

11) In following type of feature selection method we start with empty feature set _____.
   a) Forward feature selection
   b) Backward feature selection
   c) Both a) and b)
   d) None of the above

12) A feature F1 can take certain value: A, B, C, D, E, & F and represents grade of students from a college. Here feature type is _____.
   a) Nominal
   b) Ordinal
   c) Categorical
   d) Boolean

13) _____ is the machine learning algorithms that can be used with labeled data.
   a) Regression algorithms
   b) Clustering algorithms
   c) Association algorithms
   d) All of the above

14) Which of the following is FALSE about Deep Learning and Machine Learning algorithms?

a) Deep learning algorithms work efficiently on a high amount of data
b) Feature Extraction needs to be done manually in both ML and DL algorithms
c) Deep Learning algorithms are best suited for unstructured data
d) Deep Learning algorithms require high computational power

SLR-QH-543

Seat No.	

Set Q

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Data Science Machine Learning (BTN06613)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Solve Any Four of the following. **16**

a) What is Machine Learning? Give examples of Machine Learning Problem.

b) Explain Predictive and descriptive tasks.

c) Explain Reinforcement learning with examples.

d) Explain Feature construction and Transformation.

e) What is hypothesis space and inductive bias?

Q.3 Solve Any Two of the following. **12**

a) Differentiate between Machine Learning and Deep Learning.

b) Explain in detail about accessing Performance of Regression and Classification.

c) What is the Linear Regression Algorithm? How does Linear Regression work?

SECTION – II

Q.4 Solve Any Four of the following. **16**

a) What are Neural network Elements? Explain Basic Perceptron.

b) Explain the types of activation functions in ANN.

c) What is Deep learning? Explain about it.

d) Explain nearest neighbor classification with Examples.

e) What is the Association rule in ML explain with an example?

Q.5 Solve Any Two of the following. **12**

a) Explain Feed forward Network and Back Propagation Algorithm with examples.

b) Explain Image and Speech Recognition.

c) Explain the two Hierarchical Clustering techniques.

SLR-QH-543

Seat No.	

Set | **R**

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
Data Science Machine Learning (BTN06613)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose correct option. **14**

1) What is Perceptron?
a) A single layer feed-forward neural network with pre-processing
b) A neural network that contains feedback
c) A double layer auto-associative neural network
d) An auto-associative neural network

2) What is back propagation?
a) It is another name given to the curvy function in the Perceptron
b) It is the transmission of error back through the network to allow weights to be adjusted so that the network can learn
c) Both a) and b)
d) None of the above

3) Which of the following is the disadvantage of Decision Tree?
a) Factor Analysis
b) Decision tree are robust to outliers
c) Decision tree are prone to be over fit
d) None of the above

4) Disadvantages of Naïve Bayes Classifier _____.
a) Naive Bayes assumes that all features are independent or unrelated, so it cannot learn the relationship between
b) It performs well in Multi-class predictions as compared to the other
c) Naïve Bayes is one of the fast and easy ML algorithms to predict a class of
d) It is the most popular choice for text classification problems

5) What is the term known as on which the machine learning algorithms build a model based on sample data?
   a) Data training
   b) Training data
   c) Transfer data
   d) None of the above

6) Which of the following machine learning algorithm is based upon the idea of bagging?
   a) Decision tree
   b) Classification
   c) Regression
   d) Random Forest

7) What is called the average squared difference between classifier predicted output and actual output?
   a) Mean relative error
   b) Mean squared error
   c) Mean absolute error
   d) Root mean squared error

8) In following type of feature selection method we start with empty feature set _____.
   a) Forward feature selection
   b) Backward feature selection
   c) Both a) and b)
   d) None of the above

9) A feature F1 can take certain value: A, B, C, D, E, & F and represents grade of students from a college. Here feature type is _____.
   a) Nominal
   b) Ordinal
   c) Categorical
   d) Boolean

10) _____ is the machine learning algorithms that can be used with labeled data.
   a) Regression algorithms
   b) Clustering algorithms
   c) Association algorithms
   d) All of the above

11) Which of the following is FALSE about Deep Learning and Machine Learning algorithms?
   a) Deep learning algorithms work efficiently on a high amount of data
   b) Feature Extraction needs to be done manually in both ML and DL algorithms
   c) Deep Learning algorithms are best suited for unstructured data
   d) Deep Learning algorithms require high computational power

12) When performing regression or classification which of the following is the correct way to preprocess the data?
   a) Normalize the data ---PCA ---Training
   b) PCA --- Normalize PCA output ---Training
   c) Normalize the data --- PCA --- Normalize PCA output ---Training
   d) None of the Above

13) The most widely used metrics and tools to access a classification model are _____.

a) Confusion Matrix
b) Cost Sensitive accuracy
c) Area under the ROC curve
d) All of the above

14) What is over fitting?

a) Poor result in Training and poor result in test
b) Great result in Training and poor result in test
c) Great result in Training and Great result in test
d) Poor result in Training and Great result in test

SLR-QH-543

Seat No.	

Set R

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Data Science Machine Learning (BTN06613)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Solve Any Four of the following. **16**

a) What is Machine Learning? Give examples of Machine Learning Problem.

b) Explain Predictive and descriptive tasks.

c) Explain Reinforcement learning with examples.

d) Explain Feature construction and Transformation.

e) What is hypothesis space and inductive bias?

Q.3 Solve Any Two of the following. **12**

a) Differentiate between Machine Learning and Deep Learning.

b) Explain in detail about accessing Performance of Regression and Classification.

c) What is the Linear Regression Algorithm? How does Linear Regression work?

SECTION – II

Q.4 Solve Any Four of the following. **16**

a) What are Neural network Elements? Explain Basic Perceptron.

b) Explain the types of activation functions in ANN.

c) What is Deep learning? Explain about it.

d) Explain nearest neighbor classification with Examples.

e) What is the Association rule in ML explain with an example?

Q.5 Solve Any Two of the following. **12**

a) Explain Feed forward Network and Back Propagation Algorithm with examples.

b) Explain Image and Speech Recognition.

c) Explain the two Hierarchical Clustering techniques.

SLR-QH-543

Seat No.	

Set S

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April - 2026
Data Science Machine Learning (BTN06613)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose correct option. **14**

1) _____ is the machine learning algorithms that can be used with labeled data.
a) Regression algorithms b) Clustering algorithms
c) Association algorithms d) All of the above

2) Which of the following is FALSE about Deep Learning and Machine Learning algorithms?
a) Deep learning algorithms work efficiently on a high amount of data
b) Feature Extraction needs to be done manually in both ML and DL algorithms
c) Deep Learning algorithms are best suited for unstructured data
d) Deep Learning algorithms require high computational power

3) When performing regression or classification which of the following is the correct way to preprocess the data?
a) Normalize the data ---PCA ---Training
b) PCA --- Normalize PCA output ---Training
c) Normalize the data --- PCA --- Normalize PCA output ---Training
d) None of the Above

4) The most widely used metrics and tools to access a classification model are _____.
a) Confusion Matrix b) Cost Sensitive accuracy
c) Area under the ROC curve d) All of the above

5) What is over fitting?
   a) Poor result in Training and poor result in test
   b) Great result in Training and poor result in test
   c) Great result in Training and Great result in test
   d) Poor result in Training and Great result in test

6) What is Perceptron?
   a) A single layer feed-forward neural network with pre-processing
   b) A neural network that contains feedback
   c) A double layer auto-associative neural network
   d) An auto-associative neural network

7) What is back propagation?
   a) It is another name given to the curvy function in the Perceptron
   b) It is the transmission of error back through the network to allow weights to be adjusted so that the network can learn
   c) Both a) and b)
   d) None of the above

8) Which of the following is the disadvantage of Decision Tree?
   a) Factor Analysis
   b) Decision tree are robust to outliers
   c) Decision tree are prone to be over fit
   d) None of the above

9) Disadvantages of Naïve Bayes Classifier _____.
   a) Naive Bayes assumes that all features are independent or unrelated, so it cannot learn the relationship between
   b) It performs well in Multi-class predictions as compared to the other
   c) Naïve Bayes is one of the fast and easy ML algorithms to predict a class of
   d) It is the most popular choice for text classification problems

10) What is the term known as on which the machine learning algorithms build a model based on sample data?
   a) Data training
   b) Training data
   c) Transfer data
   d) None of the above

11) Which of the following machine learning algorithm is based upon the idea of bagging?
   a) Decision tree
   b) Classification
   c) Regression
   d) Random Forest

12) What is called the average squared difference between classifier predicted output and actual output?
   a) Mean relative error
   b) Mean squared error
   c) Mean absolute error
   d) Root mean squared error

13) In following type of feature selection method we start with empty feature set _____.

a) Forward feature selection
b) Backward feature selection
c) Both a) and b)
d) None of the above

14) A feature F1 can take certain value: A, B, C, D, E, & F and represents grade of students from a college. Here feature type is _____.

a) Nominal
b) Ordinal
c) Categorical
d) Boolean

SLR-QH-543

Seat No.		Set	S

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Data Science Machine Learning (BTN06613)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Solve Any Four of the following. **16**

a) What is Machine Learning? Give examples of Machine Learning Problem.

b) Explain Predictive and descriptive tasks.

c) Explain Reinforcement learning with examples.

d) Explain Feature construction and Transformation.

e) What is hypothesis space and inductive bias?

Q.3 Solve Any Two of the following. **12**

a) Differentiate between Machine Learning and Deep Learning.

b) Explain in detail about accessing Performance of Regression and Classification.

c) What is the Linear Regression Algorithm? How does Linear Regression work?

SECTION – II

Q.4 Solve Any Four of the following. **16**

a) What are Neural network Elements? Explain Basic Perceptron.

b) Explain the types of activation functions in ANN.

c) What is Deep learning? Explain about it.

d) Explain nearest neighbor classification with Examples.

e) What is the Association rule in ML explain with an example?

Q.5 Solve Any Two of the following. **12**

a) Explain Feed forward Network and Back Propagation Algorithm with examples.

b) Explain Image and Speech Recognition.

c) Explain the two Hierarchical Clustering techniques.

SLR-QH-544

Seat No.	

Set P

Fourth. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Microwave Engineering (BTN06701)

Day & Date: Saturday, 02-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no. 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct option. 14

1) The dominant mode in rectangular waveguide is _____.
a) TE10 b) TE11
c) TE01 d) TE12

2) The waveguide can be considered as _____.
a) low pass filter b) high pass filter
c) band pass filter d) notch filter

3) E-plane Tee is called _____.
a) Current divider b) Power device
c) 3 dB splitter d) Reciprocal device

4) Circulator and Isolator works on the principle of _____.
a) Faraday's rod b) Faraday's Rotation
c) Reciprocity theorem d) None of these

5) In case of directional coupler amount of coupling is decided by _____.
a) Hole dimensions b) Number of holes
c) Both of these d) None of these

6) Due to _____ property of microwaves it can be used in radar.
a) heating b) absorption
c) penetration d) directive

7) In reflex klystron as repeller voltage is increases output power _____.
a) remains constant b) increases
c) decreases d) None of these

8) PIN diode is _____ type solid state device.
a) Non-linear reactance
b) Non-linear resistance
c) Controllable impedance
d) Negative resistance

9) High power measurement can be done by _____ technique.
a) Balometer
b) Thermister
c) Special load
d) Calorimetric wattmeter

10) In TWT electron beam is _____ and RF field is _____.
a) Travelling, Stationary
b) Stationary, Stationary
c) Travelling, Travelling
d) Stationary, Travelling

11) In case of 2 cavity Klystron at the output cavity _____ modulation takes place.
a) Velocity
b) Current
c) Bunching
d) Catching

12) The _____ attenuation measurement technique is more accurate.
a) Power Ratio Method
b) Double minima method
c) Using Slotted line
d) RF substitution method

13) In a negative resistance of TED's the current and voltage are _____.
a) Out of phase
b) In phase
c) Out of phase by 180 deg.
d) None of these

14) Reflex klystron is _____ microwave generator.
a) single cavity variable freq.
b) single cavity constant freq.
c) two cavity variable freq.
d) two cavity constant freq.

Seat No.	

Set **P**

Fourth. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Microwave Engineering (BTN06701)

Day & Date: Saturday, 02-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

Section – I

Q.2 Attempt any THREE. **12**

a) Given rectangular waveguide 3×1cm operating at 9GHz. Calculate cut off wavelength and guide wavelength for TE10 mode.

b) Draw and explain Faraday's four port circulator.

c) Draw a neat diagram of magic TEE. Explain it's working.

d) What is significance of S matrix? List properties of S matrix.

Q.3 Attempt any TWO. **16**

a) What is Faraday's rotation? Explain working of Isolator with a neat phasor diagram.

b) Derive 'S' matrix for H plane tee. Explain why it is called 3dB splitter.

c) An air-filled rectangular waveguide has dimensions 2.5 × 5 cm. The signal wavelength is 4.5cm. Compute the following for TE10 mode.
i) Cut-off frequency
ii) Wavelength in the waveguide
iii) Phase velocity in the waveguide
iv) Group velocity in the waveguide

Section – II

Q.4 Answer any THREE. **12**

a) With the help of block diagram explain phase shift measurement technique.

b) With the help of two valley theory explain in detail Gunn diode.

c) In two cavity Klystron explain velocity modulation process.

d) Write similarities and differences between two cavity Klystron and TWT.

Q.5 Answer any TWO. **16**

a) With the help of block diagram explain power ratio method for measurement of attenuation. What are the limitations of this method? Also explain RF substitution method for measurement of attenuation.

b) What are TEDs? Explain IMPATT and TRAPATT diodes.

c) With the help of neat diagram explain zero mode and pi mode of magnetron.

Seat No.	

Set **Q**

Fourth. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Microwave Engineering (BTN06701)

Day & Date: Saturday, 02-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no. 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct option. 14

1) PIN diode is _____ type solid state device.
a) Non-linear reactance b) Non-linear resistance
c) Controllable impedance d) Negative resistance

2) High power measurement can be done by _____ technique.
a) Balometer b) Thermister
c) Special load d) Calorimetric wattmeter

3) In TWT electron beam is _____ and RF field is _____.
a) Travelling, Stationary b) Stationary, Stationary
c) Travelling, Travelling d) Stationary, Travelling

4) In case of 2 cavity Klystron at the output cavity _____ modulation takes place.
a) Velocity b) Current
c) Bunching d) Catching

5) The _____ attenuation measurement technique is more accurate.
a) Power Ratio Method b) Double minima method
c) Using Slotted line d) RF substitution method

6) In a negative resistance of TED's the current and voltage are _____.
a) Out of phase b) In phase
c) Out of phase by 180 deg. d) None of these

7) Reflex klystron is _____ microwave generator.
a) single cavity variable freq. b) single cavity constant freq.
c) two cavity variable freq. d) two cavity constant freq.

8) The dominant mode in rectangular waveguide is _____.
a) TE10 b) TE11
c) TE01 d) TE12

9) The waveguide can be considered as _____.
a) low pass filter b) high pass filter
c) band pass filter d) notch filter

10) E-plane Tee is called _____.
a) Current divider b) Power device
c) 3 dB splitter d) Reciprocal device

11) Circulator and Isolator works on the principle of _____.
a) Faraday's rod b) Faraday's Rotation
c) Reciprocity theorem d) None of these

12) In case of directional coupler amount of coupling is decided by _____.
a) Hole dimensions b) Number of holes
c) Both of these d) None of these

13) Due to _____ property of microwaves it can be used in radar.
a) heating b) absorption
c) penetration d) directive

14) In reflex klystron as repeller voltage is increases output power _____.
a) remains constant b) increases
c) decreases d) None of these

Seat No.	

Set **Q**

Fourth. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Microwave Engineering (BTN06701)

Day & Date: Saturday, 02-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

Section – I

Q.2 Attempt any THREE. **12**

a) Given rectangular waveguide 3×1cm operating at 9GHz. Calculate cut off wavelength and guide wavelength for TE10 mode.

b) Draw and explain Faraday's four port circulator.

c) Draw a neat diagram of magic TEE. Explain it's working.

d) What is significance of S matrix? List properties of S matrix.

Q.3 Attempt any TWO. **16**

a) What is Faraday's rotation? Explain working of Isolator with a neat phasor diagram.

b) Derive 'S' matrix for H plane tee. Explain why it is called 3dB splitter.

c) An air-filled rectangular waveguide has dimensions 2.5 × 5 cm. The signal wavelength is 4.5cm. Compute the following for TE10 mode.
i) Cut-off frequency
ii) Wavelength in the waveguide
iii) Phase velocity in the waveguide
iv) Group velocity in the waveguide

Section – II

Q.4 Answer any THREE. **12**

a) With the help of block diagram explain phase shift measurement technique.

b) With the help of two valley theory explain in detail Gunn diode.

c) In two cavity Klystron explain velocity modulation process.

d) Write similarities and differences between two cavity Klystron and TWT.

Q.5 Answer any TWO. **16**

a) With the help of block diagram explain power ratio method for measurement of attenuation. What are the limitations of this method? Also explain RF substitution method for measurement of attenuation.

b) What are TEDs? Explain IMPATT and TRAPATT diodes.

c) With the help of neat diagram explain zero mode and pi mode of magnetron.

Seat No.	

Set **R**

Fourth. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Microwave Engineering (BTN06701)

Day & Date: Saturday, 02-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no. 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct option. 14

1) In case of 2 cavity Klystron at the output cavity _____ modulation takes place.
a) Velocity b) Current
c) Bunching d) Catching

2) The _____ attenuation measurement technique is more accurate.
a) Power Ratio Method b) Double minima method
c) Using Slotted line d) RF substitution method

3) In a negative resistance of TED's the current and voltage are _____.
a) Out of phase b) In phase
c) Out of phase by 180 deg. d) None of these

4) Reflex klystron is _____ microwave generator.
a) single cavity variable freq. b) single cavity constant freq.
c) two cavity variable freq. d) two cavity constant freq.

5) The dominant mode in rectangular waveguide is _____.
a) TE10 b) TE11
c) TE01 d) TE12

6) The waveguide can be considered as _____.
a) low pass filter b) high pass filter
c) band pass filter d) notch filter

7) E-plane Tee is called _____.
a) Current divider b) Power device
c) 3 dB splitter d) Reciprocal device

8) Circulator and Isolator works on the principle of _____.
a) Faraday's rod
b) Faraday's Rotation
c) Reciprocity theorem
d) None of these

9) In case of directional coupler amount of coupling is decided by _____.
a) Hole dimensions
b) Number of holes
c) Both of these
d) None of these

10) Due to _____ property of microwaves it can be used in radar.
a) heating
b) absorption
c) penetration
d) directive

11) In reflex klystron as repeller voltage is increases output power _____.
a) remains constant
b) increases
c) decreases
d) None of these

12) PIN diode is _____ type solid state device.
a) Non-linear reactance
b) Non-linear resistance
c) Controllable impedance
d) Negative resistance

13) High power measurement can be done by _____ technique.
a) Balometer
b) Thermister
c) Special load
d) Calorimetric wattmeter

14) In TWT electron beam is _____ and RF field is _____.
a) Travelling, Stationary
b) Stationary, Stationary
c) Travelling, Travelling
d) Stationary, Travelling

Seat No.	

Set **R**

Fourth. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Microwave Engineering (BTN06701)

Day & Date: Saturday, 02-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

Section – I

Q.2 Attempt any THREE. **12**

a) Given rectangular waveguide 3×1cm operating at 9GHz. Calculate cut off wavelength and guide wavelength for TE10 mode.

b) Draw and explain Faraday's four port circulator.

c) Draw a neat diagram of magic TEE. Explain it's working.

d) What is significance of S matrix? List properties of S matrix.

Q.3 Attempt any TWO. **16**

a) What is Faraday's rotation? Explain working of Isolator with a neat phasor diagram.

b) Derive 'S' matrix for H plane tee. Explain why it is called 3dB splitter.

c) An air-filled rectangular waveguide has dimensions 2.5 × 5 cm. The signal wavelength is 4.5cm. Compute the following for TE10 mode.
i) Cut-off frequency
ii) Wavelength in the waveguide
iii) Phase velocity in the waveguide
iv) Group velocity in the waveguide

Section – II

Q.4 Answer any THREE. **12**

a) With the help of block diagram explain phase shift measurement technique.

b) With the help of two valley theory explain in detail Gunn diode.

c) In two cavity Klystron explain velocity modulation process.

d) Write similarities and differences between two cavity Klystron and TWT.

Q.5 Answer any TWO. **16**

a) With the help of block diagram explain power ratio method for measurement of attenuation. What are the limitations of this method? Also explain RF substitution method for measurement of attenuation.

b) What are TEDs? Explain IMPATT and TRAPATT diodes.

c) With the help of neat diagram explain zero mode and pi mode of magnetron.

SLR-QH-544

Seat No.	

Set S

Fourth. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Microwave Engineering (BTN06701)

Day & Date: Saturday, 02-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no. 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct option. 14

1) Due to _____ property of microwaves it can be used in radar.
a) heating b) absorption
c) penetration d) directive

2) In reflex klystron as repeller voltage is increases output power _____.
a) remains constant b) increases
c) decreases d) None of these

3) PIN diode is _____ type solid state device.
a) Non-linear reactance b) Non-linear resistance
c) Controllable impedance d) Negative resistance

4) High power measurement can be done by _____ technique.
a) Balometer b) Thermister
c) Special load d) Calorimetric wattmeter

5) In TWT electron beam is _____ and RF field is _____.
a) Travelling, Stationary b) Stationary, Stationary
c) Travelling, Travelling d) Stationary, Travelling

6) In case of 2 cavity Klystron at the output cavity _____ modulation takes place.
a) Velocity b) Current
c) Bunching d) Catching

7) The _____ attenuation measurement technique is more accurate.
a) Power Ratio Method b) Double minima method
c) Using Slotted line d) RF substitution method

8) In a negative resistance of TED's the current and voltage are _____.
a) Out of phase b) In phase
c) Out of phase by 180 deg. d) None of these

9) Reflex klystron is _____ microwave generator.
a) single cavity variable freq. b) single cavity constant freq.
c) two cavity variable freq. d) two cavity constant freq.

10) The dominant mode in rectangular waveguide is _____.
a) TE10 b) TE11
c) TE01 d) TE12

11) The waveguide can be considered as _____.
a) low pass filter b) high pass filter
c) band pass filter d) notch filter

12) E-plane Tee is called _____.
a) Current divider b) Power device
c) 3 dB splitter d) Reciprocal device

13) Circulator and Isolator works on the principle of _____.
a) Faraday's rod b) Faraday's Rotation
c) Reciprocity theorem d) None of these

14) In case of directional coupler amount of coupling is decided by _____.
a) Hole dimensions b) Number of holes
c) Both of these d) None of these

SLR-QH-544

Seat No.		Set	S

Fourth. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Microwave Engineering (BTN06701)

Day & Date: Saturday, 02-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

Section – I

Q.2 Attempt any THREE. **12**

a) Given rectangular waveguide 3×1cm operating at 9GHz. Calculate cut off wavelength and guide wavelength for TE10 mode.

b) Draw and explain Faraday's four port circulator.

c) Draw a neat diagram of magic TEE. Explain it's working.

d) What is significance of S matrix? List properties of S matrix.

Q.3 Attempt any TWO. **16**

a) What is Faraday's rotation? Explain working of Isolator with a neat phasor diagram.

b) Derive 'S' matrix for H plane tee. Explain why it is called 3dB splitter.

c) An air-filled rectangular waveguide has dimensions 2.5 × 5 cm. The signal wavelength is 4.5cm. Compute the following for TE10 mode.
i) Cut-off frequency
ii) Wavelength in the waveguide
iii) Phase velocity in the waveguide
iv) Group velocity in the waveguide

Section – II

Q.4 Answer any THREE. **12**

a) With the help of block diagram explain phase shift measurement technique.

b) With the help of two valley theory explain in detail Gunn diode.

c) In two cavity Klystron explain velocity modulation process.

d) Write similarities and differences between two cavity Klystron and TWT.

Q.5 Answer any TWO. **16**

a) With the help of block diagram explain power ratio method for measurement of attenuation. What are the limitations of this method? Also explain RF substitution method for measurement of attenuation.

b) What are TEDs? Explain IMPATT and TRAPATT diodes.

c) With the help of neat diagram explain zero mode and pi mode of magnetron.

SLR-QH-545

Seat No.	

Set P

Fourth.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Data Communication (BTN06702)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose correct option. **14**

1) While displaying a web-page, the application layer uses the _____ protocol.
a) HTTP b) FTP
c) SMTP d) None

2) In CRC generator polynomial act as _____.
a) The divisor b) The quotient
c) The dividend d) The remainder

3) A subnet mask separates _____.
a) Network ID and Host ID b) Work group from each other
c) Host ID d) All of these

4) TCP is _____ type of protocol.
a) Connection oriented b) Connectionless
c) Control d) None

5) IP Multicast uses _____ address.
a) Class A b) Class B
c) Class D d) None

6) Which is IPv4 address?
a) 311s.Parkst b) 00076A:01A5bba7ff6
c) 199.165.217.45 d) 01:A5:BB:A7:FF:60

7) The _____ layer adds a header to the packet coming from upper layer that includes the logical addresses of the sender and receiver.
a) Data-link b) Network
c) Physical d) None

8) The _____ layer enables the users to access the network.
a) Application b) Physical
c) Data-link d) Transport

9) We add r redundant bits to each block to make the length $n = k + r$. The resulting n-bits blocks are called _____.
a) Codeword b) Dataword
c) Blockword d) None of above

10) _____ does not carry any sequence no in HDLC.
a) I-frame b) U-frame
c) S-frame d) None

11) In Stop-And-Wait protocol waiting is for _____.
a) Data b) Acknowledge
c) Either a) or b) d) Neither a) or b)

12) In OSI model, which of the following is an application layer services?
a) Network virtual terminal b) File Transfer
c) Mail Services d) All the above

13) In FTP the password is send to the server using _____ command.
a) PASS b) PASSWD
c) PASSWORD d) None of these

14) IP header size is _____ long.
a) 20 to 60 bytes b) 20 bytes
c) 60 bytes d) None

Seat No.	

Set **P**

Fourth.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Data Communication (BTN06702)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Solve Any Four of the following. **16**

a) Draw and explain block diagram of MODEM.

b) Explain HDLC frame format.

c) Explain in detail any two network topologies along with its advantages and disadvantages.

d) Explain difference between Switch and Hub.

e) Explain IEEE 802.3 header format in detail.

Q.3 Solve Any Two of the following. **12**

a) Explain Pure ALOHA and Slotted ALOHA Protocol in detail.

b) Explain in brief each layer in OSI model with neat diagram.

c) Describe Stop and Wait protocol in detail with its advantages and disadvantages.

Section – II

Q.4 Solve Any Four of the following. **16**

a) Explain with suitable diagram IPV6 and compare it with IPV4.

b) Write a short note on ARP and RARP protocol.

c) Explain ICMP along with its four different message types.

d) Explain TCP header format in detail.

e) Write a short note on SMTP.

Q.5 Solve Any Two of the following. **12**

a) Write a shot note on.
i) DNS
ii) TELNET

b) Describe TCP connection establishment using Three way handshake.

c) Explain Distance vector routing with its limitations.

Seat No.	

Set **Q**

Fourth.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Data Communication (BTN06702)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose correct option. **14**

1) The _____ layer enables the users to access the network.
a) Application b) Physical
c) Data-link d) Transport

2) We add r redundant bits to each block to make the length $n = k + r$. The resulting n-bits blocks are called _____.
a) Codeword b) Dataword
c) Blockword d) None of above

3) _____ does not carry any sequence no in HDLC.
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c) S-frame d) None

4) In Stop-And-Wait protocol waiting is for _____.
a) Data b) Acknowledge
c) Either a) or b) d) Neither a) or b)

5) In OSI model, which of the following is an application layer services?
a) Network virtual terminal b) File Transfer
c) Mail Services d) All the above

6) In FTP the password is send to the server using _____ command.
a) PASS b) PASSWD
c) PASSWORD d) None of these

7) IP header size is _____ long.
a) 20 to 60 bytes b) 20 bytes
c) 60 bytes d) None

8) While displaying a web-page, the application layer uses the _____ protocol.

a) HTTP b) FTP
c) SMTP d) None

9) In CRC generator polynomial act as _____.

a) The divisor b) The quotient
c) The dividend d) The remainder

10) A subnet mask separates _____.

a) Network ID and Host ID b) Work group from each other
c) Host ID d) All of these

11) TCP is _____ type of protocol.

a) Connection oriented b) Connectionless
c) Control d) None

12) IP Multicast uses _____ address.

a) Class A b) Class B
c) Class D d) None

13) Which is IPv4 address?

a) 311s.Parkst b) 00076A:01A5bba7ff6
c) 199.165.217.45 d) 01:A5:BB:A7:FF:60

14) The _____ layer adds a header to the packet coming from upper layer that includes the logical addresses of the sender and receiver.

a) Data-link b) Network
c) Physical d) None

SLR-QH-545

Seat No.	

Set Q

Fourth.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Data Communication (BTN06702)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Solve Any Four of the following. **16**

a) Draw and explain block diagram of MODEM.

b) Explain HDLC frame format.

c) Explain in detail any two network topologies along with its advantages and disadvantages.

d) Explain difference between Switch and Hub.

e) Explain IEEE 802.3 header format in detail.

Q.3 Solve Any Two of the following. **12**

a) Explain Pure ALOHA and Slotted ALOHA Protocol in detail.

b) Explain in brief each layer in OSI model with neat diagram.

c) Describe Stop and Wait protocol in detail with its advantages and disadvantages.

Section – II

Q.4 Solve Any Four of the following. **16**

a) Explain with suitable diagram IPV6 and compare it with IPV4.

b) Write a short note on ARP and RARP protocol.

c) Explain ICMP along with its four different message types.

d) Explain TCP header format in detail.

e) Write a short note on SMTP.

Q.5 Solve Any Two of the following. **12**

a) Write a shot note on.
i) DNS
ii) TELNET

b) Describe TCP connection establishment using Three way handshake.

c) Explain Distance vector routing with its limitations.

Seat No.	

Set **R**

Fourth.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Data Communication (BTN06702)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose correct option. **14**

1) In Stop-And-Wait protocol waiting is for _____.
a) Data b) Acknowledge
c) Either a) or b) d) Neither a) or b)

2) In OSI model, which of the following is an application layer services?
a) Network virtual terminal b) File Transfer
c) Mail Services d) All the above

3) In FTP the password is send to the server using _____ command.
a) PASS b) PASSWD
c) PASSWORD d) None of these

4) IP header size is _____ long.
a) 20 to 60 bytes b) 20 bytes
c) 60 bytes d) None

5) While displaying a web-page, the application layer uses the _____ protocol.
a) HTTP b) FTP
c) SMTP d) None

6) In CRC generator polynomial act as _____.
a) The divisor b) The quotient
c) The dividend d) The remainder

7) A subnet mask separates _____.
a) Network ID and Host ID b) Work group from each other
c) Host ID d) All of these

8) TCP is _____ type of protocol.
a) Connection oriented b) Connectionless
c) Control d) None

9) IP Multicast uses _____ address.
a) Class A b) Class B
c) Class D d) None

10) Which is IPv4 address?
a) 311s.Parkst b) 00076A:01A5bba7ff6
c) 199.165.217.45 d) 01:A5:BB:A7:FF:60

11) The _____ layer adds a header to the packet coming from upper layer that includes the logical addresses of the sender and receiver.
a) Data-link b) Network
c) Physical d) None

12) The _____ layer enables the users to access the network.
a) Application b) Physical
c) Data-link d) Transport

13) We add r redundant bits to each block to make the length $n = k + r$. The resulting n-bits blocks are called _____.
a) Codeword b) Dataword
c) Blockword d) None of above

14) _____ does not carry any sequence no in HDLC.
a) I-frame b) U-frame
c) S-frame d) None

SLR-QH-545

Seat No.	

Set R

Fourth.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Data Communication (BTN06702)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Solve Any Four of the following. **16**

a) Draw and explain block diagram of MODEM.

b) Explain HDLC frame format.

c) Explain in detail any two network topologies along with its advantages and disadvantages.

d) Explain difference between Switch and Hub.

e) Explain IEEE 802.3 header format in detail.

Q.3 Solve Any Two of the following. **12**

a) Explain Pure ALOHA and Slotted ALOHA Protocol in detail.

b) Explain in brief each layer in OSI model with neat diagram.

c) Describe Stop and Wait protocol in detail with its advantages and disadvantages.

Section – II

Q.4 Solve Any Four of the following. **16**

a) Explain with suitable diagram IPV6 and compare it with IPV4.

b) Write a short note on ARP and RARP protocol.

c) Explain ICMP along with its four different message types.

d) Explain TCP header format in detail.

e) Write a short note on SMTP.

Q.5 Solve Any Two of the following. **12**

a) Write a shot note on.
i) DNS
ii) TELNET

b) Describe TCP connection establishment using Three way handshake.

c) Explain Distance vector routing with its limitations.

Seat No.	

Set **S**

Fourth.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Data Communication (BTN06702)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose correct option. **14**

1) Which is IPv4 address?
a) 311s.Parkst b) 00076A:01A5bba7ff6
c) 199.165.217.45 d) 01:A5:BB:A7:FF:60

2) The _____ layer adds a header to the packet coming from upper layer that includes the logical addresses of the sender and receiver.
a) Data-link b) Network
c) Physical d) None

3) The _____ layer enables the users to access the network.
a) Application b) Physical
c) Data-link d) Transport

4) We add r redundant bits to each block to make the length $n = k + r$. The resulting n-bits blocks are called _____.
a) Codeword b) Dataword
c) Blockword d) None of above

5) _____ does not carry any sequence no in HDLC.
a) I-frame b) U-frame
c) S-frame d) None

6) In Stop-And-Wait protocol waiting is for _____.
a) Data b) Acknowledge
c) Either a) or b) d) Neither a) or b)

7) In OSI model, which of the following is an application layer services?
a) Network virtual terminal b) File Transfer
c) Mail Services d) All the above

8) In FTP the password is send to the server using _____ command.
a) PASS b) PASSWD
c) PASSWORD d) None of these

9) IP header size is _____ long.
a) 20 to 60 bytes b) 20 bytes
c) 60 bytes d) None

10) While displaying a web-page, the application layer uses the _____ protocol.
a) HTTP b) FTP
c) SMTP d) None

11) In CRC generator polynomial act as _____.
a) The divisor b) The quotient
c) The dividend d) The remainder

12) A subnet mask separates _____.
a) Network ID and Host ID b) Work group from each other
c) Host ID d) All of these

13) TCP is _____ type of protocol.
a) Connection oriented b) Connectionless
c) Control d) None

14) IP Multicast uses _____ address.
a) Class A b) Class B
c) Class D d) None

SLR-QH-545

Seat No.	

Set S

Fourth.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Data Communication (BTN06702)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Solve Any Four of the following. **16**

a) Draw and explain block diagram of MODEM.

b) Explain HDLC frame format.

c) Explain in detail any two network topologies along with its advantages and disadvantages.

d) Explain difference between Switch and Hub.

e) Explain IEEE 802.3 header format in detail.

Q.3 Solve Any Two of the following. **12**

a) Explain Pure ALOHA and Slotted ALOHA Protocol in detail.

b) Explain in brief each layer in OSI model with neat diagram.

c) Describe Stop and Wait protocol in detail with its advantages and disadvantages.

Section – II

Q.4 Solve Any Four of the following. **16**

a) Explain with suitable diagram IPV6 and compare it with IPV4.

b) Write a short note on ARP and RARP protocol.

c) Explain ICMP along with its four different message types.

d) Explain TCP header format in detail.

e) Write a short note on SMTP.

Q.5 Solve Any Two of the following. **12**

a) Write a shot note on.
i) DNS
ii) TELNET

b) Describe TCP connection establishment using Three way handshake.

c) Explain Distance vector routing with its limitations.

SLR-QH-546

Seat No.	

Set P

Fourth. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
VLSI Design (BTN06703)

Day & Date: Thursday, 07-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) Verilog it is a _____.
a) hardware description language
b) software description language
c) hardware decision language
d) software decision language

2) Which operator is commonly used in Verilog to assign values conditionally?
a) = b) :=
c) ?: d) →

3) What is the primary purpose of a flip-flop?
a) Add numbers b) Store and synchronize data
c) Perform logical operations d) Shift data

4) What is the purpose of the LOAD input in a counter?
a) To perform subtraction b) To reset the counter
c) To load a specific value d) To enable counting

5) What is the purpose of a sequence detector?
a) Count clock cycles b) Detect a specific pattern
c) Store data d) Perform arithmetic operations

6) What is the primary function of a multiplexer?
a) Addition b) Subtraction
c) Data selection d) Data encoding

7) In a decoder module, how many outputs are there for a 2-bit input?
a) 1 b) 2
c) 4 d) 8

8) What does MOS stand for in MOS transistor?
   a) Metal Oxide Semiconductor
   b) Monolithic Operational System
   c) Microscopic Organic Structure
   d) Metal Oxide Semidevice

9) In the inversion mode of a MOS transistor, what type of carriers dominates in the channel?
   a) Holes
   b) Electrons
   c) Ions
   d) Photons

10) What is the primary advantage of using complementary CMOS logic?
   a) Low power consumption and high noise margins
   b) High speed and low cost
   c) Simple implementation of complex functions
   d) Large fan-out capability

11) How can a NOR gate be implemented using CMOS logic?
   a) Series nMOS followed by parallel pMOS
   b) Parallel nMOS followed by series pMOS
   c) Only with nMOS transistors
   d) Only with pMOS transistors

12) In ratioed logic, what is the primary role of transistors?
   a) To provide logic inversion
   b) To form a resistive divider
   c) To control fan-out
   d) To implement complex functions

13) What does CPLD stand for?
   a) Complex Programmable Logic Device
   b) Central Processing and Logic Device
   c) Configurable Program Logic Device
   d) Centralized Programmable Logic Device

14) What is the basic building block of an FPGA?
   a) Logic Cell
   b) Look-up Table (LUT)
   c) Configurable Gate (CG)
   d) Configurable Logic Block (CLB)

Seat No.	

Set **P**

Fourth. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
VLSI Design (BTN06703)

Day & Date: Thursday, 07-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt Any Four of the following. **16**

a) Explain Verilog Operators with suitable examples.

b) Explain the following.
i) Inertial Delay Effects
ii) Pulse Rejection

c) Explain Structure of Combinational Verilog HDL Program.

d) Write Verilog code for clocked D Flip Flop.

e) Write a Verilog code for Full subtractor.

Q.3 Attempt Any Two of the following. **12**

a) Explain the terms “Inertial delay” and “Transport delay” with suitable examples.

b) Write a Verilog code along with testbench for:
i) Half Adder
ii) Full Adder

c) Explain Behavioral description of Encoder using Verilog HDL Code.

SECTION – II

Q.4 Attempt Any Four of the following. **16**

a) What is accumulation, depletion & enhancement mode of E MOSFET?

b) Explain CMOS invertor with transfer characteristics.

c) Explain PUN & PDN in CMOS logic design.

d) Implement the Boolean expression using CMOS
Y = bar ((A.B.C) + (A+B+C))

e) Explain Altera Max-7000.

Q.5 Attempt Any Two of the following. **12**

a) With neat diagram explain working principal of n type CMOS transistor.

b) Explain rational and pass transistor logic. What are advantages of rational logic?

c) Explain difference between CPLD and FPGA architecture.

Seat No.	

Set **Q**

Fourth. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
VLSI Design (BTN06703)

Day & Date: Thursday, 07-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. **14**

1) What does MOS stand for in MOS transistor?
a) Metal Oxide Semiconductor
b) Monolithic Operational System
c) Microscopic Organic Structure
d) Metal Oxide Semidevice

2) In the inversion mode of a MOS transistor, what type of carriers dominates in the channel?
a) Holes b) Electrons
c) Ions d) Photons

3) What is the primary advantage of using complementary CMOS logic?
a) Low power consumption and high noise margins
b) High speed and low cost
c) Simple implementation of complex functions
d) Large fan-out capability

4) How can a NOR gate be implemented using CMOS logic?
a) Series nMOS followed by parallel pMOS
b) Parallel nMOS followed by series pMOS
c) Only with nMOS transistors
d) Only with pMOS transistors

5) In ratioed logic, what is the primary role of transistors?
a) To provide logic inversion b) To form a resistive divider
c) To control fan-out d) To implement complex functions

6) What does CPLD stand for?
   a) Complex Programmable Logic Device
   b) Central Processing and Logic Device
   c) Configurable Program Logic Device
   d) Centralized Programmable Logic Device

7) What is the basic building block of an FPGA?
   a) Logic Cell
   b) Look-up Table (LUT)
   c) Configurable Gate (CG)
   d) Configurable Logic Block (CLB)

8) Verilog it is a _____.
   a) hardware description language
   b) software description language
   c) hardware decision language
   d) software decision language

9) Which operator is commonly used in Verilog to assign values conditionally?
   a) =
   b) :=
   c) ?:
   d) →

10) What is the primary purpose of a flip-flop?
   a) Add numbers
   b) Store and synchronize data
   c) Perform logical operations
   d) Shift data

11) What is the purpose of the LOAD input in a counter?
   a) To perform subtraction
   b) To reset the counter
   c) To load a specific value
   d) To enable counting

12) What is the purpose of a sequence detector?
   a) Count clock cycles
   b) Detect a specific pattern
   c) Store data
   d) Perform arithmetic operations

13) What is the primary function of a multiplexer?
   a) Addition
   b) Subtraction
   c) Data selection
   d) Data encoding

14) In a decoder module, how many outputs are there for a 2-bit input?
   a) 1
   b) 2
   c) 4
   d) 8

Seat No.	

Set **Q**

Fourth. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
VLSI Design (BTN06703)

Day & Date: Thursday, 07-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt Any Four of the following. **16**

a) Explain Verilog Operators with suitable examples.

b) Explain the following.
i) Inertial Delay Effects
ii) Pulse Rejection

c) Explain Structure of Combinational Verilog HDL Program.

d) Write Verilog code for clocked D Flip Flop.

e) Write a Verilog code for Full subtractor.

Q.3 Attempt Any Two of the following. **12**

a) Explain the terms “Inertial delay” and “Transport delay” with suitable examples.

b) Write a Verilog code along with testbench for:
i) Half Adder
ii) Full Adder

c) Explain Behavioral description of Encoder using Verilog HDL Code.

SECTION – II

Q.4 Attempt Any Four of the following. **16**

a) What is accumulation, depletion & enhancement mode of E MOSFET?

b) Explain CMOS invertor with transfer characteristics.

c) Explain PUN & PDN in CMOS logic design.

d) Implement the Boolean expression using CMOS
Y = bar ((A.B.C) + (A+B+C))

e) Explain Altera Max-7000.

Q.5 Attempt Any Two of the following. **12**

a) With neat diagram explain working principal of n type CMOS transistor.

b) Explain rational and pass transistor logic. What are advantages of rational logic?

c) Explain difference between CPLD and FPGA architecture.

Seat No.	

Set **R**

Fourth. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
VLSI Design (BTN06703)

Day & Date: Thursday, 07-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. **14**

1) How can a NOR gate be implemented using CMOS logic?
a) Series nMOS followed by parallel pMOS
b) Parallel nMOS followed by series pMOS
c) Only with nMOS transistors
d) Only with pMOS transistors

2) In ratioed logic, what is the primary role of transistors?
a) To provide logic inversion b) To form a resistive divider
c) To control fan-out d) To implement complex functions

3) What does CPLD stand for?
a) Complex Programmable Logic Device
b) Central Processing and Logic Device
c) Configurable Program Logic Device
d) Centralized Programmable Logic Device

4) What is the basic building block of an FPGA?
a) Logic Cell b) Look-up Table (LUT)
c) Configurable Gate (CG) d) Configurable Logic Block (CLB)

5) Verilog it is a _____.
a) hardware description language
b) software description language
c) hardware decision language
d) software decision language

6) Which operator is commonly used in Verilog to assign values conditionally?
a) = b) :=
c) ?: d) →

7) What is the primary purpose of a flip-flop?
a) Add numbers b) Store and synchronize data
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8) What is the purpose of the LOAD input in a counter?
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c) To load a specific value d) To enable counting

9) What is the purpose of a sequence detector?
a) Count clock cycles b) Detect a specific pattern
c) Store data d) Perform arithmetic operations

10) What is the primary function of a multiplexer?
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c) Data selection d) Data encoding

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b) Monolithic Operational System
c) Microscopic Organic Structure
d) Metal Oxide Semidevice

13) In the inversion mode of a MOS transistor, what type of carriers dominates in the channel?
a) Holes b) Electrons
c) Ions d) Photons

14) What is the primary advantage of using complementary CMOS logic?
a) Low power consumption and high noise margins
b) High speed and low cost
c) Simple implementation of complex functions
d) Large fan-out capability

Seat No.	

Set **R**

Fourth. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
VLSI Design (BTN06703)

Day & Date: Thursday, 07-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt Any Four of the following. **16**

a) Explain Verilog Operators with suitable examples.

b) Explain the following.
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ii) Pulse Rejection

c) Explain Structure of Combinational Verilog HDL Program.

d) Write Verilog code for clocked D Flip Flop.

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Q.3 Attempt Any Two of the following. **12**

a) Explain the terms “Inertial delay” and “Transport delay” with suitable examples.

b) Write a Verilog code along with testbench for:
i) Half Adder
ii) Full Adder

c) Explain Behavioral description of Encoder using Verilog HDL Code.

SECTION – II

Q.4 Attempt Any Four of the following. **16**

a) What is accumulation, depletion & enhancement mode of E MOSFET?

b) Explain CMOS invertor with transfer characteristics.

c) Explain PUN & PDN in CMOS logic design.

d) Implement the Boolean expression using CMOS
Y = bar ((A.B.C) + (A+B+C))

e) Explain Altera Max-7000.

Q.5 Attempt Any Two of the following. **12**

a) With neat diagram explain working principal of n type CMOS transistor.

b) Explain rational and pass transistor logic. What are advantages of rational logic?

c) Explain difference between CPLD and FPGA architecture.

Seat No.	

Set **S**

Fourth. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
VLSI Design (BTN06703)

Day & Date: Thursday, 07-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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3) Figures to right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. **14**

1) What is the primary function of a multiplexer?
a) Addition b) Subtraction
c) Data selection d) Data encoding

2) In a decoder module, how many outputs are there for a 2-bit input?
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c) 4 d) 8

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c) To load a specific value d) To enable counting

14) What is the purpose of a sequence detector?
a) Count clock cycles b) Detect a specific pattern
c) Store data d) Perform arithmetic operations

Seat No.	

Set **S**

Fourth. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
VLSI Design (BTN06703)

Day & Date: Thursday, 07-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt Any Four of the following. **16**

a) Explain Verilog Operators with suitable examples.

b) Explain the following.
i) Inertial Delay Effects
ii) Pulse Rejection

c) Explain Structure of Combinational Verilog HDL Program.

d) Write Verilog code for clocked D Flip Flop.

e) Write a Verilog code for Full subtractor.

Q.3 Attempt Any Two of the following. **12**

a) Explain the terms “Inertial delay” and “Transport delay” with suitable examples.

b) Write a Verilog code along with testbench for:
i) Half Adder
ii) Full Adder

c) Explain Behavioral description of Encoder using Verilog HDL Code.

SECTION – II

Q.4 Attempt Any Four of the following. **16**

a) What is accumulation, depletion & enhancement mode of E MOSFET?

b) Explain CMOS invertor with transfer characteristics.

c) Explain PUN & PDN in CMOS logic design.

d) Implement the Boolean expression using CMOS
Y = bar ((A.B.C) + (A+B+C))

e) Explain Altera Max-7000.

Q.5 Attempt Any Two of the following. **12**

a) With neat diagram explain working principal of n type CMOS transistor.

b) Explain rational and pass transistor logic. What are advantages of rational logic?

c) Explain difference between CPLD and FPGA architecture.

SLR-QH-547

Seat No.	

Set P

Fourth. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
PLC and Industrial Controllers (BTN06707)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) What does NEMA define a PLC as?
a) An analog operating electronic apparatus for relay control
b) A mechanically switched system for sequencing
c) A digitally operating electronic apparatus using programmable memory for internal storage of instructions to control machines or processes
d) A solid-state device used exclusively for arithmetic operations

2) A Fixed/Compact PLC is typically used for which scale of applications?
a) Small-scale applications such as a washing machine or coffee vending machine
b) Medium-scale processes with over 2048 I/Os
c) Large-scale industrial processes
d) Safety-critical systems requiring extensive memory expansion

3) Why would a manufacturer choose a PLC over a relay panel, specifically considering the ease of modifying the control logic?
a) Relays are more flexible
b) PLCs require complex rewiring to change the logic, which is easier
c) Changing the logic in a PLC does not require panel rewiring, unlike a relay logic system
d) PLCs have a slower response time

4) What is the typical input voltage range for PLC power supplies?
a) 24 V DC / 220 V AC b) 5 V DC only
c) 12 V AC only d) 48 V AC only

5) Analog output modules can control _____.
a) Lights ON/OFF b) Variable speed motors
c) Relays d) Push buttons

6) _____ is used to detect very small changes in resistance of strain gauges.
a) Maxwell's bridge
b) Wheatstone bridge
c) Anderson bridge
d) Schering Bridge

7) Which one of the following is a basic component of pneumatic power system?
a) Air tank
b) Compressor
c) Valves
d) All of the above

8) In PLC input logic, an NO push button is used for _____.
a) Turn
b) Reset
c) Stop operation
d) Start operation

9) Limit switches are used to _____.
a) Measure temperature
b) Detect motion or position
c) Measure current
d) Count pulses

10) What are the main components of an industrial automation system?
a) Sensors, actuators, and a control system
b) Robots, conveyors, and a control system
c) PLC, HMI and a control system
d) All of the above

11) What is the primary function of an industrial controller?
a) Data storage
b) Data transmission
c) Process control
d) Data visualization

12) Which of the following is not a PLC programming method?
a) Ladder Diagram
b) Instruction List
c) Flowchart Programming
d) Boolean Algebra

13) Which standard defines PLC programming languages?
a) ISO 9001
b) IEC 61131-3
c) ANSI C
d) IEEE 802.15

14) Which of the following is PLC software by Siemens?
a) GX Developer
b) Zelio Soft
c) TIA Portal
d) RSLogix 500

Seat No.	

Set **P**

Fourth. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
PLC and Industrial Controllers (BTN06707)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Answer any Four. **16**

a) Define a PLC. Explain the purpose of a PLC in industrial automation.

b) Explain construction & working of IR sensor.

c) Explain the key parameters to consider when choosing a PLC for industrial applications.

d) List and explain key PLC specifications and their significance in automation applications.

e) Explain Two wire & Three wire system in RTD.

Q.3 Answer any Two. **12**

a) State need of PLC. List & explain different applications of PLC.

b) What are the suitable materials for piezo electric sensor? What is piezo electric effect? Explain working of piezoelectric Sensor.

c) Describe sinking and sourcing concept in DC input modules of PLC.

SECTION – II

Q.4 Answer any Four. **16**

a) Explain the construction and working of a stepper motor.

b) Explain the working principle of a servo motor with block diagram.

c) List & explain key features of Industrial Controllers.

d) Draw and explain ladder diagrams for AND and OR logic operations.

e) Differentiate between timers and counters in PLC.

Q.5 Answer any Two. **12**

a) Describe the construction and working of a limit switch. & solenoid valves.

b) Explain the working of a PLC-based bottle filling system with block and ladder diagram.

c) List Comparison instruction used in PLC. Explain any two instructions in detail.

Seat No.	

Set **Q**

Fourth. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
PLC and Industrial Controllers (BTN06707)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) In PLC input logic, an NO push button is used for _____.
a) Turn b) Reset
c) Stop operation d) Start operation

2) Limit switches are used to _____.
a) Measure temperature b) Detect motion or position
c) Measure current d) Count pulses

3) What are the main components of an industrial automation system?
a) Sensors, actuators, and a control system
b) Robots, conveyors, and a control system
c) PLC, HMI and a control system
d) All of the above

4) What is the primary function of an industrial controller?
a) Data storage b) Data transmission
c) Process control d) Data visualization

5) Which of the following is not a PLC programming method?
a) Ladder Diagram b) Instruction List
c) Flowchart Programming d) Boolean Algebra

6) Which standard defines PLC programming languages?
a) ISO 9001 b) IEC 61131-3
c) ANSI C d) IEEE 802.15

7) Which of the following is PLC software by Siemens?
a) GX Developer b) Zelio Soft
c) TIA Portal d) RSLogix 500

8) What does NEMA define a PLC as?
   a) An analog operating electronic apparatus for relay control
   b) A mechanically switched system for sequencing
   c) A digitally operating electronic apparatus using programmable memory for internal storage of instructions to control machines or processes
   d) A solid-state device used exclusively for arithmetic operations

9) A Fixed/Compact PLC is typically used for which scale of applications?
   a) Small-scale applications such as a washing machine or coffee vending machine
   b) Medium-scale processes with over 2048 I/Os
   c) Large-scale industrial processes
   d) Safety-critical systems requiring extensive memory expansion

10) Why would a manufacturer choose a PLC over a relay panel, specifically considering the ease of modifying the control logic?
   a) Relays are more flexible
   b) PLCs require complex rewiring to change the logic, which is easier
   c) Changing the logic in a PLC does not require panel rewiring, unlike a relay logic system
   d) PLCs have a slower response time

11) What is the typical input voltage range for PLC power supplies?
   a) 24 V DC / 220 V AC
   b) 5 V DC only
   c) 12 V AC only
   d) 48 V AC only

12) Analog output modules can control _____.
   a) Lights ON/OFF
   b) Variable speed motors
   c) Relays
   d) Push buttons

13) _____ is used to detect very small changes in resistance of strain gauges.
   a) Maxwell's bridge
   b) Wheatstone bridge
   c) Anderson bridge
   d) Schering Bridge

14) Which one of the following is a basic component of pneumatic power system?
   a) Air tank
   b) Compressor
   c) Valves
   d) All of the above

Seat No.	

Set **Q**

Fourth. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
PLC and Industrial Controllers (BTN06707)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Answer any Four. **16**

a) Define a PLC. Explain the purpose of a PLC in industrial automation.

b) Explain construction & working of IR sensor.

c) Explain the key parameters to consider when choosing a PLC for industrial applications.

d) List and explain key PLC specifications and their significance in automation applications.

e) Explain Two wire & Three wire system in RTD.

Q.3 Answer any Two. **12**

a) State need of PLC. List & explain different applications of PLC.

b) What are the suitable materials for piezo electric sensor? What is piezo electric effect? Explain working of piezoelectric Sensor.

c) Describe sinking and sourcing concept in DC input modules of PLC.

SECTION – II

Q.4 Answer any Four. **16**

a) Explain the construction and working of a stepper motor.

b) Explain the working principle of a servo motor with block diagram.

c) List & explain key features of Industrial Controllers.

d) Draw and explain ladder diagrams for AND and OR logic operations.

e) Differentiate between timers and counters in PLC.

Q.5 Answer any Two. **12**

a) Describe the construction and working of a limit switch. & solenoid valves.

b) Explain the working of a PLC-based bottle filling system with block and ladder diagram.

c) List Comparison instruction used in PLC. Explain any two instructions in detail.

Seat No.	

Set **R**

Fourth. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
PLC and Industrial Controllers (BTN06707)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) What is the primary function of an industrial controller?
a) Data storage b) Data transmission
c) Process control d) Data visualization

2) Which of the following is not a PLC programming method?
a) Ladder Diagram b) Instruction List
c) Flowchart Programming d) Boolean Algebra

3) Which standard defines PLC programming languages?
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4) Which of the following is PLC software by Siemens?
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5) What does NEMA define a PLC as?
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b) A mechanically switched system for sequencing
c) A digitally operating electronic apparatus using programmable memory for internal storage of instructions to control machines or processes
d) A solid-state device used exclusively for arithmetic operations

6) A Fixed/Compact PLC is typically used for which scale of applications?
a) Small-scale applications such as a washing machine or coffee vending machine
b) Medium-scale processes with over 2048 I/Os
c) Large-scale industrial processes
d) Safety-critical systems requiring extensive memory expansion

7) Why would a manufacturer choose a PLC over a relay panel, specifically considering the ease of modifying the control logic?
a) Relays are more flexible
b) PLCs require complex rewiring to change the logic, which is easier
c) Changing the logic in a PLC does not require panel rewiring, unlike a relay logic system
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8) What is the typical input voltage range for PLC power supplies?
a) 24 V DC / 220 V AC
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10) _____ is used to detect very small changes in resistance of strain gauges.
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11) Which one of the following is a basic component of pneumatic power system?
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b) Compressor
c) Valves
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12) In PLC input logic, an NO push button is used for _____.
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b) Reset
c) Stop operation
d) Start operation

13) Limit switches are used to _____.
a) Measure temperature
b) Detect motion or position
c) Measure current
d) Count pulses

14) What are the main components of an industrial automation system?
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b) Robots, conveyors, and a control system
c) PLC, HMI and a control system
d) All of the above

Seat No.	

Set **R**

Fourth. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
PLC and Industrial Controllers (BTN06707)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Answer any Four. **16**

a) Define a PLC. Explain the purpose of a PLC in industrial automation.

b) Explain construction & working of IR sensor.

c) Explain the key parameters to consider when choosing a PLC for industrial applications.

d) List and explain key PLC specifications and their significance in automation applications.

e) Explain Two wire & Three wire system in RTD.

Q.3 Answer any Two. **12**

a) State need of PLC. List & explain different applications of PLC.

b) What are the suitable materials for piezo electric sensor? What is piezo electric effect? Explain working of piezoelectric Sensor.

c) Describe sinking and sourcing concept in DC input modules of PLC.

SECTION – II

Q.4 Answer any Four. **16**

a) Explain the construction and working of a stepper motor.

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c) List & explain key features of Industrial Controllers.

d) Draw and explain ladder diagrams for AND and OR logic operations.

e) Differentiate between timers and counters in PLC.

Q.5 Answer any Two. **12**

a) Describe the construction and working of a limit switch. & solenoid valves.

b) Explain the working of a PLC-based bottle filling system with block and ladder diagram.

c) List Comparison instruction used in PLC. Explain any two instructions in detail.

Seat No.	

Set | S

Fourth. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
PLC and Industrial Controllers (BTN06707)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) _____ is used to detect very small changes in resistance of strain gauges.
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a) Air tank b) Compressor
c) Valves d) All of the above

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c) Stop operation d) Start operation

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c) Measure current d) Count pulses

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c) PLC, HMI and a control system
d) All of the above

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c) Process control d) Data visualization

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c) Flowchart Programming d) Boolean Algebra

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c) ANSI C d) IEEE 802.15

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13) What is the typical input voltage range for PLC power supplies?
a) 24 V DC / 220 V AC b) 5 V DC only
c) 12 V AC only d) 48 V AC only

14) Analog output modules can control _____.
a) Lights ON/OFF b) Variable speed motors
c) Relays d) Push buttons

SLR-QH-547

Seat No.		Set	S

Fourth. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
PLC and Industrial Controllers (BTN06707)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Answer any Four. **16**

a) Define a PLC. Explain the purpose of a PLC in industrial automation.

b) Explain construction & working of IR sensor.

c) Explain the key parameters to consider when choosing a PLC for industrial applications.

d) List and explain key PLC specifications and their significance in automation applications.

e) Explain Two wire & Three wire system in RTD.

Q.3 Answer any Two. **12**

a) State need of PLC. List & explain different applications of PLC.

b) What are the suitable materials for piezo electric sensor? What is piezo electric effect? Explain working of piezoelectric Sensor.

c) Describe sinking and sourcing concept in DC input modules of PLC.

SECTION – II

Q.4 Answer any Four. **16**

a) Explain the construction and working of a stepper motor.

b) Explain the working principle of a servo motor with block diagram.

c) List & explain key features of Industrial Controllers.

d) Draw and explain ladder diagrams for AND and OR logic operations.

e) Differentiate between timers and counters in PLC.

Q.5 Answer any Two. **12**

a) Describe the construction and working of a limit switch. & solenoid valves.

b) Explain the working of a PLC-based bottle filling system with block and ladder diagram.

c) List Comparison instruction used in PLC. Explain any two instructions in detail.

SLR-QH-548

Seat No.		Set	P

Fourth. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Mobile Communication (BTN06708)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Actual radio coverage of a cell is called _____.
a) Fingerprint b) Footprint
c) Imprint d) Matrix

2) What is the drawback of dynamic channel assignment?
a) Decrease channel utilization
b) Increase probability of blocked call
c) Cross talk
d) Increase storage and computational load on system

3) Dwell time is the time for _____.
a) A call within the cell b) Hand off
c) Waiting for channel allocation d) None of these

4) Which of the following technology distributes the coverage of the cell and extends the cell boundary to hard-to-reach places?
a) Cell splitting b) Scattering
c) Sectoring d) Micro cell zone concept

5) Propagation model that characterizes rapid fluctuation is called _____.
a) Hata model
b) Fading model
c) Large scale propagation model
d) Okumura model

6) Apparent shift in frequency in multipath wave is caused due to relative motion between _____.
a) Base station and MSC
b) Mobile and surrounding objects
c) Mobile and MSC
d) Mobile and base station

7) The bandwidth of FDMA channel is _____.
a) Wide b) Narrow
c) Large d) Zero

8) Why is a cyclic prefix required in an OFDMA?
a) To ensure symbol time is an integer number
b) To help overcome multipath and ISI
c) To maintain orthogonality
d) To make OFDMA scalable

9) Global Positioning System uses _____.
a) CDMA b) TDMA
c) SDMA d) FDMA

10) Which of the following is a CDMA standard of second generation network?
a) IS-95 b) IS-136
c) ETACS d) EDGE

11) What type of handovers is supported by LTE?
a) Hard handover only
b) Soft handover only
c) Hard and soft handover
d) Hard, soft and softest handover

12) What is the average uploading speed of 4G LTE network?
a) 1-3 Gbps b) 2-5 Gbps
c) 1-3 Mbps d) 2-5 Mbps

13) Which of the following are ways in which a subscriber can be identified in 5G?
a) Permanent Identity b) Concealed Identity
c) Temporary Identity d) Hidden Identity

14) Which of the following characteristics best describe 4G Internet?
a) High speed, low latency, and high capacity
b) Low speed, high latency, and low capacity
c) High speed, high latency, and low capacity
d) Low speed, low latency, and low capacity

Seat No.		Set	P

Fourth. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Mobile Communication (BTN06708)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Answer any four. **16**

a) Explain Co-channel interference in detail.

b) What is Handoff? Explain different types of Handoffs?

c) What is diffraction? Explain Knife edge diffraction

d) What is Sectoring and Splitting? Explain.

e) Explain frequency reuse technique in cellular system.

Q.3 Answer any two. **12**

a) Explain Umbrella Cell approach & cell dragging problems in handoff considerations.

b) Explain practical link budget design equation using path-loss model in detail.

c) Give comparison between FDMA, TDMA, CDMA & SDMA.

SECTION – II

Q.4 Answer any four. **16**

a) Explain call origination procedure in GSM.

b) Explain in short different GSM channels.

c) Explain Mobility & Radio Resource management in IS 95.

d) What are the key aspects of 4G technology?

e) Give classification of signaling relays.

Q.5 Answer any two. **12**

a) Draw & explain GSM network architecture.

b) Write detailed note on IMT 2020 & its capabilities.

c) Explain LTE architecture in detail.

SLR-QH-548

Seat No.		Set	Q

Fourth. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Mobile Communication (BTN06708)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Why is a cyclic prefix required in an OFDMA?
a) To ensure symbol time is an integer number
b) To help overcome multipath and ISI
c) To maintain orthogonality
d) To make OFDMA scalable

2) Global Positioning System uses _____.
a) CDMA b) TDMA
c) SDMA d) FDMA

3) Which of the following is a CDMA standard of second generation network?
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8) Actual radio coverage of a cell is called _____.
a) Fingerprint
b) Footprint
c) Imprint
d) Matrix

9) What is the drawback of dynamic channel assignment?
a) Decrease channel utilization
b) Increase probability of blocked call
c) Cross talk
d) Increase storage and computational load on system

10) Dwell time is the time for _____.
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c) Waiting for channel allocation
d) None of these

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b) Scattering
c) Sectoring
d) Micro cell zone concept

12) Propagation model that characterizes rapid fluctuation is called _____.
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b) Fading model
c) Large scale propagation model
d) Okumura model

13) Apparent shift in frequency in multipath wave is caused due to relative motion between _____.
a) Base station and MSC
b) Mobile and surrounding objects
c) Mobile and MSC
d) Mobile and base station

14) The bandwidth of FDMA channel is _____.
a) Wide
b) Narrow
c) Large
d) Zero

Seat No.	

Set **Q**

Fourth. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Mobile Communication (BTN06708)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Answer any four. **16**

a) Explain Co-channel interference in detail.

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a) Explain Umbrella Cell approach & cell dragging problems in handoff considerations.

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c) Give comparison between FDMA, TDMA, CDMA & SDMA.

SECTION – II

Q.4 Answer any four. **16**

a) Explain call origination procedure in GSM.

b) Explain in short different GSM channels.

c) Explain Mobility & Radio Resource management in IS 95.

d) What are the key aspects of 4G technology?

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Q.5 Answer any two. **12**

a) Draw & explain GSM network architecture.

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Seat No.		Set	R

Fourth. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Mobile Communication (BTN06708)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) What type of handovers is supported by LTE?
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Seat No.		Set	R

Fourth. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Mobile Communication (BTN06708)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Answer any four. **16**

a) Explain Co-channel interference in detail.

b) What is Handoff? Explain different types of Handoffs?

c) What is diffraction? Explain Knife edge diffraction

d) What is Sectoring and Splitting? Explain.

e) Explain frequency reuse technique in cellular system.

Q.3 Answer any two. **12**

a) Explain Umbrella Cell approach & cell dragging problems in handoff considerations.

b) Explain practical link budget design equation using path-loss model in detail.

c) Give comparison between FDMA, TDMA, CDMA & SDMA.

SECTION – II

Q.4 Answer any four. **16**

a) Explain call origination procedure in GSM.

b) Explain in short different GSM channels.

c) Explain Mobility & Radio Resource management in IS 95.

d) What are the key aspects of 4G technology?

e) Give classification of signaling relays.

Q.5 Answer any two. **12**

a) Draw & explain GSM network architecture.

b) Write detailed note on IMT 2020 & its capabilities.

c) Explain LTE architecture in detail.

Seat No.		Set	S

Fourth. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Mobile Communication (BTN06708)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Apparent shift in frequency in multipath wave is caused due to relative motion between _____.
a) Base station and MSC
b) Mobile and surrounding objects
c) Mobile and MSC
d) Mobile and base station

2) The bandwidth of FDMA channel is _____.
a) Wide b) Narrow
c) Large d) Zero

3) Why is a cyclic prefix required in an OFDMA?
a) To ensure symbol time is an integer number
b) To help overcome multipath and ISI
c) To maintain orthogonality
d) To make OFDMA scalable

4) Global Positioning System uses _____.
a) CDMA b) TDMA
c) SDMA d) FDMA

5) Which of the following is a CDMA standard of second generation network?
a) IS-95 b) IS-136
c) ETACS d) EDGE

6) What type of handovers is supported by LTE?
a) Hard handover only
b) Soft handover only
c) Hard and soft handover
d) Hard, soft and softest handover

7) What is the average uploading speed of 4G LTE network?
a) 1-3 Gbps b) 2-5 Gbps
c) 1-3 Mbps d) 2-5 Mbps

8) Which of the following are ways in which a subscriber can be identified in 5G?
a) Permanent Identity b) Concealed Identity
c) Temporary Identity d) Hidden Identity

9) Which of the following characteristics best describe 4G Internet?
a) High speed, low latency, and high capacity
b) Low speed, high latency, and low capacity
c) High speed, high latency, and low capacity
d) Low speed, low latency, and low capacity

10) Actual radio coverage of a cell is called _____.
a) Fingerprint b) Footprint
c) Imprint d) Matrix

11) What is the drawback of dynamic channel assignment?
a) Decrease channel utilization
b) Increase probability of blocked call
c) Cross talk
d) Increase storage and computational load on system

12) Dwell time is the time for _____.
a) A call within the cell b) Hand off
c) Waiting for channel allocation d) None of these

13) Which of the following technology distributes the coverage of the cell and extends the cell boundary to hard-to-reach places?
a) Cell splitting b) Scattering
c) Sectoring d) Micro cell zone concept

14) Propagation model that characterizes rapid fluctuation is called _____.
a) Hata model
b) Fading model
c) Large scale propagation model
d) Okumura model

SLR-QH-548

Seat No.		Set	S

Fourth. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Mobile Communication (BTN06708)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Answer any four. **16**

a) Explain Co-channel interference in detail.

b) What is Handoff? Explain different types of Handoffs?

c) What is diffraction? Explain Knife edge diffraction

d) What is Sectoring and Splitting? Explain.

e) Explain frequency reuse technique in cellular system.

Q.3 Answer any two. **12**

a) Explain Umbrella Cell approach & cell dragging problems in handoff considerations.

b) Explain practical link budget design equation using path-loss model in detail.

c) Give comparison between FDMA, TDMA, CDMA & SDMA.

SECTION – II

Q.4 Answer any four. **16**

a) Explain call origination procedure in GSM.

b) Explain in short different GSM channels.

c) Explain Mobility & Radio Resource management in IS 95.

d) What are the key aspects of 4G technology?

e) Give classification of signaling relays.

Q.5 Answer any two. **12**

a) Draw & explain GSM network architecture.

b) Write detailed note on IMT 2020 & its capabilities.

c) Explain LTE architecture in detail.

SLR-QH-550

Seat No.	

Set P

Fourth. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
AI Applications (BTN06710)

Day & Date: Monday, 11-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct options. **14**

1) Artificial Intelligence is about _____.
a) Playing a game on Computer
b) Making a machine Intelligent
c) Programming on Machine with your own Intelligence
d) Putting your intelligence in Machine

2) The main tasks of an Al agent are _____.
a) Input and Output
b) Moment and Humanly Actions
c) Perceiving, thinking, and acting on the environment
d) None of the above

3) The main function of problem-solving agent is to _____.
a) Solve the given problem and reach the goal
b) Find out which sequence of action will get it to the goal state
c) Both a) & b)
d) None of these

4) The component of an Expert system is _____.
a) Knowledge Base b) Inference Engine
c) User Interface d) All of these

5) The inference engine works on _____.
a) Forward Chaining b) Backward Chaining
c) Both a) and b) d) None of these

6) Web Crawler is an example of _____.
a) Intelligent Agent b) Problem-solving Agent
c) Simple reflex Agent d) Model-based Agent

7) Which of the given statement is true for Conditional Probability?
a) Conditional Probability gives 100% accurate results
b) Conditional Probability can be applied to a single event
c) Conditional Probability has no effect or relevance on independent events
d) None of the above

8) If a robot is able to change its own trajectory as per the external conditions, then the robot is considered as the _____.
a) Mobile b) Non-Servo
c) Open Loop d) Intelligent

9) The probabilistic reasoning depends upon _____.
a) Estimation b) Observations
c) Likelihood d) All of these

10) Who is known as the Father of Al"?
a) Fisher Ada b) Alan Turing
c) John McCarthy d) Allen Newell

11) Which term describes the common-sense of the judgmental part of problem-solving?
a) Values-based b) Critical
c) Analytical d) Heuristic

12) An Al agent perceives and acts upon the environment using _____.
a) Sensors b) Perceiver
c) Actuators d) Both a) and c)

13) Which Al technique enables the computers to understand the associations and relationships between objects and events?
a) Heuristic Processing b) Cognitive Science
c) Relative Symbolism d) Pattern Matching

14) A technique that was developed to determine whether a machine could or could not demonstrate the artificial intelligence known as the _____.
a) Boolean Algebra b) Turing Test
c) Logarithm d) Algorithm

SLR-QH-550

Seat No.	

Set P

Fourth. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
AI Applications (BTN06710)

Day & Date: Monday, 11-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Answer Any Four. **16**

a) State & explain different types of Intelligent Agents.
b) Explain the various Branches of Al in brief.
c) Explain Man Vs Computers in brief.
d) Explain the Visual perception in Al in brief.
e) Explain the Pattern Recognition in brief.

Q.3 Answer Any Two. **12**

a) Explain the major components of Intelligent System.
b) Explain the Knowledge, acquisition, Expert system tools in brief.
c) Explain the Basic architecture of an Expert system.

SECTION – II

Q.4 Answer Any Four. **16**

a) Explain the Language Models of NLP in brief.
b) Explain the Planning Uncertain in Robotics.
c) Explain the Augmented Grammars and Semantic in brief.
d) Discuss the Robotic Perception in brief.
e) Explain the Passive Reinforcement Learning in brief.

Q.5 Answer Any Two. **12**

a) Explain the Speech Recognition and Machine Translation in NLP in detail.
b) Explain the Robotic Software Architectures in brief.
c) Explain the Applications of Reinforcement Learning in brief.

Seat No.	

Set **Q**

Fourth. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
AI Applications (BTN06710)

Day & Date: Monday, 11-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct options. **14**

1) If a robot is able to change its own trajectory as per the external conditions, then the robot is considered as the _____.
a) Mobile b) Non-Servo
c) Open Loop d) Intelligent

2) The probabilistic reasoning depends upon _____.
a) Estimation b) Observations
c) Likelihood d) All of these

3) Who is known as the Father of Al"?
a) Fisher Ada b) Alan Turing
c) John McCarthy d) Allen Newell

4) Which term describes the common-sense of the judgmental part of problem-solving?
a) Values-based b) Critical
c) Analytical d) Heuristic

5) An Al agent perceives and acts upon the environment using _____.
a) Sensors b) Perceiver
c) Actuators d) Both a) and c)

6) Which Al technique enables the computers to understand the associations and relationships between objects and events?
a) Heuristic Processing b) Cognitive Science
c) Relative Symbolism d) Pattern Matching

7) A technique that was developed to determine whether a machine could or could not demonstrate the artificial intelligence known as the _____.
   a) Boolean Algebra
   b) Turing Test
   c) Logarithm
   d) Algorithm

8) Artificial Intelligence is about _____.
   a) Playing a game on Computer
   b) Making a machine Intelligent
   c) Programming on Machine with your own Intelligence
   d) Putting your intelligence in Machine

9) The main tasks of an Al agent are _____.
   a) Input and Output
   b) Moment and Humanly Actions
   c) Perceiving, thinking, and acting on the environment
   d) None of the above

10) The main function of problem-solving agent is to _____.
   a) Solve the given problem and reach the goal
   b) Find out which sequence of action will get it to the goal state
   c) Both a) & b)
   d) None of these

11) The component of an Expert system is _____.
   a) Knowledge Base
   b) Inference Engine
   c) User Interface
   d) All of these

12) The inference engine works on _____.
   a) Forward Chaining
   b) Backward Chaining
   c) Both a) and b)
   d) None of these

13) Web Crawler is an example of _____.
   a) Intelligent Agent
   b) Problem-solving Agent
   c) Simple reflex Agent
   d) Model-based Agent

14) Which of the given statement is true for Conditional Probability?
   a) Conditional Probability gives 100% accurate results
   b) Conditional Probability can be applied to a single event
   c) Conditional Probability has no effect or relevance on independent events
   d) None of the above

SLR-QH-550

Seat No.	

Set Q

Fourth. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
AI Applications (BTN06710)

Day & Date: Monday, 11-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Answer Any Four. **16**

a) State & explain different types of Intelligent Agents.
b) Explain the various Branches of Al in brief.
c) Explain Man Vs Computers in brief.
d) Explain the Visual perception in Al in brief.
e) Explain the Pattern Recognition in brief.

Q.3 Answer Any Two. **12**

a) Explain the major components of Intelligent System.
b) Explain the Knowledge, acquisition, Expert system tools in brief.
c) Explain the Basic architecture of an Expert system.

SECTION – II

Q.4 Answer Any Four. **16**

a) Explain the Language Models of NLP in brief.
b) Explain the Planning Uncertain in Robotics.
c) Explain the Augmented Grammars and Semantic in brief.
d) Discuss the Robotic Perception in brief.
e) Explain the Passive Reinforcement Learning in brief.

Q.5 Answer Any Two. **12**

a) Explain the Speech Recognition and Machine Translation in NLP in detail.
b) Explain the Robotic Software Architectures in brief.
c) Explain the Applications of Reinforcement Learning in brief.

Seat No.	

Set **R**

Fourth. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
AI Applications (BTN06710)

Day & Date: Monday, 11-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct options. **14**

1) Which term describes the common-sense of the judgmental part of problem-solving?
a) Values-based b) Critical
c) Analytical d) Heuristic

2) An Al agent perceives and acts upon the environment using _____.
a) Sensors b) Perceiver
c) Actuators d) Both a) and c)

3) Which Al technique enables the computers to understand the associations and relationships between objects and events?
a) Heuristic Processing b) Cognitive Science
c) Relative Symbolism d) Pattern Matching

4) A technique that was developed to determine whether a machine could or could not demonstrate the artificial intelligence known as the _____.
a) Boolean Algebra b) Turing Test
c) Logarithm d) Algorithm

5) Artificial Intelligence is about _____.
a) Playing a game on Computer
b) Making a machine Intelligent
c) Programming on Machine with your own Intelligence
d) Putting your intelligence in Machine

6) The main tasks of an Al agent are _____.
a) Input and Output
b) Moment and Humanly Actions
c) Perceiving, thinking, and acting on the environment
d) None of the above

7) The main function of problem-solving agent is to _____.
   a) Solve the given problem and reach the goal
   b) Find out which sequence of action will get it to the goal state
   c) Both a) & b)
   d) None of these

8) The component of an Expert system is _____.
   a) Knowledge Base
   b) Inference Engine
   c) User Interface
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9) The inference engine works on _____.
   a) Forward Chaining
   b) Backward Chaining
   c) Both a) and b)
   d) None of these

10) Web Crawler is an example of _____.
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   a) Mobile
   b) Non-Servo
   c) Open Loop
   d) Intelligent

13) The probabilistic reasoning depends upon _____.
   a) Estimation
   b) Observations
   c) Likelihood
   d) All of these

14) Who is known as the Father of Al”?
   a) Fisher Ada
   b) Alan Turing
   c) John McCarthy
   d) Allen Newell

SLR-QH-550

Seat No.	

Set R

Fourth. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
AI Applications (BTN06710)

Day & Date: Monday, 11-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Answer Any Four. **16**

a) State & explain different types of Intelligent Agents.
b) Explain the various Branches of Al in brief.
c) Explain Man Vs Computers in brief.
d) Explain the Visual perception in Al in brief.
e) Explain the Pattern Recognition in brief.

Q.3 Answer Any Two. **12**

a) Explain the major components of Intelligent System.
b) Explain the Knowledge, acquisition, Expert system tools in brief.
c) Explain the Basic architecture of an Expert system.

SECTION – II

Q.4 Answer Any Four. **16**

a) Explain the Language Models of NLP in brief.
b) Explain the Planning Uncertain in Robotics.
c) Explain the Augmented Grammars and Semantic in brief.
d) Discuss the Robotic Perception in brief.
e) Explain the Passive Reinforcement Learning in brief.

Q.5 Answer Any Two. **12**

a) Explain the Speech Recognition and Machine Translation in NLP in detail.
b) Explain the Robotic Software Architectures in brief.
c) Explain the Applications of Reinforcement Learning in brief.

Seat No.	

Set **S**

Fourth. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
AI Applications (BTN06710)

Day & Date: Monday, 11-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct options. **14**

1) Web Crawler is an example of _____.
a) Intelligent Agent b) Problem-solving Agent
c) Simple reflex Agent d) Model-based Agent

2) Which of the given statement is true for Conditional Probability?
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b) Conditional Probability can be applied to a single event
c) Conditional Probability has no effect or relevance on independent events
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3) If a robot is able to change its own trajectory as per the external conditions, then the robot is considered as the _____.
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4) The probabilistic reasoning depends upon _____.
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a) Playing a game on Computer
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d) Putting your intelligence in Machine

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c) Perceiving, thinking, and acting on the environment
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a) Solve the given problem and reach the goal
b) Find out which sequence of action will get it to the goal state
c) Both a) & b)
d) None of these

13) The component of an Expert system is _____.
a) Knowledge Base b) Inference Engine
c) User Interface d) All of these

14) The inference engine works on _____.
a) Forward Chaining b) Backward Chaining
c) Both a) and b) d) None of these

SLR-QH-550

Seat No.	

Set S

Fourth. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
AI Applications (BTN06710)

Day & Date: Monday, 11-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Answer Any Four. **16**

a) State & explain different types of Intelligent Agents.
b) Explain the various Branches of Al in brief.
c) Explain Man Vs Computers in brief.
d) Explain the Visual perception in Al in brief.
e) Explain the Pattern Recognition in brief.

Q.3 Answer Any Two. **12**

a) Explain the major components of Intelligent System.
b) Explain the Knowledge, acquisition, Expert system tools in brief.
c) Explain the Basic architecture of an Expert system.

SECTION – II

Q.4 Answer Any Four. **16**

a) Explain the Language Models of NLP in brief.
b) Explain the Planning Uncertain in Robotics.
c) Explain the Augmented Grammars and Semantic in brief.
d) Discuss the Robotic Perception in brief.
e) Explain the Passive Reinforcement Learning in brief.

Q.5 Answer Any Two. **12**

a) Explain the Speech Recognition and Machine Translation in NLP in detail.
b) Explain the Robotic Software Architectures in brief.
c) Explain the Applications of Reinforcement Learning in brief.

SLR-QH-551

Seat No.		Set	P

Fourth. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Data Science- Business Intelligence (BTN06713)

Day & Date: Monday, 11-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) What is the primary goal of Business Intelligence (BI)?
a) Data storage
b) Effective and timely decision-making
c) Software testing
d) Network security

2) Which of the following is a key component of BI architecture?
a) Compiler b) Data Warehouse
c) Operating System d) Firewall

3) OLAP stands for _____.
a) Online Logical Application Processing
b) Online Analytical Processing
c) Offline Analytical Programming
d) Online Algorithm Processing

4) Which ethical issue is related to Business Intelligence?
a) Data privacy b) Hardware installation
c) Computer assembly d) Printer sharing

5) A Decision Support System (DSS) mainly helps in _____.
a) Gaming b) Decision-making
c) Web designing d) Virus removal

6) Which model is commonly used for decision-making in DSS?
a) Mathematical model b) Waterfall model
c) Spiral model d) Network model

7) A Data Warehouse is mainly used for _____.
a) Transaction processing b) Animation
c) Programming d) Data storage and analysis

8) Data mining is the process of _____.
a) Collecting hardware devices
b) Deleting unnecessary files
c) Discovering useful patterns from data
d) Managing computer networks

9) Business reporting mainly helps organizations to _____.
a) Play games
b) Communicate information for decision-making
c) Design hardware
d) Write programs

10) Which of the following is commonly used for data visualization?
a) Flowchart b) Graphs and charts
c) Compiler d) Firewall

11) A dashboard in Business Intelligence is used to _____.
a) Store data permanently b) Monitor business performance
c) Develop software d) Control hardware

12) Balanced Scorecard is mainly used for _____.
a) Employee attendance b) Performance measurement
c) Database creation d) Network security

13) Six Sigma focuses on _____.
a) Increasing defects
b) Quality improvement and process control
c) Computer networking
d) Web design

14) Relational marketing mainly emphasizes _____.
a) Building long-term customer relationships
b) Manufacturing products
c) Computer repair
d) Coding applications

Seat No.		Set	P

Fourth. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Data Science- Business Intelligence (BTN06713)

Day & Date: Monday, 11-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

SECTION – I

Q.2 Answer Any Four. **16**

a) Explain the concept of Business Intelligence (BI). Discuss the role of BI in effective and timely decision-making.

b) Describe the architecture of a Data Warehouse with a neat diagram. Explain the role of OLAP in Business Intelligence.

c) Discuss the role of mathematical models in decision-making systems with suitable examples.

d) Define Data Warehouse. Explain the architecture and characteristics of a Data Warehouse.

e) Explain evolution of information system in detail.

Q.3 Answer Any Two. **12**

a) Explain OLAP operations in detail. Compare OLAP with traditional database systems used in organizations.

b) Explain the components and characteristics of a Decision Support System with suitable examples.

c) Explain multidimensional analysis using data cubes. Discuss its advantages in business analysis and reporting.

SECTION – II

Q.4 Answer Any Four. **16**

a) Describe Business reporting concept in detail.

b) Explain Relational marketing in detail.

c) Illustrate Supply chain optimization of logistic and production models.

d) Write short note on performance dashboards.

e) Define balanced scorecards and its parameters.

Q.5 Answer Any Two. **12**

a) Explain different types of charts and graphs in detail.

b) What is revenue management system? Explain it in detail.

c) Describe case studies of marketing models in details.

Seat No.	

Set **Q**

Fourth. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Data Science- Business Intelligence (BTN06713)

Day & Date: Monday, 11-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Data mining is the process of _____.
a) Collecting hardware devices
b) Deleting unnecessary files
c) Discovering useful patterns from data
d) Managing computer networks

2) Business reporting mainly helps organizations to _____.
a) Play games
b) Communicate information for decision-making
c) Design hardware
d) Write programs

3) Which of the following is commonly used for data visualization?
a) Flowchart b) Graphs and charts
c) Compiler d) Firewall

4) A dashboard in Business Intelligence is used to _____.
a) Store data permanently b) Monitor business performance
c) Develop software d) Control hardware

5) Balanced Scorecard is mainly used for _____.
a) Employee attendance b) Performance measurement
c) Database creation d) Network security

6) Six Sigma focuses on _____.
a) Increasing defects
b) Quality improvement and process control
c) Computer networking
d) Web design

7) Relational marketing mainly emphasizes _____.
   a) Building long-term customer relationships
   b) Manufacturing products
   c) Computer repair
   d) Coding applications

8) What is the primary goal of Business Intelligence (BI)?
   a) Data storage
   b) Effective and timely decision-making
   c) Software testing
   d) Network security

9) Which of the following is a key component of BI architecture?
   a) Compiler
   b) Data Warehouse
   c) Operating System
   d) Firewall

10) OLAP stands for _____.
   a) Online Logical Application Processing
   b) Online Analytical Processing
   c) Offline Analytical Programming
   d) Online Algorithm Processing

11) Which ethical issue is related to Business Intelligence?
   a) Data privacy
   b) Hardware installation
   c) Computer assembly
   d) Printer sharing

12) A Decision Support System (DSS) mainly helps in _____.
   a) Gaming
   b) Decision-making
   c) Web designing
   d) Virus removal

13) Which model is commonly used for decision-making in DSS?
   a) Mathematical model
   b) Waterfall model
   c) Spiral model
   d) Network model

14) A Data Warehouse is mainly used for _____.
   a) Transaction processing
   b) Animation
   c) Programming
   d) Data storage and analysis

Seat No.	

Set **Q**

Fourth. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Data Science- Business Intelligence (BTN06713)

Day & Date: Monday, 11-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

SECTION – I

Q.2 Answer Any Four. **16**

a) Explain the concept of Business Intelligence (BI). Discuss the role of BI in effective and timely decision-making.

b) Describe the architecture of a Data Warehouse with a neat diagram. Explain the role of OLAP in Business Intelligence.

c) Discuss the role of mathematical models in decision-making systems with suitable examples.

d) Define Data Warehouse. Explain the architecture and characteristics of a Data Warehouse.

e) Explain evolution of information system in detail.

Q.3 Answer Any Two. **12**

a) Explain OLAP operations in detail. Compare OLAP with traditional database systems used in organizations.

b) Explain the components and characteristics of a Decision Support System with suitable examples.

c) Explain multidimensional analysis using data cubes. Discuss its advantages in business analysis and reporting.

SECTION – II

Q.4 Answer Any Four. **16**

a) Describe Business reporting concept in detail.

b) Explain Relational marketing in detail.

c) Illustrate Supply chain optimization of logistic and production models.

d) Write short note on performance dashboards.

e) Define balanced scorecards and its parameters.

Q.5 Answer Any Two. **12**

a) Explain different types of charts and graphs in detail.

b) What is revenue management system? Explain it in detail.

c) Describe case studies of marketing models in details.

Seat No.		Set	R

Fourth. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Data Science- Business Intelligence (BTN06713)

Day & Date: Monday, 11-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) A dashboard in Business Intelligence is used to _____.
a) Store data permanently b) Monitor business performance
c) Develop software d) Control hardware

2) Balanced Scorecard is mainly used for _____.
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c) Computer networking
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4) Relational marketing mainly emphasizes _____.
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b) Manufacturing products
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d) Coding applications

5) What is the primary goal of Business Intelligence (BI)?
a) Data storage
b) Effective and timely decision-making
c) Software testing
d) Network security

6) Which of the following is a key component of BI architecture?
a) Compiler b) Data Warehouse
c) Operating System d) Firewall

7) OLAP stands for _____.
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c) Offline Analytical Programming
d) Online Algorithm Processing

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b) Hardware installation
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d) Printer sharing

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10) Which model is commonly used for decision-making in DSS?
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d) Network model

11) A Data Warehouse is mainly used for _____.
a) Transaction processing
b) Animation
c) Programming
d) Data storage and analysis

12) Data mining is the process of _____.
a) Collecting hardware devices
b) Deleting unnecessary files
c) Discovering useful patterns from data
d) Managing computer networks

13) Business reporting mainly helps organizations to _____.
a) Play games
b) Communicate information for decision-making
c) Design hardware
d) Write programs

14) Which of the following is commonly used for data visualization?
a) Flowchart
b) Graphs and charts
c) Compiler
d) Firewall

Seat No.	

Set **R**

Fourth. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Data Science- Business Intelligence (BTN06713)

Day & Date: Monday, 11-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

SECTION – I

Q.2 Answer Any Four. **16**

a) Explain the concept of Business Intelligence (BI). Discuss the role of BI in effective and timely decision-making.

b) Describe the architecture of a Data Warehouse with a neat diagram. Explain the role of OLAP in Business Intelligence.

c) Discuss the role of mathematical models in decision-making systems with suitable examples.

d) Define Data Warehouse. Explain the architecture and characteristics of a Data Warehouse.

e) Explain evolution of information system in detail.

Q.3 Answer Any Two. **12**

a) Explain OLAP operations in detail. Compare OLAP with traditional database systems used in organizations.

b) Explain the components and characteristics of a Decision Support System with suitable examples.

c) Explain multidimensional analysis using data cubes. Discuss its advantages in business analysis and reporting.

SECTION – II

Q.4 Answer Any Four. **16**

a) Describe Business reporting concept in detail.

b) Explain Relational marketing in detail.

c) Illustrate Supply chain optimization of logistic and production models.

d) Write short note on performance dashboards.

e) Define balanced scorecards and its parameters.

Q.5 Answer Any Two. **12**

a) Explain different types of charts and graphs in detail.

b) What is revenue management system? Explain it in detail.

c) Describe case studies of marketing models in details.

Seat No.		Set	S

Fourth. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Data Science- Business Intelligence (BTN06713)

Day & Date: Monday, 11-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which model is commonly used for decision-making in DSS?
a) Mathematical model b) Waterfall model
c) Spiral model d) Network model

2) A Data Warehouse is mainly used for _____.
a) Transaction processing b) Animation
c) Programming d) Data storage and analysis

3) Data mining is the process of _____.
a) Collecting hardware devices
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4) Business reporting mainly helps organizations to _____.
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5) Which of the following is commonly used for data visualization?
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6) A dashboard in Business Intelligence is used to _____.
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c) Develop software d) Control hardware

7) Balanced Scorecard is mainly used for _____.
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c) Database creation d) Network security

8) Six Sigma focuses on _____.
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b) Quality improvement and process control
c) Computer networking
d) Web design

9) Relational marketing mainly emphasizes _____.
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b) Manufacturing products
c) Computer repair
d) Coding applications

10) What is the primary goal of Business Intelligence (BI)?
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b) Effective and timely decision-making
c) Software testing
d) Network security

11) Which of the following is a key component of BI architecture?
a) Compiler b) Data Warehouse
c) Operating System d) Firewall

12) OLAP stands for _____.
a) Online Logical Application Processing
b) Online Analytical Processing
c) Offline Analytical Programming
d) Online Algorithm Processing

13) Which ethical issue is related to Business Intelligence?
a) Data privacy b) Hardware installation
c) Computer assembly d) Printer sharing

14) A Decision Support System (DSS) mainly helps in _____.
a) Gaming b) Decision-making
c) Web designing d) Virus removal

Seat No.		Set	S

Fourth. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Data Science- Business Intelligence (BTN06713)

Day & Date: Monday, 11-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
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SECTION – I

Q.2 Answer Any Four. **16**

a) Explain the concept of Business Intelligence (BI). Discuss the role of BI in effective and timely decision-making.

b) Describe the architecture of a Data Warehouse with a neat diagram. Explain the role of OLAP in Business Intelligence.

c) Discuss the role of mathematical models in decision-making systems with suitable examples.

d) Define Data Warehouse. Explain the architecture and characteristics of a Data Warehouse.

e) Explain evolution of information system in detail.

Q.3 Answer Any Two. **12**

a) Explain OLAP operations in detail. Compare OLAP with traditional database systems used in organizations.

b) Explain the components and characteristics of a Decision Support System with suitable examples.

c) Explain multidimensional analysis using data cubes. Discuss its advantages in business analysis and reporting.

SECTION – II

Q.4 Answer Any Four. **16**

a) Describe Business reporting concept in detail.

b) Explain Relational marketing in detail.

c) Illustrate Supply chain optimization of logistic and production models.

d) Write short note on performance dashboards.

e) Define balanced scorecards and its parameters.

Q.5 Answer Any Two. **12**

a) Explain different types of charts and graphs in detail.

b) What is revenue management system? Explain it in detail.

c) Describe case studies of marketing models in details.

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Seat No.	

Set P

Fourth. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Cyber Security - Information Security and Audit (BTN06719)

Day & Date: Monday, 11-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Choose the correct option from the following. **14**

1) The CIA model was first used primarily in which sector?
a) Financial b) Healthcare
c) Military and government d) Education

2) Security policies and procedures are examples of which type of control?
a) Technical b) Physical
c) Preventive d) Administrative

3) Which of the following is an example of a technical security policy?
a) Password change frequency
b) Physical security of data centers
c) Incident response roles
d) Role-based access control (RBAC) implementation

4) ISO/IEC 27001 focuses on _____.
a) IT hardware specifications
b) Environmental sustainability
c) Information Security Management Systems (ISMS)
d) Financial risk management

5) Which cryptographic technique is used in digital signatures?
a) Symmetric encryption
b) Hashing with private key encryption
c) Base64 encoding
d) XOR operation

6) A company suffered a ransomware attack because an employee clicked on a phishing email. What policy was likely weak or missing?
a) Backup policy
b) Internet access control
c) Email usage and security awareness training
d) Data retention policy

7) A common best practice in physical security is _____.
a) Using cloud backups
b) Placing security guards at entry points
c) Implementing encryption
d) Disabling USB ports

8) In IT governance, the structure refers to _____.
a) The size of the IT department
b) How responsibilities, rights, and accountabilities are distributed
c) The number of data centres
d) Network topology

9) A company wants to align its IT objectives with its business goals while ensuring risk is managed and performance is monitored. Which framework is best suited?
a) Scrum
b) COBIT
c) DevOps
d) PRINCE2

10) The term “audit trail” refers to _____.
a) A backup log
b) A record of all financial transactions
c) A chronological record of system activities
d) A list of employees in IT

11) Which type of audit involves ethical hackers simulating an attack?
a) Compliance audit
b) Procedural audit
c) Penetration testing audit
d) Financial audit

12) Which is typically the first phase in a security audit?
a) Reporting
b) Evidence collection
c) Planning and scoping
d) Risk mitigation

13) Audit costs increase significantly when _____.
a) Audits are unplanned and lack scope definition
b) Employees are trained
c) Firewalls are configured
d) Antivirus is updated

14) What is a common budgeting mistake for audits?
a) Including contingency for re-audit
b) Underestimating post-audit remediation costs
c) Including software licenses
d) Hiring experienced consultants

Seat No.	

Set | P

Fourth. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Cyber Security - Information Security and Audit (BTN06719)

Day & Date: Monday, 11-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data whenever necessary.

SECTION – I

Q.2 Solve any four of the followings. **16**

a) How did the need for information security evolve with technological advancements?

b) What are IT controls? Mention two technical and two administrative controls.

c) Give two examples each of administrative and technical controls in a security policy.

d) What is the PDCA model (Plan-Do-Check-Act) and where is it used in information security?

e) What is role-based access control (RBAC) and how does it help in data security?

Q.3 Solve any two of the followings. **12**

a) What are the types of IT controls? Explain with examples of preventive, detective, and corrective controls.

b) How does each phase of the PDCA model support continuous improvement in security policy?

c) Discuss the security risks involved in hardware acquisition and how organizations can ensure hardware integrity and trustworthiness.

SECTION – II

Q.4 Solve any four of the followings. **16**

a) List & explain the main objectives of IT Governance.

b) Define & explain the IT Governance Maturity Model.

c) What is the difference between a compliance audit and a risk assessment audit?

d) Define &explain vulnerability scanning and penetration testing in technology-based audits.

e) Name & explain two criteria for selecting external security consultants.

Q.5 Solve any two of the followings. **12**

a) Explain the COBIT framework, its components, and how it helps organizations in IT Governance.

b) Describe the organizational structure that supports effective security audits, including roles like CISO, audit committee, and IT staff.

c) Outline the detailed phases involved in a security audit and explain the purpose of each phase.

Seat No.	

Set **Q**

Fourth. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Cyber Security - Information Security and Audit (BTN06719)

Day & Date: Monday, 11-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Choose the correct option from the following. **14**

1) In IT governance, the structure refers to _____.
a) The size of the IT department
b) How responsibilities, rights, and accountabilities are distributed
c) The number of data centres
d) Network topology

2) A company wants to align its IT objectives with its business goals while ensuring risk is managed and performance is monitored. Which framework is best suited?
a) Scrum b) COBIT
c) DevOps d) PRINCE2

3) The term "audit trail" refers to _____.
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b) A record of all financial transactions
c) A chronological record of system activities
d) A list of employees in IT

4) Which type of audit involves ethical hackers simulating an attack?
a) Compliance audit b) Procedural audit
c) Penetration testing audit d) Financial audit

5) Which is typically the first phase in a security audit?
a) Reporting b) Evidence collection
c) Planning and scoping d) Risk mitigation

6) Audit costs increase significantly when _____.
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b) Employees are trained
c) Firewalls are configured
d) Antivirus is updated

7) What is a common budgeting mistake for audits?
a) Including contingency for re-audit
b) Underestimating post-audit remediation costs
c) Including software licenses
d) Hiring experienced consultants

8) The CIA model was first used primarily in which sector?
a) Financial
b) Healthcare
c) Military and government
d) Education

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a) Technical
b) Physical
c) Preventive
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10) Which of the following is an example of a technical security policy?
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11) ISO/IEC 27001 focuses on _____.
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12) Which cryptographic technique is used in digital signatures?
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13) A company suffered a ransomware attack because an employee clicked on a phishing email. What policy was likely weak or missing?
a) Backup policy
b) Internet access control
c) Email usage and security awareness training
d) Data retention policy

14) A common best practice in physical security is _____.
a) Using cloud backups
b) Placing security guards at entry points
c) Implementing encryption
d) Disabling USB ports

Seat No.	

Set **Q**

Fourth. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Cyber Security - Information Security and Audit (BTN06719)

Day & Date: Monday, 11-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data whenever necessary.

SECTION – I

Q.2 Solve any four of the followings. **16**

a) How did the need for information security evolve with technological advancements?

b) What are IT controls? Mention two technical and two administrative controls.

c) Give two examples each of administrative and technical controls in a security policy.

d) What is the PDCA model (Plan-Do-Check-Act) and where is it used in information security?

e) What is role-based access control (RBAC) and how does it help in data security?

Q.3 Solve any two of the followings. **12**

a) What are the types of IT controls? Explain with examples of preventive, detective, and corrective controls.

b) How does each phase of the PDCA model support continuous improvement in security policy?

c) Discuss the security risks involved in hardware acquisition and how organizations can ensure hardware integrity and trustworthiness.

SECTION – II

Q.4 Solve any four of the followings. **16**

a) List & explain the main objectives of IT Governance.

b) Define & explain the IT Governance Maturity Model.

c) What is the difference between a compliance audit and a risk assessment audit?

d) Define &explain vulnerability scanning and penetration testing in technology-based audits.

e) Name & explain two criteria for selecting external security consultants.

Q.5 Solve any two of the followings. **12**

a) Explain the COBIT framework, its components, and how it helps organizations in IT Governance.

b) Describe the organizational structure that supports effective security audits, including roles like CISO, audit committee, and IT staff.

c) Outline the detailed phases involved in a security audit and explain the purpose of each phase.

Seat No.	

Set **R**

Fourth. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Cyber Security - Information Security and Audit (BTN06719)

Day & Date: Monday, 11-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Choose the correct option from the following. **14**

1) Which type of audit involves ethical hackers simulating an attack?
a) Compliance audit b) Procedural audit
c) Penetration testing audit d) Financial audit

2) Which is typically the first phase in a security audit?
a) Reporting b) Evidence collection
c) Planning and scoping d) Risk mitigation

3) Audit costs increase significantly when _____.
a) Audits are unplanned and lack scope definition
b) Employees are trained
c) Firewalls are configured
d) Antivirus is updated

4) What is a common budgeting mistake for audits?
a) Including contingency for re-audit
b) Underestimating post-audit remediation costs
c) Including software licenses
d) Hiring experienced consultants

5) The CIA model was first used primarily in which sector?
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6) Security policies and procedures are examples of which type of control?
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7) Which of the following is an example of a technical security policy?
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13) A company wants to align its IT objectives with its business goals while ensuring risk is managed and performance is monitored. Which framework is best suited?
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14) The term “audit trail” refers to _____.
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d) A list of employees in IT

Seat No.	

Set **R**

Fourth. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Cyber Security - Information Security and Audit (BTN06719)

Day & Date: Monday, 11-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
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3) Assume suitable data whenever necessary.

SECTION – I

Q.2 Solve any four of the followings. **16**

a) How did the need for information security evolve with technological advancements?

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a) What are the types of IT controls? Explain with examples of preventive, detective, and corrective controls.

b) How does each phase of the PDCA model support continuous improvement in security policy?

c) Discuss the security risks involved in hardware acquisition and how organizations can ensure hardware integrity and trustworthiness.

SECTION – II

Q.4 Solve any four of the followings. **16**

a) List & explain the main objectives of IT Governance.

b) Define & explain the IT Governance Maturity Model.

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c) Outline the detailed phases involved in a security audit and explain the purpose of each phase.

Seat No.	

Set | S

Fourth. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Cyber Security - Information Security and Audit (BTN06719)

Day & Date: Monday, 11-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Choose the correct option from the following. **14**

1) A company suffered a ransomware attack because an employee clicked on a phishing email. What policy was likely weak or missing?
a) Backup policy
b) Internet access control
c) Email usage and security awareness training
d) Data retention policy

2) A common best practice in physical security is _____.
a) Using cloud backups
b) Placing security guards at entry points
c) Implementing encryption
d) Disabling USB ports

3) In IT governance, the structure refers to _____.
a) The size of the IT department
b) How responsibilities, rights, and accountabilities are distributed
c) The number of data centres
d) Network topology

4) A company wants to align its IT objectives with its business goals while ensuring risk is managed and performance is monitored. Which framework is best suited?
a) Scrum b) COBIT
c) DevOps d) PRINCE2

5) The term "audit trail" refers to _____.
a) A backup log
b) A record of all financial transactions
c) A chronological record of system activities
d) A list of employees in IT

6) Which type of audit involves ethical hackers simulating an attack?
a) Compliance audit
b) Procedural audit
c) Penetration testing audit
d) Financial audit

7) Which is typically the first phase in a security audit?
a) Reporting
b) Evidence collection
c) Planning and scoping
d) Risk mitigation

8) Audit costs increase significantly when _____.
a) Audits are unplanned and lack scope definition
b) Employees are trained
c) Firewalls are configured
d) Antivirus is updated

9) What is a common budgeting mistake for audits?
a) Including contingency for re-audit
b) Underestimating post-audit remediation costs
c) Including software licenses
d) Hiring experienced consultants

10) The CIA model was first used primarily in which sector?
a) Financial
b) Healthcare
c) Military and government
d) Education

11) Security policies and procedures are examples of which type of control?
a) Technical
b) Physical
c) Preventive
d) Administrative

12) Which of the following is an example of a technical security policy?
a) Password change frequency
b) Physical security of data centers
c) Incident response roles
d) Role-based access control (RBAC) implementation

13) ISO/IEC 27001 focuses on _____.
a) IT hardware specifications
b) Environmental sustainability
c) Information Security Management Systems (ISMS)
d) Financial risk management

14) Which cryptographic technique is used in digital signatures?
a) Symmetric encryption
b) Hashing with private key encryption
c) Base64 encoding
d) XOR operation

Seat No.		Set	S

Fourth. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Cyber Security - Information Security and Audit (BTN06719)

Day & Date: Monday, 11-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data whenever necessary.

SECTION – I

Q.2 Solve any four of the followings. **16**

a) How did the need for information security evolve with technological advancements?

b) What are IT controls? Mention two technical and two administrative controls.

c) Give two examples each of administrative and technical controls in a security policy.

d) What is the PDCA model (Plan-Do-Check-Act) and where is it used in information security?

e) What is role-based access control (RBAC) and how does it help in data security?

Q.3 Solve any two of the followings. **12**

a) What are the types of IT controls? Explain with examples of preventive, detective, and corrective controls.

b) How does each phase of the PDCA model support continuous improvement in security policy?

c) Discuss the security risks involved in hardware acquisition and how organizations can ensure hardware integrity and trustworthiness.

SECTION – II

Q.4 Solve any four of the followings. **16**

a) List & explain the main objectives of IT Governance.

b) Define & explain the IT Governance Maturity Model.

c) What is the difference between a compliance audit and a risk assessment audit?

d) Define &explain vulnerability scanning and penetration testing in technology-based audits.

e) Name & explain two criteria for selecting external security consultants.

Q.5 Solve any two of the followings. **12**

a) Explain the COBIT framework, its components, and how it helps organizations in IT Governance.

b) Describe the organizational structure that supports effective security audits, including roles like CISO, audit committee, and IT staff.

c) Outline the detailed phases involved in a security audit and explain the purpose of each phase.

SLR-QH-554

Seat No.	

Set P

Fourth. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Railway Engineering
Advanced Communication and Modern Signaling in Railway
(BTN06717)

Day & Date: Monday, 11-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. **14**

1) In railways, the disc signals are provided for the purpose of _____.
a) dead slow movement b) indicating busy platform
c) possible danger ahead d) shunting

2) What is the full form of SCRA?
a) Special Commercial Railway Apprentice
b) Special Class Railway Association
c) Super Class Railway Apprentice
d) None of these

3) Which is the first engine less Train in India?
a) Train 16 b) Train 18
c) Train 20 d) Train 22

4) Minimum speed restriction to be imposed for Track renewal is _____.
a) Stop dead & 10 Kmph b) 10 Kmph
c) 15 Kmph d) 20 Kmph

5) The reception signal is _____.
a) outer signal only
b) starter only
c) neither (outer signal) nor (starter)
d) Both (outer signal) and (starter)

6) Where is the headquarter of IRCTC _____.
a) New Delhi b) Mumbai
c) Kolkata d) Chennai

7) Shunting signals are known as _____.
a) Routing signals b) Starter signals
c) Ground signals d) Warner signals

8) In railways the signal that also acts as a routing signal is _____.
a) home signal b) advance starter signal
c) outer signal d) starter signal

9) IT tools and business systems in IR are _____.
a) Mobile Ticketing b) Web Ticketing
c) Kiosk-based Ticketing d) All of above

10) How many zones are there in Indian Railways?
a) 16 b) 18
c) 20 d) 22

11) The stations which do not have any signal are known as _____.
a) A-class stations b) B-class stations
c) Crossing stations d) Terminal stations

12) Which country has the longest railway network?
a) China b) United State
c) India d) Nepal

13) When the driver does not obey signal, in which system there are arrangements to display stop signals automatically in advance and to bring the train to a stop?
a) Absolute Block b) Automatic Block
c) Centralized Traffic Control d) Automatic Train Control

14) Intermediate Block Signaling using MSDAC system consists of the following component _____.
a) Axle Detectors b) Electronics Field Units
c) Central Evaluator d) All of the above

Seat No.	

Set **P**

Fourth. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Railway Engineering
Advanced Communication and Modern Signaling in Railway (BTN06717)

Day & Date: Monday, 11-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt Any Four. **16**

a) What is railway signaling system?

b) What is Intermediate Block Signaling using MSDAC? Explain.

c) Why is safety important in signaling?

d) Write a note on Telecommunication for Train Operation.

e) Write note on Windows NT.

Q.3 Attempt Any Two. **12**

a) Give the Role of the Signaling & Telecommunications Department in Railways.

b) What is Future Railway Mobile Communications System? Give details.

c) Explain Modern Signaling Systems.

SECTION – II

Q.4 Attempt Any Four. **16**

a) What is Automatic Train Protection (ATP)? Give details.

b) What is Networked PA (Public address) System in railway? Explain.

c) What is the difference between VHF and UHF?

d) Explain IP based Video Surveillance System (VSS) on Indian Railways.

e) Give Safety Slogans for Signal Department.

Q.5 Attempt Any Two. **12**

a) What is Software based Embedded Systems for Railway Signaling Applications? Explain.

b) What is Railway Signal and Track Control System? Explain.

c) Explain trains through two-way satellite communication.

Seat No.	

Set **Q**

Fourth. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Railway Engineering
Advanced Communication and Modern Signaling in Railway (BTN06717)

Day & Date: Monday, 11-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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a) home signal b) advance starter signal
c) outer signal d) starter signal

2) IT tools and business systems in IR are _____.
a) Mobile Ticketing b) Web Ticketing
c) Kiosk-based Ticketing d) All of above

3) How many zones are there in Indian Railways?
a) 16 b) 18
c) 20 d) 22

4) The stations which do not have any signal are known as _____.
a) A-class stations b) B-class stations
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5) Which country has the longest railway network?
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7) Intermediate Block Signaling using MSDAC system consists of the following component _____.
   a) Axle Detectors
   b) Electronics Field Units
   c) Central Evaluator
   d) All of the above

8) In railways, the disc signals are provided for the purpose of _____.
   a) dead slow movement
   b) indicating busy platform
   c) possible danger ahead
   d) shunting

9) What is the full form of SCRA?
   a) Special Commercial Railway Apprentice
   b) Special Class Railway Association
   c) Super Class Railway Apprentice
   d) None of these

10) Which is the first engine less Train in India?
   a) Train 16
   b) Train 18
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11) Minimum speed restriction to be imposed for Track renewal is _____.
   a) Stop dead & 10 Kmph
   b) 10 Kmph
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12) The reception signal is _____.
   a) outer signal only
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13) Where is the headquarter of IRCTC _____.
   a) New Delhi
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   c) Ground signals
   d) Warner signals

SLR-QH-554

Seat No.	

Set Q

Fourth. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Railway Engineering
Advanced Communication and Modern Signaling in Railway (BTN06717)

Day & Date: Monday, 11-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
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SECTION – I

Q.2 Attempt Any Four. **16**

a) What is railway signaling system?

b) What is Intermediate Block Signaling using MSDAC? Explain.

c) Why is safety important in signaling?

d) Write a note on Telecommunication for Train Operation.

e) Write note on Windows NT.

Q.3 Attempt Any Two. **12**

a) Give the Role of the Signaling & Telecommunications Department in Railways.

b) What is Future Railway Mobile Communications System? Give details.

c) Explain Modern Signaling Systems.

SECTION – II

Q.4 Attempt Any Four. **16**

a) What is Automatic Train Protection (ATP)? Give details.

b) What is Networked PA (Public address) System in railway? Explain.

c) What is the difference between VHF and UHF?

d) Explain IP based Video Surveillance System (VSS) on Indian Railways.

e) Give Safety Slogans for Signal Department.

Q.5 Attempt Any Two. **12**

a) What is Software based Embedded Systems for Railway Signaling Applications? Explain.

b) What is Railway Signal and Track Control System? Explain.

c) Explain trains through two-way satellite communication.

Seat No.	

Set | **R**

Fourth. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Railway Engineering
Advanced Communication and Modern Signaling in Railway (BTN06717)

Day & Date: Monday, 11-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. **14**

1) The stations which do not have any signal are known as _____.
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c) 20 d) 22

Seat No.	

Set **R**

Fourth. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Railway Engineering
Advanced Communication and Modern Signaling in Railway (BTN06717)

Day & Date: Monday, 11-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt Any Four. **16**

a) What is railway signaling system?

b) What is Intermediate Block Signaling using MSDAC? Explain.

c) Why is safety important in signaling?

d) Write a note on Telecommunication for Train Operation.

e) Write note on Windows NT.

Q.3 Attempt Any Two. **12**

a) Give the Role of the Signaling & Telecommunications Department in Railways.

b) What is Future Railway Mobile Communications System? Give details.

c) Explain Modern Signaling Systems.

SECTION – II

Q.4 Attempt Any Four. **16**

a) What is Automatic Train Protection (ATP)? Give details.

b) What is Networked PA (Public address) System in railway? Explain.

c) What is the difference between VHF and UHF?

d) Explain IP based Video Surveillance System (VSS) on Indian Railways.

e) Give Safety Slogans for Signal Department.

Q.5 Attempt Any Two. **12**

a) What is Software based Embedded Systems for Railway Signaling Applications? Explain.

b) What is Railway Signal and Track Control System? Explain.

c) Explain trains through two-way satellite communication.

Seat No.	

Set | S

Fourth. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Railway Engineering
Advanced Communication and Modern Signaling in Railway (BTN06717)

Day & Date: Monday, 11-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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1) Where is the headquarter of IRCTC _____.
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SLR-QH-554

Seat No.	

Set S

Fourth. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Railway Engineering
Advanced Communication and Modern Signaling in Railway (BTN06717)

Day & Date: Monday, 11-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt Any Four. **16**

a) What is railway signaling system?

b) What is Intermediate Block Signaling using MSDAC? Explain.

c) Why is safety important in signaling?

d) Write a note on Telecommunication for Train Operation.

e) Write note on Windows NT.

Q.3 Attempt Any Two. **12**

a) Give the Role of the Signaling & Telecommunications Department in Railways.

b) What is Future Railway Mobile Communications System? Give details.

c) Explain Modern Signaling Systems.

SECTION – II

Q.4 Attempt Any Four. **16**

a) What is Automatic Train Protection (ATP)? Give details.

b) What is Networked PA (Public address) System in railway? Explain.

c) What is the difference between VHF and UHF?

d) Explain IP based Video Surveillance System (VSS) on Indian Railways.

e) Give Safety Slogans for Signal Department.

Q.5 Attempt Any Two. **12**

a) What is Software based Embedded Systems for Railway Signaling Applications? Explain.

b) What is Railway Signal and Track Control System? Explain.

c) Explain trains through two-way satellite communication.

SLR-QH-555

Seat No.		Set	P

Fourth. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Research Methodology (BTN06704)

Day & Date: Wednesday, 13-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.
5) Use of nonprogrammable calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) An image, perception or concept that is capable of measurement is called _____.
a) Scale b) Hypothesis
c) Type d) Variable

2) Which type of research is typically conducted to solve practical problems or address specific issues?
a) Applied research b) Fundamental research
c) Descriptive research d) Analytical research

3) In order to pursue the research, which of the following is priory required?
a) Developing a research design
b) Formulating a research question
c) Deciding about the data analysis procedure
d) Formulating a research hypothesis

4) What is a hypothesis in research?
a) A conclusion drawn from data analysis
b) A summary of research findings
c) A measurement of data accuracy
d) A statement of predicted relationship between variables

5) How to judge the depth of any research?
a) By research title
b) By research duration
c) By research objectives
d) By total expenditure on research

6) A complete list of all the sampling units is called _____.
a) Sampling design
b) Sampling frame
c) Population frame
d) Cluster

7) Which feature is essential for a good research design?
a) Completing the research quickly
b) Simplicity and ease of execution
c) Relying solely on secondary data
d) Ignoring ethical considerations

8) What is the difference between a quantitative and qualitative research design?
a) The type of data collected
b) The methods used for data collection
c) The methods used for data analysis
d) All of the above

9) ANOVA is _____.
a) A government body which collects social statistics
b) The name of a statistical software package
c) A one-way analysis of variance
d) A two-way analysis of variance

10) What is the purpose of research design?
a) To develop a hypothesis
b) To select a sample
c) To determine the methods for data collection and analysis
d) All of the above

11) Which of the following is not one of the seven major parts to the research report?
a) Results
b) Abstract
c) Method
d) Footnotes

12) Which of the following is not a type of research design?
a) Experimental design
b) Descriptive design
c) Correlational design
d) Probability design

13) Which type of report aims to provide an overview of a specific topic, often for decision-makers?
a) Research report
b) Technical report
c) Feasibility report
d) Progress report

14) Which basic ethical principle involves telling the truth and avoiding deception in research?
a) Objectivity
b) Honesty
c) Efficiency
d) Accuracy

SLR-QH-555

Seat No.		Set	P

Fourth. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Research Methodology (BTN06704)

Day & Date: Wednesday, 13-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

Section – I

Q.2 Solve any Four the followings. **16**

a) Write a short note on objective of research.

b) Explain the Criteria for good Research.

c) Distinguish between research methods and research methodology.

d) Briefly describe the different steps involved in Research process.

e) What are the different strategic for good sample design?

Q.3 Solve any Two of the following. **12**

a) Explain the meaning and significance of Research design - Basic Principles.

b) What are different types of research. Explain Descriptive *vs.* Analytical research in detail.

c) What is a research problem? Define the main issues which should receive the attention of the researcher in formulating the research problem. Give suitable examples to elucidate your points.

Section – II

Q.4 Solve any Four of the following. **16**

a) Explain the collection of primary data by Observation method.

b) Explain Plagiarism and Citation in brief.

c) Explain Data Processing in Research.

d) Explain the Research and Publication ethics.

e) Discuss interview as a technique as a data collection.

Q.5 Solve any Two of the followings. **12**

a) Write in brief note on different types of data Analysis strategies using Chi-Square, ANOVA.

b) Write about Honestly, Objectivity, Efficiency and Accuracy of research.

c) Explain the significance of a research report and narrate the various steps involved in writing such reports.

Seat No.	

Set | Q

Fourth. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Research Methodology (BTN06704)

Day & Date: Wednesday, 13-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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5) Use of nonprogrammable calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) What is the difference between a quantitative and qualitative research design?
a) The type of data collected
b) The methods used for data collection
c) The methods used for data analysis
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2) ANOVA is _____.
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a) Results b) Abstract
c) Method d) Footnotes

5) Which of the following is not a type of research design?
a) Experimental design b) Descriptive design
c) Correlational design d) Probability design

6) Which type of report aims to provide an overview of a specific topic, often for decision-makers?
a) Research report
b) Technical report
c) Feasibility report
d) Progress report

7) Which basic ethical principle involves telling the truth and avoiding deception in research?
a) Objectivity
b) Honesty
c) Efficiency
d) Accuracy

8) An image, perception or concept that is capable of measurement is called _____.
a) Scale
b) Hypothesis
c) Type
d) Variable

9) Which type of research is typically conducted to solve practical problems or address specific issues?
a) Applied research
b) Fundamental research
c) Descriptive research
d) Analytical research

10) In order to pursue the research, which of the following is priory required?
a) Developing a research design
b) Formulating a research question
c) Deciding about the data analysis procedure
d) Formulating a research hypothesis

11) What is a hypothesis in research?
a) A conclusion drawn from data analysis
b) A summary of research findings
c) A measurement of data accuracy
d) A statement of predicted relationship between variables

12) How to judge the depth of any research?
a) By research title
b) By research duration
c) By research objectives
d) By total expenditure on research

13) A complete list of all the sampling units is called _____.
a) Sampling design
b) Sampling frame
c) Population frame
d) Cluster

14) Which feature is essential for a good research design?
a) Completing the research quickly
b) Simplicity and ease of execution
c) Relying solely on secondary data
d) Ignoring ethical considerations

Seat No.		Set	Q

Fourth. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Research Methodology (BTN06704)

Day & Date: Wednesday, 13-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

Section – I

Q.2 Solve any Four the followings. **16**

a) Write a short note on objective of research.

b) Explain the Criteria for good Research.

c) Distinguish between research methods and research methodology.

d) Briefly describe the different steps involved in Research process.

e) What are the different strategic for good sample design?

Q.3 Solve any Two of the following. **12**

a) Explain the meaning and significance of Research design - Basic Principles.

b) What are different types of research. Explain Descriptive *vs.* Analytical research in detail.

c) What is a research problem? Define the main issues which should receive the attention of the researcher in formulating the research problem. Give suitable examples to elucidate your points.

Section – II

Q.4 Solve any Four of the following. **16**

a) Explain the collection of primary data by Observation method.

b) Explain Plagiarism and Citation in brief.

c) Explain Data Processing in Research.

d) Explain the Research and Publication ethics.

e) Discuss interview as a technique as a data collection.

Q.5 Solve any Two of the followings. **12**

a) Write in brief note on different types of data Analysis strategies using Chi-Square, ANOVA.

b) Write about Honestly, Objectivity, Efficiency and Accuracy of research.

c) Explain the significance of a research report and narrate the various steps involved in writing such reports.

Seat No.	

Set **R**

Fourth. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Research Methodology (BTN06704)

Day & Date: Wednesday, 13-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.
5) Use of nonprogrammable calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which of the following is not one of the seven major parts to the research report?
a) Results b) Abstract
c) Method d) Footnotes

2) Which of the following is not a type of research design?
a) Experimental design b) Descriptive design
c) Correlational design d) Probability design

3) Which type of report aims to provide an overview of a specific topic, often for decision-makers?
a) Research report b) Technical report
c) Feasibility report d) Progress report

4) Which basic ethical principle involves telling the truth and avoiding deception in research?
a) Objectivity b) Honesty
c) Efficiency d) Accuracy

5) An image, perception or concept that is capable of measurement is called _____.
a) Scale b) Hypothesis
c) Type d) Variable

6) Which type of research is typically conducted to solve practical problems or address specific issues?
a) Applied research b) Fundamental research
c) Descriptive research d) Analytical research

7) In order to pursue the research, which of the following is priory required?
   a) Developing a research design
   b) Formulating a research question
   c) Deciding about the data analysis procedure
   d) Formulating a research hypothesis

8) What is a hypothesis in research?
   a) A conclusion drawn from data analysis
   b) A summary of research findings
   c) A measurement of data accuracy
   d) A statement of predicted relationship between variables

9) How to judge the depth of any research?
   a) By research title
   b) By research duration
   c) By research objectives
   d) By total expenditure on research

10) A complete list of all the sampling units is called _____.
   a) Sampling design
   b) Sampling frame
   c) Population frame
   d) Cluster

11) Which feature is essential for a good research design?
   a) Completing the research quickly
   b) Simplicity and ease of execution
   c) Relying solely on secondary data
   d) Ignoring ethical considerations

12) What is the difference between a quantitative and qualitative research design?
   a) The type of data collected
   b) The methods used for data collection
   c) The methods used for data analysis
   d) All of the above

13) ANOVA is _____.
   a) A government body which collects social statistics
   b) The name of a statistical software package
   c) A one-way analysis of variance
   d) A two-way analysis of variance

14) What is the purpose of research design?
   a) To develop a hypothesis
   b) To select a sample
   c) To determine the methods for data collection and analysis
   d) All of the above

SLR-QH-555

Seat No.		Set	R

Fourth. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Research Methodology (BTN06704)

Day & Date: Wednesday, 13-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

Section – I

Q.2 Solve any Four the followings. **16**

a) Write a short note on objective of research.

b) Explain the Criteria for good Research.

c) Distinguish between research methods and research methodology.

d) Briefly describe the different steps involved in Research process.

e) What are the different strategic for good sample design?

Q.3 Solve any Two of the following. **12**

a) Explain the meaning and significance of Research design - Basic Principles.

b) What are different types of research. Explain Descriptive *vs.* Analytical research in detail.

c) What is a research problem? Define the main issues which should receive the attention of the researcher in formulating the research problem. Give suitable examples to elucidate your points.

Section – II

Q.4 Solve any Four of the following. **16**

a) Explain the collection of primary data by Observation method.

b) Explain Plagiarism and Citation in brief.

c) Explain Data Processing in Research.

d) Explain the Research and Publication ethics.

e) Discuss interview as a technique as a data collection.

Q.5 Solve any Two of the followings. **12**

a) Write in brief note on different types of data Analysis strategies using Chi-Square, ANOVA.

b) Write about Honestly, Objectivity, Efficiency and Accuracy of research.

c) Explain the significance of a research report and narrate the various steps involved in writing such reports.

Seat No.	

Set | S

Fourth. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Research Methodology (BTN06704)

Day & Date: Wednesday, 13-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.
5) Use of nonprogrammable calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) A complete list of all the sampling units is called _____.
a) Sampling design b) Sampling frame
c) Population frame d) Cluster

2) Which feature is essential for a good research design?
a) Completing the research quickly
b) Simplicity and ease of execution
c) Relying solely on secondary data
d) Ignoring ethical considerations

3) What is the difference between a quantitative and qualitative research design?
a) The type of data collected
b) The methods used for data collection
c) The methods used for data analysis
d) All of the above

4) ANOVA is _____.
a) A government body which collects social statistics
b) The name of a statistical software package
c) A one-way analysis of variance
d) A two-way analysis of variance

5) What is the purpose of research design?
a) To develop a hypothesis
b) To select a sample
c) To determine the methods for data collection and analysis
d) All of the above

6) Which of the following is not one of the seven major parts to the research report?
a) Results
b) Abstract
c) Method
d) Footnotes

7) Which of the following is not a type of research design?
a) Experimental design
b) Descriptive design
c) Correlational design
d) Probability design

8) Which type of report aims to provide an overview of a specific topic, often for decision-makers?
a) Research report
b) Technical report
c) Feasibility report
d) Progress report

9) Which basic ethical principle involves telling the truth and avoiding deception in research?
a) Objectivity
b) Honesty
c) Efficiency
d) Accuracy

10) An image, perception or concept that is capable of measurement is called _____.
a) Scale
b) Hypothesis
c) Type
d) Variable

11) Which type of research is typically conducted to solve practical problems or address specific issues?
a) Applied research
b) Fundamental research
c) Descriptive research
d) Analytical research

12) In order to pursue the research, which of the following is priory required?
a) Developing a research design
b) Formulating a research question
c) Deciding about the data analysis procedure
d) Formulating a research hypothesis

13) What is a hypothesis in research?
a) A conclusion drawn from data analysis
b) A summary of research findings
c) A measurement of data accuracy
d) A statement of predicted relationship between variables

14) How to judge the depth of any research?
a) By research title
b) By research duration
c) By research objectives
d) By total expenditure on research

SLR-QH-555

Seat No.		Set	S

Fourth. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Research Methodology (BTN06704)

Day & Date: Wednesday, 13-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

Section – I

Q.2 Solve any Four the followings. **16**

a) Write a short note on objective of research.

b) Explain the Criteria for good Research.

c) Distinguish between research methods and research methodology.

d) Briefly describe the different steps involved in Research process.

e) What are the different strategic for good sample design?

Q.3 Solve any Two of the following. **12**

a) Explain the meaning and significance of Research design - Basic Principles.

b) What are different types of research. Explain Descriptive *vs.* Analytical research in detail.

c) What is a research problem? Define the main issues which should receive the attention of the researcher in formulating the research problem. Give suitable examples to elucidate your points.

Section – II

Q.4 Solve any Four of the following. **16**

a) Explain the collection of primary data by Observation method.

b) Explain Plagiarism and Citation in brief.

c) Explain Data Processing in Research.

d) Explain the Research and Publication ethics.

e) Discuss interview as a technique as a data collection.

Q.5 Solve any Two of the followings. **12**

a) Write in brief note on different types of data Analysis strategies using Chi-Square, ANOVA.

b) Write about Honestly, Objectivity, Efficiency and Accuracy of research.

c) Explain the significance of a research report and narrate the various steps involved in writing such reports.

SLR-QH-556

Seat No.	

Set P

Fourth Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026
Wireless Sensor Networks (BTN06802)

Day & Date: Thursday, 14-05-2026 Max. Marks: 50
Time: 03:00 PM To 05:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Consider data whenever necessary.

MCQ/Objective Type Questions

Duration: 20 Minutes Marks: 10

Q.1 Multiple Choice Questions. (1 x 10) 10

1) What are the application areas of WSN?
a) Asset Management b) Automobile
c) Healthcare d) All

2) Network of WSN is _____ centric but not _____ centric.
a) data, node b) node, data
c) information, data d) node, mode

3) A WSN is designed to collect information from _____ environment.
a) Logical b) Physical
c) both a) and b) d) None

4) The challenges we faced in designing WSN system and applications including _____.
a) Limited hardware b) limited support for network
c) Scalability d) All of these

5) This mode of WSN will communication directly with each other ____.
a) Digital b) Physical
c) ad-hoc d) Infrastructure

6) EMC stands for _____.
a) Electric Measurements and Components
b) Electromagnetic Compatibility
c) Electric and Mechanical Components
d) None

7) The principle behind backscatter communication is _____ of radio waves.

a) Refraction b) Reflection
c) ionization d) back propagation

8) Which RFID Tag has don't have its own power supply _____.

a) Active b) Passive
c) Semi-Passive d) All

9) Malware means _____.

a) small software b) Instruction
c) block diagram d) None

10) RFID stands for _____.

a) Radio Frequency Identification Device
b) Radio Frequency identification
c) Radar Frequency Identification
d) None of all

SLR-QH-556

Seat No.	

Set P

Fourth Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026
Wireless Sensor Networks (BTN06802)

Day & Date: Thursday, 14-05-2026 Max. Marks: 40
Time: 03:00 PM To 05:00 PM

Instructions: 1) All Questions are compulsory.
2) Figures to the right indicate full marks.
3) Consider data whenever necessary.

SECTION - I

Q.2 Attempt Any Two from the following. **08**

a) Explain the Operating System for WSN.

b) Explain the Enabling Technologies for Wireless Sensor Networks.

c) What are the types of Sources and Sinks in Network Architecture.

Q.3 Attempt Any Two from the following. **12**

a) Explain Wireless sensor Network with suitable diagram.

b) Explain the Gateway used in WSN with its types.

c) Explain the applications of Wireless Sensor Networks.

SECTION – II

Q.4 Attempt Any Two from the following. **08**

a) Why energy management is required in WSN.

b) Explain RFID with suitable diagram.

c) What is malicious Node? Explain it.

Q.5 Attempt Any Two from the following. **12**

a) Explain Application of RFID in healthcare application with suitable example.

b) What is energy Management? How it will done in Wireless Sensor Networks.

c) Explain the Aspects of EMC.

Seat No.	

Set **Q**

Fourth Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026
Wireless Sensor Networks (BTN06802)

Day & Date: Thursday, 14-05-2026 Max. Marks: 50
Time: 03:00 PM To 05:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Consider data whenever necessary.

MCQ/Objective Type Questions

Duration: 20 Minutes Marks: 10

Q.1 Multiple Choice Questions. (1 x 10) **10**

1) EMC stands for _____.
a) Electric Measurements and Components
b) Electromagnetic Compatibility
c) Electric and Mechanical Components
d) None

2) The principle behind backscatter communication is _____ of radio waves.
a) Refraction b) Reflection
c) ionization d) back propagation

3) Which RFID Tag has don't have its own power supply _____.
a) Active b) Passive
c) Semi-Passive d) All

4) Malware means _____.
a) small software b) Instruction
c) block diagram d) None

5) RFID stands for _____.
a) Radio Frequency Identification Device
b) Radio Frequency identification
c) Radar Frequency Identification
d) None of all

6) What are the application areas of WSN?
a) Asset Management b) Automobile
c) Healthcare d) All

7) Network of WSN is _____ centric but not _____ centric.
   a) data, node b) node, data
   c) information, data d) node, mode

8) A WSN is designed to collect information from _____ environment.
   a) Logical b) Physical
   c) both a) and b) d) None

9) The challenges we faced in designing WSN system and applications including _____.
   a) Limited hardware b) limited support for network
   c) Scalability d) All of these

10) This mode of WSN will communication directly with each other ____.
   a) Digital b) Physical
   c) ad-hoc d) Infrastructure

SLR-QH-556

Seat No.	

Set Q

Fourth Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026
Wireless Sensor Networks (BTN06802)

Day & Date: Thursday, 14-05-2026 Max. Marks: 40
Time: 03:00 PM To 05:00 PM

Instructions: 1) All Questions are compulsory.
2) Figures to the right indicate full marks.
3) Consider data whenever necessary.

SECTION - I

Q.2 Attempt Any Two from the following. **08**

a) Explain the Operating System for WSN.

b) Explain the Enabling Technologies for Wireless Sensor Networks.

c) What are the types of Sources and Sinks in Network Architecture.

Q.3 Attempt Any Two from the following. **12**

a) Explain Wireless sensor Network with suitable diagram.

b) Explain the Gateway used in WSN with its types.

c) Explain the applications of Wireless Sensor Networks.

SECTION – II

Q.4 Attempt Any Two from the following. **08**

a) Why energy management is required in WSN.

b) Explain RFID with suitable diagram.

c) What is malicious Node? Explain it.

Q.5 Attempt Any Two from the following. **12**

a) Explain Application of RFID in healthcare application with suitable example.

b) What is energy Management? How it will done in Wireless Sensor Networks.

c) Explain the Aspects of EMC.

Seat No.	

Set **R**

Fourth Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026
Wireless Sensor Networks (BTN06802)

Day & Date: Thursday, 14-05-2026 Max. Marks: 50
Time: 03:00 PM To 05:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Consider data whenever necessary.

MCQ/Objective Type Questions

Duration: 20 Minutes Marks: 10

Q.1 Multiple Choice Questions. (1 x 10) **10**

1) Malware means _____.
a) small software b) Instruction
c) block diagram d) None

2) RFID stands for _____.
a) Radio Frequency Identification Device
b) Radio Frequency identification
c) Radar Frequency Identification
d) None of all

3) What are the application areas of WSN?
a) Asset Management b) Automobile
c) Healthcare d) All

4) Network of WSN is _____ centric but not _____ centric.
a) data, node b) node, data
c) information, data d) node, mode

5) A WSN is designed to collect information from _____ environment.
a) Logical b) Physical
c) both a) and b) d) None

6) The challenges we faced in designing WSN system and applications including _____.
a) Limited hardware b) limited support for network
c) Scalability d) All of these

7) This mode of WSN will communication directly with each other ____.
   a) Digital
   b) Physical
   c) ad-hoc
   d) Infrastructure

8) EMC stands for _____.
   a) Electric Measurements and Components
   b) Electromagnetic Compatibility
   c) Electric and Mechanical Components
   d) None

9) The principle behind backscatter communication is _____ of radio waves.
   a) Refraction
   b) Reflection
   c) ionization
   d) back propagation

10) Which RFID Tag has don't have its own power supply _____.
   a) Active
   b) Passive
   c) Semi-Passive
   d) All

SLR-QH-556

Seat No.	

Set R

Fourth Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026
Wireless Sensor Networks (BTN06802)

Day & Date: Thursday, 14-05-2026 Max. Marks: 40
Time: 03:00 PM To 05:00 PM

Instructions: 1) All Questions are compulsory.
2) Figures to the right indicate full marks.
3) Consider data whenever necessary.

SECTION - I

Q.2 Attempt Any Two from the following. **08**

a) Explain the Operating System for WSN.

b) Explain the Enabling Technologies for Wireless Sensor Networks.

c) What are the types of Sources and Sinks in Network Architecture.

Q.3 Attempt Any Two from the following. **12**

a) Explain Wireless sensor Network with suitable diagram.

b) Explain the Gateway used in WSN with its types.

c) Explain the applications of Wireless Sensor Networks.

SECTION – II

Q.4 Attempt Any Two from the following. **08**

a) Why energy management is required in WSN.

b) Explain RFID with suitable diagram.

c) What is malicious Node? Explain it.

Q.5 Attempt Any Two from the following. **12**

a) Explain Application of RFID in healthcare application with suitable example.

b) What is energy Management? How it will done in Wireless Sensor Networks.

c) Explain the Aspects of EMC.

SLR-QH-556

Seat No.	

Set S

Fourth Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026
Wireless Sensor Networks (BTN06802)

Day & Date: Thursday, 14-05-2026 Max. Marks: 50
Time: 03:00 PM To 05:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Consider data whenever necessary.

MCQ/Objective Type Questions

Duration: 20 Minutes Marks: 10

Q.1 Multiple Choice Questions. (1 x 10) **10**

1) A WSN is designed to collect information from _____ environment.
a) Logical b) Physical
c) both a) and b) d) None

2) The challenges we faced in designing WSN system and applications including _____.
a) Limited hardware b) limited support for network
c) Scalability d) All of these

3) This mode of WSN will communication directly with each other ____.
a) Digital b) Physical
c) ad-hoc d) Infrastructure

4) EMC stands for _____.
a) Electric Measurements and Components
b) Electromagnetic Compatibility
c) Electric and Mechanical Components
d) None

5) The principle behind backscatter communication is _____ of radio waves.
a) Refraction b) Reflection
c) ionization d) back propagation

6) Which RFID Tag has don't have its own power supply _____.
a) Active b) Passive
c) Semi-Passive d) All

7) Malware means _____.
   a) small software
   b) Instruction
   c) block diagram
   d) None

8) RFID stands for _____.
   a) Radio Frequency Identification Device
   b) Radio Frequency identification
   c) Radar Frequency Identification
   d) None of all

9) What are the application areas of WSN?
   a) Asset Management
   b) Automobile
   c) Healthcare
   d) All

10) Network of WSN is _____ centric but not _____ centric.
   a) data, node
   b) node, data
   c) information, data
   d) node, mode

SLR-QH-556

Seat No.	

Set S

Fourth Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026
Wireless Sensor Networks (BTN06802)

Day & Date: Thursday, 14-05-2026 Max. Marks: 40
Time: 03:00 PM To 05:00 PM

Instructions: 1) All Questions are compulsory.
2) Figures to the right indicate full marks.
3) Consider data whenever necessary.

SECTION - I

Q.2 Attempt Any Two from the following. **08**

a) Explain the Operating System for WSN.

b) Explain the Enabling Technologies for Wireless Sensor Networks.

c) What are the types of Sources and Sinks in Network Architecture.

Q.3 Attempt Any Two from the following. **12**

a) Explain Wireless sensor Network with suitable diagram.

b) Explain the Gateway used in WSN with its types.

c) Explain the applications of Wireless Sensor Networks.

SECTION – II

Q.4 Attempt Any Two from the following. **08**

a) Why energy management is required in WSN.

b) Explain RFID with suitable diagram.

c) What is malicious Node? Explain it.

Q.5 Attempt Any Two from the following. **12**

a) Explain Application of RFID in healthcare application with suitable example.

b) What is energy Management? How it will done in Wireless Sensor Networks.

c) Explain the Aspects of EMC.

SLR-QH-557

Seat No.	

Set P

Fourth Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026
Satellite Communication (BTN06803)

Day & Date: Thursday, 14-05-2026 Max. Marks: 50
Time: 03:00 PM To 05:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume if any data required to solve the problems.

MCQ/Objective Type Questions

Duration: 20 Minutes Marks: 10

Q.1 Multiple Choice Questions. **10**

1) The Height of Geostationary satellite is _____.
a) 35930 Km b) 45930
c) 55930 d) None of above

2) Apogee?
a) The point farthest from earth
b) The point nearest from earth
c) The point smallest from earth
d) None of the above

3) A television (TV) transmission is an example of which type of transmission?
a) Simplex b) Half duplex
c) Full duplex d) None of the above

4) Atmospheric drag has negligible effect on _____.
a) geostationary satellites b) MEO
c) LEO d) None of the above

5) For an elliptical orbit?
a) $e < 0$ b) $0 < e < 1$
c) $e = 1$ d) None of the above

6) Calculate the radius of a circular orbit for which the period is 1 day?
a) 42.241 Km b) 42.241 m
c) 4.241 Km d) 2.241 Km

7) Ascending node?
- a) The point longest from earth
- b) The point closest approach to earth
- c) The point where the orbit crosses the equatorial plane going from south to north
- d) None of the above

8) The period of a satellite, the time required for a satellite to make a complete trip around the Earth, is determined by _____ law.
- a) Ohm's
- b) Kepler's
- c) Newton's
- d) Both a) and b)

9) What is sideral time?
- a) Sideral time is time measured relative to the fixed stars. It will be seen that one complete rotation sideral time relative to the sun. This is because the earth moves in its orbit around the sun
- b) Sideral time is time measured relative to the variable stars. It will be seen that one complete rotation sideral time relative to the sun. This is because the earth moves in its orbit around the sun
- c) Sideral time, is time measured relative to the fixed stars. It will be seen that one complete rotation sideral time relative to the moon. This is because the earth moves in its orbit around the moon
- d) None of above

10) The signal fed to the indoor unit is normally a wideband signal covering the range _____.
- a) 12.2 to 12.7 GHz
- b) 12-GHz
- c) Both a) and b)
- d) 950 to 1450 MHz

Seat No.	

Set **P**

Fourth Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026
Satellite Communication (BTN06803)

Day & Date: Thursday, 14-05-2026 Max. Marks: 40
Time: 03:00 PM To 05:00 PM

Instructions: 1) All Questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Solve Any Two of the following. **08**

a) Explain the Three Kepler Law of motion.

b) Define the following:
i) Apogee and Perigee
ii) Line of Apsides
iii) Ascending and Descending Nodes
iv) Line of Nodes

c) Explain the Antenna look angles for satellite with a neat diagram.

Q.3 Solve Any Two of the following. **12**

a) Explain in details Polar orbiting satellite?

b) Write short notes on -
i) Limits of Visibility
ii) Sun Transit Outages

c) Explain the different Launching orbits of ISRO?

SECTION - II

Q.4 Solve Any Two of the following. **08**

a) With the help of Block diagram explain working of transponder.

b) Write a note on different Transmission Losses.

c) What is significant of Carrier to noise ratio in Link budget design explain in brief?

Q.5 Solve Any Two of the following. **12**

a) Explain how to calculate the Link Power Budget for both uplink and downlink.

b) Write a brief note on TT&C Sub-system of satellite.

c) Explain the Master Antenna TV system with block diagram.

SLR-QH-557

Seat No.	

Set Q

Fourth Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026
Satellite Communication (BTN06803)

Day & Date: Thursday, 14-05-2026 Max. Marks: 50
Time: 03:00 PM To 05:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume if any data required to solve the problems.

MCQ/Objective Type Questions

Duration: 20 Minutes Marks: 10

Q.1 Multiple Choice Questions. **10**

1) Calculate the radius of a circular orbit for which the period is 1 day?
a) 42.241 Km b) 42.241 m
c) 4.241 Km d) 2.241 Km

2) Ascending node?
a) The point longest from earth
b) The point closest approach to earth
c) The point where the orbit crosses the equatorial plane going from south to north
d) None of the above

3) The period of a satellite, the time required for a satellite to make a complete trip around the Earth, is determined by _____ law.
a) Ohm's b) Kepler's
c) Newton's d) Both a) and b)

4) What is sideral time?
a) Sideral time is time measured relative to the fixed stars. It will be seen that one complete rotation sideral time relative to the sun. This is because the earth moves in its orbit around the sun
b) Sideral time is time measured relative to the variable stars. It will be seen that one complete rotation sideral time relative to the sun. This is because the earth moves in its orbit around the sun
c) Sideral time, is time measured relative to the fixed stars. It will be seen that one complete rotation sideral time relative to the moon. This is because the earth moves in its orbit around the moon
d) None of above

5) The signal fed to the indoor unit is normally a wideband signal covering the range _____.

a) 12.2 to 12.7 GHz
b) 12-GHz
c) Both a) and b)
d) 950 to 1450 MHz

6) The Height of Geostationary satellite is _____.

a) 35930 Km
b) 45930
c) 55930
d) None of above

7) Apogee?

a) The point farthest from earth
b) The point nearest from earth
c) The point smallest from earth
d) None of the above

8) A television (TV) transmission is an example of which type of transmission?

a) Simplex
b) Half duplex
c) Full duplex
d) None of the above

9) Atmospheric drag has negligible effect on _____.

a) geostationary satellites
b) MEO
c) LEO
d) None of the above

10) For an elliptical orbit?

a) $e < 0$
b) $0 < e < 1$
c) $e = 1$
d) None of the above

Seat No.	

Set **Q**

Fourth Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026
Satellite Communication (BTN06803)

Day & Date: Thursday, 14-05-2026 Max. Marks: 40
Time: 03:00 PM To 05:00 PM

Instructions: 1) All Questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Solve Any Two of the following. **08**

a) Explain the Three Kepler Law of motion.

b) Define the following:
i) Apogee and Perigee
ii) Line of Apsides
iii) Ascending and Descending Nodes
iv) Line of Nodes

c) Explain the Antenna look angles for satellite with a neat diagram.

Q.3 Solve Any Two of the following. **12**

a) Explain in details Polar orbiting satellite?

b) Write short notes on -
i) Limits of Visibility
ii) Sun Transit Outages

c) Explain the different Launching orbits of ISRO?

SECTION - II

Q.4 Solve Any Two of the following. **08**

a) With the help of Block diagram explain working of transponder.

b) Write a note on different Transmission Losses.

c) What is significant of Carrier to noise ratio in Link budget design explain in brief?

Q.5 Solve Any Two of the following. **12**

a) Explain how to calculate the Link Power Budget for both uplink and downlink.

b) Write a brief note on TT&C Sub-system of satellite.

c) Explain the Master Antenna TV system with block diagram.

Seat No.	

Set R

Fourth Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026
Satellite Communication (BTN06803)

Day & Date: Thursday, 14-05-2026 Max. Marks: 50
Time: 03:00 PM To 05:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume if any data required to solve the problems.

MCQ/Objective Type Questions

Duration: 20 Minutes Marks: 10

Q.1 Multiple Choice Questions. **10**

1) What is sideral time?
a) Sideral time is time measured relative to the fixed stars. It will be seen that one complete rotation sideral time relative to the sun. This is because the earth moves in its orbit around the sun
b) Sideral time is time measured relative to the variable stars. It will be seen that one complete rotation sideral time relative to the sun. This is because the earth moves in its orbit around the sun
c) Sideral time, is time measured relative to the fixed stars. It will be seen that one complete rotation sideral time relative to the moon. This is because the earth moves in its orbit around the moon
d) None of above

2) The signal fed to the indoor unit is normally a wideband signal covering the range _____.
a) 12.2 to 12.7 GHz b) 12-GHz
c) Both a) and b) d) 950 to 1450 MHz

3) The Height of Geostationary satellite is _____.
a) 35930 Km b) 45930
c) 55930 d) None of above

4) Apogee?
a) The point farthest from earth
b) The point nearest from earth
c) The point smallest from earth
d) None of the above

5) A television (TV) transmission is an example of which type of transmission?
a) Simplex
b) Half duplex
c) Full duplex
d) None of the above

6) Atmospheric drag has negligible effect on _____.
a) geostationary satellites
b) MEO
c) LEO
d) None of the above

7) For an elliptical orbit?
a) $e < 0$
b) $0 < e < 1$
c) $e = 1$
d) None of the above

8) Calculate the radius of a circular orbit for which the period is 1 day?
a) 42.241 Km
b) 42.241 m
c) 4.241 Km
d) 2.241 Km

9) Ascending node?
a) The point longest from earth
b) The point closest approach to earth
c) The point where the orbit crosses the equatorial plane going from south to north
d) None of the above

10) The period of a satellite, the time required for a satellite to make a complete trip around the Earth, is determined by _____ law.
a) Ohm's
b) Kepler's
c) Newton's
d) Both a) and b)

Seat No.	

Set **R**

Fourth Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026
Satellite Communication (BTN06803)

Day & Date: Thursday, 14-05-2026 Max. Marks: 40
Time: 03:00 PM To 05:00 PM

Instructions: 1) All Questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Solve Any Two of the following. **08**

a) Explain the Three Kepler Law of motion.

b) Define the following:
i) Apogee and Perigee
ii) Line of Apsides
iii) Ascending and Descending Nodes
iv) Line of Nodes

c) Explain the Antenna look angles for satellite with a neat diagram.

Q.3 Solve Any Two of the following. **12**

a) Explain in details Polar orbiting satellite?

b) Write short notes on -
i) Limits of Visibility
ii) Sun Transit Outages

c) Explain the different Launching orbits of ISRO?

SECTION - II

Q.4 Solve Any Two of the following. **08**

a) With the help of Block diagram explain working of transponder.

b) Write a note on different Transmission Losses.

c) What is significant of Carrier to noise ratio in Link budget design explain in brief?

Q.5 Solve Any Two of the following. **12**

a) Explain how to calculate the Link Power Budget for both uplink and downlink.

b) Write a brief note on TT&C Sub-system of satellite.

c) Explain the Master Antenna TV system with block diagram.

SLR-QH-557

Seat No.		Set	S

Fourth Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026
Satellite Communication (BTN06803)

Day & Date: Thursday, 14-05-2026 Max. Marks: 50
Time: 03:00 PM To 05:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume if any data required to solve the problems.

MCQ/Objective Type Questions

Duration: 20 Minutes Marks: 10

Q.1 Multiple Choice Questions. **10**

1) A television (TV) transmission is an example of which type of transmission?
a) Simplex b) Half duplex
c) Full duplex d) None of the above

2) Atmospheric drag has negligible effect on _____.
a) geostationary satellites b) MEO
c) LEO d) None of the above

3) For an elliptical orbit?
a) $e < 0$ b) $0 < e < 1$
c) $e = 1$ d) None of the above

4) Calculate the radius of a circular orbit for which the period is 1 day?
a) 42.241 Km b) 42.241 m
c) 4.241 Km d) 2.241 Km

5) Ascending node?
a) The point longest from earth
b) The point closest approach to earth
c) The point where the orbit crosses the equatorial plane going from south to north
d) None of the above

6) The period of a satellite, the time required for a satellite to make a complete trip around the Earth, is determined by _____ law.
a) Ohm's b) Kepler's
c) Newton's d) Both a) and b)

7) What is sideral time?

a) Sideral time is time measured relative to the fixed stars. It will be seen that one complete rotation sideral time relative to the sun. This is because the earth moves in its orbit around the sun

b) Sideral time is time measured relative to the variable stars. It will be seen that one complete rotation sideral time relative to the sun. This is because the earth moves in its orbit around the sun

c) Sideral time, is time measured relative to the fixed stars. It will be seen that one complete rotation sideral time relative to the moon. This is because the earth moves in its orbit around the moon

d) None of above

8) The signal fed to the indoor unit is normally a wideband signal covering the range _____.

a) 12.2 to 12.7 GHz
b) 12-GHz
c) Both a) and b)
d) 950 to 1450 MHz

9) The Height of Geostationary satellite is _____.

a) 35930 Km
b) 45930
c) 55930
d) None of above

10) Apogee?

a) The point farthest from earth
b) The point nearest from earth
c) The point smallest from earth
d) None of the above

SLR-QH-557

Seat No.	

Set S

Fourth Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026
Satellite Communication (BTN06803)

Day & Date: Thursday, 14-05-2026 Max. Marks: 40
Time: 03:00 PM To 05:00 PM

Instructions: 1) All Questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Solve Any Two of the following. **08**

a) Explain the Three Kepler Law of motion.

b) Define the following:
i) Apogee and Perigee
ii) Line of Apsides
iii) Ascending and Descending Nodes
iv) Line of Nodes

c) Explain the Antenna look angles for satellite with a neat diagram.

Q.3 Solve Any Two of the following. **12**

a) Explain in details Polar orbiting satellite?

b) Write short notes on -
i) Limits of Visibility
ii) Sun Transit Outages

c) Explain the different Launching orbits of ISRO?

SECTION - II

Q.4 Solve Any Two of the following. **08**

a) With the help of Block diagram explain working of transponder.

b) Write a note on different Transmission Losses.

c) What is significant of Carrier to noise ratio in Link budget design explain in brief?

Q.5 Solve Any Two of the following. **12**

a) Explain how to calculate the Link Power Budget for both uplink and downlink.

b) Write a brief note on TT&C Sub-system of satellite.

c) Explain the Master Antenna TV system with block diagram.

SLR-QH-559

Seat No.		Set	P

Fourth Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026
Electric Vehicles (BTN06805)

Day & Date: Monday, 18-05-2026 Max. Marks: 50
Time: 03:00 PM To 05:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 20 Minutes Marks:10

Q.1 Choose the correct alternative from the given options. 10

1) A Plug-in Hybrid EV is different from Conventional Hybrid EV because it has _____.
a) Built in Battery Charger b) Li Ox battery
c) more batteries d) Bigger motor generator

2) EV and HEV has following components common except _____.
a) Battery
b) ECU
c) Generator
d) Internal Combustion Engine

3) EVSE stands for _____.
a) Electrical Vehicle supply Equipment
b) Could be AC or DC
c) Used for charging
d) All

4) Electric Vehicles are generally powered by _____.
a) Aluminum batteries b) Lead-acid batteries
c) Sodium batteries d) Magnesium batteries

5) This battery is not suitable for EVs _____.
a) Li ion battery b) Na Ni Cl battery
c) NaS battery d) Lead Acid Battery

6) What affect do petrol and diesel engines have on the environment?
   a) They help deplete natural resources and contribute to increasing CO2 emissions
   b) They help deplete natural resources and reduce CO2 emissions
   c) They contribute to increasing CO2 emissions but help reduce global warming
   d) None all of above

7) There are _____ methods of battery charging.
   a) Three
   b) Two
   c) One
   d) Four

8) Which of the following is common voltage of Battery _____.
   a) 2 V
   b) 10V
   c) 12 V
   d) 25V

9) Active Safety includes _____.
   a) Anti-Lock Breaking System (ABS)
   b) Air bags
   c) Headrest
   d) All

10) Which of the following is provided to charge the battery constantly ____.
   a) Generator
   b) ECU
   c) Ignition coil
   d) Fuse box

SLR-QH-559

Seat No.		Set	P

Fourth Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026
Electric Vehicles (BTN06805)

Day & Date: Monday, 18-05-2026 Max. Marks: 40
Time: 03:00 PM To 05:00 PM

Instructions: 1) All questions are compulsory
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt Any Two. **08**

a) Compare Patrol/ Diesel Vehicle and Electrical Vehicle.

b) Write a short note on types of EVs.

c) Explain Brushless DC Electric Motor.

Q.3 Attempt Any Two. **12**

a) Give details of in Two and Four wheelers leading manufacturing companies.

b) Explain the construction and working of a Permanent Magnet Synchronous Motors (PMSM) with suitable diagram.

c) Explain Hybrid Electrical Vehicle (HEV) with suitable diagram.

Section – II

Q.4 Attempt Any Two. **08**

a) Explain Lead acid battery with suitable diagram.

b) Give the selection Criteria for EVs.

c) Explain the terms regarding EV- Safety, Testing.

Q.5 Attempt Any Two. **12**

a) Explain in general the charger technology used in EV battery charger.

b) Explain with suitable diagram about Lithium-Ion Battery Management Systems.

c) Explain with suitable diagram about charging station and its requirements.

SLR-QH-559

Seat No.		Set	Q

Fourth Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026
Electric Vehicles (BTN06805)

Day & Date: Monday, 18-05-2026 Max. Marks: 50
Time: 03:00 PM To 05:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 20 Minutes Marks:10

Q.1 Choose the correct alternative from the given options. 10

1) What affect do petrol and diesel engines have on the environment?
a) They help deplete natural resources and contribute to increasing CO2 emissions
b) They help deplete natural resources and reduce CO2 emissions
c) They contribute to increasing CO2 emissions but help reduce global warming
d) None all of above

2) There are _____ methods of battery charging.
a) Three b) Two
c) One d) Four

3) Which of the following is common voltage of Battery _____.
a) 2 V b) 10V
c) 12 V d) 25V

4) Active Safety includes _____.
a) Anti-Lock Breaking System (ABS)
b) Air bags
c) Headrest
d) All

5) Which of the following is provided to charge the battery constantly ____.
a) Generator b) ECU
c) Ignition coil d) Fuse box

6) A Plug-in Hybrid EV is different from Conventional Hybrid EV because it has _____.

a) Built in Battery Charger
b) Li Ox battery
c) more batteries
d) Bigger motor generator

7) EV and HEV has following components common except _____.

a) Battery
b) ECU
c) Generator
d) Internal Combustion Engine

8) EVSE stands for _____.

a) Electrical Vehicle supply Equipment
b) Could be AC or DC
c) Used for charging
d) All

9) Electric Vehicles are generally powered by _____.

a) Aluminum batteries
b) Lead-acid batteries
c) Sodium batteries
d) Magnesium batteries

10) This battery is not suitable for EVs _____.

a) Li ion battery
b) Na Ni Cl battery
c) NaS battery
d) Lead Acid Battery

SLR-QH-559

Seat No.	

Set Q

Fourth Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026
Electric Vehicles (BTN06805)

Day & Date: Monday, 18-05-2026 Max. Marks: 40
Time: 03:00 PM To 05:00 PM

Instructions: 1) All questions are compulsory
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt Any Two. **08**

a) Compare Patrol/ Diesel Vehicle and Electrical Vehicle.

b) Write a short note on types of EVs.

c) Explain Brushless DC Electric Motor.

Q.3 Attempt Any Two. **12**

a) Give details of in Two and Four wheelers leading manufacturing companies.

b) Explain the construction and working of a Permanent Magnet Synchronous Motors (PMSM) with suitable diagram.

c) Explain Hybrid Electrical Vehicle (HEV) with suitable diagram.

Section – II

Q.4 Attempt Any Two. **08**

a) Explain Lead acid battery with suitable diagram.

b) Give the selection Criteria for EVs.

c) Explain the terms regarding EV- Safety, Testing.

Q.5 Attempt Any Two. **12**

a) Explain in general the charger technology used in EV battery charger.

b) Explain with suitable diagram about Lithium-Ion Battery Management Systems.

c) Explain with suitable diagram about charging station and its requirements.

SLR-QH-559

Seat No.		Set	R

Fourth Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026
Electric Vehicles (BTN06805)

Day & Date: Monday, 18-05-2026 Max. Marks: 50
Time: 03:00 PM To 05:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 20 Minutes Marks:10

Q.1 Choose the correct alternative from the given options. 10

1) Active Safety includes _____.
a) Anti-Lock Breaking System (ABS)
b) Air bags
c) Headrest
d) All

2) Which of the following is provided to charge the battery constantly ____.
a) Generator b) ECU
c) Ignition coil d) Fuse box

3) A Plug-in Hybrid EV is different from Conventional Hybrid EV because it has _____.
a) Built in Battery Charger b) Li Ox battery
c) more batteries d) Bigger motor generator

4) EV and HEV has following components common except _____.
a) Battery
b) ECU
c) Generator
d) Internal Combustion Engine

5) EVSE stands for _____.
a) Electrical Vehicle supply Equipment
b) Could be AC or DC
c) Used for charging
d) All

6) Electric Vehicles are generally powered by _____.

a) Aluminum batteries
b) Lead-acid batteries
c) Sodium batteries
d) Magnesium batteries

7) This battery is not suitable for EVs _____.

a) Li ion battery
b) Na Ni Cl battery
c) NaS battery
d) Lead Acid Battery

8) What affect do petrol and diesel engines have on the environment?

a) They help deplete natural resources and contribute to increasing CO2 emissions
b) They help deplete natural resources and reduce CO2 emissions
c) They contribute to increasing CO2 emissions but help reduce global warming
d) None all of above

9) There are _____ methods of battery charging.

a) Three
b) Two
c) One
d) Four

10) Which of the following is common voltage of Battery _____.

a) 2 V
b) 10V
c) 12 V
d) 25V

SLR-QH-559

Seat No.	

Set R

Fourth Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026
Electric Vehicles (BTN06805)

Day & Date: Monday, 18-05-2026 Max. Marks: 40
Time: 03:00 PM To 05:00 PM

Instructions: 1) All questions are compulsory
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt Any Two. **08**

a) Compare Patrol/ Diesel Vehicle and Electrical Vehicle.

b) Write a short note on types of EVs.

c) Explain Brushless DC Electric Motor.

Q.3 Attempt Any Two. **12**

a) Give details of in Two and Four wheelers leading manufacturing companies.

b) Explain the construction and working of a Permanent Magnet Synchronous Motors (PMSM) with suitable diagram.

c) Explain Hybrid Electrical Vehicle (HEV) with suitable diagram.

Section – II

Q.4 Attempt Any Two. **08**

a) Explain Lead acid battery with suitable diagram.

b) Give the selection Criteria for EVs.

c) Explain the terms regarding EV- Safety, Testing.

Q.5 Attempt Any Two. **12**

a) Explain in general the charger technology used in EV battery charger.

b) Explain with suitable diagram about Lithium-Ion Battery Management Systems.

c) Explain with suitable diagram about charging station and its requirements.

SLR-QH-559

Seat No.		Set	S

Fourth Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026
Electric Vehicles (BTN06805)

Day & Date: Monday, 18-05-2026 Max. Marks: 50
Time: 03:00 PM To 05:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 20 Minutes Marks:10

Q.1 Choose the correct alternative from the given options. 10

1) EVSE stands for _____.
a) Electrical Vehicle supply Equipment
b) Could be AC or DC
c) Used for charging
d) All

2) Electric Vehicles are generally powered by _____.
a) Aluminum batteries b) Lead-acid batteries
c) Sodium batteries d) Magnesium batteries

3) This battery is not suitable for EVs _____.
a) Li ion battery b) Na Ni Cl battery
c) NaS battery d) Lead Acid Battery

4) What affect do petrol and diesel engines have on the environment?
a) They help deplete natural resources and contribute to increasing CO2 emissions
b) They help deplete natural resources and reduce CO2 emissions
c) They contribute to increasing CO2 emissions but help reduce global warming
d) None all of above

5) There are _____ methods of battery charging.
a) Three b) Two
c) One d) Four

6) Which of the following is common voltage of Battery _____.
a) 2 V b) 10V
c) 12 V d) 25V

7) Active Safety includes _____.
   a) Anti-Lock Breaking System (ABS)
   b) Air bags
   c) Headrest
   d) All

8) Which of the following is provided to charge the battery constantly ____.
   a) Generator
   b) ECU
   c) Ignition coil
   d) Fuse box

9) A Plug-in Hybrid EV is different from Conventional Hybrid EV because it has _____.
   a) Built in Battery Charger
   b) Li Ox battery
   c) more batteries
   d) Bigger motor generator

10) EV and HEV has following components common except _____.
   a) Battery
   b) ECU
   c) Generator
   d) Internal Combustion Engine

SLR-QH-559

Seat No.		Set	S

Fourth Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026
Electric Vehicles (BTN06805)

Day & Date: Monday, 18-05-2026 Max. Marks: 40
Time: 03:00 PM To 05:00 PM

Instructions: 1) All questions are compulsory
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt Any Two. **08**

a) Compare Patrol/ Diesel Vehicle and Electrical Vehicle.

b) Write a short note on types of EVs.

c) Explain Brushless DC Electric Motor.

Q.3 Attempt Any Two. **12**

a) Give details of in Two and Four wheelers leading manufacturing companies.

b) Explain the construction and working of a Permanent Magnet Synchronous Motors (PMSM) with suitable diagram.

c) Explain Hybrid Electrical Vehicle (HEV) with suitable diagram.

Section – II

Q.4 Attempt Any Two. **08**

a) Explain Lead acid battery with suitable diagram.

b) Give the selection Criteria for EVs.

c) Explain the terms regarding EV- Safety, Testing.

Q.5 Attempt Any Two. **12**

a) Explain in general the charger technology used in EV battery charger.

b) Explain with suitable diagram about Lithium-Ion Battery Management Systems.

c) Explain with suitable diagram about charging station and its requirements.

SLR-QH-560

Seat No.		Set	P

Fourth Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026 Mechatronics (BTN06806)

Day & Date: Monday, 18-05-2026 Max. Marks: 50
Time: 03:00 PM To 05:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 20 Minutes Marks: 10

Q.1 Choose the correct alternatives from the give options. 10

1) Which of the following is NOT a key element of a Mechatronic system?
a) Sensors and Actuators b) Mechanical Systems
c) Software Systems d) Biological Systems

2) Which of the following is an example of a Mechatronic system?
a) Mechanical Clock b) Automatic Camera
c) Simple Lever d) Steam Engine

3) In modern automobiles, ABS stands for _____.
a) Anti-Braking System b) Automated Braking System
c) Anti-lock Braking System d) Auto-Balancing System

4) Industry 4.0 is mainly based on _____.
a) Manual operations
b) Digitalization and loT integration
c) Steam power and mechanization
d) Mass production with labor-intensive work

5) PLC stands for _____.
a) Programmable Logic Controller
b) Process Level Control
c) Programmable Level Counter
d) Process Logic Calculator

6) In PLC architecture, the CPU performs which function?
   a) Power conversion
   b) Data processing and logic execution
   c) Communication with sensors only
   d) None of the above

7) MEMS devices are generally made using _____.
   a) Steel sheets
   b) Silicon micromachining techniques
   c) Plastic molding
   d) Magnetic laminations

8) Electrostatic actuators in MEMS operate based on _____.
   a) Magnetic field
   b) Electric field force
   c) Fluid pressure
   d) Thermal expansion

9) A stepper motor converts _____.
   a) Electrical energy into continuous rotation
   b) Electrical pulses into discrete mechanical steps
   c) Mechanical energy into electrical energy
   d) None of these

10) A gyroscope is mainly used to measure _____.
   a) Linear velocity
   b) Angular velocity or orientation
   c) Pressure
   d) Temperature

SLR-QH-560

Seat No.	

Set P

Fourth Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026 Mechatronics (BTN06806)

Day & Date: Monday, 18-05-2026 Max. Marks: 40
Time: 03:00 PM To 05:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section - I

Q.2 Solve Any Two of the following. **08**

a) Define Mechatronics. Explain its key elements and interdisciplinary nature.

b) Draw and explain the architecture of a PLC.

c) Write a Short note on Industry 4.0.

Q.3 Solve Any Two of following. **12**

a) Explain any three examples of Mechatronic systems with suitable diagrams.

b) Compare between PLC & PC Based control systems.

c) State Different PLC instruction, and explain any two Logical Instructions.

Section - II

Q.4 Solve Any Two of the following. **08**

a) Write a short note on source current and sink current.

b) Compare between sensors & actuators.

c) Describe different types of actuators used in Mechatronic systems with example.

Q.5 Solve Any Two of following. **12**

a) Write a note on Variable frequency drive motors.

b) Describe the operation of Gyroscope with Proper diagram. Also State its applications.

c) Write short Note on Capacitive Micro-machined Ultrasonic Transducers.

SLR-QH-560

Seat No.	

Set Q

Fourth Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026 Mechatronics (BTN06806)

Day & Date: Monday, 18-05-2026 Max. Marks: 50
Time: 03:00 PM To 05:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 20 Minutes Marks: 10

Q.1 Choose the correct alternatives from the give options. 10

1) In PLC architecture, the CPU performs which function?
a) Power conversion
b) Data processing and logic execution
c) Communication with sensors only
d) None of the above

2) MEMS devices are generally made using _____.
a) Steel sheets
b) Silicon micromachining techniques
c) Plastic molding
d) Magnetic laminations

3) Electrostatic actuators in MEMS operate based on _____.
a) Magnetic field b) Electric field force
c) Fluid pressure d) Thermal expansion

4) A stepper motor converts _____.
a) Electrical energy into continuous rotation
b) Electrical pulses into discrete mechanical steps
c) Mechanical energy into electrical energy
d) None of these

5) A gyroscope is mainly used to measure _____.
a) Linear velocity b) Angular velocity or orientation
c) Pressure d) Temperature

6) Which of the following is NOT a key element of a Mechatronic system?
a) Sensors and Actuators b) Mechanical Systems
c) Software Systems d) Biological Systems

7) Which of the following is an example of a Mechatronic system?
a) Mechanical Clock
b) Automatic Camera
c) Simple Lever
d) Steam Engine

8) In modern automobiles, ABS stands for _____.
a) Anti-Braking System
b) Automated Braking System
c) Anti-lock Braking System
d) Auto-Balancing System

9) Industry 4.0 is mainly based on _____.
a) Manual operations
b) Digitalization and loT integration
c) Steam power and mechanization
d) Mass production with labor-intensive work

10) PLC stands for _____.
a) Programmable Logic Controller
b) Process Level Control
c) Programmable Level Counter
d) Process Logic Calculator

SLR-QH-560

Seat No.	

Set Q

Fourth Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026 Mechatronics (BTN06806)

Day & Date: Monday, 18-05-2026 Max. Marks: 40
Time: 03:00 PM To 05:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section - I

Q.2 Solve Any Two of the following. **08**

a) Define Mechatronics. Explain its key elements and interdisciplinary nature.

b) Draw and explain the architecture of a PLC.

c) Write a Short note on Industry 4.0.

Q.3 Solve Any Two of following. **12**

a) Explain any three examples of Mechatronic systems with suitable diagrams.

b) Compare between PLC & PC Based control systems.

c) State Different PLC instruction, and explain any two Logical Instructions.

Section - II

Q.4 Solve Any Two of the following. **08**

a) Write a short note on source current and sink current.

b) Compare between sensors & actuators.

c) Describe different types of actuators used in Mechatronic systems with example.

Q.5 Solve Any Two of following. **12**

a) Write a note on Variable frequency drive motors.

b) Describe the operation of Gyroscope with Proper diagram. Also State its applications.

c) Write short Note on Capacitive Micro-machined Ultrasonic Transducers.

SLR-QH-560

Seat No.	

Set R

Fourth Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026 Mechatronics (BTN06806)

Day & Date: Monday, 18-05-2026 Max. Marks: 50
Time: 03:00 PM To 05:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 20 Minutes Marks: 10

Q.1 Choose the correct alternatives from the give options. 10

1) A stepper motor converts _____.
a) Electrical energy into continuous rotation
b) Electrical pulses into discrete mechanical steps
c) Mechanical energy into electrical energy
d) None of these

2) A gyroscope is mainly used to measure _____.
a) Linear velocity b) Angular velocity or orientation
c) Pressure d) Temperature

3) Which of the following is NOT a key element of a Mechatronic system?
a) Sensors and Actuators b) Mechanical Systems
c) Software Systems d) Biological Systems

4) Which of the following is an example of a Mechatronic system?
a) Mechanical Clock b) Automatic Camera
c) Simple Lever d) Steam Engine

5) In modern automobiles, ABS stands for _____.
a) Anti-Braking System b) Automated Braking System
c) Anti-lock Braking System d) Auto-Balancing System

6) Industry 4.0 is mainly based on _____.
a) Manual operations
b) Digitalization and loT integration
c) Steam power and mechanization
d) Mass production with labor-intensive work

7) PLC stands for _____.
   a) Programmable Logic Controller
   b) Process Level Control
   c) Programmable Level Counter
   d) Process Logic Calculator

8) In PLC architecture, the CPU performs which function?
   a) Power conversion
   b) Data processing and logic execution
   c) Communication with sensors only
   d) None of the above

9) MEMS devices are generally made using _____.
   a) Steel sheets
   b) Silicon micromachining techniques
   c) Plastic molding
   d) Magnetic laminations

10) Electrostatic actuators in MEMS operate based on _____.
   a) Magnetic field
   b) Electric field force
   c) Fluid pressure
   d) Thermal expansion

SLR-QH-560

Seat No.	

Set R

Fourth Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026 Mechatronics (BTN06806)

Day & Date: Monday, 18-05-2026 Max. Marks: 40
Time: 03:00 PM To 05:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section - I

Q.2 Solve Any Two of the following. **08**

a) Define Mechatronics. Explain its key elements and interdisciplinary nature.

b) Draw and explain the architecture of a PLC.

c) Write a Short note on Industry 4.0.

Q.3 Solve Any Two of following. **12**

a) Explain any three examples of Mechatronic systems with suitable diagrams.

b) Compare between PLC & PC Based control systems.

c) State Different PLC instruction, and explain any two Logical Instructions.

Section - II

Q.4 Solve Any Two of the following. **08**

a) Write a short note on source current and sink current.

b) Compare between sensors & actuators.

c) Describe different types of actuators used in Mechatronic systems with example.

Q.5 Solve Any Two of following. **12**

a) Write a note on Variable frequency drive motors.

b) Describe the operation of Gyroscope with Proper diagram. Also State its applications.

c) Write short Note on Capacitive Micro-machined Ultrasonic Transducers.

SLR-QH-560

Seat No.		Set	S

Fourth Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026 Mechatronics (BTN06806)

Day & Date: Monday, 18-05-2026 Max. Marks: 50
Time: 03:00 PM To 05:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 20 Minutes Marks: 10

Q.1 Choose the correct alternatives from the give options. 10

1) In modern automobiles, ABS stands for _____.
a) Anti-Braking System b) Automated Braking System
c) Anti-lock Braking System d) Auto-Balancing System

2) Industry 4.0 is mainly based on _____.
a) Manual operations
b) Digitalization and loT integration
c) Steam power and mechanization
d) Mass production with labor-intensive work

3) PLC stands for _____.
a) Programmable Logic Controller
b) Process Level Control
c) Programmable Level Counter
d) Process Logic Calculator

4) In PLC architecture, the CPU performs which function?
a) Power conversion
b) Data processing and logic execution
c) Communication with sensors only
d) None of the above

5) MEMS devices are generally made using _____.
a) Steel sheets
b) Silicon micromachining techniques
c) Plastic molding
d) Magnetic laminations

6) Electrostatic actuators in MEMS operate based on _____.
a) Magnetic field
b) Electric field force
c) Fluid pressure
d) Thermal expansion

7) A stepper motor converts _____.
a) Electrical energy into continuous rotation
b) Electrical pulses into discrete mechanical steps
c) Mechanical energy into electrical energy
d) None of these

8) A gyroscope is mainly used to measure _____.
a) Linear velocity
b) Angular velocity or orientation
c) Pressure
d) Temperature

9) Which of the following is NOT a key element of a Mechatronic system?
a) Sensors and Actuators
b) Mechanical Systems
c) Software Systems
d) Biological Systems

10) Which of the following is an example of a Mechatronic system?
a) Mechanical Clock
b) Automatic Camera
c) Simple Lever
d) Steam Engine

SLR-QH-560

Seat No.	

Set | **S**

Fourth Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026 Mechatronics (BTN06806)

Day & Date: Monday, 18-05-2026 Max. Marks: 40
Time: 03:00 PM To 05:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section - I

Q.2 Solve Any Two of the following. **08**

a) Define Mechatronics. Explain its key elements and interdisciplinary nature.

b) Draw and explain the architecture of a PLC.

c) Write a Short note on Industry 4.0.

Q.3 Solve Any Two of following. **12**

a) Explain any three examples of Mechatronic systems with suitable diagrams.

b) Compare between PLC & PC Based control systems.

c) State Different PLC instruction, and explain any two Logical Instructions.

Section - II

Q.4 Solve Any Two of the following. **08**

a) Write a short note on source current and sink current.

b) Compare between sensors & actuators.

c) Describe different types of actuators used in Mechatronic systems with example.

Q.5 Solve Any Two of following. **12**

a) Write a note on Variable frequency drive motors.

b) Describe the operation of Gyroscope with Proper diagram. Also State its applications.

c) Write short Note on Capacitive Micro-machined Ultrasonic Transducers.

SLR-QH-561

Seat No.		Set	P

Fourth Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026
Biomedical Instrumentation (BTN06807)

Day & Date: Monday, 18-05-2026 Max. Marks: 50
Time: 03:00 PM To 05:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.
4) Assume suitable data if required and state it clearly.

MCQ/Objective Type Questions

Duration: 20 Minutes Marks: 10

Q.1 Choose correct answer. **10**

1) A major challenge in measuring living systems is _____.
a) High cost of instruments
b) Biological variability and dynamic nature of tissues
c) Complexity of coding software
d) Poor hospital infrastructure

2) Engineers play a key role in healthcare facilities by _____.
a) Designing fashion equipment
b) Performing surgeries
c) Developing and maintaining medical instruments
d) Prescribing medications

3) Which system is primarily responsible for oxygen exchange in the human body?
a) Nervous system b) Cardiovascular system
c) Respiratory system d) Auditory system

4) Which of the following is an example of a biomedical signal?
a) ECG b) MRI image
c) X-ray image d) Ultrasound image

5) The main goal of feature extraction is _____.
a) Reduce signal noise
b) Compress the signal
c) Store images in a database
d) Extract important characteristics for analysis

6) ENG (Electroneurogram) is used to record _____.
   a) Nerve electrical activity b) Muscle activity
   c) Heart activity d) Eye movements

7) Clinical laboratory instruments for biomedical signals/images are mainly used for _____.
   a) Diagnosis and monitoring of diseases
   b) Entertainment
   c) Data storage
   d) None of the above

8) Action potentials are _____.
   a) Slow changes in tissue potential
   b) Rapid electrical impulses in neurons
   c) Heart sounds
   d) Muscle vibrations

9) Artificial heart valves are categorized as _____.
   a) Prosthetic devices b) Therapeutic devices
   c) Rehabilitation devices d) Monitoring systems

10) Rehabilitation devices primarily help in _____.
   a) Diagnosing diseases
   b) Monitoring blood sugar only
   c) Imaging tissues
   d) Restoring physical or cognitive function

SLR-QH-561

Seat No.	

Set P

Fourth Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026
Biomedical Instrumentation (BTN06807)

Day & Date: Monday, 18-05-2026 Max. Marks: 40
Time: 03:00 PM To 05:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section - I

Q.2 Attempt Any Two of the following. **08**

a) Define biomedical signal processing and explain its significance in healthcare and medical research.

b) Describe feature extraction techniques in biomedical signal processing.

c) Write short note on Biological neurons and different biological systems.

Q.3 Attempt Any Two of following. **12**

a) Describe the anatomical and physiological mechanisms of the human respiratory system.

b) Discuss case studies of biomedical signal processing for noise removal and feature extraction.

c) Discuss the regulation of blood pressure and blood flow by the autonomic nervous system and hormonal factors.

Section - II

Q.4 Attempt Any Two of the following. **08**

a) Explain therapeutic devices with examples and clinical applications.

b) Explain the different types of transducers used in biomedical signal acquisition.

c) Describe the fundamental concepts of Computed Tomography (CT) scans and Positron Emission Tomography (PET) in the context of biomedical imaging.

Q.5 Attempt Any Two of following. **12**

a) Explain patient monitoring systems, their types, and clinical relevance.

b) Describe electrode placement techniques for ECG, EEG, and EMG recordings.

c) Describe 2D biomedical signals/images with examples: X-ray, CT scan, MRI/fMRI, PET, Ultrasonic images.

SLR-QH-561

Seat No.	

Set Q

Fourth Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026
Biomedical Instrumentation (BTN06807)

Day & Date: Monday, 18-05-2026 Max. Marks: 50
Time: 03:00 PM To 05:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.
4) Assume suitable data if required and state it clearly.

MCQ/Objective Type Questions

Duration: 20 Minutes Marks: 10

Q.1 Choose correct answer. **10**

1) ENG (Electroneurogram) is used to record _____.
a) Nerve electrical activity b) Muscle activity
c) Heart activity d) Eye movements

2) Clinical laboratory instruments for biomedical signals/images are mainly used for _____.
a) Diagnosis and monitoring of diseases
b) Entertainment
c) Data storage
d) None of the above

3) Action potentials are _____.
a) Slow changes in tissue potential
b) Rapid electrical impulses in neurons
c) Heart sounds
d) Muscle vibrations

4) Artificial heart valves are categorized as _____.
a) Prosthetic devices b) Therapeutic devices
c) Rehabilitation devices d) Monitoring systems

5) Rehabilitation devices primarily help in _____.
a) Diagnosing diseases
b) Monitoring blood sugar only
c) Imaging tissues
d) Restoring physical or cognitive function

6) A major challenge in measuring living systems is _____.
   a) High cost of instruments
   b) Biological variability and dynamic nature of tissues
   c) Complexity of coding software
   d) Poor hospital infrastructure

7) Engineers play a key role in healthcare facilities by _____.
   a) Designing fashion equipment
   b) Performing surgeries
   c) Developing and maintaining medical instruments
   d) Prescribing medications

8) Which system is primarily responsible for oxygen exchange in the human body?
   a) Nervous system
   b) Cardiovascular system
   c) Respiratory system
   d) Auditory system

9) Which of the following is an example of a biomedical signal?
   a) ECG
   b) MRI image
   c) X-ray image
   d) Ultrasound image

10) The main goal of feature extraction is _____.
   a) Reduce signal noise
   b) Compress the signal
   c) Store images in a database
   d) Extract important characteristics for analysis

SLR-QH-561

Seat No.	

Set Q

Fourth Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026
Biomedical Instrumentation (BTN06807)

Day & Date: Monday, 18-05-2026 Max. Marks: 40
Time: 03:00 PM To 05:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section - I

Q.2 Attempt Any Two of the following. **08**

a) Define biomedical signal processing and explain its significance in healthcare and medical research.

b) Describe feature extraction techniques in biomedical signal processing.

c) Write short note on Biological neurons and different biological systems.

Q.3 Attempt Any Two of following. **12**

a) Describe the anatomical and physiological mechanisms of the human respiratory system.

b) Discuss case studies of biomedical signal processing for noise removal and feature extraction.

c) Discuss the regulation of blood pressure and blood flow by the autonomic nervous system and hormonal factors.

Section - II

Q.4 Attempt Any Two of the following. **08**

a) Explain therapeutic devices with examples and clinical applications.

b) Explain the different types of transducers used in biomedical signal acquisition.

c) Describe the fundamental concepts of Computed Tomography (CT) scans and Positron Emission Tomography (PET) in the context of biomedical imaging.

Q.5 Attempt Any Two of following. **12**

a) Explain patient monitoring systems, their types, and clinical relevance.

b) Describe electrode placement techniques for ECG, EEG, and EMG recordings.

c) Describe 2D biomedical signals/images with examples: X-ray, CT scan, MRI/fMRI, PET, Ultrasonic images.

Seat No.	

Set **R**

Fourth Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026
Biomedical Instrumentation (BTN06807)

Day & Date: Monday, 18-05-2026 Max. Marks: 50
Time: 03:00 PM To 05:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.
4) Assume suitable data if required and state it clearly.

MCQ/Objective Type Questions

Duration: 20 Minutes Marks: 10

Q.1 Choose correct answer. **10**

1) Artificial heart valves are categorized as _____.
a) Prosthetic devices b) Therapeutic devices
c) Rehabilitation devices d) Monitoring systems

2) Rehabilitation devices primarily help in _____.
a) Diagnosing diseases
b) Monitoring blood sugar only
c) Imaging tissues
d) Restoring physical or cognitive function

3) A major challenge in measuring living systems is _____.
a) High cost of instruments
b) Biological variability and dynamic nature of tissues
c) Complexity of coding software
d) Poor hospital infrastructure

4) Engineers play a key role in healthcare facilities by _____.
a) Designing fashion equipment
b) Performing surgeries
c) Developing and maintaining medical instruments
d) Prescribing medications

5) Which system is primarily responsible for oxygen exchange in the human body?
a) Nervous system b) Cardiovascular system
c) Respiratory system d) Auditory system

6) Which of the following is an example of a biomedical signal?
a) ECG b) MRI image
c) X-ray image d) Ultrasound image

7) The main goal of feature extraction is _____.
a) Reduce signal noise
b) Compress the signal
c) Store images in a database
d) Extract important characteristics for analysis

8) ENG (Electroneurogram) is used to record _____.
a) Nerve electrical activity b) Muscle activity
c) Heart activity d) Eye movements

9) Clinical laboratory instruments for biomedical signals/images are mainly used for _____.
a) Diagnosis and monitoring of diseases
b) Entertainment
c) Data storage
d) None of the above

10) Action potentials are _____.
a) Slow changes in tissue potential
b) Rapid electrical impulses in neurons
c) Heart sounds
d) Muscle vibrations

SLR-QH-561

Seat No.	

Set R

Fourth Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026
Biomedical Instrumentation (BTN06807)

Day & Date: Monday, 18-05-2026 Max. Marks: 40
Time: 03:00 PM To 05:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section - I

Q.2 Attempt Any Two of the following. **08**

a) Define biomedical signal processing and explain its significance in healthcare and medical research.

b) Describe feature extraction techniques in biomedical signal processing.

c) Write short note on Biological neurons and different biological systems.

Q.3 Attempt Any Two of following. **12**

a) Describe the anatomical and physiological mechanisms of the human respiratory system.

b) Discuss case studies of biomedical signal processing for noise removal and feature extraction.

c) Discuss the regulation of blood pressure and blood flow by the autonomic nervous system and hormonal factors.

Section - II

Q.4 Attempt Any Two of the following. **08**

a) Explain therapeutic devices with examples and clinical applications.

b) Explain the different types of transducers used in biomedical signal acquisition.

c) Describe the fundamental concepts of Computed Tomography (CT) scans and Positron Emission Tomography (PET) in the context of biomedical imaging.

Q.5 Attempt Any Two of following. **12**

a) Explain patient monitoring systems, their types, and clinical relevance.

b) Describe electrode placement techniques for ECG, EEG, and EMG recordings.

c) Describe 2D biomedical signals/images with examples: X-ray, CT scan, MRI/fMRI, PET, Ultrasonic images.

Seat No.	

Set **S**

Fourth Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026
Biomedical Instrumentation (BTN06807)

Day & Date: Monday, 18-05-2026 Max. Marks: 50
Time: 03:00 PM To 05:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.
4) Assume suitable data if required and state it clearly.

MCQ/Objective Type Questions

Duration: 20 Minutes Marks: 10

Q.1 Choose correct answer. **10**

1) Which system is primarily responsible for oxygen exchange in the human body?
a) Nervous system b) Cardiovascular system
c) Respiratory system d) Auditory system

2) Which of the following is an example of a biomedical signal?
a) ECG b) MRI image
c) X-ray image d) Ultrasound image

3) The main goal of feature extraction is _____.
a) Reduce signal noise
b) Compress the signal
c) Store images in a database
d) Extract important characteristics for analysis

4) ENG (Electroneurogram) is used to record _____.
a) Nerve electrical activity b) Muscle activity
c) Heart activity d) Eye movements

5) Clinical laboratory instruments for biomedical signals/images are mainly used for _____.
a) Diagnosis and monitoring of diseases
b) Entertainment
c) Data storage
d) None of the above

6) Action potentials are _____.
   a) Slow changes in tissue potential
   b) Rapid electrical impulses in neurons
   c) Heart sounds
   d) Muscle vibrations

7) Artificial heart valves are categorized as _____.
   a) Prosthetic devices
   b) Therapeutic devices
   c) Rehabilitation devices
   d) Monitoring systems

8) Rehabilitation devices primarily help in _____.
   a) Diagnosing diseases
   b) Monitoring blood sugar only
   c) Imaging tissues
   d) Restoring physical or cognitive function

9) A major challenge in measuring living systems is _____.
   a) High cost of instruments
   b) Biological variability and dynamic nature of tissues
   c) Complexity of coding software
   d) Poor hospital infrastructure

10) Engineers play a key role in healthcare facilities by _____.
   a) Designing fashion equipment
   b) Performing surgeries
   c) Developing and maintaining medical instruments
   d) Prescribing medications

SLR-QH-561

Seat No.	

Set | **S**

Fourth Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026
Biomedical Instrumentation (BTN06807)

Day & Date: Monday, 18-05-2026 Max. Marks: 40
Time: 03:00 PM To 05:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section - I

Q.2 Attempt Any Two of the following. **08**

a) Define biomedical signal processing and explain its significance in healthcare and medical research.

b) Describe feature extraction techniques in biomedical signal processing.

c) Write short note on Biological neurons and different biological systems.

Q.3 Attempt Any Two of following. **12**

a) Describe the anatomical and physiological mechanisms of the human respiratory system.

b) Discuss case studies of biomedical signal processing for noise removal and feature extraction.

c) Discuss the regulation of blood pressure and blood flow by the autonomic nervous system and hormonal factors.

Section - II

Q.4 Attempt Any Two of the following. **08**

a) Explain therapeutic devices with examples and clinical applications.

b) Explain the different types of transducers used in biomedical signal acquisition.

c) Describe the fundamental concepts of Computed Tomography (CT) scans and Positron Emission Tomography (PET) in the context of biomedical imaging.

Q.5 Attempt Any Two of following. **12**

a) Explain patient monitoring systems, their types, and clinical relevance.

b) Describe electrode placement techniques for ECG, EEG, and EMG recordings.

c) Describe 2D biomedical signals/images with examples: X-ray, CT scan, MRI/fMRI, PET, Ultrasonic images.

SLR-QH-563

Seat No.		Set	P

T.Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS)
Examination: March/April - 2026
Electromagnetic Engineering (EEPCC-07)

Day & Date: Saturday, 02-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data whenever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Choose the correct option. **14**

1) If dot product of two vectors is zero then vectors are _____.
a) Perpendicular b) Parallel
c) Oblique d) None of these

2) The differential volume (dv) in cylindrical coordinate system is given by _____.
a) $drd\Phi dz$ b) $rdrd\Phi dz$
c) $rdrd\Phi$ d) $rd\Phi dz$

3) Unit vector is having _____.
a) Direction with one magnitude
b) Magnitude is one but not direction
c) Not both
d) None of these

4) To convert spherical coordinate into Cartesian 'x' coordinate, we have relation _____.
a) $x = r\sin\theta\cos\varphi$ b) $x = r\sin\theta\sin\varphi$
c) $x = r\cos\theta\cos\varphi$ d) $x = \sin\theta\cos\varphi$

5) The relation between field intensity and potential is _____.
a) $E = \nabla V$ b) $E = -\nabla V$
c) $V = \nabla \times E$ d) $V = -(\nabla \times E)$

6) The unit of Electric field intensity is _____.
a) A/m^2 b) V/m^2
c) V/m d) A/sec

7) The electric field intensity is defined a _____.
a) Force per unit charge
b) Force on a test charge
c) Force per unit charge on a test charge
d) Product of force and charge

8) Relation between electric field intensity and permittivity is given by _____.
a) $D = \varepsilon E$ b) $E = DE$
c) $D = E/E$ d) $E = E/d$

9) Unit of current density is _____.
a) Cm b) A/m
c) A/m^2 d) C/m^3

10) Capacitance increases with _____.
a) increase in plate area and decrease in distance between the plates
b) increase in plate area and distance between the plates
c) decrease in plate area and value of applied voltage
d) reduction in plate area and distance between the plates

11) The product of no. of turns and the flux is called _____.
a) Field linkage b) Magnetic field
c) Flux linkage d) Area linkage

12) Ampere's circuital law in differential form is _____.
a) $\nabla \times H = J$ b) $\nabla . H = J$
c) $\nabla \times H = I$ d) $\nabla . H = I$ Gauss's law

13) Energy stored in an inductor is _____.
a) $\frac{1}{2}LI^2$ b) $\frac{1}{2}L^2I$
c) $\frac{1}{4}LI^2$ d) None of these

14) Maxwell's first equation is based on _____.
a) Ampere's Law b) Faraday's Law
c) Lenz Law d) Both b) and c)

Seat No.	

Set P

T.Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS)
Examination: March/April - 2026
Electromagnetic Engineering (EEPCC-07)

Day & Date: Saturday, 02-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data whenever necessary.

Section – I

Q.2 Attempt Any Four. **16**

a) Prove that $\nabla.(\nabla \times \mathrm{V}) = 0$

b) State and Explain the Coulomb's Law in vector form.

c) Derive Poisson's and Laplace's equation with necessary conditions.

d) Parallel plate capacitor has conducting plates of area $0.04\ \mathrm{m}^2$. The plates are separated by a dielectric material whose relative permittivity is 2 with plate separation of 1 cm.
Find:
i) Its capacitance
ii) Charge on plates if $V = 10V$

e) Transform $A = 4a_x - 2a_y - 4a_z$ to cylindrical coordinate at the point $(2, 3, 5)$

Q.3 Attempt Any Two. **12**

a) State Gauss law with mathematical expression and it's any two applications in detail.

b) Derive an expression of Electric Field intensity due to infinite sheet charge.

c) Uniform line charges of $5\ nC/m$ are located in free space at $x = 1, z = 1$ and $y = 1, z = 0$. Obtain an expression for D in Cartesian coordinates at $P(0, 0, 8)$.

Section – II

Q.4 Attempt Any Four. **16**

a) A current filament of $5.0\ A$ in a_y direction is parallel to y axis at $x = 2, z = -2$. Find H at the origin.

b) Derive an expression for inductance of toroidal coil having rectangular cross section.

c) State and prove Ampere's circuital law in point form.

d) Derive Maxwell's equation in point and integral form from Gauss law for static electric field.

e) Explain the nature of magnetic material.

Q.5 Attempt Any Two. **12**

a) Evaluate both sides of Stroke's theorem for the field.

$$H = \left(\frac{y^2 z}{x}\right) a_x + \left(\frac{0.5 y^2 z^2}{x^2}\right) a_z$$

and find current in a_y direction crossing the square surface in the plane $y = 2$, bounded by $x = z = 1$ and $x = z = 2$.

b) Derive expression for boundary conditions in magnetic field.

c) Write word statement of all maxwell's equations.

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS)
Examination: March/April - 2026
Electromagnetic Engineering (EEPCC-07)

Day & Date: Saturday, 02-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data whenever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Choose the correct option. **14**

1) Relation between electric field intensity and permittivity is given by _____.
a) $D = \varepsilon E$ b) $E = DE$
c) $D = E/E$ d) $E = E/d$

2) Unit of current density is _____.
a) Cm b) A/m
c) A/m^2 d) C/m^3

3) Capacitance increases with _____.
a) increase in plate area and decrease in distance between the plates
b) increase in plate area and distance between the plates
c) decrease in plate area and value of applied voltage
d) reduction in plate area and distance between the plates

4) The product of no. of turns and the flux is called _____.
a) Field linkage b) Magnetic field
c) Flux linkage d) Area linkage

5) Ampere's circuital law in differential form is _____.
a) $\nabla \times H = J$ b) $\nabla . H = J$
c) $\nabla \times H = I$ d) $\nabla . H = I$ Gauss's law

6) Energy stored in an inductor is _____.
a) $\frac{1}{2}LI^2$ b) $\frac{1}{2}L^2I$
c) $\frac{1}{4}LI^2$ d) None of these

7) Maxwell's first equation is based on _____.
a) Ampere's Law
b) Faraday's Law
c) Lenz Law
d) Both b) and c)

8) If dot product of two vectors is zero then vectors are _____.
a) Perpendicular
b) Parallel
c) Oblique
d) None of these

9) The differential volume (dv) in cylindrical coordinate system is given by _____.
a) $drd\Phi dz$
b) $rdrd\Phi dz$
c) $rdrd\Phi$
d) $rd\Phi dz$

10) Unit vector is having _____.
a) Direction with one magnitude
b) Magnitude is one but not direction
c) Not both
d) None of these

11) To convert spherical coordinate into Cartesian 'x' coordinate, we have relation _____.
a) $x = r\sin\theta\cos\varphi$
b) $x = r\sin\theta\sin\varphi$
c) $x = r\cos\theta\cos\varphi$
d) $x = \sin\theta\cos\varphi$

12) The relation between field intensity and potential is _____.
a) $E = \nabla V$
b) $E = -\nabla V$
c) $V = \nabla \times E$
d) $V = -(\nabla \times E)$

13) The unit of Electric field intensity is _____.
a) A/m^2
b) V/m^2
c) V/m
d) A/sec

14) The electric field intensity is defined a _____.
a) Force per unit charge
b) Force on a test charge
c) Force per unit charge on a test charge
d) Product of force and charge

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS)
Examination: March/April - 2026
Electromagnetic Engineering (EEPCC-07)

Day & Date: Saturday, 02-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data whenever necessary.

Section – I

Q.2 Attempt Any Four. **16**

a) Prove that $\nabla.(\nabla \times \mathrm{V}) = 0$

b) State and Explain the Coulomb's Law in vector form.

c) Derive Poisson's and Laplace's equation with necessary conditions.

d) Parallel plate capacitor has conducting plates of area $0.04\ \mathrm{m}^2$. The plates are separated by a dielectric material whose relative permittivity is 2 with plate separation of 1 cm.
Find:
i) Its capacitance
ii) Charge on plates if $V = 10V$

e) Transform $A = 4a_x - 2a_y - 4a_z$ to cylindrical coordinate at the point $(2, 3, 5)$

Q.3 Attempt Any Two. **12**

a) State Gauss law with mathematical expression and it's any two applications in detail.

b) Derive an expression of Electric Field intensity due to infinite sheet charge.

c) Uniform line charges of $5\ nC/m$ are located in free space at $x = 1, z = 1$ and $y = 1, z = 0$. Obtain an expression for D in Cartesian coordinates at $P(0, 0, 8)$.

Section – II

Q.4 Attempt Any Four. **16**

a) A current filament of $5.0\ A$ in a_y direction is parallel to y axis at $x = 2, z = -2$. Find H at the origin.

b) Derive an expression for inductance of toroidal coil having rectangular cross section.

c) State and prove Ampere's circuital law in point form.

d) Derive Maxwell's equation in point and integral form from Gauss law for static electric field.

e) Explain the nature of magnetic material.

Q.5 Attempt Any Two. **12**

a) Evaluate both sides of Stroke's theorem for the field.

$$H = \left(\frac{y^2 z}{x}\right) a_x + \left(\frac{0.5 y^2 z^2}{x^2}\right) a_z$$

and find current in a_y direction crossing the square surface in the plane $y = 2$, bounded by $x = z = 1$ and $x = z = 2$.

b) Derive expression for boundary conditions in magnetic field.

c) Write word statement of all maxwell's equations.

SLR-QH-563

Seat No.		Set	R

T.Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS)
Examination: March/April - 2026
Electromagnetic Engineering (EEPCC-07)

Day & Date: Saturday, 02-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data whenever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Choose the correct option. **14**

1) The product of no. of turns and the flux is called _____.
a) Field linkage b) Magnetic field
c) Flux linkage d) Area linkage

2) Ampere's circuital law in differential form is _____.
a) $\nabla \times H = J$ b) $\nabla . H = J$
c) $\nabla \times H = I$ d) $\nabla . H = I$ Gauss's law

3) Energy stored in an inductor is _____.
a) $\frac{1}{2}LI^2$ b) $\frac{1}{2}L^2I$
c) $\frac{1}{4}LI^2$ d) None of these

4) Maxwell's first equation is based on _____.
a) Ampere's Law b) Faraday's Law
c) Lenz Law d) Both b) and c)

5) If dot product of two vectors is zero then vectors are _____.
a) Perpendicular b) Parallel
c) Oblique d) None of these

6) The differential volume (dv) in cylindrical coordinate system is given by _____.
a) $drd\Phi dz$ b) $rdrd\Phi dz$
c) $rdrd\Phi$ d) $rd\Phi dz$

7) Unit vector is having _____.
a) Direction with one magnitude
b) Magnitude is one but not direction
c) Not both
d) None of these

8) To convert spherical coordinate into Cartesian 'x' coordinate, we have relation _____.
a) $x = r \sin\theta \cos\varphi$ b) $x = r \sin\theta \sin\varphi$
c) $x = r \cos\theta \cos\varphi$ d) $x = \sin\theta \cos\varphi$

9) The relation between field intensity and potential is _____.
a) $E = \nabla V$ b) $E = -\nabla V$
c) $V = \nabla \times E$ d) $V = -(\nabla \times E)$

10) The unit of Electric field intensity is _____.
a) A/m^2 b) V/m^2
c) V/m d) A/sec

11) The electric field intensity is defined a _____.
a) Force per unit charge
b) Force on a test charge
c) Force per unit charge on a test charge
d) Product of force and charge

12) Relation between electric field intensity and permittivity is given by _____.
a) $D = \varepsilon E$ b) $E = DE$
c) $D = E/E$ d) $E = E/d$

13) Unit of current density is _____.
a) Cm b) A/m
c) A/m^2 d) C/m^3

14) Capacitance increases with _____.
a) increase in plate area and decrease in distance between the plates
b) increase in plate area and distance between the plates
c) decrease in plate area and value of applied voltage
d) reduction in plate area and distance between the plates

Seat No.	

Set R

T.Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS)
Examination: March/April - 2026
Electromagnetic Engineering (EEPCC-07)

Day & Date: Saturday, 02-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data whenever necessary.

Section – I

Q.2 Attempt Any Four. **16**

a) Prove that $\nabla.(\nabla \times \mathrm{V}) = 0$

b) State and Explain the Coulomb's Law in vector form.

c) Derive Poisson's and Laplace's equation with necessary conditions.

d) Parallel plate capacitor has conducting plates of area $0.04\ \mathrm{m}^2$. The plates are separated by a dielectric material whose relative permittivity is 2 with plate separation of 1 cm.
Find:
i) Its capacitance
ii) Charge on plates if $V = 10V$

e) Transform $A = 4a_x - 2a_y - 4a_z$ to cylindrical coordinate at the point $(2, 3, 5)$

Q.3 Attempt Any Two. **12**

a) State Gauss law with mathematical expression and it's any two applications in detail.

b) Derive an expression of Electric Field intensity due to infinite sheet charge.

c) Uniform line charges of $5\ nC/m$ are located in free space at $x = 1, z = 1$ and $y = 1, z = 0$. Obtain an expression for D in Cartesian coordinates at $P(0, 0, 8)$.

Section – II

Q.4 Attempt Any Four. **16**

a) A current filament of $5.0\ A$ in a_y direction is parallel to y axis at $x = 2, z = -2$. Find H at the origin.

b) Derive an expression for inductance of toroidal coil having rectangular cross section.

c) State and prove Ampere's circuital law in point form.

d) Derive Maxwell's equation in point and integral form from Gauss law for static electric field.

e) Explain the nature of magnetic material.

Q.5 Attempt Any Two. **12**

a) Evaluate both sides of Stroke's theorem for the field.

$$H = \left(\frac{y^2 z}{x}\right) a_x + \left(\frac{0.5 y^2 z^2}{x^2}\right) a_z$$

and find current in a_y direction crossing the square surface in the plane $y = 2$, bounded by $x = z = 1$ and $x = z = 2$.

b) Derive expression for boundary conditions in magnetic field.

c) Write word statement of all maxwell's equations.

SLR-QH-563

Seat No.		Set	S

T.Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS)
Examination: March/April - 2026
Electromagnetic Engineering (EEPCC-07)

Day & Date: Saturday, 02-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data whenever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Choose the correct option. **14**

1) The unit of Electric field intensity is _____.
a) A/m^2 b) V/m^2
c) V/m d) A/sec

2) The electric field intensity is defined a _____.
a) Force per unit charge
b) Force on a test charge
c) Force per unit charge on a test charge
d) Product of force and charge

3) Relation between electric field intensity and permittivity is given by _____.
a) $D = \varepsilon E$ b) $E = DE$
c) $D = E/E$ d) $E = E/d$

4) Unit of current density is _____.
a) Cm b) A/m
c) A/m^2 d) C/m^3

5) Capacitance increases with _____.
a) increase in plate area and decrease in distance between the plates
b) increase in plate area and distance between the plates
c) decrease in plate area and value of applied voltage
d) reduction in plate area and distance between the plates

6) The product of no. of turns and the flux is called _____.
a) Field linkage b) Magnetic field
c) Flux linkage d) Area linkage

7) Ampere's circuital law in differential form is _____.

a) $\nabla \times H = J$ b) $\nabla . H = J$

c) $\nabla \times H = I$ d) $\nabla . H = I$ Gauss's law

8) Energy stored in an inductor is _____.

a) $\frac{1}{2}LI^2$ b) $\frac{1}{2}L^2I$

c) $\frac{1}{4}LI^2$ d) None of these

9) Maxwell's first equation is based on _____.

a) Ampere's Law b) Faraday's Law

c) Lenz Law d) Both b) and c)

10) If dot product of two vectors is zero then vectors are _____.

a) Perpendicular b) Parallel

c) Oblique d) None of these

11) The differential volume (dv) in cylindrical coordinate system is given by _____.

a) $drd\Phi dz$ b) $rdrd\Phi dz$

c) $rdrd\Phi$ d) $rd\Phi dz$

12) Unit vector is having _____.

a) Direction with one magnitude

b) Magnitude is one but not direction

c) Not both

d) None of these

13) To convert spherical coordinate into Cartesian 'x' coordinate, we have relation _____.

a) $x = r\sin\theta\cos\varphi$ b) $x = r\sin\theta\sin\varphi$

c) $x = r\cos\theta\cos\varphi$ d) $x = \sin\theta\cos\varphi$

14) The relation between field intensity and potential is _____.

a) $E = \nabla V$ b) $E = -\nabla V$

c) $V = \nabla \times E$ d) $V = -(\nabla \times E)$

Seat No.		Set	S

T.Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS)
Examination: March/April - 2026
Electromagnetic Engineering (EEPCC-07)

Day & Date: Saturday, 02-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data whenever necessary.

Section – I

Q.2 Attempt Any Four. **16**

a) Prove that $\nabla.(\nabla \times \mathrm{V}) = 0$

b) State and Explain the Coulomb's Law in vector form.

c) Derive Poisson's and Laplace's equation with necessary conditions.

d) Parallel plate capacitor has conducting plates of area $0.04\ \mathrm{m}^2$. The plates are separated by a dielectric material whose relative permittivity is 2 with plate separation of 1 cm.
Find:
i) Its capacitance
ii) Charge on plates if $V = 10V$

e) Transform $A = 4a_x - 2a_y - 4a_z$ to cylindrical coordinate at the point $(2, 3, 5)$

Q.3 Attempt Any Two. **12**

a) State Gauss law with mathematical expression and it's any two applications in detail.

b) Derive an expression of Electric Field intensity due to infinite sheet charge.

c) Uniform line charges of $5\ nC/m$ are located in free space at $x = 1, z = 1$ and $y = 1, z = 0$. Obtain an expression for D in Cartesian coordinates at $P(0, 0, 8)$.

Section – II

Q.4 Attempt Any Four. **16**

a) A current filament of $5.0\ A$ in a_y direction is parallel to y axis at $x = 2, z = -2$. Find H at the origin.

b) Derive an expression for inductance of toroidal coil having rectangular cross section.

c) State and prove Ampere's circuital law in point form.

d) Derive Maxwell's equation in point and integral form from Gauss law for static electric field.

e) Explain the nature of magnetic material.

Q.5 Attempt Any Two. **12**

a) Evaluate both sides of Stroke's theorem for the field.

$$H = \left(\frac{y^2 z}{x}\right) a_x + \left(\frac{0.5 y^2 z^2}{x^2}\right) a_z$$

and find current in a_y direction crossing the square surface in the plane $y = 2$, bounded by $x = z = 1$ and $x = z = 2$.

b) Derive expression for boundary conditions in magnetic field.

c) Write word statement of all maxwell's equations.

Seat No.	

Set **P**

T.Y. (B.Tech.) (Electrical Engineering) (Sem - I) (New) (CBCS)
Examination: March/April – 2026
Power System Analysis (EEPCC-08)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options and rewrite the sentences. **14**

1) If the P U impedance of circuit is x then, if the Base KV and Base MVA doubled then the PU impedance become _____.
a) x b) $x/2$
c) $2x$ d) $4x$

2) Impedance diagram is used for analysis of _____.
a) Load flow b) Alternator
c) Fault d) Transmission Line

3) What is the relation between percentage value and per unit value?
a) 100 times b) 10 times
c) 1000 times d) 500 times

4) Which among the following reactance have a greater value?
a) Sub transient reactance
b) Transient reactance
c) Synchronous reactance
d) All of these
e) None of these

5) For limiting the short circuit current _____.
a) Reactors are used b) Resistors are used
c) Capacitors are used d) Any of above

6) A transformer rated at 11KV/0.4 KV, 500 KVA, 5% Reactance. What is the Shirt Circuit MVA of circuit breaker when it is connected to infinite bus?
a) 15 MVA
b) 5 MVA
c) 10 MVA
d) 20 MVA

7) A balanced 3-phase system consist of _____.
a) zero sequence currents only
b) positive sequence currents only
c) negative sequence currents only
d) zero, positive and negative sequence currents only

8) What is the value of $(1 + a + a^2)$?
a) ∞
b) 1
c) -1
d) 0

9) The three phase SC MVA to be interrupted by a circuit breaker in a power system is given by _____.
a) $\sqrt{3} \times$ post fault line voltage in kV $\times$ SC current in kA
b) $3 \times$ pre fault line voltage in kV $\times$ SC current in kA
c) $\sqrt{3} \times$ pre fault line voltage in kV $\times$ SC current in kA
d) $(1/\sqrt{3}) \times$ pre fault line voltage in kV $\times$ SC current in kA

10) What happens if the neutral is not grounded in case of the single line to ground fault?
a) Only the zero sequence impedance will be zero
b) The zero sequence impedance will be infinite
c) Fault current will be zero
d) Both (b) and (c)
e) All of these

11) For accurate load flow calculations on large power systems, the best method is _____.
a) Fast Decoupled Newton method
b) Gauss-seidel method
c) Newton Raphson method
d) None of these

12) Which among the following quantities are specified at the voltage controlled bus generator Bus.
a) P & Q
b) P & |V|
c) Q & |V|
d) P & δ
e) None of the above

13) A 50hz, 4 pole alternator rated at 20MVA, 13.2KV has an inertia constant H = 4KW.sec/KVA. The K.E. stored in the rotor at synchronous speed is _____.

a) 80 KJ
b) 80 MJ
c) 40 MJ
d) 20 MJ

14) Equal area criterion is used to study _____.

a) load flow analysis
b) fault analysis
c) stability analysis
d) None of these

SLR-QH-564

Seat No.		Set	P

T.Y. (B.Tech.) (Electrical Engineering) (Sem - I) (New) (CBCS)
Examination: March/April - 2026
Power System Analysis (EEPCC-08)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Make suitable assumptions if necessary and state them clearly.

Section – I

Q.2 Attempt any Four. **16**

a) Explain per unit system (PU) and state the merits and demerits of PU system.

b) $\mathrm{G}: 300\mathrm{MVA}, 20\mathrm{kV}, \mathrm{X}'' = 1.2\Omega$
$\mathrm{T1}: 350\mathrm{MVA}, 230\mathrm{V\ Y}/20\mathrm{kV}\ \Delta, \mathrm{X} = 15.2\ \Omega/\mathrm{ph}$
$\mathrm{T2}: 300\mathrm{MVA}, 230\mathrm{V\ Y}/13.2\mathrm{kV}\ \Delta, \mathrm{X} = 16\ \Omega/\mathrm{ph}$
$\mathrm{TL}: 1 = 64\mathrm{km}, \mathrm{XTL} = 0.5\ \Omega/\mathrm{km}$
$\mathrm{M1}: 200\mathrm{MVA}, 13.2\mathrm{kV}, \mathrm{X}'' = 1.6\ \Omega$
$\mathrm{M2}: 100\mathrm{MVA}, 13.2\mathrm{kV}, \mathrm{X}'' = 1.6\ \Omega$
Draw the Single line diagram for above data.

c) Describe any two methods of short circuit current control with neat circuit diagram also state merits and demerits of each.

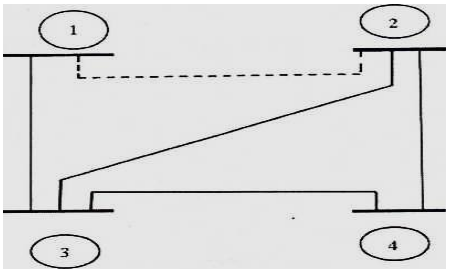
d) With the help of sample power system, describe step by step method for formation of Y bus using mutual inspection method.

e) Derive an expression for Short Circuit KVA of Circuit Breaker, discuss the selection of short circuit KVA of circuit Breaker.

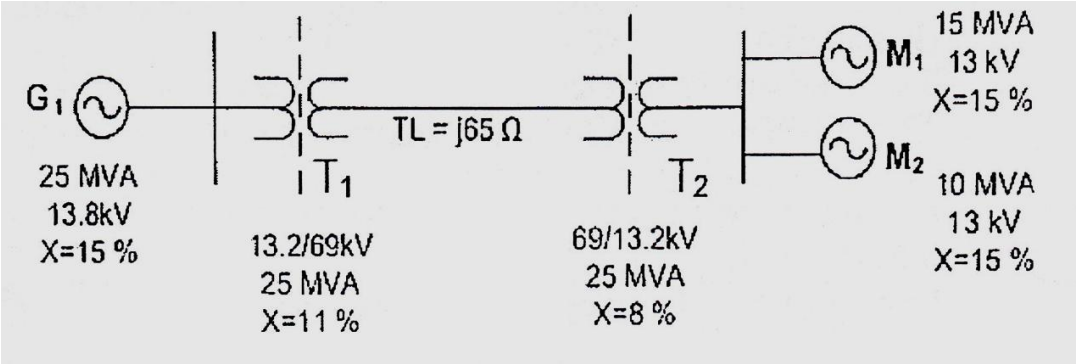
Q.3 Attempt any Two. **12**

a) The one-line diagram of a simple four bus system shown in below fig. Table below gives the line impedances identified by the buses on which these terminate. The shunt admittance at all buses are negligible. Determine the Y Bus Matrix assuming that the line shown in dotted is not connected.

Line	R1 P.U.	X1 P.U.
1-2	0.05	0.15
1-3	0.10	0.30
2-3	0.15	0.45
2-4	0.10	0.30
3-4	0.05	0.15



b) Determine the reactance of the various power system network components shown in the fig. the ratings of the components are $\mathrm{G}: 25\ \mathrm{MVA}, 13.8\ \mathrm{KV}, \mathrm{X}'' = 15\%, \mathrm{T1} = 25\ \mathrm{MVA}, 13.2\ \mathrm{KV}/69\ \mathrm{KV}$, $\mathrm{X} = 11\%, \mathrm{T2} = 25\ \mathrm{MVA}, 69\ \mathrm{KV}/13.2\ \mathrm{KV}, \mathrm{X} = 11\%, \mathrm{M1} = 15\ \mathrm{MVA}$, $13\ \mathrm{KV}, \mathrm{X}'' = 15\%$, and $\mathrm{M2} = 10\ \mathrm{MVA}, 13\ \mathrm{KV}, \mathrm{X}'' = 15\%, \mathrm{XTL} = \mathrm{j}\ 65\mathrm{ohm}$. Draw the reactance diagram.



c) Explain how an unbalanced set of three phase voltages (V_a, V_b, V_c,) can be represented by three sets of symmetrical components (V_{a1}, V_{a2}, V_{a0}).

Section – II

Q.4 Attempt any Four. **16**

a) Describe various types of buses in power system and their significance in brief.

b) What is mean by, Enlist and Describe in brief different types of stability in case of Synchronous generator system.

c) Derive power flow equation in rectangular form for the load flow analysis.

d) The line currents in a 3-ph 4-wire system are Ia = 25 < 65 A, Ib = 50 < 30 A and Ic = 30 < 180. Find the symmetrical components of fault current and the neutral current.

e) In a three phase four wire system the currents in the lines a, b and c under abnormal condition of loading were as follows: V_{a1} = 200 < 30 V, V_{a2} = 150 < 60 V, V_{a0} = 180 < 110 V. Calculate the per phase voltages.

Q.5 Attempt any Two. **12**

a) Derive the necessary equation to determine the fault current for single line to ground fault. Draw a diagram showing the interconnections of sequence networks.

b) Explain rotor dynamics and derive expression for swing equation.

c) State Equal Area Criterion (EAC). What are the assumptions made in applying EAC? Discuss its applications of it.

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Electrical Engineering) (Sem - I) (New) (CBCS)
Examination: March/April – 2026
Power System Analysis (EEPCC-08)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options and rewrite the sentences. **14**

1) What is the value of $(1 + a + a^2)$?
a) ∞ b) 1
c) -1 d) 0

2) The three phase SC MVA to be interrupted by a circuit breaker in a power system is given by _____.
a) $\sqrt{3}$ × post fault line voltage in kV × SC current in kA
b) 3 × pre fault line voltage in kV × SC current in kA
c) $\sqrt{3}$ × pre fault line voltage in kV × SC current in kA
d) $(1/\sqrt{3})$ × pre fault line voltage in kV × SC current in kA

3) What happens if the neutral is not grounded in case of the single line to ground fault?
a) Only the zero sequence impedance will be zero
b) The zero sequence impedance will be infinite
c) Fault current will be zero
d) Both (b) and (c)
e) All of these

4) For accurate load flow calculations on large power systems, the best method is _____.
a) Fast Decoupled Newton method
b) Gauss-seidel method
c) Newton Raphson method
d) None of these

5) Which among the following quantities are specified at the voltage controlled bus generator Bus.
a) P & Q
b) P & $|V|$
c) Q & $|V|$
d) P & δ
e) None of the above

6) A 50hz, 4 pole alternator rated at 20MVA, 13.2KV has an inertia constant H = 4KW.sec/KVA. The K.E. stored in the rotor at synchronous speed is _____.
a) 80 KJ
b) 80 MJ
c) 40 MJ
d) 20 MJ

7) Equal area criterion is used to study _____.
a) load flow analysis
b) fault analysis
c) stability analysis
d) None of these

8) If the P U impedance of circuit is x then, if the Base KV and Base MVA doubled then the PU impedance become _____.
a) x
b) $x/2$
c) $2x$
d) $4x$

9) Impedance diagram is used for analysis of _____.
a) Load flow
b) Alternator
c) Fault
d) Transmission Line

10) What is the relation between percentage value and per unit value?
a) 100 times
b) 10 times
c) 1000 times
d) 500 times

11) Which among the following reactance have a greater value?
a) Sub transient reactance
b) Transient reactance
c) Synchronous reactance
d) All of these
e) None of these

12) For limiting the short circuit current _____.
a) Reactors are used
b) Resistors are used
c) Capacitors are used
d) Any of above

13) A transformer rated at 11KV/0.4 KV, 500 KVA, 5% Reactance. What is the Shirt Circuit MVA of circuit breaker when it is connected to infinite bus?
a) 15 MVA
b) 5 MVA
c) 10 MVA
d) 20 MVA

14) A balanced 3-phase system consist of _____.

a) zero sequence currents only
b) positive sequence currents only
c) negative sequence currents only
d) zero, positive and negative sequence currents only

SLR-QH-564

Seat No.	

Set Q

T.Y. (B.Tech.) (Electrical Engineering) (Sem - I) (New) (CBCS)
Examination: March/April - 2026
Power System Analysis (EEPCC-08)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Make suitable assumptions if necessary and state them clearly.

Section – I

Q.2 Attempt any Four. **16**

a) Explain per unit system (PU) and state the merits and demerits of PU system.

b) $\mathrm{G}: 300\mathrm{MVA}, 20\mathrm{kV}, \mathrm{X}'' = 1.2\Omega$
$\mathrm{T1}: 350\mathrm{MVA}, 230\mathrm{V\ Y}/20\mathrm{kV}\ \Delta, \mathrm{X} = 15.2\ \Omega/\mathrm{ph}$
$\mathrm{T2}: 300\mathrm{MVA}, 230\mathrm{V\ Y}/13.2\mathrm{kV}\ \Delta, \mathrm{X} = 16\ \Omega/\mathrm{ph}$
$\mathrm{TL}: 1 = 64\mathrm{km}, \mathrm{XTL} = 0.5\ \Omega/\mathrm{km}$
$\mathrm{M1}: 200\mathrm{MVA}, 13.2\mathrm{kV}, \mathrm{X}'' = 1.6\ \Omega$
$\mathrm{M2}: 100\mathrm{MVA}, 13.2\mathrm{kV}, \mathrm{X}'' = 1.6\ \Omega$
Draw the Single line diagram for above data.

c) Describe any two methods of short circuit current control with neat circuit diagram also state merits and demerits of each.

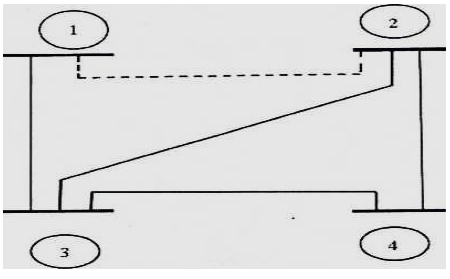
d) With the help of sample power system, describe step by step method for formation of Y bus using mutual inspection method.

e) Derive an expression for Short Circuit KVA of Circuit Breaker, discuss the selection of short circuit KVA of circuit Breaker.

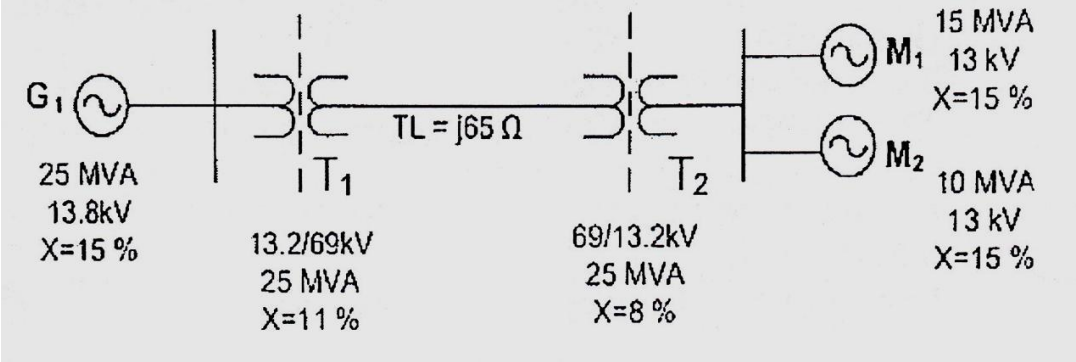
Q.3 Attempt any Two. **12**

a) The one-line diagram of a simple four bus system shown in below fig. Table below gives the line impedances identified by the buses on which these terminate. The shunt admittance at all buses are negligible. Determine the Y Bus Matrix assuming that the line shown in dotted is not connected.

Line	R1 P.U.	X1 P.U.
1-2	0.05	0.15
1-3	0.10	0.30
2-3	0.15	0.45
2-4	0.10	0.30
3-4	0.05	0.15



b) Determine the reactance of the various power system network components shown in the fig. the ratings of the components are $\mathrm{G}: 25\ \mathrm{MVA}, 13.8\ \mathrm{KV}, \mathrm{X}'' = 15\%, \mathrm{T1} = 25\ \mathrm{MVA}, 13.2\ \mathrm{KV}/69\ \mathrm{KV}$, $\mathrm{X} = 11\%, \mathrm{T2} = 25\ \mathrm{MVA}, 69\ \mathrm{KV}/13.2\ \mathrm{KV}, \mathrm{X} = 11\%, \mathrm{M1} = 15\ \mathrm{MVA}$, $13\ \mathrm{KV}, \mathrm{X}'' = 15\%$, and $\mathrm{M2} = 10\ \mathrm{MVA}, 13\ \mathrm{KV}, \mathrm{X}'' = 15\%, \mathrm{XTL} = \mathrm{j}\ 65\mathrm{ohm}$. Draw the reactance diagram.



c) Explain how an unbalanced set of three phase voltages (V_a, V_b, V_c,) can be represented by three sets of symmetrical components (V_{a1}, V_{a2}, V_{a0}).

Section – II

Q.4 Attempt any Four. **16**

a) Describe various types of buses in power system and their significance in brief.

b) What is mean by, Enlist and Describe in brief different types of stability in case of Synchronous generator system.

c) Derive power flow equation in rectangular form for the load flow analysis.

d) The line currents in a 3-ph 4-wire system are Ia = 25 < 65 A, Ib = 50 < 30 A and Ic = 30 < 180. Find the symmetrical components of fault current and the neutral current.

e) In a three phase four wire system the currents in the lines a, b and c under abnormal condition of loading were as follows: V_{a1} = 200 < 30 V, V_{a2} = 150 < 60 V, V_{a0} = 180 < 110 V. Calculate the per phase voltages.

Q.5 Attempt any Two. **12**

a) Derive the necessary equation to determine the fault current for single line to ground fault. Draw a diagram showing the interconnections of sequence networks.

b) Explain rotor dynamics and derive expression for swing equation.

c) State Equal Area Criterion (EAC). What are the assumptions made in applying EAC? Discuss its applications of it.

Seat No.	

Set **R**

T.Y. (B.Tech.) (Electrical Engineering) (Sem - I) (New) (CBCS)
Examination: March/April – 2026
Power System Analysis (EEPCC-08)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options and rewrite the sentences. **14**

1) For accurate load flow calculations on large power systems, the best method is _____.
a) Fast Decoupled Newton method
b) Gauss-seidel method
c) Newton Raphson method
d) None of these

2) Which among the following quantities are specified at the voltage controlled bus generator Bus.
a) P & Q
b) P & |V|
c) Q & |V|
d) P & δ
e) None of the above

3) A 50hz, 4 pole alternator rated at 20MVA, 13.2KV has an inertia constant H = 4KW.sec/KVA. The K.E. stored in the rotor at synchronous speed is _____.
a) 80 KJ b) 80 MJ
c) 40 MJ d) 20 MJ

4) Equal area criterion is used to study _____.
a) load flow analysis b) fault analysis
c) stability analysis d) None of these

5) If the P U impedance of circuit is x then, if the Base KV and Base MVA doubled then the PU impedance become _____.

a) x b) $x/2$

c) $2x$ d) $4x$

6) Impedance diagram is used for analysis of _____.

a) Load flow b) Alternator

c) Fault d) Transmission Line

7) What is the relation between percentage value and per unit value?

a) 100 times b) 10 times

c) 1000 times d) 500 times

8) Which among the following reactance have a greater value?

a) Sub transient reactance

b) Transient reactance

c) Synchronous reactance

d) All of these

e) None of these

9) For limiting the short circuit current _____.

a) Reactors are used b) Resistors are used

c) Capacitors are used d) Any of above

10) A transformer rated at 11KV/0.4 KV, 500 KVA, 5% Reactance. What is the Shirt Circuit MVA of circuit breaker when it is connected to infinite bus?

a) 15 MVA b) 5 MVA

c) 10 MVA d) 20 MVA

11) A balanced 3-phase system consist of _____.

a) zero sequence currents only

b) positive sequence currents only

c) negative sequence currents only

d) zero, positive and negative sequence currents only

12) What is the value of $(1 + a + a^2)$?

a) ∞ b) 1

c) -1 d) 0

13) The three phase SC MVA to be interrupted by a circuit breaker in a power system is given by _____.

a) $\sqrt{3} \times$ post fault line voltage in kV $\times$ SC current in kA

b) $3 \times$ pre fault line voltage in kV $\times$ SC current in kA

c) $\sqrt{3} \times$ pre fault line voltage in kV $\times$ SC current in kA

d) $(1/\sqrt{3}) \times$ pre fault line voltage in kV $\times$ SC current in kA

14) What happens if the neutral is not grounded in case of the single line to ground fault?

a) Only the zero sequence impedance will be zero
b) The zero sequence impedance will be infinite
c) Fault current will be zero
d) Both (b) and (c)
e) All of these

SLR-QH-564

Seat No.	

Set R

T.Y. (B.Tech.) (Electrical Engineering) (Sem - I) (New) (CBCS)
Examination: March/April - 2026
Power System Analysis (EEPCC-08)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Make suitable assumptions if necessary and state them clearly.

Section – I

Q.2 Attempt any Four. **16**

a) Explain per unit system (PU) and state the merits and demerits of PU system.

b) $\mathrm{G}: 300\mathrm{MVA}, 20\mathrm{kV}, \mathrm{X}'' = 1.2\Omega$
$\mathrm{T1}: 350\mathrm{MVA}, 230\mathrm{V\ Y}/20\mathrm{kV}\ \Delta, \mathrm{X} = 15.2\ \Omega/\mathrm{ph}$
$\mathrm{T2}: 300\mathrm{MVA}, 230\mathrm{V\ Y}/13.2\mathrm{kV}\ \Delta, \mathrm{X} = 16\ \Omega/\mathrm{ph}$
$\mathrm{TL}: 1 = 64\mathrm{km}, \mathrm{XTL} = 0.5\ \Omega/\mathrm{km}$
$\mathrm{M1}: 200\mathrm{MVA}, 13.2\mathrm{kV}, \mathrm{X}'' = 1.6\ \Omega$
$\mathrm{M2}: 100\mathrm{MVA}, 13.2\mathrm{kV}, \mathrm{X}'' = 1.6\ \Omega$
Draw the Single line diagram for above data.

c) Describe any two methods of short circuit current control with neat circuit diagram also state merits and demerits of each.

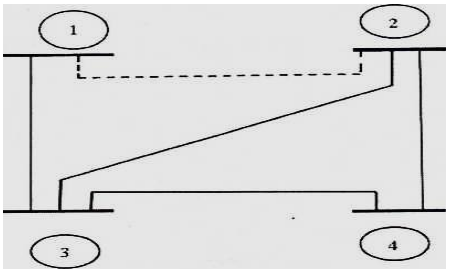
d) With the help of sample power system, describe step by step method for formation of Y bus using mutual inspection method.

e) Derive an expression for Short Circuit KVA of Circuit Breaker, discuss the selection of short circuit KVA of circuit Breaker.

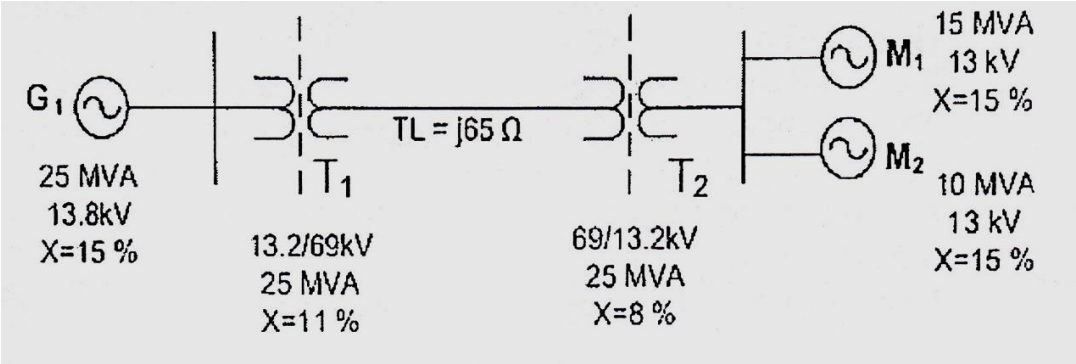
Q.3 Attempt any Two. **12**

a) The one-line diagram of a simple four bus system shown in below fig. Table below gives the line impedances identified by the buses on which these terminate. The shunt admittance at all buses are negligible. Determine the Y Bus Matrix assuming that the line shown in dotted is not connected.

Line	R1 P.U.	X1 P.U.
1-2	0.05	0.15
1-3	0.10	0.30
2-3	0.15	0.45
2-4	0.10	0.30
3-4	0.05	0.15



b) Determine the reactance of the various power system network components shown in the fig. the ratings of the components are $\mathrm{G}: 25\ \mathrm{MVA}, 13.8\ \mathrm{KV}, \mathrm{X}'' = 15\%, \mathrm{T1} = 25\ \mathrm{MVA}, 13.2\ \mathrm{KV}/69\ \mathrm{KV}$, $\mathrm{X} = 11\%, \mathrm{T2} = 25\ \mathrm{MVA}, 69\ \mathrm{KV}/13.2\ \mathrm{KV}, \mathrm{X} = 11\%, \mathrm{M1} = 15\ \mathrm{MVA}$, $13\ \mathrm{KV}, \mathrm{X}'' = 15\%$, and $\mathrm{M2} = 10\ \mathrm{MVA}, 13\ \mathrm{KV}, \mathrm{X}'' = 15\%, \mathrm{XTL} = \mathrm{j}\ 65\mathrm{ohm}$. Draw the reactance diagram.



c) Explain how an unbalanced set of three phase voltages (V_a, V_b, V_c,) can be represented by three sets of symmetrical components (V_{a1}, V_{a2}, V_{a0}).

Section – II

Q.4 Attempt any Four. **16**

a) Describe various types of buses in power system and their significance in brief.

b) What is mean by, Enlist and Describe in brief different types of stability in case of Synchronous generator system.

c) Derive power flow equation in rectangular form for the load flow analysis.

d) The line currents in a 3-ph 4-wire system are Ia = 25 < 65 A, Ib = 50 < 30 A and Ic = 30 < 180. Find the symmetrical components of fault current and the neutral current.

e) In a three phase four wire system the currents in the lines a, b and c under abnormal condition of loading were as follows: V_{a1} = 200 < 30 V, V_{a2} = 150 < 60 V, V_{a0} = 180 < 110 V. Calculate the per phase voltages.

Q.5 Attempt any Two. **12**

a) Derive the necessary equation to determine the fault current for single line to ground fault. Draw a diagram showing the interconnections of sequence networks.

b) Explain rotor dynamics and derive expression for swing equation.

c) State Equal Area Criterion (EAC). What are the assumptions made in applying EAC? Discuss its applications of it.

Seat No.	

Set **S**

T.Y. (B.Tech.) (Electrical Engineering) (Sem - I) (New) (CBCS)
Examination: March/April – 2026
Power System Analysis (EEPCC-08)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options and rewrite the sentences. **14**

1) A transformer rated at 11KV/0.4 KV, 500 KVA, 5% Reactance. What is the Shirt Circuit MVA of circuit breaker when it is connected to infinite bus?
a) 15 MVA b) 5 MVA
c) 10 MVA d) 20 MVA

2) A balanced 3-phase system consist of _____.
a) zero sequence currents only
b) positive sequence currents only
c) negative sequence currents only
d) zero, positive and negative sequence currents only

3) What is the value of $(1 + a + a^2)$?
a) ∞ b) 1
c) -1 d) 0

4) The three phase SC MVA to be interrupted by a circuit breaker in a power system is given by _____.
a) $\sqrt{3} \times$ post fault line voltage in kV $\times$ SC current in kA
b) $3 \times$ pre fault line voltage in kV $\times$ SC current in kA
c) $\sqrt{3} \times$ pre fault line voltage in kV $\times$ SC current in kA
d) $(1/\sqrt{3}) \times$ pre fault line voltage in kV $\times$ SC current in kA

5) What happens if the neutral is not grounded in case of the single line to ground fault?
   a) Only the zero sequence impedance will be zero
   b) The zero sequence impedance will be infinite
   c) Fault current will be zero
   d) Both (b) and (c)
   e) All of these

6) For accurate load flow calculations on large power systems, the best method is _____.
   a) Fast Decoupled Newton method
   b) Gauss-seidel method
   c) Newton Raphson method
   d) None of these

7) Which among the following quantities are specified at the voltage controlled bus generator Bus.
   a) P & Q
   b) P & $|V|$
   c) Q & $|V|$
   d) P & δ
   e) None of the above

8) A 50hz, 4 pole alternator rated at 20MVA, 13.2KV has an inertia constant H = 4KW.sec/KVA. The K.E. stored in the rotor at synchronous speed is _____.
   a) 80 KJ
   b) 80 MJ
   c) 40 MJ
   d) 20 MJ

9) Equal area criterion is used to study _____.
   a) load flow analysis
   b) fault analysis
   c) stability analysis
   d) None of these

10) If the P U impedance of circuit is x then, if the Base KV and Base MVA doubled then the PU impedance become _____.
   a) x
   b) $x/2$
   c) $2x$
   d) $4x$

11) Impedance diagram is used for analysis of _____.
   a) Load flow
   b) Alternator
   c) Fault
   d) Transmission Line

12) What is the relation between percentage value and per unit value?
   a) 100 times
   b) 10 times
   c) 1000 times
   d) 500 times

13) Which among the following reactance have a greater value?

a) Sub transient reactance
b) Transient reactance
c) Synchronous reactance
d) All of these
e) None of these

14) For limiting the short circuit current _____.

a) Reactors are used
b) Resistors are used
c) Capacitors are used
d) Any of above

SLR-QH-564

Seat No.		Set	S

T.Y. (B.Tech.) (Electrical Engineering) (Sem - I) (New) (CBCS)
Examination: March/April - 2026
Power System Analysis (EEPCC-08)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Make suitable assumptions if necessary and state them clearly.

Section – I

Q.2 Attempt any Four. **16**

a) Explain per unit system (PU) and state the merits and demerits of PU system.

b) $\mathrm{G}: 300\mathrm{MVA}, 20\mathrm{kV}, \mathrm{X}'' = 1.2\Omega$
$\mathrm{T1}: 350\mathrm{MVA}, 230\mathrm{V\ Y}/20\mathrm{kV}\ \Delta, \mathrm{X} = 15.2\ \Omega/\mathrm{ph}$
$\mathrm{T2}: 300\mathrm{MVA}, 230\mathrm{V\ Y}/13.2\mathrm{kV}\ \Delta, \mathrm{X} = 16\ \Omega/\mathrm{ph}$
$\mathrm{TL}: 1 = 64\mathrm{km}, \mathrm{XTL} = 0.5\ \Omega/\mathrm{km}$
$\mathrm{M1}: 200\mathrm{MVA}, 13.2\mathrm{kV}, \mathrm{X}'' = 1.6\ \Omega$
$\mathrm{M2}: 100\mathrm{MVA}, 13.2\mathrm{kV}, \mathrm{X}'' = 1.6\ \Omega$
Draw the Single line diagram for above data.

c) Describe any two methods of short circuit current control with neat circuit diagram also state merits and demerits of each.

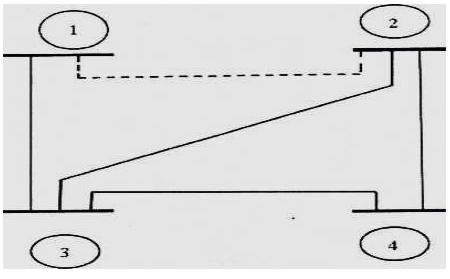
d) With the help of sample power system, describe step by step method for formation of Y bus using mutual inspection method.

e) Derive an expression for Short Circuit KVA of Circuit Breaker, discuss the selection of short circuit KVA of circuit Breaker.

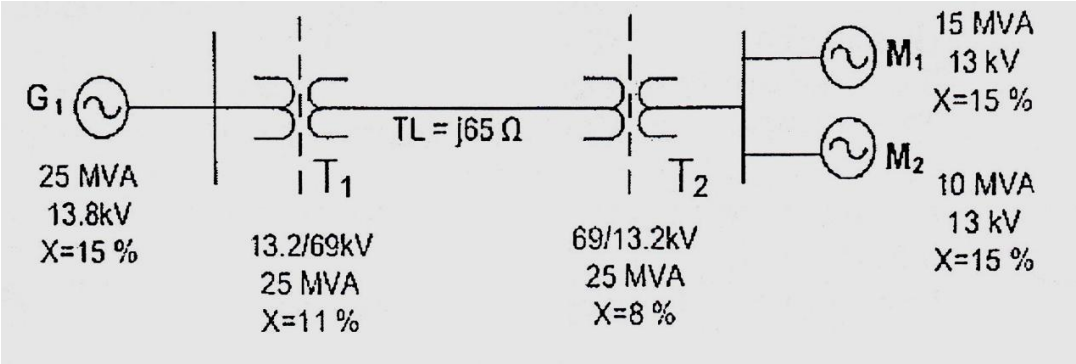
Q.3 Attempt any Two. **12**

a) The one-line diagram of a simple four bus system shown in below fig. Table below gives the line impedances identified by the buses on which these terminate. The shunt admittance at all buses are negligible. Determine the Y Bus Matrix assuming that the line shown in dotted is not connected.

Line	R1 P.U.	X1 P.U.
1-2	0.05	0.15
1-3	0.10	0.30
2-3	0.15	0.45
2-4	0.10	0.30
3-4	0.05	0.15



b) Determine the reactance of the various power system network components shown in the fig. the ratings of the components are $\mathrm{G}: 25\ \mathrm{MVA}, 13.8\ \mathrm{KV}, \mathrm{X}'' = 15\%, \mathrm{T1} = 25\ \mathrm{MVA}, 13.2\ \mathrm{KV}/69\ \mathrm{KV}$, $\mathrm{X} = 11\%, \mathrm{T2} = 25\ \mathrm{MVA}, 69\ \mathrm{KV}/13.2\ \mathrm{KV}, \mathrm{X} = 11\%, \mathrm{M1} = 15\ \mathrm{MVA}$, $13\ \mathrm{KV}, \mathrm{X}'' = 15\%$, and $\mathrm{M2} = 10\ \mathrm{MVA}, 13\ \mathrm{KV}, \mathrm{X}'' = 15\%, \mathrm{XTL} = \mathrm{j}\ 65\mathrm{ohm}$. Draw the reactance diagram.



c) Explain how an unbalanced set of three phase voltages (V_a, V_b, V_c,) can be represented by three sets of symmetrical components (V_{a1}, V_{a2}, V_{a0}).

Section – II

Q.4 Attempt any Four. **16**

a) Describe various types of buses in power system and their significance in brief.

b) What is mean by, Enlist and Describe in brief different types of stability in case of Synchronous generator system.

c) Derive power flow equation in rectangular form for the load flow analysis.

d) The line currents in a 3-ph 4-wire system are Ia = 25 < 65 A, Ib = 50 < 30 A and Ic = 30 < 180. Find the symmetrical components of fault current and the neutral current.

e) In a three phase four wire system the currents in the lines a, b and c under abnormal condition of loading were as follows: V_{a1} = 200 < 30 V, V_{a2} = 150 < 60 V, V_{a0} = 180 < 110 V. Calculate the per phase voltages.

Q.5 Attempt any Two. **12**

a) Derive the necessary equation to determine the fault current for single line to ground fault. Draw a diagram showing the interconnections of sequence networks.

b) Explain rotor dynamics and derive expression for swing equation.

c) State Equal Area Criterion (EAC). What are the assumptions made in applying EAC? Discuss its applications of it.

SLR-QH-565

Seat No.	

Set P

T.Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Linear Control System (EEPCC-09)

Day & Date: Thursday, 07-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top on page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answers from the given options. 14

1) In a control system the comparator compares the output response and reference input and actuates the _____.
a) Transducer b) Signal Conditioner
c) Control element d) Primary sensing element

2) A good control system has all the following features except _____.
a) good stability b) slow response
c) good accuracy d) sufficient power handling capacity

3) _____ is a closed loop system.
a) Auto-pilot for an aircraft b) Direct current generator
c) Car starter d) Electric switch

4) In force-voltage analogy, reciprocal of capacitance is analogous to _____.
a) spring stiffness b) co-efficient of friction
c) rate of change of velocity d) rate of change of displacement

5) A take-off point in a block diagram is used to _____.
a) Split signal b) Add signal
c) Delay signal d) Multiply signal

6) A loop in a signal flow graph is a path that _____.
a) Starts and ends at different nodes
b) Has no gain
c) Starts and ends at the same node
d) Has only one node

7) The gain of a forward path is the product of _____
a) All node values
b) All loop gains
c) All branch gains along the path
d) All feedback gains

8) The transient response, with feedback system, _____.
a) rises slowly
b) rises quickly
c) decays slowly
d) decays quickly

9) The percentage overshoot in a second-order system depends on _____.
a) Natural frequency
b) Damping ratio
c) Gain
d) Time constant

10) Steady-state error is calculated using _____.
a) Initial value theorem
b) Final value theorem
c) Laplace transform
d) Fourier transform

11) The root loci of a system have three asymptotes; the system can have _____.
a) five poles and two zeros
b) four poles and one zero
c) three poles
d) All of the above

12) The frequency at which the phase angle is 180° is called the _____ frequency.
a) Cut off
b) Break
c) Phase cross over
d) Critical

13) The bandwidth of a system is the range of frequencies over which _____
a) Output is zero
b) Gain is constant
c) System responds effectively
d) Phase is constant

14) Which of the following is not a frequency domain specification?
a) Gain margin
b) Phase margin
c) Bandwidth
d) Rise time

Seat No.	

Set **P**

T.Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Linear Control System (EEPCC-09)

Day & Date: Thursday, 07-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

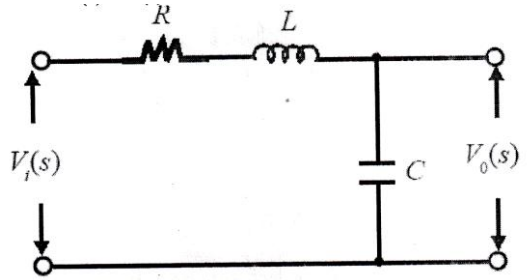
Instructions: 1) All questions are compulsory.
2) Figures to the right indicates full marks.
3) Assume suitable data if required.
4) Draw neat diagrams whenever necessary.

Section – I

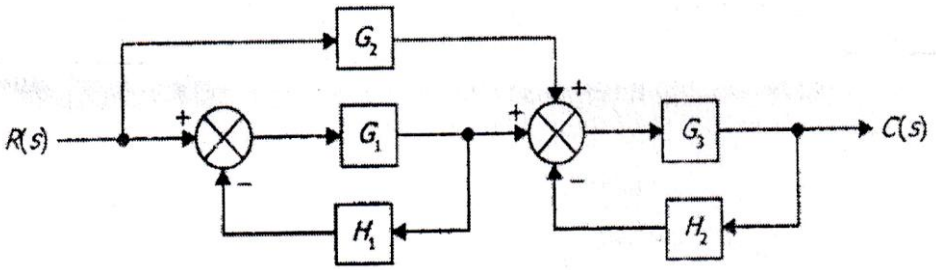
Q.2 Attempt any Four. **16**

a) Explain the different classification of control systems in detail.

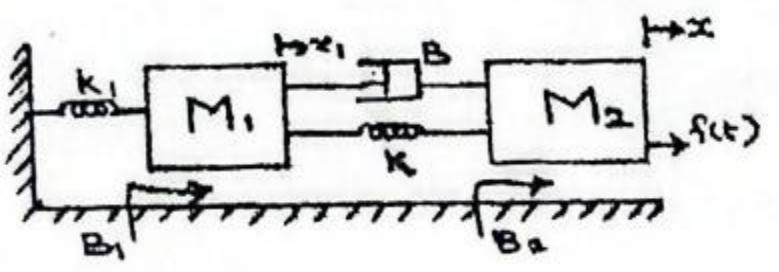
b) Derive the transfer function $V_0(s) / V_i(s)$ for the electrical system shown below



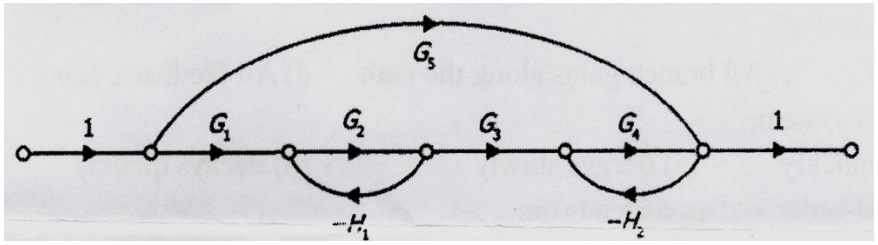
c) Determine the transfer function of the following block diagram:



d) Write the differential equations governing the mechanical translational system as shown in figure and determine the transfer function X(s)/F(s).

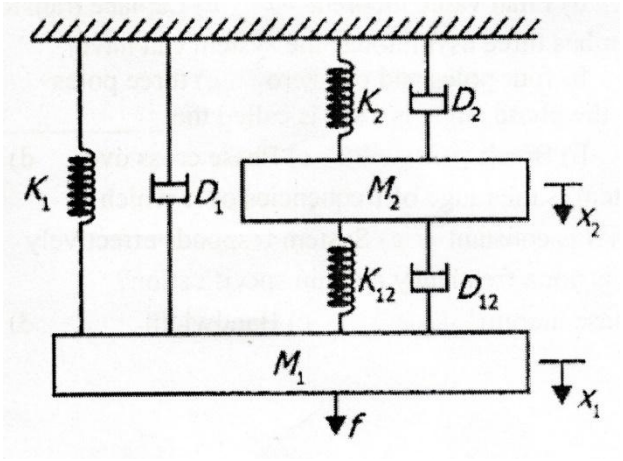


e) Derive the transfer function for the SFG shown.

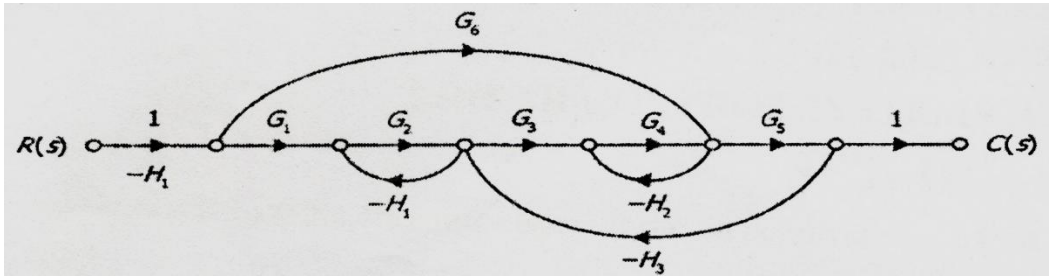


Q.3 Attempt the following questions. **12**

a) Find the system equation of the mechanical system shown in Fig. Also find the force-voltage (F-V) and force-current (F-I) analogy.

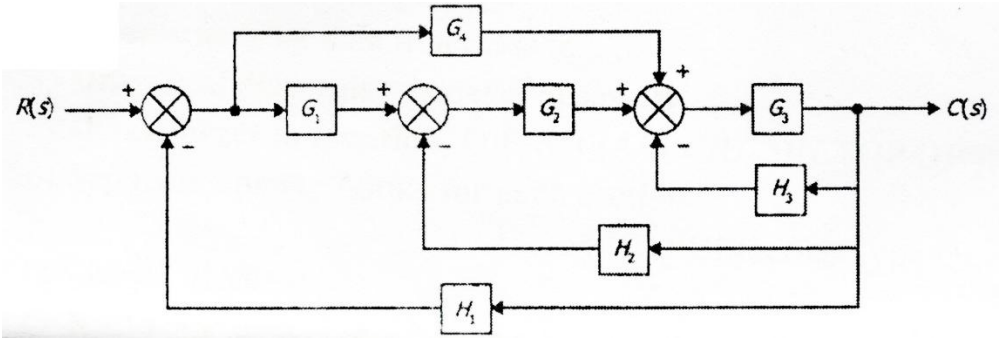


b) Derive the Transfer Function using Masson's gain formula.



OR

b) Derive the Transfer Function using block, diagram reduction technique.



Section – II

Q.4 Attempt any Four. **16**

a) Explain in detail about the types of controllers used in control systems with their advantages and disadvantages.

b) Derive the rise time and peak time for a second-order underdamped system with unit step input.

c) How stability is related to the location of the pole? Explain in detail the different cases of step input.

d) Explain the frequency domain specifications.

e) The open-loop transfer function of a unity feedback system is given by $G(s) = \frac{25}{s(s+5)}$. Calculate

i) Peak time
ii) Percent overshoot
iii) Settling time
iv) Rise time

Q.5 Attempt any Two. **12**

a) For the system with equation $F(s) = s^4 + 2s^3 + 10s^2 + 20s + 5 = 0$ Determine stability and the number of roots lying in the right half of s-plane.

b) Draw the root locus for the unity feedback system whose OLTF is

$$G(s) = \frac{k}{s(s+2)(s+3)}$$

c) Construct the BODE plot for system below whose open loop transfer function is

$$G(s)H(s) = \frac{80}{s(s+2)(s+20)}$$

Determine the

i) Gain margin
ii) Phase margin
iii) ω_{gc} & ω_{pc}
iv) Comment on the stability

SLR-QH-565

Seat No.	

Set Q

T.Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Linear Control System (EEPCC-09)

Day & Date: Thursday, 07-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answers from the given options. 14

1) The transient response, with feedback system, _____.
a) rises slowly b) rises quickly
c) decays slowly d) decays quickly

2) The percentage overshoot in a second-order system depends on _____.
a) Natural frequency b) Damping ratio
c) Gain d) Time constant

3) Steady-state error is calculated using _____.
a) Initial value theorem b) Final value theorem
c) Laplace transform d) Fourier transform

4) The root loci of a system have three asymptotes; the system can have _____.
a) five poles and two zeros b) four poles and one zero
c) three poles d) All of the above

5) The frequency at which the phase angle is 180° is called the _____ frequency.
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c) Phase cross over d) Critical

6) The bandwidth of a system is the range of frequencies over which _____
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Seat No.	

Set **Q**

T.Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Linear Control System (EEPCC-09)

Day & Date: Thursday, 07-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
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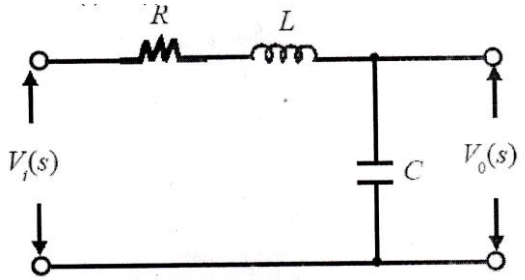
Section – I

Q.2 Attempt any Four. **16**

a) Explain the different classification of control systems in detail.

b) Derive the transfer function $V_0(s) / V_i(s)$ for the electrical system shown below



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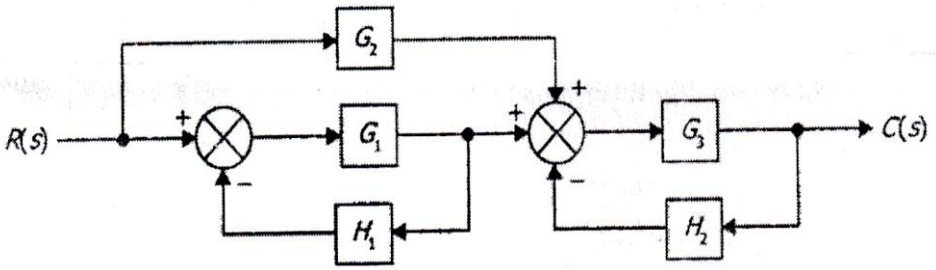
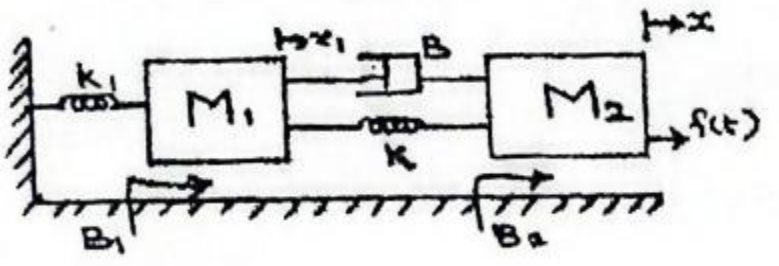


d) Write the differential equations governing the mechanical translational system as shown in figure and determine the transfer function X(s)/F(s).



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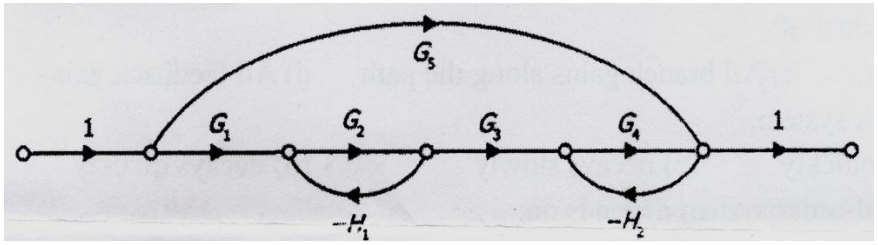

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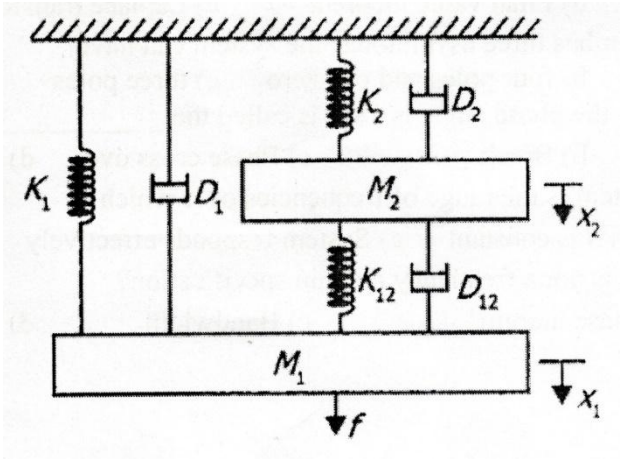

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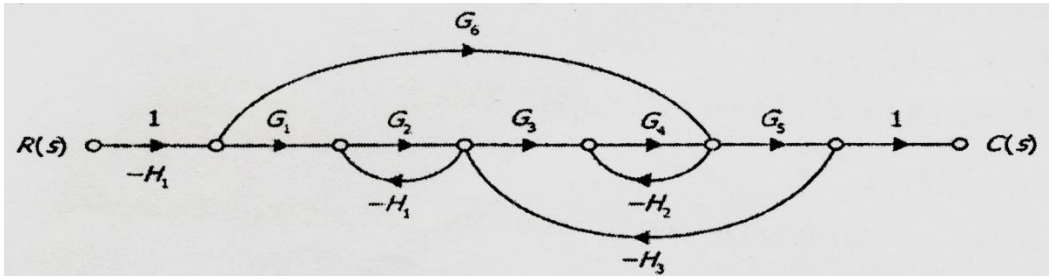

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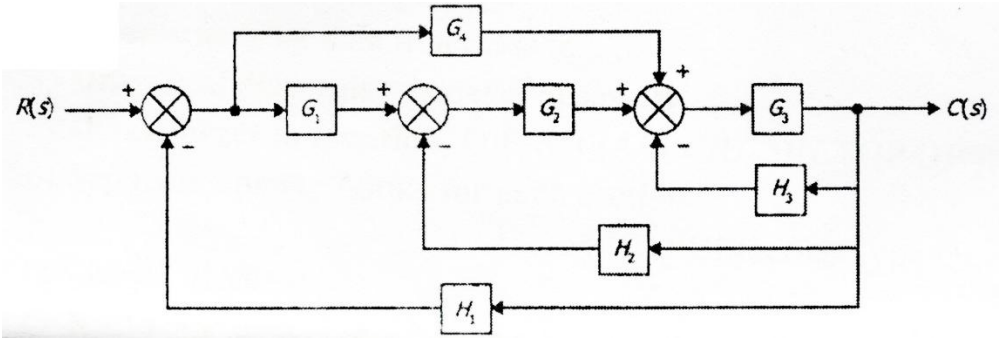

Section – II

Q.4 Attempt any Four. **16**

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i) Peak time
ii) Percent overshoot
iii) Settling time
iv) Rise time

Q.5 Attempt any Two. **12**

a) For the system with equation $F(s) = s^4 + 2s^3 + 10s^2 + 20s + 5 = 0$ Determine stability and the number of roots lying in the right half of s-plane.

b) Draw the root locus for the unity feedback system whose OLTF is

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c) Construct the BODE plot for system below whose open loop transfer function is

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Determine the

i) Gain margin
ii) Phase margin
iii) ω_{gc} & ω_{pc}
iv) Comment on the stability

SLR-QH-565

Seat No.	

Set R

T.Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Linear Control System (EEPCC-09)

Day & Date: Thursday, 07-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answers from the given options. 14

1) The root loci of a system have three asymptotes; the system can have _____.
a) five poles and two zeros b) four poles and one zero
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2) The frequency at which the phase angle is 180° is called the _____ frequency.
a) Cut off b) Break
c) Phase cross over d) Critical

3) The bandwidth of a system is the range of frequencies over which _____
a) Output is zero
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4) Which of the following is not a frequency domain specification?
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c) Laplace transform
d) Fourier transform

SLR-QH-565

Seat No.	

Set R

T.Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Linear Control System (EEPCC-09)

Day & Date: Thursday, 07-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicates full marks.
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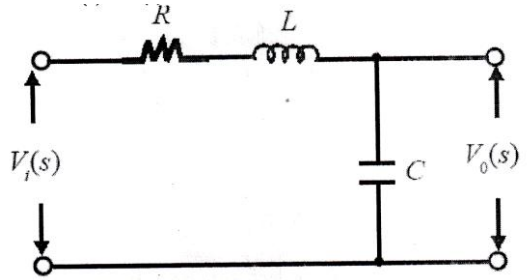
4) Draw neat diagrams whenever necessary.

Section – I

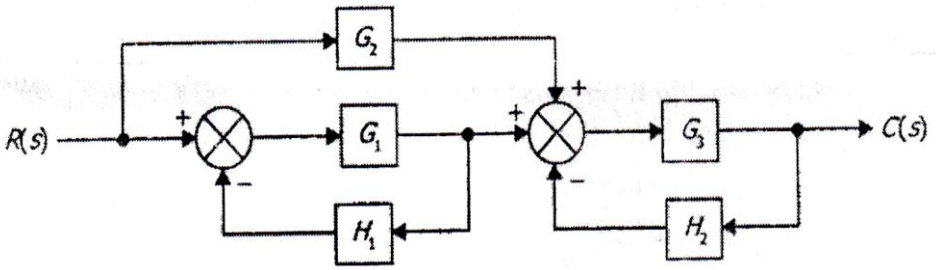
Q.2 Attempt any Four. **16**

a) Explain the different classification of control systems in detail.

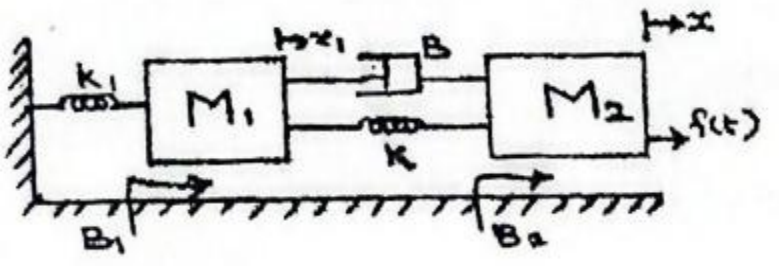
b) Derive the transfer function $V_0(s) / V_i(s)$ for the electrical system shown below



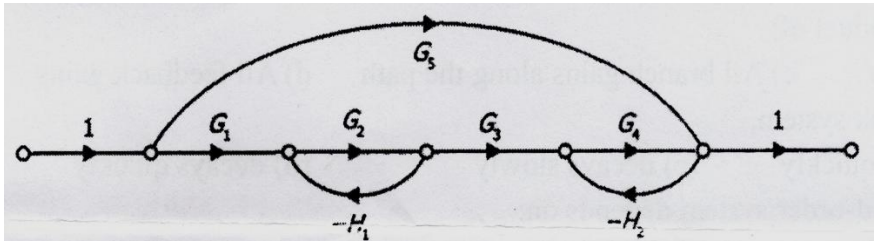
c) Determine the transfer function of the following block diagram:



d) Write the differential equations governing the mechanical translational system as shown in figure and determine the transfer function X(s)/F(s).

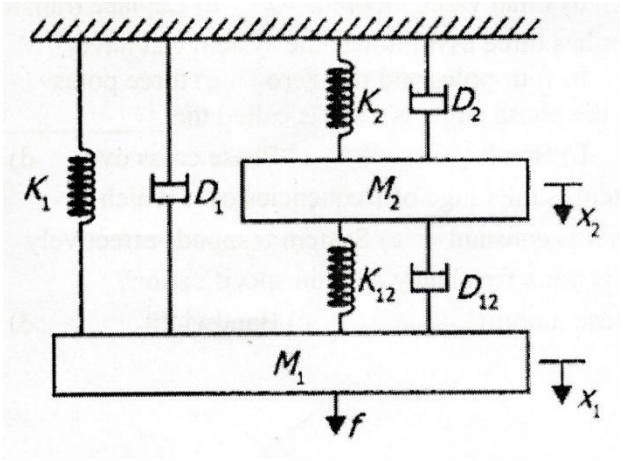


e) Derive the transfer function for the SFG shown.

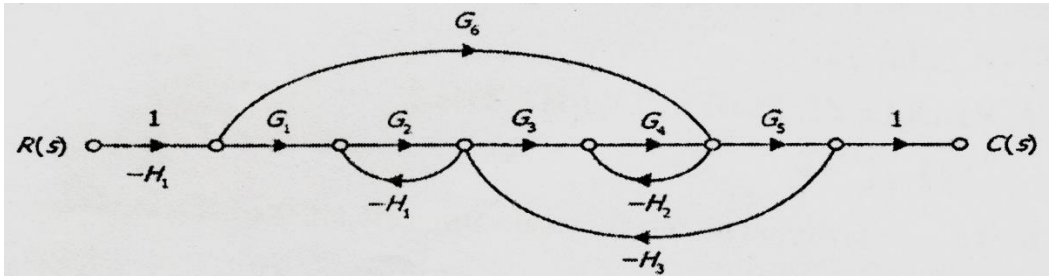


Q.3 Attempt the following questions. **12**

a) Find the system equation of the mechanical system shown in Fig. Also find the force-voltage (F-V) and force-current (F-I) analogy.

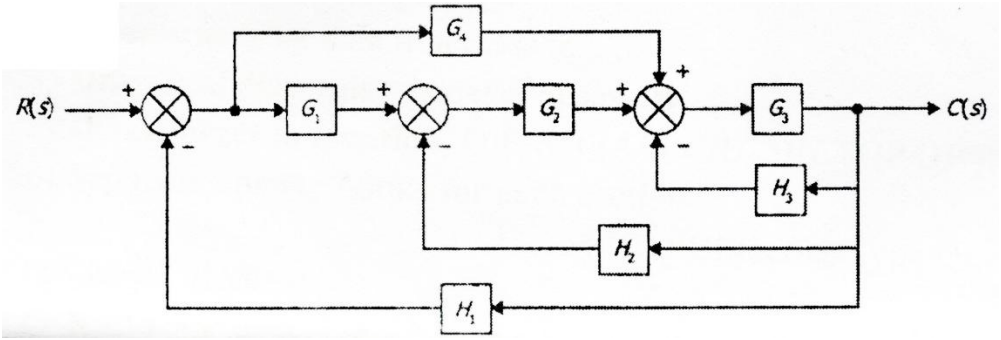


b) Derive the Transfer Function using Masson's gain formula.



OR

b) Derive the Transfer Function using block, diagram reduction technique.



Section – II

Q.4 Attempt any Four. **16**

a) Explain in detail about the types of controllers used in control systems with their advantages and disadvantages.

b) Derive the rise time and peak time for a second-order underdamped system with unit step input.

c) How stability is related to the location of the pole? Explain in detail the different cases of step input.

d) Explain the frequency domain specifications.

e) The open-loop transfer function of a unity feedback system is given by $G(s) = \frac{25}{s(s+5)}$. Calculate

i) Peak time
ii) Percent overshoot
iii) Settling time
iv) Rise time

Q.5 Attempt any Two. **12**

a) For the system with equation $F(s) = s^4 + 2s^3 + 10s^2 + 20s + 5 = 0$ Determine stability and the number of roots lying in the right half of s-plane.

b) Draw the root locus for the unity feedback system whose OLTF is

$$G(s) = \frac{k}{s(s+2)(s+3)}$$

c) Construct the BODE plot for system below whose open loop transfer function is

$$G(s)H(s) = \frac{80}{s(s+2)(s+20)}$$

Determine the

i) Gain margin
ii) Phase margin
iii) ω_{gc} & ω_{pc}
iv) Comment on the stability

Seat No.	

Set **S**

T.Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Linear Control System (EEPCC-09)

Day & Date: Thursday, 07-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top on page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answers from the given options. **14**

1) A loop in a signal flow graph is a path that _____.
a) Starts and ends at different nodes
b) Has no gain
c) Starts and ends at the same node
d) Has only one node

2) The gain of a forward path is the product of _____
a) All node values
b) All loop gains
c) All branch gains along the path
d) All feedback gains

3) The transient response, with feedback system, _____.
a) rises slowly b) rises quickly
c) decays slowly d) decays quickly

4) The percentage overshoot in a second-order system depends on _____.
a) Natural frequency b) Damping ratio
c) Gain d) Time constant

5) Steady-state error is calculated using _____.
a) Initial value theorem b) Final value theorem
c) Laplace transform d) Fourier transform

6) The root loci of a system have three asymptotes; the system can have _____.
a) five poles and two zeros b) four poles and one zero
c) three poles d) All of the above

7) The frequency at which the phase angle is 180° is called the _____ frequency.
a) Cut off
b) Break
c) Phase cross over
d) Critical

8) The bandwidth of a system is the range of frequencies over which _____
a) Output is zero
b) Gain is constant
c) System responds effectively
d) Phase is constant

9) Which of the following is not a frequency domain specification?
a) Gain margin
b) Phase margin
c) Bandwidth
d) Rise time

10) In a control system the comparator compares the output response and reference input and actuates the _____.
a) Transducer
b) Signal Conditioner
c) Control element
d) Primary sensing element

11) A good control system has all the following features except _____.
a) good stability
b) slow response
c) good accuracy
d) sufficient power handling capacity

12) _____ is a closed loop system.
a) Auto-pilot for an aircraft
b) Direct current generator
c) Car starter
d) Electric switch

13) In force-voltage analogy, reciprocal of capacitance is analogous to _____.
a) spring stiffness
b) co-efficient of friction
c) rate of change of velocity
d) rate of change of displacement

14) A take-off point in a block diagram is used to _____.
a) Split signal
b) Add signal
c) Delay signal
d) Multiply signal

Seat No.	

Set **S**

T.Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Linear Control System (EEPCC-09)

Day & Date: Thursday, 07-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

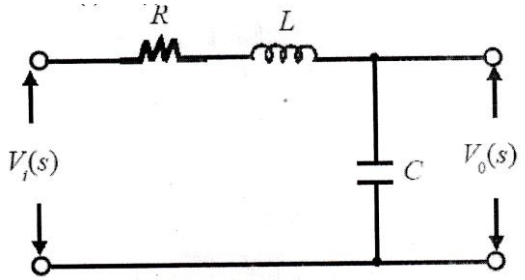
Instructions: 1) All questions are compulsory.
2) Figures to the right indicates full marks.
3) Assume suitable data if required.
4) Draw neat diagrams whenever necessary.

Section – I

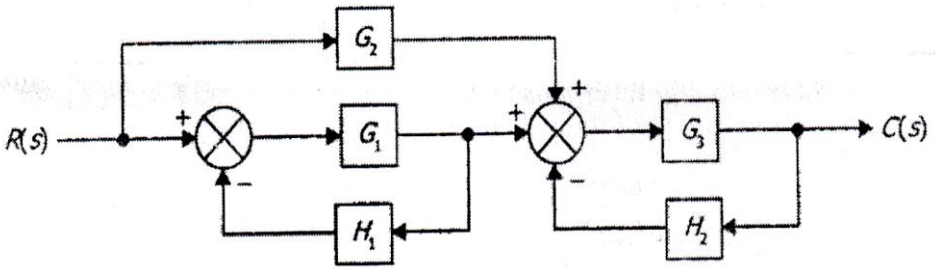
Q.2 Attempt any Four. **16**

a) Explain the different classification of control systems in detail.

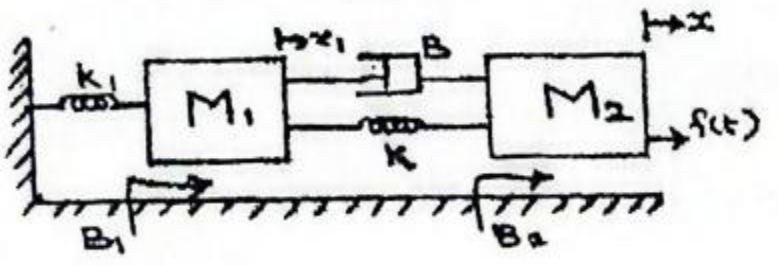
b) Derive the transfer function $V_0(s) / V_i(s)$ for the electrical system shown below



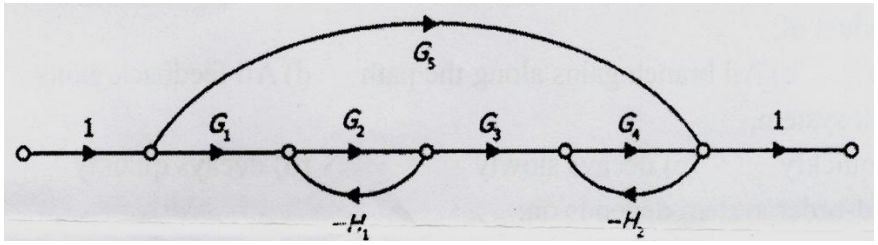
c) Determine the transfer function of the following block diagram:



d) Write the differential equations governing the mechanical translational system as shown in figure and determine the transfer function X(s)/F(s).

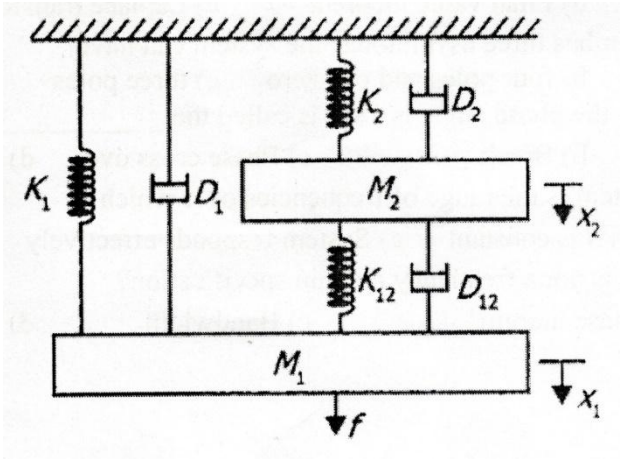


e) Derive the transfer function for the SFG shown.



Q.3 Attempt the following questions. **12**

a) Find the system equation of the mechanical system shown in Fig. Also find the force-voltage (F-V) and force-current (F-I) analogy.



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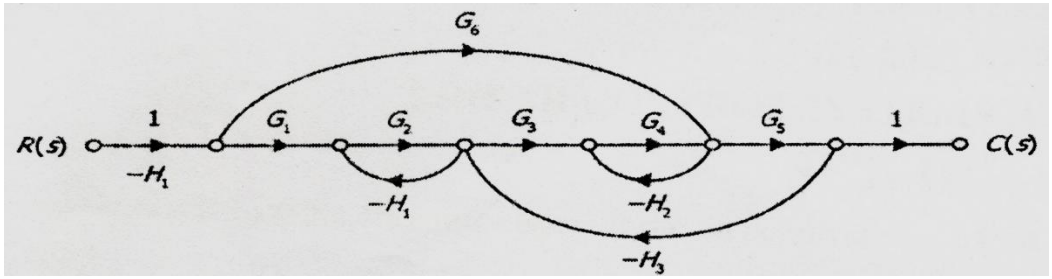

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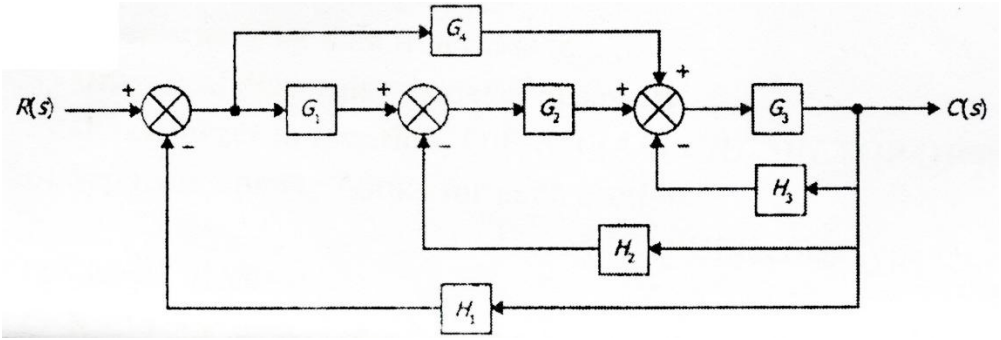

Section – II

Q.4 Attempt any Four. **16**

a) Explain in detail about the types of controllers used in control systems with their advantages and disadvantages.

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c) How stability is related to the location of the pole? Explain in detail the different cases of step input.

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e) The open-loop transfer function of a unity feedback system is given by $G(s) = \frac{25}{s(s+5)}$. Calculate

i) Peak time
ii) Percent overshoot
iii) Settling time
iv) Rise time

Q.5 Attempt any Two. **12**

a) For the system with equation $F(s) = s^4 + 2s^3 + 10s^2 + 20s + 5 = 0$ Determine stability and the number of roots lying in the right half of s-plane.

b) Draw the root locus for the unity feedback system whose OLTF is

$$G(s) = \frac{k}{s(s+2)(s+3)}$$

c) Construct the BODE plot for system below whose open loop transfer function is

$$G(s)H(s) = \frac{80}{s(s+2)(s+20)}$$

Determine the

i) Gain margin
ii) Phase margin
iii) ω_{gc} & ω_{pc}
iv) Comment on the stability

SLR-QH-566

Seat No.		Set	P

T.Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Advanced Microcontroller Systems (EEPEC – 01A)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) Which of the following correctly differentiates between a microprocessor and a microcontroller?
a) Microprocessor has on-chip peripherals, microcontroller doesn't
b) Microcontroller has built-in memory and peripherals
c) Both are same in structure
d) Microprocessor is only used in washing machines

2) The main purpose of a K-map is _____.
a) Data storage
b) Minimization of Boolean functions
c) Encoding data
d) Decoding data

3) In 8051 microcontroller, how many input/output ports are available?
a) Two b) Three
c) Four d) Five

4) The smallest building blocks of combinational logic are _____.
a) Logic gates b) Multiplexers
c) Adders d) Counters

5) Flip-flops are used to store _____.
a) Single bit b) Multiple bits
c) Decimal numbers d) Hexadecimal numbers

6) The 8051 operates typically at a clock frequency of _____.
a) 1 MHz b) 6 MHz
c) 12 MHz d) 24 MHz

7) The data pointer (DPTR) is _____.
a) 8-bit b) 16-bit
c) 32-bit d) Variable size

8) Which addressing mode is used in instruction: MOV A, #25H?
a) Direct b) Indirect
c) Immediate d) Register

9) The purpose of the TMOD register in 8051 is to _____.
a) Control timer operation modes
b) Enable serial communication
c) Store interrupt priorities
d) Reset microcontroller

10) Which category does ANL A, R1 belong to?
a) Data transfer b) Arithmetic
c) Logical d) Branch

11) RET is used for _____.
a) Returning from a subroutine b) Resetting the 8051
c) Reloading DPTR d) Enabling interrupts

12) External program memory in 8051 can be up to _____.
a) 4 KB b) 8 KB
c) 32 KB d) 64 KB

13) Port 0 in 8051 serves as _____.
a) Control bus
b) Multiplexed lower address/data bus
c) Serial port
d) Timer output

14) PWM stands for _____.
a) Pulse Width Modulation b) Power With Motor
c) Pulse Wave Measurement d) Power Wave Modulation

Seat No.	

Set **P**

T.Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Advanced Microcontroller Systems (EEPEC – 01A)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Solve any Four. **16**

a) Implement 4:1 multiplexer using a logic gates.

b) Explain the diagram of SISO shift register with figure & transition table.

c) Explain the feature of 8051 Microcontroller.

d) What is full adder? Explain with example.

e) Explain different addressing mode of 8051.

Q.3 Solve any Two. **12**

a) Draw the block diagram of microcontroller. Explain.

b) Explain the memory organization of 8051.

c) Implement the K-map using SOP,
$f(A,B,C,D) = \sum m\,(1,3,4,7,11,15) + d(0,2,5)$
Reduce it, write equation.

SECTION – II

Q.4 Solve any Four. **16**

a) What semiconductor memory? Explain with classification in details.

b) Explain servo motor interfacing with 8051 in details with sketch.

c) What is IDE (Integral Development Environment)?
Define:
i) Simulator
ii) Assembler
iii) Compiler

d) What are the types of instruction groups? Explain.

e) Explain C data types used in microcontroller.

Q.5 Solve any Two. **12**

a) Draw the interfacing diagram for 16 × 2 LCD display with 8051 microcontroller and write an ALP to display “PUNYASHLOK” on LCD display.

b) Draw the interfacing diagram of stepper motor with 8051. Write an ALP to rotate the stepper motor one revolution in clockwise direction and then stop.

c) Design a microcontroller System to connect 4kb of ROM to microcontroller, starting address should be 0000h.

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Advanced Microcontroller Systems (EEPEC – 01A)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) Which addressing mode is used in instruction: MOV A, #25H?
a) Direct b) Indirect
c) Immediate d) Register

2) The purpose of the TMOD register in 8051 is to _____.
a) Control timer operation modes
b) Enable serial communication
c) Store interrupt priorities
d) Reset microcontroller

3) Which category does ANL A, R1 belong to?
a) Data transfer b) Arithmetic
c) Logical d) Branch

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a) Returning from a subroutine b) Resetting the 8051
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5) External program memory in 8051 can be up to _____.
a) 4 KB b) 8 KB
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6) Port 0 in 8051 serves as _____.
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7) PWM stands for _____.
   a) Pulse Width Modulation b) Power With Motor
   c) Pulse Wave Measurement d) Power Wave Modulation

8) Which of the following correctly differentiates between a microprocessor and a microcontroller?
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12) Flip-flops are used to store _____.
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13) The 8051 operates typically at a clock frequency of _____.
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14) The data pointer (DPTR) is _____.
   a) 8-bit b) 16-bit
   c) 32-bit d) Variable size

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Advanced Microcontroller Systems (EEPEC – 01A)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
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SECTION – I

Q.2 Solve any Four. **16**

a) Implement 4:1 multiplexer using a logic gates.

b) Explain the diagram of SISO shift register with figure & transition table.

c) Explain the feature of 8051 Microcontroller.

d) What is full adder? Explain with example.

e) Explain different addressing mode of 8051.

Q.3 Solve any Two. **12**

a) Draw the block diagram of microcontroller. Explain.

b) Explain the memory organization of 8051.

c) Implement the K-map using SOP,
$f(A,B,C,D) = \sum m\,(1,3,4,7,11,15) + d(0,2,5)$
Reduce it, write equation.

SECTION – II

Q.4 Solve any Four. **16**

a) What semiconductor memory? Explain with classification in details.

b) Explain servo motor interfacing with 8051 in details with sketch.

c) What is IDE (Integral Development Environment)?
Define:
i) Simulator
ii) Assembler
iii) Compiler

d) What are the types of instruction groups? Explain.

e) Explain C data types used in microcontroller.

Q.5 Solve any Two. **12**

a) Draw the interfacing diagram for 16 × 2 LCD display with 8051 microcontroller and write an ALP to display “PUNYASHLOK” on LCD display.

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c) Design a microcontroller System to connect 4kb of ROM to microcontroller, starting address should be 0000h.

Seat No.		Set	R

T.Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Advanced Microcontroller Systems (EEPEC – 01A)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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c) Logical d) Branch

Seat No.	

Set **R**

T.Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Advanced Microcontroller Systems (EEPEC – 01A)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Solve any Four. **16**

a) Implement 4:1 multiplexer using a logic gates.

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SLR-QH-566

Seat No.		Set	S

T.Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Advanced Microcontroller Systems (EEPEC – 01A)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) The 8051 operates typically at a clock frequency of _____.
a) 1 MHz b) 6 MHz
c) 12 MHz d) 24 MHz

2) The data pointer (DPTR) is _____.
a) 8-bit b) 16-bit
c) 32-bit d) Variable size

3) Which addressing mode is used in instruction: MOV A, #25H?
a) Direct b) Indirect
c) Immediate d) Register

4) The purpose of the TMOD register in 8051 is to _____.
a) Control timer operation modes
b) Enable serial communication
c) Store interrupt priorities
d) Reset microcontroller

5) Which category does ANL A, R1 belong to?
a) Data transfer b) Arithmetic
c) Logical d) Branch

6) RET is used for _____.
a) Returning from a subroutine b) Resetting the 8051
c) Reloading DPTR d) Enabling interrupts

7) External program memory in 8051 can be up to _____.
a) 4 KB b) 8 KB
c) 32 KB d) 64 KB

8) Port 0 in 8051 serves as _____.
   a) Control bus
   b) Multiplexed lower address/data bus
   c) Serial port
   d) Timer output

9) PWM stands for _____.
   a) Pulse Width Modulation
   b) Power With Motor
   c) Pulse Wave Measurement
   d) Power Wave Modulation

10) Which of the following correctly differentiates between a microprocessor and a microcontroller?
   a) Microprocessor has on-chip peripherals, microcontroller doesn't
   b) Microcontroller has built-in memory and peripherals
   c) Both are same in structure
   d) Microprocessor is only used in washing machines

11) The main purpose of a K-map is _____.
   a) Data storage
   b) Minimization of Boolean functions
   c) Encoding data
   d) Decoding data

12) In 8051 microcontroller, how many input/output ports are available?
   a) Two
   b) Three
   c) Four
   d) Five

13) The smallest building blocks of combinational logic are _____.
   a) Logic gates
   b) Multiplexers
   c) Adders
   d) Counters

14) Flip-flops are used to store _____.
   a) Single bit
   b) Multiple bits
   c) Decimal numbers
   d) Hexadecimal numbers

SLR-QH-566

Seat No.		Set	S

T.Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Advanced Microcontroller Systems (EEPEC – 01A)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Solve any Four. **16**

a) Implement 4:1 multiplexer using a logic gates.

b) Explain the diagram of SISO shift register with figure & transition table.

c) Explain the feature of 8051 Microcontroller.

d) What is full adder? Explain with example.

e) Explain different addressing mode of 8051.

Q.3 Solve any Two. **12**

a) Draw the block diagram of microcontroller. Explain.

b) Explain the memory organization of 8051.

c) Implement the K-map using SOP,
$f(A,B,C,D) = \sum m\,(1,3,4,7,11,15) + d(0,2,5)$
Reduce it, write equation.

SECTION – II

Q.4 Solve any Four. **16**

a) What semiconductor memory? Explain with classification in details.

b) Explain servo motor interfacing with 8051 in details with sketch.

c) What is IDE (Integral Development Environment)?
Define:
i) Simulator
ii) Assembler
iii) Compiler

d) What are the types of instruction groups? Explain.

e) Explain C data types used in microcontroller.

Q.5 Solve any Two. **12**

a) Draw the interfacing diagram for 16 × 2 LCD display with 8051 microcontroller and write an ALP to display “PUNYASHLOK” on LCD display.

b) Draw the interfacing diagram of stepper motor with 8051. Write an ALP to rotate the stepper motor one revolution in clockwise direction and then stop.

c) Design a microcontroller System to connect 4kb of ROM to microcontroller, starting address should be 0000h.

SLR-QH-568

Seat No.	

Set P

T.Y. (B.Tech.) (Electrical Engineering) (Sem - I) (New) (CBCS)
Examination: March/April – 2026
Hybrid Electrical Vehicle Design (EEPEC-01C)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if required.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which of the following is NOT a component of EV?
a) Battery b) Electric motor
c) Radiator d) Motor controller

2) A primary benefit of EVs is _____.
a) Higher emissions b) Low noise & pollution
c) Higher fuel consumption d) None of the above

3) Electric vehicles have maximum torque at _____.
a) Low RPM b) High RPM
c) Idle RPM d) 2000 RPM

4) Air drag force increases with _____.
a) $Speed^2$ b) Speed
c) Constant d) Weight

5) Tractive effort is _____.
a) Braking force
b) Force at wheels to move vehicle
c) Battery charging force
d) None

6) Fuel cell EV uses _____.
a) Hydrogen b) Petrol
c) Methanol d) Ethanol

7) PHEV can be charged by _____.
a) Plug-in charger b) Regenerative braking
c) On-board engine d) All

8) A Motor Generator (MG) is essential for driving hybrid vehicles because _____.
   a) it generates electricity
   b) it serves as the main power source when starting driving a vehicle
   c) it assists the engine during acceleration
   d) all of above

9) For modern electric vehicles, which type of motor is often favored due to its high efficiency and power density?
   a) DC Series Motor
   b) 3-phase Induction Motor
   c) Permanent Magnet Synchronous Motor (PMSM)
   d) DC Shunt Motor

10) Which is the electrolyte used in Li-ion battery?
   a) Lead dioxide
   b) Lithium-based gel
   c) Sulfur dioxide
   d) Cobalt

11) Cells are connected in parallel to _____.
   a) increase the voltage output
   b) increases the internal resistance
   c) decreases the current capacity
   d) increases the current capacity.

12) A BMS helps maintain battery performance by preventing _____.
   a) Consistent optimal operating temperatures
   b) Overcharging and undercharging of individual cells
   c) Balanced charge and discharge of the battery pack
   d) Accurate voltage and current monitoring

13) What does the BMS perform to ensure each cell contributes equally to the battery pack's overall capacity and lifespan?
   a) Overcurrent protection
   b) Cell balancing
   c) Isolation resistance monitoring
   d) Thermal management

14) Which of the following component is formed on the positive plate after the discharged reaction in a lead-acid battery?
   a) Sulphuric acid
   b) Lead peroxide
   c) Lead sulphate
   d) Spongy lead

Seat No.	

Set **P**

T.Y. (B.Tech.) (Electrical Engineering) (Sem - I) (New) (CBCS)
Examination: March/April – 2026
Hybrid Electrical Vehicle Design (EEPEC-01C)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.
4) Draw neat diagrams whenever necessary.

Section – I

Q.2 Attempt the following. (Any Four) **16**

a) Explain the historical evolution of electric vehicles.

b) Compare EV and ICE vehicles in terms of powertrain and efficiency.

c) Discuss advantages of solar power for EV.

d) Define rolling resistance and explain its effect on EV motion.

e) Explain photovoltaic-based EV systems.

f) Compare electric vs fuel-based vehicles in terms of efficiency & emissions.

Q.3 Attempt the following. (Any Two) **12**

a) Define EV classification and electrification levels with examples.

b) Explain tractive effort and torque calculation with an example.

c) Draw EV architecture and explain components.

Section – II

Q.4 Attempt the following. (Any Four) **16**

a) Explain the requirement of electric motors for Electric vehicle.

b) Explain various components of electric motor controller used in electric vehicle.

c) Explain with chemical reactions discharging process of a lead acid battery.

d) Explain with chemical reactions charging process of a NiMH battery.

e) Explain the need of Battery Management System (BMS) in case of EVs.

f) What are different types of electric motors used in electric vehicle. Explain one with characteristics.

Q.5 Attempt the following. (Any Two) **12**

a) Explain with chemical reactions charging & discharging process of Lithium-ion Battery.

b) Explain with block diagram Software based high level supervisory control System in Battery Management System (BMS) of EVs.

c) Explain in detail factors of selection of electric motors for Electric vehicle.

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Electrical Engineering) (Sem - I) (New) (CBCS)
Examination: March/April – 2026
Hybrid Electrical Vehicle Design (EEPEC-01C)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if required.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) A Motor Generator (MG) is essential for driving hybrid vehicles because _____.
a) it generates electricity
b) it serves as the main power source when starting driving a vehicle
c) it assists the engine during acceleration
d) all of above

2) For modern electric vehicles, which type of motor is often favored due to its high efficiency and power density?
a) DC Series Motor
b) 3-phase Induction Motor
c) Permanent Magnet Synchronous Motor (PMSM)
d) DC Shunt Motor

3) Which is the electrolyte used in Li-ion battery?
a) Lead dioxide b) Lithium-based gel
c) Sulfur dioxide d) Cobalt

4) Cells are connected in parallel to _____.
a) increase the voltage output
b) increases the internal resistance
c) decreases the current capacity
d) increases the current capacity.

5) A BMS helps maintain battery performance by preventing _____.
a) Consistent optimal operating temperatures
b) Overcharging and undercharging of individual cells
c) Balanced charge and discharge of the battery pack
d) Accurate voltage and current monitoring

6) What does the BMS perform to ensure each cell contributes equally to the battery pack's overall capacity and lifespan?
   a) Overcurrent protection
   b) Cell balancing
   c) Isolation resistance monitoring
   d) Thermal management

7) Which of the following component is formed on the positive plate after the discharged reaction in a lead-acid battery?
   a) Sulphuric acid
   b) Lead peroxide
   c) Lead sulphate
   d) Spongy lead

8) Which of the following is NOT a component of EV?
   a) Battery
   b) Electric motor
   c) Radiator
   d) Motor controller

9) A primary benefit of EVs is _____.
   a) Higher emissions
   b) Low noise & pollution
   c) Higher fuel consumption
   d) None of the above

10) Electric vehicles have maximum torque at _____.
   a) Low RPM
   b) High RPM
   c) Idle RPM
   d) 2000 RPM

11) Air drag force increases with _____.
   a) $Speed^2$
   b) Speed
   c) Constant
   d) Weight

12) Tractive effort is _____.
   a) Braking force
   b) Force at wheels to move vehicle
   c) Battery charging force
   d) None

13) Fuel cell EV uses _____.
   a) Hydrogen
   b) Petrol
   c) Methanol
   d) Ethanol

14) PHEV can be charged by _____.
   a) Plug-in charger
   b) Regenerative braking
   c) On-board engine
   d) All

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Electrical Engineering) (Sem - I) (New) (CBCS)
Examination: March/April – 2026
Hybrid Electrical Vehicle Design (EEPEC-01C)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.
4) Draw neat diagrams whenever necessary.

Section – I

Q.2 Attempt the following. (Any Four) **16**

a) Explain the historical evolution of electric vehicles.
b) Compare EV and ICE vehicles in terms of powertrain and efficiency.
c) Discuss advantages of solar power for EV.
d) Define rolling resistance and explain its effect on EV motion.
e) Explain photovoltaic-based EV systems.
f) Compare electric vs fuel-based vehicles in terms of efficiency & emissions.

Q.3 Attempt the following. (Any Two) **12**

a) Define EV classification and electrification levels with examples.
b) Explain tractive effort and torque calculation with an example.
c) Draw EV architecture and explain components.

Section – II

Q.4 Attempt the following. (Any Four) **16**

a) Explain the requirement of electric motors for Electric vehicle.
b) Explain various components of electric motor controller used in electric vehicle.
c) Explain with chemical reactions discharging process of a lead acid battery.
d) Explain with chemical reactions charging process of a NiMH battery.
e) Explain the need of Battery Management System (BMS) in case of EVs.
f) What are different types of electric motors used in electric vehicle. Explain one with characteristics.

Q.5 Attempt the following. (Any Two) **12**

a) Explain with chemical reactions charging & discharging process of Lithium-ion Battery.

b) Explain with block diagram Software based high level supervisory control System in Battery Management System (BMS) of EVs.

c) Explain in detail factors of selection of electric motors for Electric vehicle.

Seat No.	

Set **R**

T.Y. (B.Tech.) (Electrical Engineering) (Sem - I) (New) (CBCS)
Examination: March/April – 2026
Hybrid Electrical Vehicle Design (EEPEC-01C)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if required.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Cells are connected in parallel to _____.
a) increase the voltage output
b) increases the internal resistance
c) decreases the current capacity
d) increases the current capacity.

2) A BMS helps maintain battery performance by preventing _____.
a) Consistent optimal operating temperatures
b) Overcharging and undercharging of individual cells
c) Balanced charge and discharge of the battery pack
d) Accurate voltage and current monitoring

3) What does the BMS perform to ensure each cell contributes equally to the battery pack's overall capacity and lifespan?
a) Overcurrent protection
b) Cell balancing
c) Isolation resistance monitoring
d) Thermal management

4) Which of the following component is formed on the positive plate after the discharged reaction in a lead-acid battery?
a) Sulphuric acid b) Lead peroxide
c) Lead sulphate d) Spongy lead

5) Which of the following is NOT a component of EV?
a) Battery b) Electric motor
c) Radiator d) Motor controller

6) A primary benefit of EVs is _____.
a) Higher emissions b) Low noise & pollution
c) Higher fuel consumption d) None of the above

7) Electric vehicles have maximum torque at _____.
a) Low RPM
b) High RPM
c) Idle RPM
d) 2000 RPM

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b) Speed
c) Constant
d) Weight

9) Tractive effort is _____.
a) Braking force
b) Force at wheels to move vehicle
c) Battery charging force
d) None

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c) Methanol
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c) On-board engine
d) All

12) A Motor Generator (MG) is essential for driving hybrid vehicles because _____.
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b) it serves as the main power source when starting driving a vehicle
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d) all of above

13) For modern electric vehicles, which type of motor is often favored due to its high efficiency and power density?
a) DC Series Motor
b) 3-phase Induction Motor
c) Permanent Magnet Synchronous Motor (PMSM)
d) DC Shunt Motor

14) Which is the electrolyte used in Li-ion battery?
a) Lead dioxide
b) Lithium-based gel
c) Sulfur dioxide
d) Cobalt

Seat No.	

Set **R**

T.Y. (B.Tech.) (Electrical Engineering) (Sem - I) (New) (CBCS)
Examination: March/April – 2026
Hybrid Electrical Vehicle Design (EEPEC-01C)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.
4) Draw neat diagrams whenever necessary.

Section – I

Q.2 Attempt the following. (Any Four) **16**

a) Explain the historical evolution of electric vehicles.

b) Compare EV and ICE vehicles in terms of powertrain and efficiency.

c) Discuss advantages of solar power for EV.

d) Define rolling resistance and explain its effect on EV motion.

e) Explain photovoltaic-based EV systems.

f) Compare electric vs fuel-based vehicles in terms of efficiency & emissions.

Q.3 Attempt the following. (Any Two) **12**

a) Define EV classification and electrification levels with examples.

b) Explain tractive effort and torque calculation with an example.

c) Draw EV architecture and explain components.

Section – II

Q.4 Attempt the following. (Any Four) **16**

a) Explain the requirement of electric motors for Electric vehicle.

b) Explain various components of electric motor controller used in electric vehicle.

c) Explain with chemical reactions discharging process of a lead acid battery.

d) Explain with chemical reactions charging process of a NiMH battery.

e) Explain the need of Battery Management System (BMS) in case of EVs.

f) What are different types of electric motors used in electric vehicle. Explain one with characteristics.

Q.5 Attempt the following. (Any Two) **12**

a) Explain with chemical reactions charging & discharging process of Lithium-ion Battery.

b) Explain with block diagram Software based high level supervisory control System in Battery Management System (BMS) of EVs.

c) Explain in detail factors of selection of electric motors for Electric vehicle.

Seat No.	

Set | S

T.Y. (B.Tech.) (Electrical Engineering) (Sem - I) (New) (CBCS)
Examination: March/April – 2026
Hybrid Electrical Vehicle Design (EEPEC-01C)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if required.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Fuel cell EV uses _____.
a) Hydrogen b) Petrol
c) Methanol d) Ethanol

2) PHEV can be charged by _____.
a) Plug-in charger b) Regenerative braking
c) On-board engine d) All

3) A Motor Generator (MG) is essential for driving hybrid vehicles because _____.
a) it generates electricity
b) it serves as the main power source when starting driving a vehicle
c) it assists the engine during acceleration
d) all of above

4) For modern electric vehicles, which type of motor is often favored due to its high efficiency and power density?
a) DC Series Motor
b) 3-phase Induction Motor
c) Permanent Magnet Synchronous Motor (PMSM)
d) DC Shunt Motor

5) Which is the electrolyte used in Li-ion battery?
a) Lead dioxide b) Lithium-based gel
c) Sulfur dioxide d) Cobalt

6) Cells are connected in parallel to _____.
   a) increase the voltage output
   b) increases the internal resistance
   c) decreases the current capacity
   d) increases the current capacity.

7) A BMS helps maintain battery performance by preventing _____.
   a) Consistent optimal operating temperatures
   b) Overcharging and undercharging of individual cells
   c) Balanced charge and discharge of the battery pack
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8) What does the BMS perform to ensure each cell contributes equally to the battery pack's overall capacity and lifespan?
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   c) Isolation resistance monitoring
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9) Which of the following component is formed on the positive plate after the discharged reaction in a lead-acid battery?
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   c) Lead sulphate
   d) Spongy lead

10) Which of the following is NOT a component of EV?
   a) Battery
   b) Electric motor
   c) Radiator
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11) A primary benefit of EVs is _____.
   a) Higher emissions
   b) Low noise & pollution
   c) Higher fuel consumption
   d) None of the above

12) Electric vehicles have maximum torque at _____.
   a) Low RPM
   b) High RPM
   c) Idle RPM
   d) 2000 RPM

13) Air drag force increases with _____.
   a) $Speed^2$
   b) Speed
   c) Constant
   d) Weight

14) Tractive effort is _____.
   a) Braking force
   b) Force at wheels to move vehicle
   c) Battery charging force
   d) None

Seat No.		Set	S

T.Y. (B.Tech.) (Electrical Engineering) (Sem - I) (New) (CBCS)
Examination: March/April – 2026
Hybrid Electrical Vehicle Design (EEPEC-01C)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.
4) Draw neat diagrams whenever necessary.

Section – I

Q.2 Attempt the following. (Any Four) **16**

a) Explain the historical evolution of electric vehicles.
b) Compare EV and ICE vehicles in terms of powertrain and efficiency.
c) Discuss advantages of solar power for EV.
d) Define rolling resistance and explain its effect on EV motion.
e) Explain photovoltaic-based EV systems.
f) Compare electric vs fuel-based vehicles in terms of efficiency & emissions.

Q.3 Attempt the following. (Any Two) **12**

a) Define EV classification and electrification levels with examples.
b) Explain tractive effort and torque calculation with an example.
c) Draw EV architecture and explain components.

Section – II

Q.4 Attempt the following. (Any Four) **16**

a) Explain the requirement of electric motors for Electric vehicle.
b) Explain various components of electric motor controller used in electric vehicle.
c) Explain with chemical reactions discharging process of a lead acid battery.
d) Explain with chemical reactions charging process of a NiMH battery.
e) Explain the need of Battery Management System (BMS) in case of EVs.
f) What are different types of electric motors used in electric vehicle. Explain one with characteristics.

Q.5 Attempt the following. (Any Two) **12**

a) Explain with chemical reactions charging & discharging process of Lithium-ion Battery.

b) Explain with block diagram Software based high level supervisory control System in Battery Management System (BMS) of EVs.

c) Explain in detail factors of selection of electric motors for Electric vehicle.

SLR-QH-569

Seat No.		Set	P

Marks Obtained		Signature of Examiner		Signature of Junior Supervisor	

T.Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Creativity and Design Thinking (AEC-02)

Day & Date: Tuesday, 12-05-2026 Max. Marks: 50
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Mention Question Paper Set (P/Q/R/S) on Top of Page.
4) Use of non-programmable calculators is allowed.

Answer

Q.1 Multiple Choice Questions.

1) Innovation mainly focuses on _____.
a) Generating ideas only b) Implementing creative ideas
c) Copying others d) Marketing

2) Creativity and Innovation together lead to _____.
a) Routine performance b) Problem discovery
c) Practical novelty d) Mechanical repetition

3) A characteristic of a creative person is _____.
a) Rigidity b) Curiosity
c) Fearfulness d) Passivity

4) Which of the following represents a major *barrier* to creativity?
a) Time pressure b) Risk-taking
c) Playfulness d) Flexibility

5) The “Ideate” stage in design thinking focuses on _____.
a) Understanding users b) Generating solutions
c) Testing ideas d) Building prototypes

6) Design thinking is fundamentally _____.
a) User-centered b) Manager-centered
c) Engineer-centered d) Cost-centered

7) Which of these helps to *overcome* creative blocks?
a) Collaboration b) Fear of mistakes
c) Over-planning d) Isolation

8) A design thinker empathizes to _____.
a) Know customer feelings and needs
b) Find product cost
c) Estimate profit
d) Collect market data

9) The *Define* phase results in _____.
a) Problem statement b) Prototype
c) Survey d) Marketing plan

10) Barriers to creativity can be removed through _____.
a) Open communication b) Discouragement
c) Repetition d) Judgmental thinking

11) The last phase of design thinking is _____.
a) Prototype b) Test
c) Ideate d) Define

12) Which term best describes the ability to see connections between unrelated ideas?
a) Fluency b) Flexibility
c) Originality d) Association

13) One of the benefits of design thinking is _____.
a) Focusing on user-friendly solutions
b) Ignoring customers
c) Cost reduction only
d) Quick fixes

14) Divergent and convergent thinking together ensure _____.
a) Balance between idea generation and selection
b) Faster production
c) Market analysis
d) Less creativity

15) In brainstorming, criticism should be ____.
a) Encouraged b) Postponed
c) Ignored d) Repeated

16) SCAMPER is mainly used for _____.
a) Modifying existing ideas b) Market study
c) Testing materials d) Estimating cost

17) In mind mapping, central themes are _____.
a) Placed at center with branches outward
b) At the edges
c) Hidden
d) Random

18) TRIZ encourages _____.
a) Systematic innovation through contradictions
b) Copying existing patents
c) Brainstorm blocking
d) Linear analysis

19) Which is a creative ideation technique?
a) Storyboarding b) Checklist creation
c) Prototype testing d) Quality audit

20) Concept sketching helps _____.
a) Express ideas visually b) Replace written reports
c) Perform tests d) Manage finance

21) In SCAMPER, "C" stands for _____.
a) Combine b) Copy
c) Create d) Classify

22) The purpose of divergent thinking is to _____.
a) Explore many possibilities b) Select one answer
c) Limit imagination d) Finalize design

23) Which of the following tools is best suited for *organizing ideas?*
a) Mind map b) Pie chart
c) Spreadsheet d) Histogram

24) "Storytelling" in concept development helps designers _____.
a) Communicate user experiences effectively
b) Draw detailed schematics
c) Analyze budget
d) Fix prototypes

25) The last step of concept development is _____.
a) Visualization of ideas b) Brainstorming
c) TRIZ analysis d) Market feedback

26) Prototyping in design helps _____.
a) Convert abstract ideas into tangible models
b) Replace manufacturing
c) Finalize budgets
d) Avoid testing

27) Which prototype type is *cheapest* and fastest?
a) Low-fidelity b) High-fidelity
c) Final d) Medium

28) High-fidelity prototypes allow _____.
a) User interaction and realism
b) Concept only
c) Paper sketching
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b) Making single model
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31) Which tool is commonly used in rapid prototyping?
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c) CNC lathe d) Mind map

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46) The staged (waterfall) model is _____.
a) Sequential b) Iterative
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48) The most important sustainability factor in manufacturing is _____.
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b) Advertisement
c) Branding
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49) Which practice promotes a circular economy?
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SLR-QH-569

Seat No.		Set	Q

Marks Obtained		Signature of Examiner		Signature of Junior Supervisor	

T.Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Creativity and Design Thinking (AEC-02)

Day & Date: Tuesday, 12-05-2026 Max. Marks: 50
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Mention Question Paper Set (P/Q/R/S) on Top of Page.
4) Use of non-programmable calculators is allowed.

Answer

Q.1 Multiple Choice Questions.

1) In SCAMPER, "C" stands for _____.
a) Combine b) Copy
c) Create d) Classify

2) The purpose of divergent thinking is to _____.
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3) Which of the following tools is best suited for *organizing ideas?*
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c) Spreadsheet d) Histogram

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SLR-QH-569

Seat No.		Set	R

Marks Obtained		Signature of Examiner		Signature of Junior Supervisor	

T.Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Creativity and Design Thinking (AEC-02)

Day & Date: Tuesday, 12-05-2026 Max. Marks: 50
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Mention Question Paper Set (P/Q/R/S) on Top of Page.
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Answer

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49) Which phase is crucial for sustainability decisions?

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SLR-QH-569

Seat No.		Set	S

Marks Obtained		Signature of Examiner		Signature of Junior Supervisor	

T.Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Creativity and Design Thinking (AEC-02)

Day & Date: Tuesday, 12-05-2026 Max. Marks: 50
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
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3) Mention Question Paper Set (P/Q/R/S) on Top of Page.
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Answer

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c) Survey d) Marketing plan

50) Barriers to creativity can be removed through _____.

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c) Repetition d) Judgmental thinking

SLR-QH-570

Seat No.		Set	P

T.Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Honors in Electrical Vehicle
Energy Management System for Electric Vehicle (EEHn-03A)

Day & Date: Thursday,14-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume data wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which process describes the conversion of chemical energy into electrical energy in cells and batteries?
a) Electrolysis
b) Ionization
c) Oxidation-reduction reaction
d) Electromagnetic induction

2) Which variables are commonly used to characterize battery operating conditions?
a) Nickel b) Lead
c) Lithium d) Zinc

3) Which type of battery is commonly used in portable electronic devices due to its high energy density?
a) Nickel-based Battery b) Sodium-based Battery
c) Lead Acid Battery d) Lithium-based Battery

4) Which process describes the conversion of chemical energy into electrical energy in cells and batteries?
a) Electrolysis b) Ionization
c) Oxidation-reduction reaction d) Electromagnetic induction

5) Which variables are commonly used to characterize battery operating conditions?
a) Voltage and current
b) Temperature and pressure
c) Capacity and charge/discharge rate
d) Color and shape

6) Battery specifications typically include which of the following characteristics?
   a) Chemical composition
   b) Weight and dimensions
   c) Internal resistance
   d) All of the above

7) What is a common approach to modeling batteries?
   a) Using only theoretical equations
   b) Utilizing experimental data exclusively
   c) Combining theoretical equations and experimental data
   d) Ignoring both theory and experimentation

8) Which type of battery is known for its high energy density and stable voltage characteristics?
   a) Lead-acid battery
   b) Nickel-metal hydride (NiMH) battery
   c) Rechargeable lithium-ion (Li-ion) battery
   d) Nickel-cadmium (NiCd) battery

9) What is a key advantage of using simulation models for batteries?
   a) Simulation models are always more accurate than experimental testing
   b) Simulation models are less time-consuming than experimental testing
   c) Simulation models require less computational power than experimental testing
   d) Simulation models cannot be used for predictive analysis

10) Which factor is most crucial in the selection of batteries for Electric Vehicles (EVs) and Hybrid Electric Vehicles (HEVs)?
   a) Voltage output
   b) Energy density
   c) Resistance to overcharging
   d) Cycle life

11) What is a primary consideration in traction battery pack design for EVs and HEVs?
   a) Minimizing weight
   b) Maximizing voltage output
   c) Reducing energy density
   d) Optimizing internal resistance

12) Why is battery monitoring essential in EVs and HEVs?
   a) To increase battery lifespan
   b) To reduce vehicle speed
   c) To decrease energy efficiency
   d) To eliminate battery overheating

13) What is a critical consideration for ensuring cell safety and battery design?
   a) Voltage output
   b) Material properties
   c) Color of the casing
   d) Number of charging cycles

14) Which testing method is commonly used to evaluate the safety and performance of batteries?
   a) Accelerated life testing
   b) Visual inspection
   c) Listening for sounds
   d) Taste testing

SLR-QH-570

Seat No.		Set	P

T.Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Honors in Electrical Vehicle
Energy Management System for Electric Vehicle (EEHn-03A)

Day & Date: Thursday,14-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume data wherever necessary.

SECTION – I

Q.2 Attempt Any Four of the following. **16**

a) Explain with chemical reactions discharging process of a lead acid battery.

b) Explain with application operation of Metal air battery.

c) Explain charging and discharging current with characteristics of a battery.

d) Explain in short nominal parameters of a battery.

e) Explain general approach to modeling of batteries.

f) Define battery efficiency and how it is calculated.

Q.3 Attempt Any Two of the following. **12**

a) Explain following regarding performance criteria for Electric Vehicles batteries.
i) Vehicle propulsion factors
ii) Power and energy requirements of batteries

b) Develop a step-by-step explanation of the simulation model for a rechargeable Li-ion battery.

c) Explain the working principle of ultra-capacitors with suitable diagrams.

d) Describe the components and functioning of a flywheel energy storage system.

SECTION – II

Q.4 Attempt Any Four of the following. **16**

a) Explain requirements of battery monitoring in electric vehicles and hybrid electric vehicles.

b) Explain the fundamentals of battery pack design.

c) Describe the types of battery cell equalization methods.

d) Explain the chemical properties for cell safety of EV batteries.

e) Describes the EV Battery testing methods.

f) Describe the causes and consequences of gas generation in batteries.

Q.5 Attempt Any Two of the following. **12**

a) Explain the limitations and regulations related to the transport and storage of cells and batteries.

b) Explain the recycling, disposal, and second use of EV batteries.

c) Describes the State of Charge (SOC) estimation methods.

d) Describe the voltage sensing in the battery Management System (BMS).

SLR-QH-570

Seat No.		Set	Q

T.Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Honors in Electrical Vehicle
Energy Management System for Electric Vehicle (EEHn-03A)

Day & Date: Thursday,14-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume data wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which type of battery is known for its high energy density and stable voltage characteristics?
a) Lead-acid battery
b) Nickel-metal hydride (NiMH) battery
c) Rechargeable lithium-ion (Li-ion) battery
d) Nickel-cadmium (NiCd) battery

2) What is a key advantage of using simulation models for batteries?
a) Simulation models are always more accurate than experimental testing
b) Simulation models are less time-consuming than experimental testing
c) Simulation models require less computational power than experimental testing
d) Simulation models cannot be used for predictive analysis

3) Which factor is most crucial in the selection of batteries for Electric Vehicles (EVs) and Hybrid Electric Vehicles (HEVs)?
a) Voltage output b) Energy density
c) Resistance to overcharging d) Cycle life

4) What is a primary consideration in traction battery pack design for EVs and HEVs?
a) Minimizing weight b) Maximizing voltage output
c) Reducing energy density d) Optimizing internal resistance

5) Why is battery monitoring essential in EVs and HEVs?
a) To increase battery lifespan b) To reduce vehicle speed
c) To decrease energy efficiency d) To eliminate battery overheating

6) What is a critical consideration for ensuring cell safety and battery design?
a) Voltage output b) Material properties
c) Color of the casing d) Number of charging cycles

7) Which testing method is commonly used to evaluate the safety and performance of batteries?
a) Accelerated life testing b) Visual inspection
c) Listening for sounds d) Taste testing

8) Which process describes the conversion of chemical energy into electrical energy in cells and batteries?
a) Electrolysis
b) Ionization
c) Oxidation-reduction reaction
d) Electromagnetic induction

9) Which variables are commonly used to characterize battery operating conditions?
a) Nickel b) Lead
c) Lithium d) Zinc

10) Which type of battery is commonly used in portable electronic devices due to its high energy density?
a) Nickel-based Battery b) Sodium-based Battery
c) Lead Acid Battery d) Lithium-based Battery

11) Which process describes the conversion of chemical energy into electrical energy in cells and batteries?
a) Electrolysis b) Ionization
c) Oxidation-reduction reaction d) Electromagnetic induction

12) Which variables are commonly used to characterize battery operating conditions?
a) Voltage and current
b) Temperature and pressure
c) Capacity and charge/discharge rate
d) Color and shape

13) Battery specifications typically include which of the following characteristics?
a) Chemical composition b) Weight and dimensions
c) Internal resistance d) All of the above

14) What is a common approach to modeling batteries?

a) Using only theoretical equations
b) Utilizing experimental data exclusively
c) Combining theoretical equations and experimental data
d) Ignoring both theory and experimentation

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Honors in Electrical Vehicle
Energy Management System for Electric Vehicle (EEHn-03A)

Day & Date: Thursday,14-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume data wherever necessary.

SECTION – I

Q.2 Attempt Any Four of the following. **16**

a) Explain with chemical reactions discharging process of a lead acid battery.

b) Explain with application operation of Metal air battery.

c) Explain charging and discharging current with characteristics of a battery.

d) Explain in short nominal parameters of a battery.

e) Explain general approach to modeling of batteries.

f) Define battery efficiency and how it is calculated.

Q.3 Attempt Any Two of the following. **12**

a) Explain following regarding performance criteria for Electric Vehicles batteries.
i) Vehicle propulsion factors
ii) Power and energy requirements of batteries

b) Develop a step-by-step explanation of the simulation model for a rechargeable Li-ion battery.

c) Explain the working principle of ultra-capacitors with suitable diagrams.

d) Describe the components and functioning of a flywheel energy storage system.

SECTION – II

Q.4 Attempt Any Four of the following. **16**

a) Explain requirements of battery monitoring in electric vehicles and hybrid electric vehicles.

b) Explain the fundamentals of battery pack design.

c) Describe the types of battery cell equalization methods.

d) Explain the chemical properties for cell safety of EV batteries.

e) Describes the EV Battery testing methods.

f) Describe the causes and consequences of gas generation in batteries.

Q.5 Attempt Any Two of the following. **12**

a) Explain the limitations and regulations related to the transport and storage of cells and batteries.

b) Explain the recycling, disposal, and second use of EV batteries.

c) Describes the State of Charge (SOC) estimation methods.

d) Describe the voltage sensing in the battery Management System (BMS).

Seat No.		Set	R

T.Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Honors in Electrical Vehicle
Energy Management System for Electric Vehicle (EEHn-03A)

Day & Date: Thursday,14-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume data wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) What is a primary consideration in traction battery pack design for EVs and HEVs?
a) Minimizing weight b) Maximizing voltage output
c) Reducing energy density d) Optimizing internal resistance

2) Why is battery monitoring essential in EVs and HEVs?
a) To increase battery lifespan b) To reduce vehicle speed
c) To decrease energy efficiency d) To eliminate battery overheating

3) What is a critical consideration for ensuring cell safety and battery design?
a) Voltage output b) Material properties
c) Color of the casing d) Number of charging cycles

4) Which testing method is commonly used to evaluate the safety and performance of batteries?
a) Accelerated life testing b) Visual inspection
c) Listening for sounds d) Taste testing

5) Which process describes the conversion of chemical energy into electrical energy in cells and batteries?
a) Electrolysis
b) Ionization
c) Oxidation-reduction reaction
d) Electromagnetic induction

6) Which variables are commonly used to characterize battery operating conditions?

a) Nickel
b) Lead
c) Lithium
d) Zinc

7) Which type of battery is commonly used in portable electronic devices due to its high energy density?

a) Nickel-based Battery
b) Sodium-based Battery
c) Lead Acid Battery
d) Lithium-based Battery

8) Which process describes the conversion of chemical energy into electrical energy in cells and batteries?

a) Electrolysis
b) Ionization
c) Oxidation-reduction reaction
d) Electromagnetic induction

9) Which variables are commonly used to characterize battery operating conditions?

a) Voltage and current
b) Temperature and pressure
c) Capacity and charge/discharge rate
d) Color and shape

10) Battery specifications typically include which of the following characteristics?

a) Chemical composition
b) Weight and dimensions
c) Internal resistance
d) All of the above

11) What is a common approach to modeling batteries?

a) Using only theoretical equations
b) Utilizing experimental data exclusively
c) Combining theoretical equations and experimental data
d) Ignoring both theory and experimentation

12) Which type of battery is known for its high energy density and stable voltage characteristics?

a) Lead-acid battery
b) Nickel-metal hydride (NiMH) battery
c) Rechargeable lithium-ion (Li-ion) battery
d) Nickel-cadmium (NiCd) battery

13) What is a key advantage of using simulation models for batteries?

a) Simulation models are always more accurate than experimental testing
b) Simulation models are less time-consuming than experimental testing
c) Simulation models require less computational power than experimental testing
d) Simulation models cannot be used for predictive analysis

14) Which factor is most crucial in the selection of batteries for Electric Vehicles (EVs) and Hybrid Electric Vehicles (HEVs)?

a) Voltage output
b) Energy density
c) Resistance to overcharging
d) Cycle life

SLR-QH-570

Seat No.		Set	R

T.Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Honors in Electrical Vehicle
Energy Management System for Electric Vehicle (EEHn-03A)

Day & Date: Thursday,14-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume data wherever necessary.

SECTION – I

Q.2 Attempt Any Four of the following. **16**

a) Explain with chemical reactions discharging process of a lead acid battery.

b) Explain with application operation of Metal air battery.

c) Explain charging and discharging current with characteristics of a battery.

d) Explain in short nominal parameters of a battery.

e) Explain general approach to modeling of batteries.

f) Define battery efficiency and how it is calculated.

Q.3 Attempt Any Two of the following. **12**

a) Explain following regarding performance criteria for Electric Vehicles batteries.
i) Vehicle propulsion factors
ii) Power and energy requirements of batteries

b) Develop a step-by-step explanation of the simulation model for a rechargeable Li-ion battery.

c) Explain the working principle of ultra-capacitors with suitable diagrams.

d) Describe the components and functioning of a flywheel energy storage system.

SECTION – II

Q.4 Attempt Any Four of the following. **16**

a) Explain requirements of battery monitoring in electric vehicles and hybrid electric vehicles.

b) Explain the fundamentals of battery pack design.

c) Describe the types of battery cell equalization methods.

d) Explain the chemical properties for cell safety of EV batteries.

e) Describes the EV Battery testing methods.

f) Describe the causes and consequences of gas generation in batteries.

Q.5 Attempt Any Two of the following. **12**

a) Explain the limitations and regulations related to the transport and storage of cells and batteries.

b) Explain the recycling, disposal, and second use of EV batteries.

c) Describes the State of Charge (SOC) estimation methods.

d) Describe the voltage sensing in the battery Management System (BMS).

SLR-QH-570

Seat No.		Set	S

T.Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Honors in Electrical Vehicle
Energy Management System for Electric Vehicle (EEHn-03A)

Day & Date: Thursday,14-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume data wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Battery specifications typically include which of the following characteristics?
a) Chemical composition
b) Weight and dimensions
c) Internal resistance
d) All of the above

2) What is a common approach to modeling batteries?
a) Using only theoretical equations
b) Utilizing experimental data exclusively
c) Combining theoretical equations and experimental data
d) Ignoring both theory and experimentation

3) Which type of battery is known for its high energy density and stable voltage characteristics?
a) Lead-acid battery
b) Nickel-metal hydride (NiMH) battery
c) Rechargeable lithium-ion (Li-ion) battery
d) Nickel-cadmium (NiCd) battery

4) What is a key advantage of using simulation models for batteries?
a) Simulation models are always more accurate than experimental testing
b) Simulation models are less time-consuming than experimental testing
c) Simulation models require less computational power than experimental testing
d) Simulation models cannot be used for predictive analysis

5) Which factor is most crucial in the selection of batteries for Electric Vehicles (EVs) and Hybrid Electric Vehicles (HEVs)?

a) Voltage output
b) Energy density
c) Resistance to overcharging
d) Cycle life

6) What is a primary consideration in traction battery pack design for EVs and HEVs?

a) Minimizing weight
b) Maximizing voltage output
c) Reducing energy density
d) Optimizing internal resistance

7) Why is battery monitoring essential in EVs and HEVs?

a) To increase battery lifespan
b) To reduce vehicle speed
c) To decrease energy efficiency
d) To eliminate battery overheating

8) What is a critical consideration for ensuring cell safety and battery design?

a) Voltage output
b) Material properties
c) Color of the casing
d) Number of charging cycles

9) Which testing method is commonly used to evaluate the safety and performance of batteries?

a) Accelerated life testing
b) Visual inspection
c) Listening for sounds
d) Taste testing

10) Which process describes the conversion of chemical energy into electrical energy in cells and batteries?

a) Electrolysis
b) Ionization
c) Oxidation-reduction reaction
d) Electromagnetic induction

11) Which variables are commonly used to characterize battery operating conditions?

a) Nickel
b) Lead
c) Lithium
d) Zinc

12) Which type of battery is commonly used in portable electronic devices due to its high energy density?

a) Nickel-based Battery
b) Sodium-based Battery
c) Lead Acid Battery
d) Lithium-based Battery

13) Which process describes the conversion of chemical energy into electrical energy in cells and batteries?

a) Electrolysis
b) Ionization
c) Oxidation-reduction reaction
d) Electromagnetic induction

14) Which variables are commonly used to characterize battery operating conditions?

a) Voltage and current
b) Temperature and pressure
c) Capacity and charge/discharge rate
d) Color and shape

SLR-QH-570

Seat No.		Set	S

T.Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Honors in Electrical Vehicle
Energy Management System for Electric Vehicle (EEHn-03A)

Day & Date: Thursday,14-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume data wherever necessary.

SECTION – I

Q.2 Attempt Any Four of the following. **16**

a) Explain with chemical reactions discharging process of a lead acid battery.

b) Explain with application operation of Metal air battery.

c) Explain charging and discharging current with characteristics of a battery.

d) Explain in short nominal parameters of a battery.

e) Explain general approach to modeling of batteries.

f) Define battery efficiency and how it is calculated.

Q.3 Attempt Any Two of the following. **12**

a) Explain following regarding performance criteria for Electric Vehicles batteries.
i) Vehicle propulsion factors
ii) Power and energy requirements of batteries

b) Develop a step-by-step explanation of the simulation model for a rechargeable Li-ion battery.

c) Explain the working principle of ultra-capacitors with suitable diagrams.

d) Describe the components and functioning of a flywheel energy storage system.

SECTION – II

Q.4 Attempt Any Four of the following. **16**

a) Explain requirements of battery monitoring in electric vehicles and hybrid electric vehicles.

b) Explain the fundamentals of battery pack design.

c) Describe the types of battery cell equalization methods.

d) Explain the chemical properties for cell safety of EV batteries.

e) Describes the EV Battery testing methods.

f) Describe the causes and consequences of gas generation in batteries.

Q.5 Attempt Any Two of the following. **12**

a) Explain the limitations and regulations related to the transport and storage of cells and batteries.

b) Explain the recycling, disposal, and second use of EV batteries.

c) Describes the State of Charge (SOC) estimation methods.

d) Describe the voltage sensing in the battery Management System (BMS).

SLR-QH-571

Seat No.		Set	P

T. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Honors in Sustainable Power Systems-Distributed Energy Integration (EEHn-03B)

Day & Date: Thursday, 14-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary and mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose correct answer. **14**

1) Distribution management systems _____.
a) Radial system b) Tree system
c) Ring mains system d) All are equally reliable

2) The energy strategies of companies have the principle of _____.
a) restoring and preserving the environment
b) reducing wastes and pollutants
c) reducing people about energy conservation
d) All of these

3) Energy management is a key component of _____.
a) Environmental management b) Carbon management
c) Nitrogen management d) Water management

4) In passive potential energy strategies, _____.
a) There is no systematic planning
b) Measures with low profitability are not considered
c) One should have high knowledge of the energy price
d) All of these

5) The area of cross-section of the neutral in a 3-wire D.C. system is generally _____ the area of cross section of the main conductor.
a) same as b) One-fourth
c) One-half d) Double

6) Which of the following is formed at the graphite electrode during the charging process of a battery when the lithium-ion moves through the separator?

a) Water
b) Graphite
c) Lithium hydroxide
d) Lithium carbide

7) In a distribution system, major cost is that of _____.

a) Earthing system
b) Distribution transformer
c) Conductors
d) Metres

8) The flywheel is accelerated when _____.

a) Driving torque > Load torque
b) Driving torque < Load torque
c) Driving torque = Load torque
d) Any of the above

9) For the same conductor length, same amount of power, same losses and maximum voltage to earth, which system requires minimum conductor area?

a) 3-wire AC
b) 2-wire AC
c) 2-wire DC
d) Single phase

10) Cloud base energy management system provides the ability to _____.

a) Remotely control HVAC
b) Collect real-time data
c) Generate intelligent, specific and real-time guidance
d) All of these

11) The null point of a uniformly loaded distributor feed at the equal voltage at both ends lies at _____.

a) Midpoint
b) Either end
c) Two-thirds distance from one end
d) One-fourth distance from one end

12) Why is compressed air in a storage system cooled before storage?

a) Prevent heat loss during storage
b) Improve turn-around efficiency
c) Reduces storage volume
d) Helps in a hybrid system

13) What is the permissible limit of voltage variations allowed in the distribution systems?

a) ± 2%
b) ± 5%
c) ± 10%
d) ± 6%

14) As compared to cables, the disadvantages of transmission lines is ____.

a) inductive interference between power and communication circuits
b) exposure to lightning
c) exposure to atmospheric hazards like smoke, ice, etc.
d) All of the above

SLR-QH-571

Seat No.		Set	P

T. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Honors in Sustainable Power Systems-Distributed Energy Integration (EEHn-03B)

Day & Date: Thursday, 14-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All Questions are compulsory.
2) Figures to the right indicates full marks.
3) Assume suitable data if necessary and mention it clearly.
4) Draw neat diagrams whenever necessary.

SECTION – I

Q.2 Answer the following. (Any Four) **16**

a) Write a short note on the security and reliability of distributed generation.

b) Discuss different integration issues in distributed generation.

c) Write a short note on the protection of DGs.

d) Explain the impact on transmission and generation systems on DG.

e) Write a short note on large-scale storage for grid stability.

Q.3 Answer the following. (Any Two) **12**

a) Explain different Forecasting methods and their applications.

b) What are the Regulatory challenges in the interconnection of DGS to the power systems?

c) Explain in detail the types of DG plants.

SECTION – II

Q.4 Answer the following. (Any Four) **16**

a) Write a short note on Loss reduction and Investment reduction.

b) Explain the role of microgrids in Energy Reliability.

c) Discuss allocation of losses in distribution networks with DG.

d) Write a short note on DGs in distribution networks.

e) What are alternative frameworks for distribution tariff development?

Q.5 Answer the following. (Any Two) **12**

a) Discuss energy storage's role in Energy Security.

b) Explain the Virtual Power Plant in detail.

c) Explain the types of energy storage systems.

SLR-QH-571

Seat No.	

Set Q

T. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Honors in Sustainable Power Systems-Distributed Energy Integration (EEHn-03B)

Day & Date: Thursday, 14-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary and mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose correct answer. **14**

1) The flywheel is accelerated when _____.
a) Driving torque > Load torque b) Driving torque < Load torque
c) Driving torque = Load torque d) Any of the above

2) For the same conductor length, same amount of power, same losses and maximum voltage to earth, which system requires minimum conductor area?
a) 3-wire AC b) 2-wire AC
c) 2-wire DC d) Single phase

3) Cloud base energy management system provides the ability to _____.
a) Remotely control HVAC
b) Collect real-time data
c) Generate intelligent, specific and real-time guidance
d) All of these

4) The null point of a uniformly loaded distributor feed at the equal voltage at both ends lies at _____.
a) Midpoint
b) Either end
c) Two-thirds distance from one end
d) One-fourth distance from one end

5) Why is compressed air in a storage system cooled before storage?
a) Prevent heat loss during storage
b) Improve turn-around efficiency
c) Reduces storage volume
d) Helps in a hybrid system

6) What is the permissible limit of voltage variations allowed in the distribution systems?

a) ± 2% b) ± 5%
c) ± 10% d) ± 6%

7) As compared to cables, the disadvantages of transmission lines is ____.

a) inductive interference between power and communication circuits
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c) exposure to atmospheric hazards like smoke, ice, etc.
d) All of the above

8) Distribution management systems _____.

a) Radial system b) Tree system
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a) restoring and preserving the environment
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10) Energy management is a key component of _____.

a) Environmental management b) Carbon management
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11) In passive potential energy strategies, _____.

a) There is no systematic planning
b) Measures with low profitability are not considered
c) One should have high knowledge of the energy price
d) All of these

12) The area of cross-section of the neutral in a 3-wire D.C. system is generally _____ the area of cross section of the main conductor.

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c) One-half d) Double

13) Which of the following is formed at the graphite electrode during the charging process of a battery when the lithium-ion moves through the separator?

a) Water b) Graphite
c) Lithium hydroxide d) Lithium carbide

14) In a distribution system, major cost is that of _____.

a) Earthing system b) Distribution transformer
c) Conductors d) Metres

SLR-QH-571

Seat No.		Set	Q

T. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Honors in Sustainable Power Systems-Distributed Energy Integration (EEHn-03B)

Day & Date: Thursday, 14-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All Questions are compulsory.
2) Figures to the right indicates full marks.
3) Assume suitable data if necessary and mention it clearly.
4) Draw neat diagrams whenever necessary.

SECTION – I

Q.2 Answer the following. (Any Four) **16**

a) Write a short note on the security and reliability of distributed generation.

b) Discuss different integration issues in distributed generation.

c) Write a short note on the protection of DGs.

d) Explain the impact on transmission and generation systems on DG.

e) Write a short note on large-scale storage for grid stability.

Q.3 Answer the following. (Any Two) **12**

a) Explain different Forecasting methods and their applications.

b) What are the Regulatory challenges in the interconnection of DGS to the power systems?

c) Explain in detail the types of DG plants.

SECTION – II

Q.4 Answer the following. (Any Four) **16**

a) Write a short note on Loss reduction and Investment reduction.

b) Explain the role of microgrids in Energy Reliability.

c) Discuss allocation of losses in distribution networks with DG.

d) Write a short note on DGs in distribution networks.

e) What are alternative frameworks for distribution tariff development?

Q.5 Answer the following. (Any Two) **12**

a) Discuss energy storage's role in Energy Security.

b) Explain the Virtual Power Plant in detail.

c) Explain the types of energy storage systems.

SLR-QH-571

Seat No.	

Set R

T. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Honors in Sustainable Power Systems-Distributed Energy Integration (EEHn-03B)

Day & Date: Thursday, 14-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary and mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose correct answer. 14

1) The null point of a uniformly loaded distributor feed at the equal voltage at both ends lies at _____.
a) Midpoint
b) Either end
c) Two-thirds distance from one end
d) One-fourth distance from one end

2) Why is compressed air in a storage system cooled before storage?
a) Prevent heat loss during storage
b) Improve turn-around efficiency
c) Reduces storage volume
d) Helps in a hybrid system

3) What is the permissible limit of voltage variations allowed in the distribution systems?
a) ± 2% b) ± 5%
c) ± 10% d) ± 6%

4) As compared to cables, the disadvantages of transmission lines is ____.
a) inductive interference between power and communication circuits
b) exposure to lightning
c) exposure to atmospheric hazards like smoke, ice, etc.
d) All of the above

5) Distribution management systems _____.
a) Radial system b) Tree system
c) Ring mains system d) All are equally reliable

6) The energy strategies of companies have the principle of _____.
a) restoring and preserving the environment
b) reducing wastes and pollutants
c) reducing people about energy conservation
d) All of these

7) Energy management is a key component of _____.
a) Environmental management b) Carbon management
c) Nitrogen management d) Water management

8) In passive potential energy strategies, _____.
a) There is no systematic planning
b) Measures with low profitability are not considered
c) One should have high knowledge of the energy price
d) All of these

9) The area of cross-section of the neutral in a 3-wire D.C. system is generally _____ the area of cross section of the main conductor.
a) same as b) One-fourth
c) One-half d) Double

10) Which of the following is formed at the graphite electrode during the charging process of a battery when the lithium-ion moves through the separator?
a) Water b) Graphite
c) Lithium hydroxide d) Lithium carbide

11) In a distribution system, major cost is that of _____.
a) Earthing system b) Distribution transformer
c) Conductors d) Metres

12) The flywheel is accelerated when _____.
a) Driving torque > Load torque b) Driving torque < Load torque
c) Driving torque = Load torque d) Any of the above

13) For the same conductor length, same amount of power, same losses and maximum voltage to earth, which system requires minimum conductor area?
a) 3-wire AC b) 2-wire AC
c) 2-wire DC d) Single phase

14) Cloud base energy management system provides the ability to _____.
a) Remotely control HVAC
b) Collect real-time data
c) Generate intelligent, specific and real-time guidance
d) All of these

SLR-QH-571

Seat No.		Set	R

T. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Honors in Sustainable Power Systems-Distributed Energy Integration (EEHn-03B)

Day & Date: Thursday, 14-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All Questions are compulsory.
2) Figures to the right indicates full marks.
3) Assume suitable data if necessary and mention it clearly.
4) Draw neat diagrams whenever necessary.

SECTION – I

Q.2 Answer the following. (Any Four) **16**

a) Write a short note on the security and reliability of distributed generation.

b) Discuss different integration issues in distributed generation.

c) Write a short note on the protection of DGs.

d) Explain the impact on transmission and generation systems on DG.

e) Write a short note on large-scale storage for grid stability.

Q.3 Answer the following. (Any Two) **12**

a) Explain different Forecasting methods and their applications.

b) What are the Regulatory challenges in the interconnection of DGS to the power systems?

c) Explain in detail the types of DG plants.

SECTION – II

Q.4 Answer the following. (Any Four) **16**

a) Write a short note on Loss reduction and Investment reduction.

b) Explain the role of microgrids in Energy Reliability.

c) Discuss allocation of losses in distribution networks with DG.

d) Write a short note on DGs in distribution networks.

e) What are alternative frameworks for distribution tariff development?

Q.5 Answer the following. (Any Two) **12**

a) Discuss energy storage's role in Energy Security.

b) Explain the Virtual Power Plant in detail.

c) Explain the types of energy storage systems.

SLR-QH-571

Seat No.		Set	S

T. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Honors in Sustainable Power Systems-Distributed Energy Integration (EEHn-03B)

Day & Date: Thursday, 14-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary and mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose correct answer. **14**

1) Which of the following is formed at the graphite electrode during the charging process of a battery when the lithium-ion moves through the separator?
a) Water b) Graphite
c) Lithium hydroxide d) Lithium carbide

2) In a distribution system, major cost is that of _____.
a) Earthing system b) Distribution transformer
c) Conductors d) Metres

3) The flywheel is accelerated when _____.
a) Driving torque > Load torque b) Driving torque < Load torque
c) Driving torque = Load torque d) Any of the above

4) For the same conductor length, same amount of power, same losses and maximum voltage to earth, which system requires minimum conductor area?
a) 3-wire AC b) 2-wire AC
c) 2-wire DC d) Single phase

5) Cloud base energy management system provides the ability to _____.
a) Remotely control HVAC
b) Collect real-time data
c) Generate intelligent, specific and real-time guidance
d) All of these

6) The null point of a uniformly loaded distributor feed at the equal voltage at both ends lies at _____.
a) Midpoint
b) Either end
c) Two-thirds distance from one end
d) One-fourth distance from one end

7) Why is compressed air in a storage system cooled before storage?
a) Prevent heat loss during storage
b) Improve turn-around efficiency
c) Reduces storage volume
d) Helps in a hybrid system

8) What is the permissible limit of voltage variations allowed in the distribution systems?
a) ± 2%
b) ± 5%
c) ± 10%
d) ± 6%

9) As compared to cables, the disadvantages of transmission lines is ____.
a) inductive interference between power and communication circuits
b) exposure to lightning
c) exposure to atmospheric hazards like smoke, ice, etc.
d) All of the above

10) Distribution management systems _____.
a) Radial system
b) Tree system
c) Ring mains system
d) All are equally reliable

11) The energy strategies of companies have the principle of _____.
a) restoring and preserving the environment
b) reducing wastes and pollutants
c) reducing people about energy conservation
d) All of these

12) Energy management is a key component of _____.
a) Environmental management
b) Carbon management
c) Nitrogen management
d) Water management

13) In passive potential energy strategies, _____.
a) There is no systematic planning
b) Measures with low profitability are not considered
c) One should have high knowledge of the energy price
d) All of these

14) The area of cross-section of the neutral in a 3-wire D.C. system is generally _____ the area of cross section of the main conductor.
a) same as
b) One-fourth
c) One-half
d) Double

SLR-QH-571

Seat No.		Set	S

T. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Honors in Sustainable Power Systems-Distributed Energy Integration (EEHn-03B)

Day & Date: Thursday, 14-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All Questions are compulsory.
2) Figures to the right indicates full marks.
3) Assume suitable data if necessary and mention it clearly.
4) Draw neat diagrams whenever necessary.

SECTION – I

Q.2 Answer the following. (Any Four) **16**

a) Write a short note on the security and reliability of distributed generation.

b) Discuss different integration issues in distributed generation.

c) Write a short note on the protection of DGs.

d) Explain the impact on transmission and generation systems on DG.

e) Write a short note on large-scale storage for grid stability.

Q.3 Answer the following. (Any Two) **12**

a) Explain different Forecasting methods and their applications.

b) What are the Regulatory challenges in the interconnection of DGS to the power systems?

c) Explain in detail the types of DG plants.

SECTION – II

Q.4 Answer the following. (Any Four) **16**

a) Write a short note on Loss reduction and Investment reduction.

b) Explain the role of microgrids in Energy Reliability.

c) Discuss allocation of losses in distribution networks with DG.

d) Write a short note on DGs in distribution networks.

e) What are alternative frameworks for distribution tariff development?

Q.5 Answer the following. (Any Two) **12**

a) Discuss energy storage's role in Energy Security.

b) Explain the Virtual Power Plant in detail.

c) Explain the types of energy storage systems.

SLR-QH-572

Seat No.		Set	P

T. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Power System - III (BTN07501)

Day & Date: Saturday, 02-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of Page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the Correct Alternatives from the Options and Rewrite the Sentence. **14**

1) Which among the following quantities are specified at the generator Bus?
a) P & Q
b) P & |V|
c) Q & |V|
d) P & δ

2) The three phase SC MVA to be interrupted by a circuit breaker in a power system is given by _____.
a) $\sqrt{3}\times$ post fault line voltage in kV $\times$ SC current in kA
b) $3\times$ pre fault line voltage in kV $\times$ SC current in kA
c) $\sqrt{3}\times$ pre fault line voltage in kV $\times$ SC current in kA
d) $(1/\sqrt{3})\times$ pre fault line voltage in kV $\times$ SC current in kA

3) Under line-to-line fault zero sequence component of fault current will be _____.
a) Very Large
b) Zero
c) Negligible
d) Both b & c

4) In load flow studies of a power system, a voltage control bus is specified by _____.
a) Real power and reactive power
b) Reactive power and voltage magnitude
c) Voltage and voltage phase angle
d) Real power and voltage magnitude

5) What is the value of $(1+a+a^2)$?
a) ∞
b) 1
c) -1
d) 0

6) What are the common assumptions made for the equal area criterion?
a) The transmission line and machine resistances are neglected.
b) Rotor speed of the machine is constant
c) Mechanical input remains constant.
d) All of these

7) Equal area criterion is used to study _____.
a) Load flow analysis b) Fault analysis
c) Stability analysis d) None of these

8) Reactance diagram contains which of the following?
a) Resistance of Alternator
b) Resistance of transformer winding
c) Induction motor's equivalent circuit
d) Inductive reactance of transmission lines

9) Impedance diagram is used for analysis of _____.
a) Load flow b) Alternator
c) Fault d) Transmission Line

10) Fault level means _____.
a) Voltage at the point of fault b) fault current
c) Fault power factor d) fault MVA

11) The magnitude of p.u. impedance of a transformer determined from the HT side and LT side of transformer are _____.
a) Unequal
b) Equal
c) Depends on the turns ratio
d) None of above

12) The most common buses in power system are _____.
a) slack bus b) generator bus
c) load bus d) a and b

13) A transformer rated at 11KV/0.4 KV, 500 KVA, 5% Reactance. What is the Shirt Circuit MVA of transformer when it is connected to infinite bus?
a) 15 MVA b) 5 MVA
c) 10 MVA d) 20 MVA

14) _____ is a series type unbalanced faults occurs in power system.
a) L-L b) L-L-G
c) L-L-L d) Open Conductor Fault

Seat No.	

Set | P

T. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April - 2026
Power System - III (BTN07501)

Day & Date: Saturday, 02-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All Questions are compulsory.
2) Figures to the right indicates full marks.

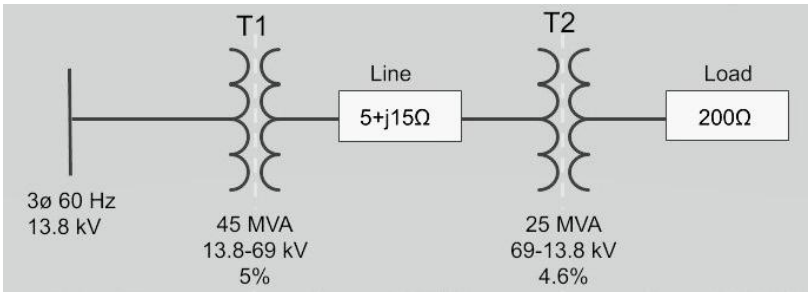
Section – I

Q.2 Attempt any four. **16**

a) Explain Per Unit System with merits and demerits.

b) $\mathrm{G}: 300\mathrm{MVA}, 20\mathrm{kV}, \mathrm{X}'' = 1.2\ \Omega$
$\mathrm{T1}: 350\mathrm{MVA}, 230\mathrm{V\ Y}/20\mathrm{kV}\ \Delta, \mathrm{X} = 15.2\ \Omega/\mathrm{ph}$
$\mathrm{T2}: 300\mathrm{MVA}, 230\mathrm{V\ Y}/13.2\mathrm{kV}\ \Delta, \mathrm{X} = 16\ \Omega/\mathrm{ph}$
$\mathrm{TL}: 1 = 64\mathrm{km}, \mathrm{XTL} = 0.5\ \Omega/\mathrm{km}$
$\mathrm{M1}: 200\mathrm{MVA}, 13.2\mathrm{kV}, \mathrm{X}'' = 1.6\ \Omega$
$\mathrm{M2}: 100\mathrm{MVA}, 13.2\mathrm{kV}, \mathrm{X}'' = 1.6\ \Omega$
Draw the Single line diagram for above data.

c) Calculate Per Unit Impedance line and per unit impedance of load. If base impedance for line is 115.8 Ω and base impedance for load is 5.232 Ω



d) With the help of sample power system, describe step by step method for formation of Y bus using inspection method.

e) Write short note on selection of circuit breaker.

Q.3 Attempt Any Two. **12**

a) Describe any two methods of short circuit current control with neat circuit diagram also state merits and demerits of each.

b) The primary and secondary sides of a single phase 1 MVA, 4kV / 2kV transformer have a leakage reactance of 2 Ω each. Find the p.u reactance of the transformer referred to the primary and secondary side.

c) Explain how an unbalanced set of three phase voltages (V_a, V_b, V_c,) can be represented by three sets of symmetrical components (V_{a1}, V_{a2}, V_{a0}).

Section – II

Q.4 Attempt Any Four. **16**

a) Derive power flow equation in rectangular form for the load flow analysis.

b) Explain rotor dynamics and derive expression for swing equation.

c) Describe various types of buses in power system and their significance in brief.

d) Explain with sequence network various open conductor fault on power system.

e) Derive an expression for single line to ground fault on an unloaded synchronous generator.

Q.5 Attempt Any Two. **12**

a) Derive the necessary equation to determine the fault current for single line to ground fault. Draw a diagram showing the interconnections of sequence networks.

b) Derive an expression for load flow analysis by Gauss-Siedel method.

c) State Equal Area Criterion (EAC). What are the assumptions made in applying EAC? Discuss its applications.

Seat No.		Set	Q

T. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Power System - III (BTN07501)

Day & Date: Saturday, 02-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of Page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the Correct Alternatives from the Options and Rewrite the Sentence. **14**

1) Reactance diagram contains which of the following?
a) Resistance of Alternator
b) Resistance of transformer winding
c) Induction motor's equivalent circuit
d) Inductive reactance of transmission lines

2) Impedance diagram is used for analysis of _____.
a) Load flow b) Alternator
c) Fault d) Transmission Line

3) Fault level means _____.
a) Voltage at the point of fault b) fault current
c) Fault power factor d) fault MVA

4) The magnitude of p.u. impedance of a transformer determined from the HT side and LT side of transformer are _____.
a) Unequal
b) Equal
c) Depends on the turns ratio
d) None of above

5) The most common buses in power system are _____.
a) slack bus b) generator bus
c) load bus d) a and b

6) A transformer rated at 11KV/0.4 KV, 500 KVA, 5% Reactance. What is the Shirt Circuit MVA of transformer when it is connected to infinite bus?

a) 15 MVA
b) 5 MVA
c) 10 MVA
d) 20 MVA

7) _____ is a series type unbalanced faults occurs in power system.

a) L-L
b) L-L-G
c) L-L-L
d) Open Conductor Fault

8) Which among the following quantities are specified at the generator Bus?

a) P & Q
b) P & $|V|$
c) Q & $|V|$
d) P & δ

9) The three phase SC MVA to be interrupted by a circuit breaker in a power system is given by _____.

a) $\sqrt{3}\times$ post fault line voltage in kV $\times$ SC current in kA
b) $3\times$ pre fault line voltage in kV $\times$ SC current in kA
c) $\sqrt{3}\times$ pre fault line voltage in kV $\times$ SC current in kA
d) $(1/\sqrt{3})\times$ pre fault line voltage in kV $\times$ SC current in kA

10) Under line-to-line fault zero sequence component of fault current will be _____.

a) Very Large
b) Zero
c) Negligible
d) Both b & c

11) In load flow studies of a power system, a voltage control bus is specified by _____.

a) Real power and reactive power
b) Reactive power and voltage magnitude
c) Voltage and voltage phase angle
d) Real power and voltage magnitude

12) What is the value of $(1+a+a^2)$?

a) ∞
b) 1
c) -1
d) 0

13) What are the common assumptions made for the equal area criterion?

a) The transmission line and machine resistances are neglected.
b) Rotor speed of the machine is constant
c) Mechanical input remains constant.
d) All of these

14) Equal area criterion is used to study _____.

a) Load flow analysis
b) Fault analysis
c) Stability analysis
d) None of these

Seat No.	

Set **Q**

T. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April - 2026
Power System - III (BTN07501)

Day & Date: Saturday, 02-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All Questions are compulsory.
2) Figures to the right indicates full marks.

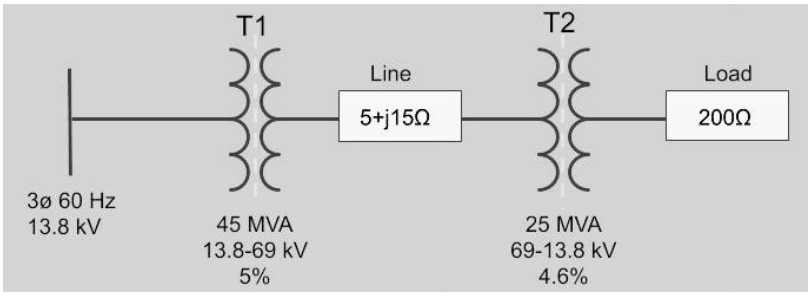
Section – I

Q.2 Attempt any four. **16**

a) Explain Per Unit System with merits and demerits.

b) $\mathrm{G}: 300\mathrm{MVA}, 20\mathrm{kV}, \mathrm{X}'' = 1.2\ \Omega$
$\mathrm{T1}: 350\mathrm{MVA}, 230\mathrm{V\ Y}/20\mathrm{kV}\ \Delta, \mathrm{X} = 15.2\ \Omega/\mathrm{ph}$
$\mathrm{T2}: 300\mathrm{MVA}, 230\mathrm{V\ Y}/13.2\mathrm{kV}\ \Delta, \mathrm{X} = 16\ \Omega/\mathrm{ph}$
$\mathrm{TL}: 1 = 64\mathrm{km}, \mathrm{XTL} = 0.5\ \Omega/\mathrm{km}$
$\mathrm{M1}: 200\mathrm{MVA}, 13.2\mathrm{kV}, \mathrm{X}'' = 1.6\ \Omega$
$\mathrm{M2}: 100\mathrm{MVA}, 13.2\mathrm{kV}, \mathrm{X}'' = 1.6\ \Omega$
Draw the Single line diagram for above data.

c) Calculate Per Unit Impedance line and per unit impedance of load. If base impedance for line is 115.8 Ω and base impedance for load is 5.232 Ω



d) With the help of sample power system, describe step by step method for formation of Y bus using inspection method.

e) Write short note on selection of circuit breaker.

Q.3 Attempt Any Two. **12**

a) Describe any two methods of short circuit current control with neat circuit diagram also state merits and demerits of each.

b) The primary and secondary sides of a single phase 1 MVA, 4kV / 2kV transformer have a leakage reactance of 2 Ω each. Find the p.u reactance of the transformer referred to the primary and secondary side.

c) Explain how an unbalanced set of three phase voltages (V_a, V_b, V_c,) can be represented by three sets of symmetrical components (V_{a1}, V_{a2}, V_{a0}).

Section – II

Q.4 Attempt Any Four. **16**

a) Derive power flow equation in rectangular form for the load flow analysis.

b) Explain rotor dynamics and derive expression for swing equation.

c) Describe various types of buses in power system and their significance in brief.

d) Explain with sequence network various open conductor fault on power system.

e) Derive an expression for single line to ground fault on an unloaded synchronous generator.

Q.5 Attempt Any Two. **12**

a) Derive the necessary equation to determine the fault current for single line to ground fault. Draw a diagram showing the interconnections of sequence networks.

b) Derive an expression for load flow analysis by Gauss-Siedel method.

c) State Equal Area Criterion (EAC). What are the assumptions made in applying EAC? Discuss its applications.

SLR-QH-572

Seat No.		Set	R

T. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Power System - III (BTN07501)

Day & Date: Saturday, 02-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of Page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the Correct Alternatives from the Options and Rewrite the Sentence. **14**

1) The magnitude of p.u. impedance of a transformer determined from the HT side and LT side of transformer are _____.
a) Unequal
b) Equal
c) Depends on the turns ratio
d) None of above

2) The most common buses in power system are _____.
a) slack bus b) generator bus
c) load bus d) a and b

3) A transformer rated at 11KV/0.4 KV, 500 KVA, 5% Reactance. What is the Shirt Circuit MVA of transformer when it is connected to infinite bus?
a) 15 MVA b) 5 MVA
c) 10 MVA d) 20 MVA

4) _____ is a series type unbalanced faults occurs in power system.
a) L-L b) L-L-G
c) L-L-L d) Open Conductor Fault

5) Which among the following quantities are specified at the generator Bus?
a) P & Q b) P & |V|
c) Q & |V| d) P & δ

6) The three phase SC MVA to be interrupted by a circuit breaker in a power system is given by _____.
a) $\sqrt{3} \times$ post fault line voltage in kV $\times$ SC current in kA
b) $3 \times$ pre fault line voltage in kV $\times$ SC current in kA
c) $\sqrt{3} \times$ pre fault line voltage in kV $\times$ SC current in kA
d) $(1/\sqrt{3}) \times$ pre fault line voltage in kV $\times$ SC current in kA

7) Under line-to-line fault zero sequence component of fault current will be _____.
a) Very Large
b) Zero
c) Negligible
d) Both b & c

8) In load flow studies of a power system, a voltage control bus is specified by _____.
a) Real power and reactive power
b) Reactive power and voltage magnitude
c) Voltage and voltage phase angle
d) Real power and voltage magnitude

9) What is the value of $(1 + a + a^2)$?
a) ∞
b) 1
c) -1
d) 0

10) What are the common assumptions made for the equal area criterion?
a) The transmission line and machine resistances are neglected.
b) Rotor speed of the machine is constant
c) Mechanical input remains constant.
d) All of these

11) Equal area criterion is used to study _____.
a) Load flow analysis
b) Fault analysis
c) Stability analysis
d) None of these

12) Reactance diagram contains which of the following?
a) Resistance of Alternator
b) Resistance of transformer winding
c) Induction motor's equivalent circuit
d) Inductive reactance of transmission lines

13) Impedance diagram is used for analysis of _____.
a) Load flow
b) Alternator
c) Fault
d) Transmission Line

14) Fault level means _____.
a) Voltage at the point of fault
b) fault current
c) Fault power factor
d) fault MVA

Seat No.	

Set **R**

T. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April - 2026
Power System - III (BTN07501)

Day & Date: Saturday, 02-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All Questions are compulsory.
2) Figures to the right indicates full marks.

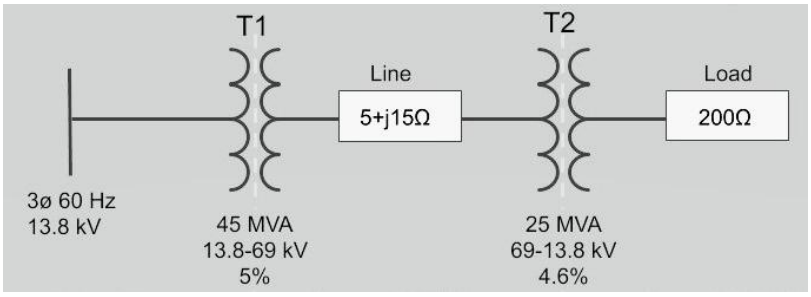
Section – I

Q.2 Attempt any four. **16**

a) Explain Per Unit System with merits and demerits.

b) $\mathrm{G}: 300\mathrm{MVA}, 20\mathrm{kV}, \mathrm{X}'' = 1.2\ \Omega$
$\mathrm{T1}: 350\mathrm{MVA}, 230\mathrm{V\ Y}/20\mathrm{kV}\ \Delta, \mathrm{X} = 15.2\ \Omega/\mathrm{ph}$
$\mathrm{T2}: 300\mathrm{MVA}, 230\mathrm{V\ Y}/13.2\mathrm{kV}\ \Delta, \mathrm{X} = 16\ \Omega/\mathrm{ph}$
$\mathrm{TL}: 1 = 64\mathrm{km}, \mathrm{XTL} = 0.5\ \Omega/\mathrm{km}$
$\mathrm{M1}: 200\mathrm{MVA}, 13.2\mathrm{kV}, \mathrm{X}'' = 1.6\ \Omega$
$\mathrm{M2}: 100\mathrm{MVA}, 13.2\mathrm{kV}, \mathrm{X}'' = 1.6\ \Omega$
Draw the Single line diagram for above data.

c) Calculate Per Unit Impedance line and per unit impedance of load. If base impedance for line is 115.8 Ω and base impedance for load is 5.232 Ω



d) With the help of sample power system, describe step by step method for formation of Y bus using inspection method.

e) Write short note on selection of circuit breaker.

Q.3 Attempt Any Two. **12**

a) Describe any two methods of short circuit current control with neat circuit diagram also state merits and demerits of each.

b) The primary and secondary sides of a single phase 1 MVA, 4kV / 2kV transformer have a leakage reactance of 2 Ω each. Find the p.u reactance of the transformer referred to the primary and secondary side.

c) Explain how an unbalanced set of three phase voltages (V_a, V_b, V_c,) can be represented by three sets of symmetrical components (V_{a1}, V_{a2}, V_{a0}).

Section – II

Q.4 Attempt Any Four. **16**

a) Derive power flow equation in rectangular form for the load flow analysis.

b) Explain rotor dynamics and derive expression for swing equation.

c) Describe various types of buses in power system and their significance in brief.

d) Explain with sequence network various open conductor fault on power system.

e) Derive an expression for single line to ground fault on an unloaded synchronous generator.

Q.5 Attempt Any Two. **12**

a) Derive the necessary equation to determine the fault current for single line to ground fault. Draw a diagram showing the interconnections of sequence networks.

b) Derive an expression for load flow analysis by Gauss-Siedel method.

c) State Equal Area Criterion (EAC). What are the assumptions made in applying EAC? Discuss its applications.

SLR-QH-572

Seat No.		Set	S

T. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Power System - III (BTN07501)

Day & Date: Saturday, 02-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of Page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the Correct Alternatives from the Options and Rewrite the Sentence. 14

1) What are the common assumptions made for the equal area criterion?
a) The transmission line and machine resistances are neglected.
b) Rotor speed of the machine is constant
c) Mechanical input remains constant.
d) All of these

2) Equal area criterion is used to study _____.
a) Load flow analysis b) Fault analysis
c) Stability analysis d) None of these

3) Reactance diagram contains which of the following?
a) Resistance of Alternator
b) Resistance of transformer winding
c) Induction motor's equivalent circuit
d) Inductive reactance of transmission lines

4) Impedance diagram is used for analysis of _____.
a) Load flow b) Alternator
c) Fault d) Transmission Line

5) Fault level means _____.
a) Voltage at the point of fault b) fault current
c) Fault power factor d) fault MVA

6) The magnitude of p.u. impedance of a transformer determined from the HT side and LT side of transformer are _____.
a) Unequal
b) Equal
c) Depends on the turns ratio
d) None of above

7) The most common buses in power system are _____.
a) slack bus
b) generator bus
c) load bus
d) a and b

8) A transformer rated at 11KV/0.4 KV, 500 KVA, 5% Reactance. What is the Shirt Circuit MVA of transformer when it is connected to infinite bus?
a) 15 MVA
b) 5 MVA
c) 10 MVA
d) 20 MVA

9) _____ is a series type unbalanced faults occurs in power system.
a) L-L
b) L-L-G
c) L-L-L
d) Open Conductor Fault

10) Which among the following quantities are specified at the generator Bus?
a) P & Q
b) P & $|\mathrm{V}|$
c) Q & $|\mathrm{V}|$
d) P & δ

11) The three phase SC MVA to be interrupted by a circuit breaker in a power system is given by _____.
a) $\sqrt{3}\times$ post fault line voltage in kV $\times$ SC current in kA
b) $3\times$ pre fault line voltage in kV $\times$ SC current in kA
c) $\sqrt{3}\times$ pre fault line voltage in kV $\times$ SC current in kA
d) $(1/\sqrt{3})\times$ pre fault line voltage in kV $\times$ SC current in kA

12) Under line-to-line fault zero sequence component of fault current will be _____.
a) Very Large
b) Zero
c) Negligible
d) Both b & c

13) In load flow studies of a power system, a voltage control bus is specified by _____.
a) Real power and reactive power
b) Reactive power and voltage magnitude
c) Voltage and voltage phase angle
d) Real power and voltage magnitude

14) What is the value of $(1+a+a^2)$?
a) ∞
b) 1
c) -1
d) 0

Seat No.	

Set **S**

T. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April - 2026
Power System - III (BTN07501)

Day & Date: Saturday, 02-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All Questions are compulsory.
2) Figures to the right indicates full marks.

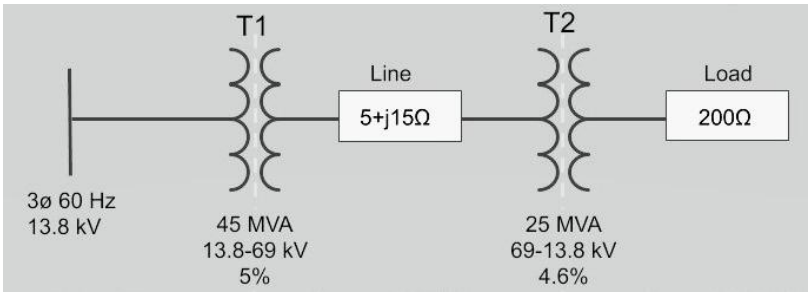
Section – I

Q.2 Attempt any four. **16**

a) Explain Per Unit System with merits and demerits.

b) $\mathrm{G}: 300\mathrm{MVA}, 20\mathrm{kV}, \mathrm{X}'' = 1.2\ \Omega$
$\mathrm{T1}: 350\mathrm{MVA}, 230\mathrm{V\ Y}/20\mathrm{kV}\ \Delta, \mathrm{X} = 15.2\ \Omega/\mathrm{ph}$
$\mathrm{T2}: 300\mathrm{MVA}, 230\mathrm{V\ Y}/13.2\mathrm{kV}\ \Delta, \mathrm{X} = 16\ \Omega/\mathrm{ph}$
$\mathrm{TL}: 1 = 64\mathrm{km}, \mathrm{XTL} = 0.5\ \Omega/\mathrm{km}$
$\mathrm{M1}: 200\mathrm{MVA}, 13.2\mathrm{kV}, \mathrm{X}'' = 1.6\ \Omega$
$\mathrm{M2}: 100\mathrm{MVA}, 13.2\mathrm{kV}, \mathrm{X}'' = 1.6\ \Omega$
Draw the Single line diagram for above data.

c) Calculate Per Unit Impedance line and per unit impedance of load. If base impedance for line is 115.8 Ω and base impedance for load is 5.232 Ω



d) With the help of sample power system, describe step by step method for formation of Y bus using inspection method.

e) Write short note on selection of circuit breaker.

Q.3 Attempt Any Two. **12**

a) Describe any two methods of short circuit current control with neat circuit diagram also state merits and demerits of each.

b) The primary and secondary sides of a single phase 1 MVA, 4kV / 2kV transformer have a leakage reactance of 2 Ω each. Find the p.u reactance of the transformer referred to the primary and secondary side.

c) Explain how an unbalanced set of three phase voltages (V_a, V_b, V_c,) can be represented by three sets of symmetrical components (V_{a1}, V_{a2}, V_{a0}).

Section – II

Q.4 Attempt Any Four. **16**

a) Derive power flow equation in rectangular form for the load flow analysis.

b) Explain rotor dynamics and derive expression for swing equation.

c) Describe various types of buses in power system and their significance in brief.

d) Explain with sequence network various open conductor fault on power system.

e) Derive an expression for single line to ground fault on an unloaded synchronous generator.

Q.5 Attempt Any Two. **12**

a) Derive the necessary equation to determine the fault current for single line to ground fault. Draw a diagram showing the interconnections of sequence networks.

b) Derive an expression for load flow analysis by Gauss-Siedel method.

c) State Equal Area Criterion (EAC). What are the assumptions made in applying EAC? Discuss its applications.

SLR-QH-573

Seat No.	

Set P

T. Y. (B.Tech.) (Electrical Engineering) (Sem - I) (New/Old) (CBCS)
Examination: March/April – 2026
Linear Control System (BTN07502)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.
5) Draw neat diagrams whenever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Give the correct option for the following questions. 14

1) By which of the following the control action is determined when a man walks along a path?
a) Brain b) Hands
c) Legs d) Eyes

2) In an open loop system, the control action _____.
a) depends on the input signal
b) depends on system variables
c) depends on size of the system
d) is independent of the output

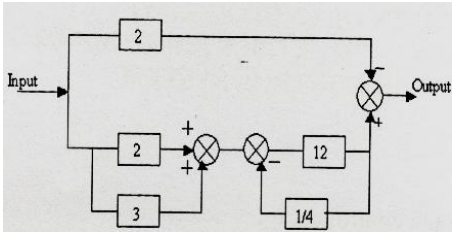
3) In force-Voltage analogy mass is analogous to _____.
a) Inductance b) Current
c) Voltage d) Capacitance

4) Main difference between servomotor and standard motor is that _____.
a) Servomotor has low inertia and higher starting torque
b) Servomotor has low inertia low starting torque
c) Servomotor has high inertia and high starting torque
d) None of these

5) Effect of feedback on sensitivity is minimum in _____.
a) Open loop control system b) Closed loop control system
c) None of the mentioned d) Both of the mentioned

6) Signal flow graphs _____.
- a) They apply to linear systems
- b) The equation obtained may or may not be in the form of cause or effect
- c) Arrows are not important in the graph
- d) They cannot be converted back to block diagram

7) The gain of given system is, _____.



a) 31 b) 13
c) 17 d) 6

8) Integral error compensation in a control system _____.
- a) minimizes steady state error
- b) increases steady-state error
- c) does not have any effect on steady state error
- d) None of the above

9) A type I system under steady state will have position error when there is _____.
- a) step displacement input
- b) ramp input
- c) either of a or b above
- d) None of the above

10) If overshoot is excessive, then the damping ratio is _____.
- a) Equal to 0.4
- b) Less than 0.4
- c) More than 0.4
- d) Infinity

11) The system with characteristics equation $s^4 + 3s^3 + 6s^2 + 9s + 12 = 0$.
- a) stable
- b) unstable
- c) marginally stable
- d) None of the above

12) Routh Hurwitz criterion gives _____.
- a) roots in right half of s-plane
- b) roots in the left half of s-plane
- c) roots in right half of s-plane and/ or roots on imaginary axes
- d) roots in the left half of the s-plane and/or roots on the imaginary axis.

13) In a root locus plot, the increase in K will _____.

a) Increase damping ratio
b) Decrease damping ratio
c) Not change damping ratio
d) None of these

14) The octave frequency range is specified by _____.

a) $\frac{w2}{w1} = 1$
b) $\frac{w2}{w1} = 2$
c) $\frac{w2}{w1} = 6$
d) $\frac{w2}{w1} = 8$

Seat No.	

Set **P**

T. Y. (B.Tech.) (Electrical Engineering) (Sem - I) (New/Old) (CBCS)
Examination: March/April – 2026
Linear Control System (BTN07502)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All Questions are compulsory.
2) Figures to the right indicates full marks.
3) Assume suitable data if necessary.
4) Draw neat diagrams whenever necessary.

SECTION – I

Q.2 Solve Any Four. **16**

a) Explain the different classification of control systems in detail.

b) For the mechanical system shown in fig. 1.
i) Draw the mechanical equivalent network
ii) Write the system differential equations
iii) Determine the transfer function

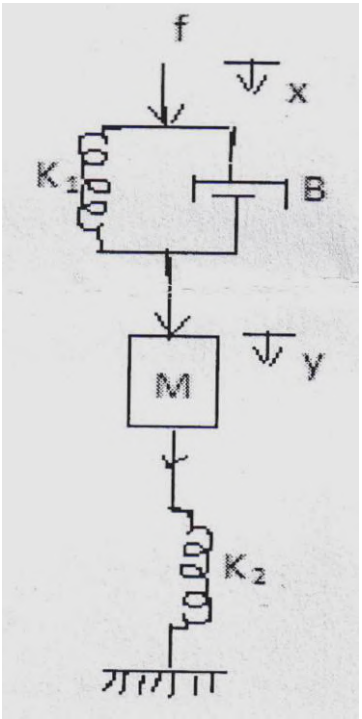


Fig. 1

c) Determine the T.F. for the electric network given in fig.2.

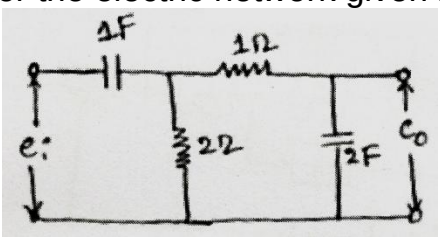


Fig. 2

d) Consider the block diagram shown in fig.3. Find C/R using block diagram reduction technique.

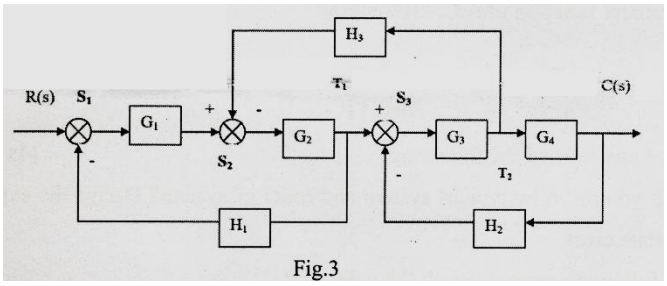


Fig.3

e) Obtain the T.F. C/R using SFG shown in fig.4.

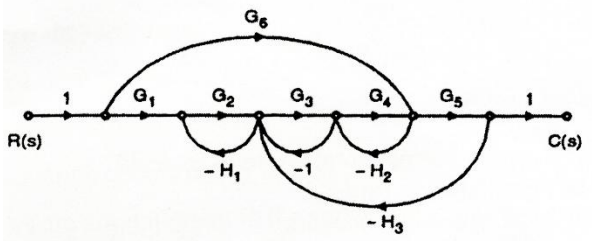


Fig. 4

Q.3 Solve Any Two. **12**

a) Write the differential equations governing the mechanical system shown in fig.5. Also draw F-V and F-I analogous circuit.

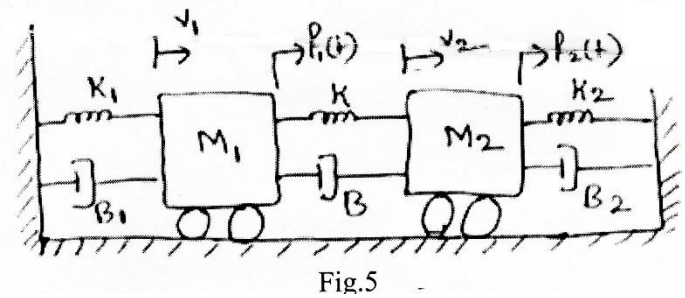


Fig.5

b) Draw a SFG and find the closed loop transfer function of system as shown in fig. 6 below.

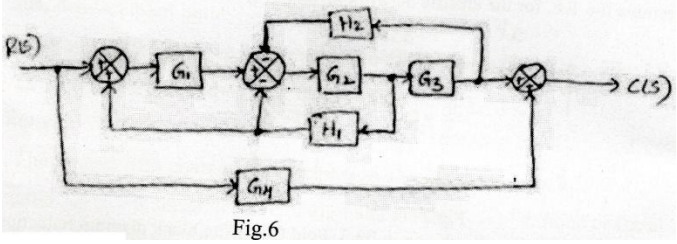


Fig.6

c) Derive the transfer of A.C. servomotor.

SECTION – II

Q.4 Attempt Any Four. **16**

a) What do you mean by type of system and order of system? Derive the expression for steady-state error.

b) For the following system sketch the polar plot.

$$G(s)H(s) = \frac{100}{s(s+2)(s+10)}$$

c) With the help of neat sketches and mathematical expression explain:

i) PI controller
ii) PD controller
iii) PID controller

d) The characteristic equation of a feedback control system is $s^4 + 4s^3 + 13s^2 + 36s + k = 0$, determine the range of k for the system to be stable.

e) Explain the frequency domain specifications.

f) The open-loop transfer function of a unity feedback system is given by $G(s) = 25 \,/\, s(s+6)$. Calculate

i) Peak time
ii) Percent overshoot
iii) Settling time
iv) Rise time

Q.5 Solve Any two. **12**

a) Draw the root locus for the unity feedback system whose OLTF is

$$G(s) = \frac{k(s+4)}{(s+2)(s+3)}$$

b) Construct the BODE plot for the system below whose open loop transfer function is

$$G(S)H(S) = \frac{80}{s(s+2)(s+20)}$$

Determine the

i) Gain margin
ii) Phase margin
iii) wgc & wpc
iv) Comment on the stability

c) Derive an expression for the time response of an underdamped second-order system when subjected to a unit step input.

Seat No.	

Set **Q**

T. Y. (B.Tech.) (Electrical Engineering) (Sem - I) (New/Old) (CBCS)
Examination: March/April – 2026
Linear Control System (BTN07502)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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11) Main difference between servomotor and standard motor is that _____.
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a) Open loop control system
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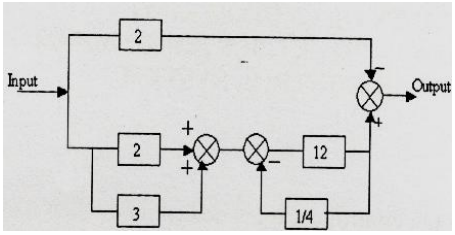

a) 31
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Seat No.	

Set **Q**

T. Y. (B.Tech.) (Electrical Engineering) (Sem - I) (New/Old) (CBCS)
Examination: March/April – 2026
Linear Control System (BTN07502)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All Questions are compulsory.
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SECTION – I

Q.2 Solve Any Four. **16**

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b) For the mechanical system shown in fig. 1.
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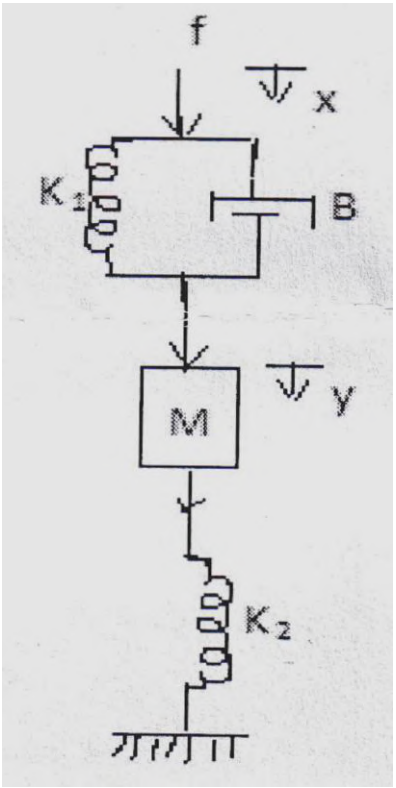

Fig. 1

c) Determine the T.F. for the electric network given in fig.2.

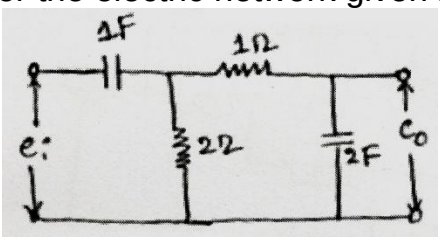

Fig. 2

d) Consider the block diagram shown in fig.3. Find C/R using block diagram reduction technique.

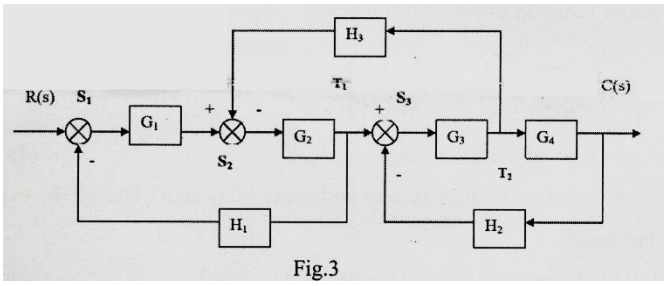

Fig.3

e) Obtain the T.F. C/R using SFG shown in fig.4.

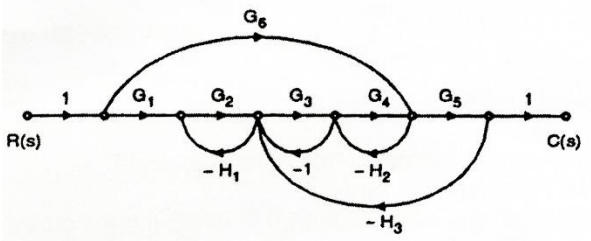

Fig. 4

Q.3 Solve Any Two. **12**

a) Write the differential equations governing the mechanical system shown in fig.5. Also draw F-V and F-I analogous circuit.

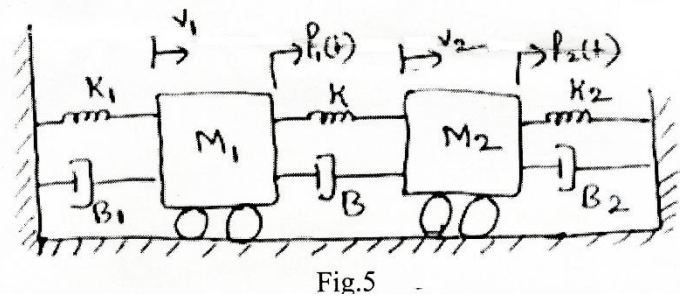

Fig.5

b) Draw a SFG and find the closed loop transfer function of system as shown in fig. 6 below.

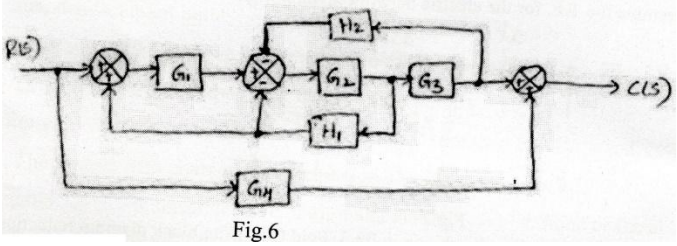

Fig.6

c) Derive the transfer of A.C. servomotor.

SECTION – II

Q.4 Attempt Any Four. **16**

a) What do you mean by type of system and order of system? Derive the expression for steady-state error.

b) For the following system sketch the polar plot.

$$G(s)H(s) = \frac{100}{s(s+2)(s+10)}$$

c) With the help of neat sketches and mathematical expression explain:

i) PI controller
ii) PD controller
iii) PID controller

d) The characteristic equation of a feedback control system is $s^4 + 4s^3 + 13s^2 + 36s + k = 0$, determine the range of k for the system to be stable.

e) Explain the frequency domain specifications.

f) The open-loop transfer function of a unity feedback system is given by $G(s) = 25 \,/\, s(s+6)$. Calculate

i) Peak time
ii) Percent overshoot
iii) Settling time
iv) Rise time

Q.5 Solve Any two. **12**

a) Draw the root locus for the unity feedback system whose OLTF is

$$G(s) = \frac{k(s+4)}{(s+2)(s+3)}$$

b) Construct the BODE plot for the system below whose open loop transfer function is

$$G(S)H(S) = \frac{80}{s(s+2)(s+20)}$$

Determine the

i) Gain margin
ii) Phase margin
iii) wgc & wpc
iv) Comment on the stability

c) Derive an expression for the time response of an underdamped second-order system when subjected to a unit step input.

SLR-QH-573

Seat No.	

Set R

T. Y. (B.Tech.) (Electrical Engineering) (Sem - I) (New/Old) (CBCS)
Examination: March/April – 2026
Linear Control System (BTN07502)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.
5) Draw neat diagrams whenever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Give the correct option for the following questions. 14

1) The system with characteristics equation $s^4 + 3s^3 + 6s^2 + 9s + 12 = 0$.
a) stable b) unstable
c) marginally stable d) None of the above

2) Routh Hurwitz criterion gives _____.
a) roots in right half of s-plane
b) roots in the left half of s-plane
c) roots in right half of s-plane and/ or roots on imaginary axes
d) roots in the left half of the s-plane and/or roots on the imaginary axis.

3) In a root locus plot, the increase in K will _____.
a) Increase damping ratio
b) Decrease damping ratio
c) Not change damping ratio
d) None of these

4) The octave frequency range is specified by _____.
a) $\frac{w2}{w1} = 1$ b) $\frac{w2}{w1} = 2$
c) $\frac{w2}{w1} = 6$ d) $\frac{w2}{w1} = 8$

5) By which of the following the control action is determined when a man walks along a path?
a) Brain b) Hands
c) Legs d) Eyes

6) In an open loop system, the control action _____.
a) depends on the input signal
b) depends on system variables
c) depends on size of the system
d) is independent of the output

7) In force-Voltage analogy mass is analogous to _____.
a) Inductance
b) Current
c) Voltage
d) Capacitance

8) Main difference between servomotor and standard motor is that _____.
a) Servomotor has low inertia and higher starting torque
b) Servomotor has low inertia low starting torque
c) Servomotor has high inertia and high starting torque
d) None of these

9) Effect of feedback on sensitivity is minimum in _____.
a) Open loop control system
b) Closed loop control system
c) None of the mentioned
d) Both of the mentioned

10) Signal flow graphs _____.
a) They apply to linear systems
b) The equation obtained may or may not be in the form of cause or effect
c) Arrows are not important in the graph
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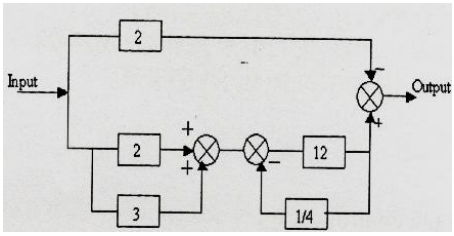
11) The gain of given system is, _____.



a) 31
b) 13
c) 17
d) 6

12) Integral error compensation in a control system _____.
a) minimizes steady state error
b) increases steady-state error
c) does not have any effect on steady state error
d) None of the above

13) A type I system under steady state will have position error when there is _____.
a) step displacement input
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14) If overshoot is excessive, then the damping ratio is _____.

a) Equal to 0.4
b) Less than 0.4
c) More than 0.4
d) Infinity

Seat No.	

Set **R**

T. Y. (B.Tech.) (Electrical Engineering) (Sem - I) (New/Old) (CBCS)
Examination: March/April – 2026
Linear Control System (BTN07502)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 56
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Instructions: 1) All Questions are compulsory.
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SECTION – I

Q.2 Solve Any Four. **16**

a) Explain the different classification of control systems in detail.

b) For the mechanical system shown in fig. 1.
i) Draw the mechanical equivalent network
ii) Write the system differential equations
iii) Determine the transfer function

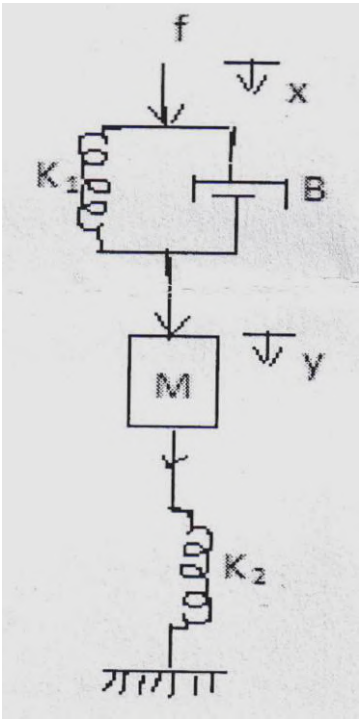

Fig. 1

c) Determine the T.F. for the electric network given in fig.2.

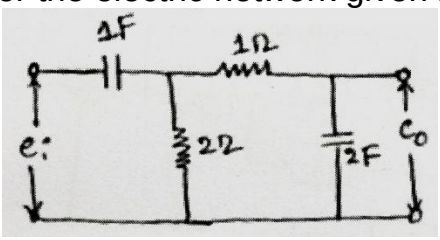

Fig. 2

d) Consider the block diagram shown in fig.3. Find C/R using block diagram reduction technique.

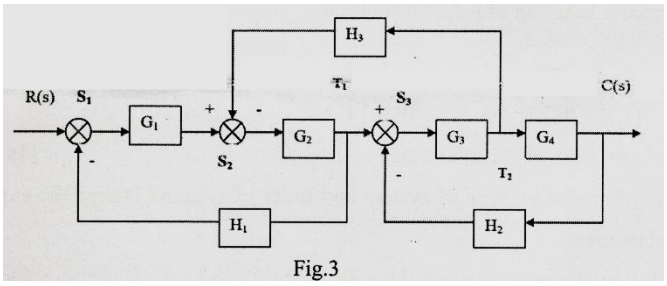

Fig.3

e) Obtain the T.F. C/R using SFG shown in fig.4.

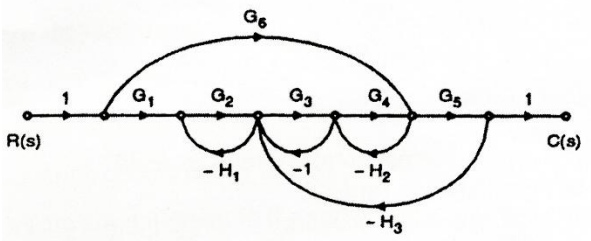

Fig. 4

Q.3 Solve Any Two. **12**

a) Write the differential equations governing the mechanical system shown in fig.5. Also draw F-V and F-I analogous circuit.

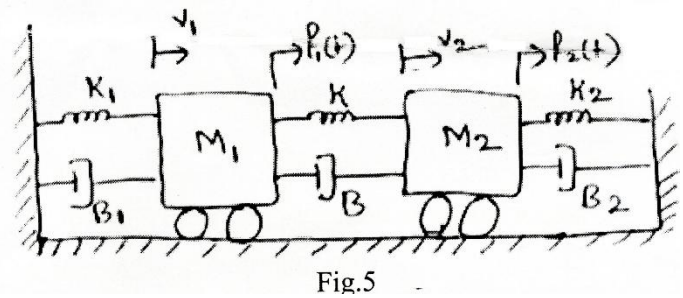

Fig.5

b) Draw a SFG and find the closed loop transfer function of system as shown in fig. 6 below.

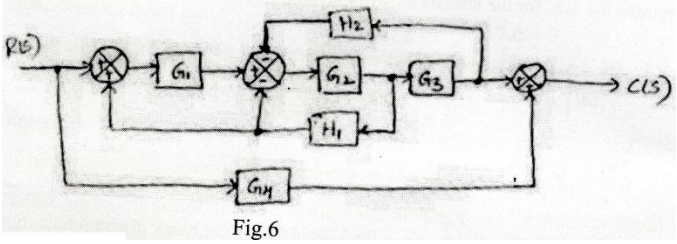

Fig.6

c) Derive the transfer of A.C. servomotor.

SECTION – II

Q.4 Attempt Any Four. **16**

a) What do you mean by type of system and order of system? Derive the expression for steady-state error.

b) For the following system sketch the polar plot.

$$G(s)H(s) = \frac{100}{s(s+2)(s+10)}$$

c) With the help of neat sketches and mathematical expression explain:

i) PI controller
ii) PD controller
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d) The characteristic equation of a feedback control system is $s^4 + 4s^3 + 13s^2 + 36s + k = 0$, determine the range of k for the system to be stable.

e) Explain the frequency domain specifications.

f) The open-loop transfer function of a unity feedback system is given by $G(s) = 25 \,/\, s(s+6)$. Calculate

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Determine the

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c) Derive an expression for the time response of an underdamped second-order system when subjected to a unit step input.

Seat No.		Set	S

T. Y. (B.Tech.) (Electrical Engineering) (Sem - I) (New/Old) (CBCS)
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Linear Control System (BTN07502)

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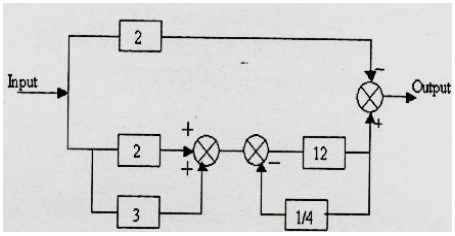

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Seat No.	

Set **S**

T. Y. (B.Tech.) (Electrical Engineering) (Sem - I) (New/Old) (CBCS)
Examination: March/April – 2026
Linear Control System (BTN07502)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 56
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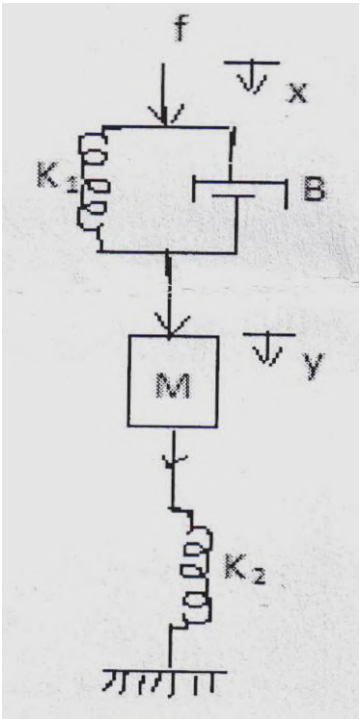

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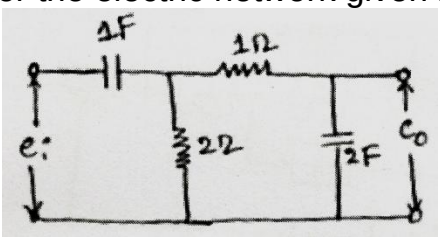

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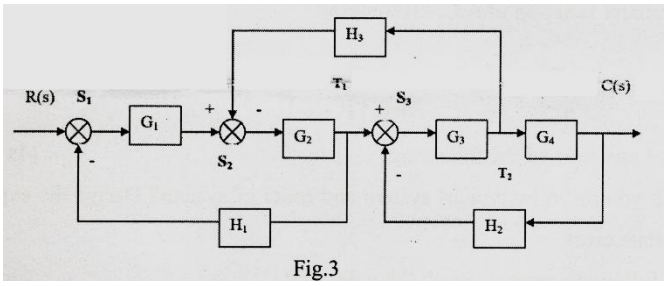

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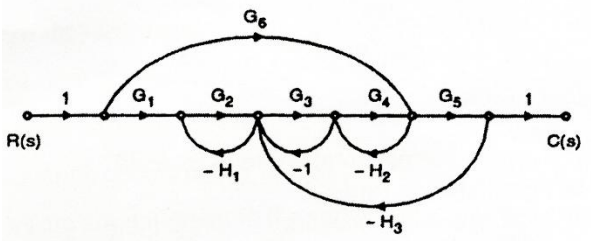

Fig. 4

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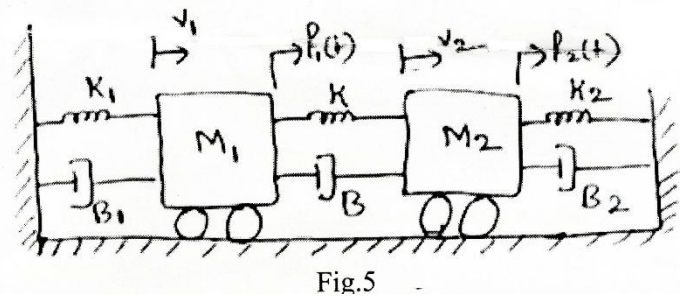

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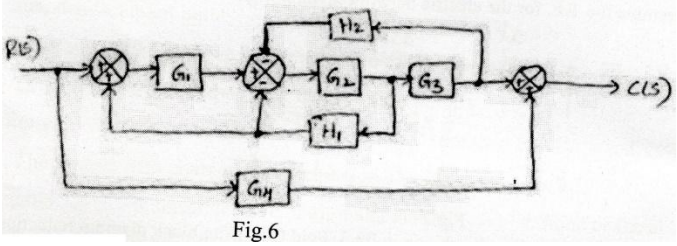

Fig.6

c) Derive the transfer of A.C. servomotor.

SECTION – II

Q.4 Attempt Any Four. **16**

a) What do you mean by type of system and order of system? Derive the expression for steady-state error.

b) For the following system sketch the polar plot.

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c) With the help of neat sketches and mathematical expression explain:

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ii) Percent overshoot
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c) Derive an expression for the time response of an underdamped second-order system when subjected to a unit step input.

SLR-QH-574

Seat No.	

Set P

T. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Advanced Microcontroller System (BTN07503)

Day & Date: Thursday, 07-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. **14**

1) Internal pull up resisters are not available for _____.
a) port 0 b) port 1
c) port 2 d) port 3

2) The 8051 microcontroller has _____ bytes of on-chip ROM.
a) 256 b) 1K
c) 4K d) 8K

3) The PSW (Program Status Word) register contains: _____.
a) Address of program b) Arithmetic flags
c) Stack pointer value d) Memory address

4) The default value of stack pointer after reset is: _____.
a) 00H b) 07H
c) 08H d) FFH

5) The assembler translates: _____.
a) C code to object code
b) Assembly code to machine code
c) Binary to hexadecimal
d) None of these

6) The instruction SJMP LABEL is used for: _____.
a) Short jump (within -128 to +127 bytes)
b) Long jump
c) Call subroutine
d) None

7) Address lines are required for accessing the data if memory capacity is 8KB bytes.

a) 10 b) 11
c) 12 d) 13

8) In 8051 C programming, while (1) is used for: _____.

a) Infinite loop b) One-time execution
c) Delay d) Interrupt

9) The RS pin of an LCD is used to: _____.

a) Reset LCD
b) Select command/data register
c) Send enable signal
d) Clear display

10) In PIC 16F877 Port C and D are _____ & _____ bits wide respectively.

a) 6, 3 b) 3, 8
c) 8, 8 d) 6, 8

11) The IC commonly used to drive stepper motors with 8051 is: _____.

a) ULN2003 b) MAX232
c) ADC0808 d) LM35

12) PIC 16F877 A consists of _____ KB flash program memory.

a) 2 b) 4
c) 8 d) None of these

13) LM35 has how many pins?

a) 2 b) 1
c) 3 d) 4

14) A typical servo motor rotates: _____.

a) 0°-90° b) 0°-180°
c) 0°-270° d) Unlimited rotation

Seat No.	

Set **P**

T. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Advanced Microcontroller System (BTN07503)

Day & Date: Thursday, 07-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All Questions are compulsory.
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SECTION – I

Q.2 Solve any Four. **16**

a) Differentiate between RAM and ROM (Any four Points).

b) Explain PSW Register of 8051 microcontroller.

c) Explain TCON SFR of 8051 microcontroller.

d) Explain SCON SFR of 8051 microcontroller.

e) Explain with example various addressing modes of 8051 microcontroller.

Q.3 Solve any Two. **12**

a) Describe IE and IP SFR's of 8051 microcontroller.

b) Draw and explain internal memory structure of RAM in 8051 microcontroller.

c) Describe the port3 structure of 8051 microcontroller and give the alternate functions of it.

SECTION – II

Q.4 Attempt any Four. **16**

a) Draw the interfacing diagram for 16×2 LCD display with 8051 microcontroller.

b) Draw the interfacing diagram for relay with 8051 microcontroller.

c) Explain the architecture of ARM Processor.

d) Draw and explain Status Register of PIC 16F877A.

e) Draw the interfacing diagram of LM35 with 8051 Microcontroller.

Q.5 Attempt any Two. **12**

a) Draw the interfacing diagram of 4KB ROM with 8051 microcontroller also mention starting and ending addresses of interfaces memory.

b) Draw the interfacing diagram of stepper motor with 8051. Write an ALP to rotate the stepper motor one revolution in counter clockwise direction and then stop.

c) Draw the interfacing diagram of ADC 0809 with 8051 microcontroller and also explain the functions of ADC pins
i) SOC ii) EOC iii) ALE

Seat No.	

Set **Q**

T. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
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SLR-QH-574

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Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) The IC commonly used to drive stepper motors with 8051 is: _____.
a) ULN2003 b) MAX232
c) ADC0808 d) LM35

2) PIC 16F877 A consists of _____ KB flash program memory.
a) 2 b) 4
c) 8 d) None of these

3) LM35 has how many pins?
a) 2 b) 1
c) 3 d) 4

4) A typical servo motor rotates: _____.
a) 0°-90° b) 0°-180°
c) 0°-270° d) Unlimited rotation

5) Internal pull up resisters are not available for _____.
a) port 0 b) port 1
c) port 2 d) port 3

6) The 8051 microcontroller has _____ bytes of on-chip ROM.
a) 256 b) 1K
c) 4K d) 8K

7) The PSW (Program Status Word) register contains: _____.
a) Address of program b) Arithmetic flags
c) Stack pointer value d) Memory address

8) The default value of stack pointer after reset is: _____.
a) 00H b) 07H
c) 08H d) FFH

9) The assembler translates: _____.
   a) C code to object code
   b) Assembly code to machine code
   c) Binary to hexadecimal
   d) None of these

10) The instruction SJMP LABEL is used for: _____.
   a) Short jump (within -128 to +127 bytes)
   b) Long jump
   c) Call subroutine
   d) None

11) Address lines are required for accessing the data if memory capacity is 8KB bytes.
   a) 10 b) 11
   c) 12 d) 13

12) In 8051 C programming, while (1) is used for: _____.
   a) Infinite loop b) One-time execution
   c) Delay d) Interrupt

13) The RS pin of an LCD is used to: _____.
   a) Reset LCD
   b) Select command/data register
   c) Send enable signal
   d) Clear display

14) In PIC 16F877 Port C and D are _____ & _____ bits wide respectively.
   a) 6, 3 b) 3, 8
   c) 8, 8 d) 6, 8

SLR-QH-574

Seat No.	

Set R

T. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Advanced Microcontroller System (BTN07503)

Day & Date: Thursday, 07-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All Questions are compulsory.
2) Figures to the right indicates full marks.

SECTION – I

Q.2 Solve any Four. **16**

a) Differentiate between RAM and ROM (Any four Points).

b) Explain PSW Register of 8051 microcontroller.

c) Explain TCON SFR of 8051 microcontroller.

d) Explain SCON SFR of 8051 microcontroller.

e) Explain with example various addressing modes of 8051 microcontroller.

Q.3 Solve any Two. **12**

a) Describe IE and IP SFR's of 8051 microcontroller.

b) Draw and explain internal memory structure of RAM in 8051 microcontroller.

c) Describe the port3 structure of 8051 microcontroller and give the alternate functions of it.

SECTION – II

Q.4 Attempt any Four. **16**

a) Draw the interfacing diagram for 16×2 LCD display with 8051 microcontroller.

b) Draw the interfacing diagram for relay with 8051 microcontroller.

c) Explain the architecture of ARM Processor.

d) Draw and explain Status Register of PIC 16F877A.

e) Draw the interfacing diagram of LM35 with 8051 Microcontroller.

Q.5 Attempt any Two. **12**

a) Draw the interfacing diagram of 4KB ROM with 8051 microcontroller also mention starting and ending addresses of interfaces memory.

b) Draw the interfacing diagram of stepper motor with 8051. Write an ALP to rotate the stepper motor one revolution in counter clockwise direction and then stop.

c) Draw the interfacing diagram of ADC 0809 with 8051 microcontroller and also explain the functions of ADC pins
i) SOC ii) EOC iii) ALE

SLR-QH-574

Seat No.		Set	S

T. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Advanced Microcontroller System (BTN07503)

Day & Date: Thursday, 07-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) The instruction SJMP LABEL is used for: _____.
a) Short jump (within -128 to +127 bytes)
b) Long jump
c) Call subroutine
d) None

2) Address lines are required for accessing the data if memory capacity is 8KB bytes.
a) 10 b) 11
c) 12 d) 13

3) In 8051 C programming, while (1) is used for: _____.
a) Infinite loop b) One-time execution
c) Delay d) Interrupt

4) The RS pin of an LCD is used to: _____.
a) Reset LCD
b) Select command/data register
c) Send enable signal
d) Clear display

5) In PIC 16F877 Port C and D are _____ & _____ bits wide respectively.
a) 6, 3 b) 3, 8
c) 8, 8 d) 6, 8

6) The IC commonly used to drive stepper motors with 8051 is: _____.
a) ULN2003 b) MAX232
c) ADC0808 d) LM35

7) PIC 16F877 A consists of _____ KB flash program memory.
a) 2 b) 4
c) 8 d) None of these

8) LM35 has how many pins?
a) 2 b) 1
c) 3 d) 4

9) A typical servo motor rotates: _____.
a) 0°-90° b) 0°-180°
c) 0°-270° d) Unlimited rotation

10) Internal pull up resisters are not available for _____.
a) port 0 b) port 1
c) port 2 d) port 3

11) The 8051 microcontroller has _____ bytes of on-chip ROM.
a) 256 b) 1K
c) 4K d) 8K

12) The PSW (Program Status Word) register contains: _____.
a) Address of program b) Arithmetic flags
c) Stack pointer value d) Memory address

13) The default value of stack pointer after reset is: _____.
a) 00H b) 07H
c) 08H d) FFH

14) The assembler translates: _____.
a) C code to object code
b) Assembly code to machine code
c) Binary to hexadecimal
d) None of these

SLR-QH-574

Seat No.	

Set S

T. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Advanced Microcontroller System (BTN07503)

Day & Date: Thursday, 07-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All Questions are compulsory.
2) Figures to the right indicates full marks.

SECTION – I

Q.2 Solve any Four. **16**

a) Differentiate between RAM and ROM (Any four Points).

b) Explain PSW Register of 8051 microcontroller.

c) Explain TCON SFR of 8051 microcontroller.

d) Explain SCON SFR of 8051 microcontroller.

e) Explain with example various addressing modes of 8051 microcontroller.

Q.3 Solve any Two. **12**

a) Describe IE and IP SFR's of 8051 microcontroller.

b) Draw and explain internal memory structure of RAM in 8051 microcontroller.

c) Describe the port3 structure of 8051 microcontroller and give the alternate functions of it.

SECTION – II

Q.4 Attempt any Four. **16**

a) Draw the interfacing diagram for 16×2 LCD display with 8051 microcontroller.

b) Draw the interfacing diagram for relay with 8051 microcontroller.

c) Explain the architecture of ARM Processor.

d) Draw and explain Status Register of PIC 16F877A.

e) Draw the interfacing diagram of LM35 with 8051 Microcontroller.

Q.5 Attempt any Two. **12**

a) Draw the interfacing diagram of 4KB ROM with 8051 microcontroller also mention starting and ending addresses of interfaces memory.

b) Draw the interfacing diagram of stepper motor with 8051. Write an ALP to rotate the stepper motor one revolution in counter clockwise direction and then stop.

c) Draw the interfacing diagram of ADC 0809 with 8051 microcontroller and also explain the functions of ADC pins
i) SOC ii) EOC iii) ALE

SLR-QH-575

Seat No.		Set	P

T. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April - 2026
Electromagnetic Engineering (BTN07504)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in first 30 Minutes in Answer Book Each question carries one mark.
2) All questions are compulsory.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Give the correct option for the following questions. **14**

1) If dot product of two vectors is zero then vectors are _____.
a) Perpendicular b) Parallel
c) Oblique d) None of these

2) In Dot product of unit vector in cylindrical and rectangular coordinate system for $a_y \, . a_\varphi$ is _____.
a) $-\cos\varphi$ b) $-\sin\varphi$
c) $\sin\varphi$ d) $\cos\varphi$

3) The unit of electric field intensity E is _____.
a) $\mathrm{N/C}$ b) $\mathrm{J/C}$
c) $\mathrm{N.M/C}$ d) $\mathrm{V/M}$

4) The electric field due to electric dipole is _____.
a) proportional to distance from dipole
b) proportional to square of distance from dipole
c) proportional to inverse square of distance from dipole
d) proportional to inverse cube of distance from dipole

5) Vectors $A = -3a_x + 2a_y + a_z$ and $B = 5a_x + 6a_y + 3a_z$ are _____.
a) Parallel b) Perpendicular
c) At an angle 35° d) None of these

6) The force between two charges is $120\ \mathrm{N}$. If the distance between the charge is doubled. Then force will be _____.
a) $60\ \mathrm{N}$ b) $30\ \mathrm{N}$
c) $40\ \mathrm{N}$ d) $240\ \mathrm{N}$

7) The relative permittivity of free space is given by _____.
a) 1 b) 10
c) 100 d) 1000

8) Work done in electric field is _____.
a) $\mathrm{W} = \mathrm{Q}/\mathrm{V}$ b) $\mathrm{W} = \mathrm{V}/\mathrm{Q}$
c) $\mathrm{W} = \mathrm{QV}$ d) None of the above

9) The units of capacitance are _____.
a) volts/coulomb b) coulombs/volt
c) ohms d) henry/Wb

10) Relation between electric field intensity and permittivity is given by ____.
a) $D = \epsilon E$ b) $E = D\epsilon$
c) $D = E/\epsilon$ d) $E = \epsilon/d$

11) Magnetic vector potential for volume current is expressed as _____.
a) $B = \nabla \times A$ b) $A = \nabla \times B$
c) $B = \nabla . A$ d) $A = \nabla . B$

12) The Stoke's theorem can be used to find which of the following?
a) Area enclosed by a function in the given region
b) Volume enclosed by a function in the given region
c) Linear distance
d) Curl of the function

13) Lorentz force equation is _____.
a) $F = Q \times [E + V \times B]$ b) $F = Q\,[E + V \times B]$
c) $F = Q\,V + E \times B$ d) $F = Q\,[B + V \times E]$

14) Magnetic boundary condition is that the normal component of magnetic flux density is _____ across the boundary.
a) Unity b) Zero
c) Non-continuous d) Continuous

Seat No.	

Set **P**

T. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April - 2026
Electromagnetic Engineering (BTN07504)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All Questions are compulsory.
2) Figures to the right indicates full marks.

SECTION – I

Q.2 Attempt Any Four. **16**

a) Show that $\nabla . D = \rho_V$.

b) If $\emptyset = 3x^2y - y^3\, z^2$ find the gradient of $\emptyset$ at a point $(1, -2, 1)$.

c) Derive Laplace and Poisson Equations from Gauss' law.

d) Parallel plate capacitor has conducting plates of area 0.04m^2. The plates are separated by a dielectric material whose relative permittivity is 2 with plate separation of 1 cm.
Find:
i) Its capacitance
ii) Charge on plates if $\text{V} = 10\text{V}$.

e) Find force on $100\ \mu\text{C}$ charge at $(0, 0, 3)$ m if four like charges of $20\ \mu\text{C}$ are located on x and y axis at ± 4 m.

Q.3 Solve Any Two. **12**

a) If $D = 4xy\ a_x + 2(x^2 + z^2)a_y + 4yz\ a_z\ \text{C/m}^2$. Evaluate surface integral to find total charge enclosed in the rectangular parallelepiped $0 < x < 2, 0 < y < 3, 0 < z < 5$ m.

b) State Gauss law with mathematical expression and it's any two applications in detail.

c) Three-point charges $Q_1 = 10^{-6}\text{C}, Q_2 = 10^{-6}\text{C}, Q_3 = 0.5 \times 10^{-6}\text{C}$, are located at corners of equilateral triangle of 50 cm side. Determine magnitude and direction of force on Q_3.

SECTION – II

Q.4 Attempt Any Four. **16**

a) A current filament of $3a_x$ lies along x axis. Find H component at $P(-1,3,2)$.

b) Derive an expression for inductance of toroid.

c) State and explain Biot-Savart law.

d) Derive the Maxwell's equation from Faraday's law for static field in integral and point form.

e) Derive an expression for energy density in magnetic field.

Q.5 Attempt Any Two. **12**

a) Derive expression for boundary conditions in magnetic field.

b) Evaluate both sides of Stroke's theorem for the field $H = (y^2z/x)a_x + (0.5y^2z^2/x^2)az$ and find current in a_y direction crossing the square surface in the plane $y = 2$, bounded by $x = z = 1$ and $x = z = 2$.

c) Derive the Maxwell's equation from Ampere's law for static and harmonically varying field's in integral and point form.

Seat No.	

Set **Q**

T. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April - 2026
Electromagnetic Engineering (BTN07504)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in first 30 Minutes in Answer Book Each question carries one mark.
2) All questions are compulsory.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Give the correct option for the following questions. 14

1) Work done in electric field is _____.
a) $\mathrm{W} = \mathrm{Q}/\mathrm{V}$ b) $\mathrm{W} = \mathrm{V}/\mathrm{Q}$
c) $\mathrm{W} = \mathrm{QV}$ d) None of the above

2) The units of capacitance are _____.
a) volts/coulomb b) coulombs/volt
c) ohms d) henry/Wb

3) Relation between electric field intensity and permittivity is given by ____.
a) $D = \epsilon E$ b) $E = D\epsilon$
c) $D = E/\epsilon$ d) $E = \epsilon/d$

4) Magnetic vector potential for volume current is expressed as _____.
a) $B = \nabla \times A$ b) $A = \nabla \times B$
c) $B = \nabla . A$ d) $A = \nabla . B$

5) The Stoke's theorem can be used to find which of the following?
a) Area enclosed by a function in the given region
b) Volume enclosed by a function in the given region
c) Linear distance
d) Curl of the function

6) Lorentz force equation is _____.
a) $F = Q \times [E + V \times B]$ b) $F = Q\,[E + V \times B]$
c) $F = Q\,V + E \times B$ d) $F = Q\,[B + V \times E]$

7) Magnetic boundary condition is that the normal component of magnetic flux density is _____ across the boundary.
a) Unity b) Zero
c) Non-continuous d) Continuous

8) If dot product of two vectors is zero then vectors are _____.

a) Perpendicular
b) Parallel
c) Oblique
d) None of these

9) In Dot product of unit vector in cylindrical and rectangular coordinate system for $a_y \, . a_\varphi$ is _____.

a) $-\cos\varphi$
b) $-\sin\varphi$
c) $\sin\varphi$
d) $\cos\varphi$

10) The unit of electric field intensity E is _____.

a) $\mathrm{N/C}$
b) $\mathrm{J/C}$
c) $\mathrm{N.M/C}$
d) $\mathrm{V/M}$

11) The electric field due to electric dipole is _____.

a) proportional to distance from dipole
b) proportional to square of distance from dipole
c) proportional to inverse square of distance from dipole
d) proportional to inverse cube of distance from dipole

12) Vectors $A = -3a_x + 2a_y + a_z$ and $B = 5a_x + 6a_y + 3a_z$ are _____.

a) Parallel
b) Perpendicular
c) At an angle 35°
d) None of these

13) The force between two charges is $120\ \mathrm{N}$. If the distance between the charge is doubled. Then force will be _____.

a) $60\ \mathrm{N}$
b) $30\ \mathrm{N}$
c) $40\ \mathrm{N}$
d) $240\ \mathrm{N}$

14) The relative permittivity of free space is given by _____.

a) 1
b) 10
c) 100
d) 1000

Seat No.	

Set **Q**

T. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April - 2026
Electromagnetic Engineering (BTN07504)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All Questions are compulsory.
2) Figures to the right indicates full marks.

SECTION – I

Q.2 Attempt Any Four. **16**

a) Show that $\nabla . D = \rho_V$.

b) If $\emptyset = 3x^2y - y^3\, z^2$ find the gradient of $\emptyset$ at a point $(1, -2, 1)$.

c) Derive Laplace and Poisson Equations from Gauss' law.

d) Parallel plate capacitor has conducting plates of area 0.04m^2. The plates are separated by a dielectric material whose relative permittivity is 2 with plate separation of 1 cm.
Find:
i) Its capacitance
ii) Charge on plates if $\text{V} = 10\text{V}$.

e) Find force on $100\ \mu\text{C}$ charge at $(0, 0, 3)$ m if four like charges of $20\ \mu\text{C}$ are located on x and y axis at ± 4 m.

Q.3 Solve Any Two. **12**

a) If $D = 4xy\ a_x + 2(x^2 + z^2)a_y + 4yz\ a_z\ \text{C/m}^2$. Evaluate surface integral to find total charge enclosed in the rectangular parallelepiped $0 < x < 2, 0 < y < 3, 0 < z < 5$ m.

b) State Gauss law with mathematical expression and it's any two applications in detail.

c) Three-point charges $Q_1 = 10^{-6}\text{C}, Q_2 = 10^{-6}\text{C}, Q_3 = 0.5 \times 10^{-6}\text{C}$, are located at corners of equilateral triangle of 50 cm side. Determine magnitude and direction of force on Q_3.

SECTION – II

Q.4 Attempt Any Four. **16**

a) A current filament of $3a_x$ lies along x axis. Find H component at $P(-1,3,2)$.

b) Derive an expression for inductance of toroid.

c) State and explain Biot-Savart law.

d) Derive the Maxwell's equation from Faraday's law for static field in integral and point form.

e) Derive an expression for energy density in magnetic field.

Q.5 Attempt Any Two. **12**

a) Derive expression for boundary conditions in magnetic field.

b) Evaluate both sides of Stroke's theorem for the field $H = (y^2z/x)a_x + (0.5y^2z^2/x^2)az$ and find current in a_y direction crossing the square surface in the plane $y = 2$, bounded by $x = z = 1$ and $x = z = 2$.

c) Derive the Maxwell's equation from Ampere's law for static and harmonically varying field's in integral and point form.

SLR-QH-575

Seat No.	

Set R

T. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April - 2026
Electromagnetic Engineering (BTN07504)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in first 30 Minutes in Answer Book Each question carries one mark.
2) All questions are compulsory.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Give the correct option for the following questions. 14

1) Magnetic vector potential for volume current is expressed as _____.
a) $B = \nabla \times A$ b) $A = \nabla \times B$
c) $B = \nabla . A$ d) $A = \nabla . B$

2) The Stoke's theorem can be used to find which of the following?
a) Area enclosed by a function in the given region
b) Volume enclosed by a function in the given region
c) Linear distance
d) Curl of the function

3) Lorentz force equation is _____.
a) $F = Q \times [E + V \times B]$ b) $F = Q\ [E + V \times B]$
c) $F = Q\ V + E \times B$ d) $F = Q\ [B + V \times E]$

4) Magnetic boundary condition is that the normal component of magnetic flux density is _____ across the boundary.
a) Unity b) Zero
c) Non-continuous d) Continuous

5) If dot product of two vectors is zero then vectors are _____.
a) Perpendicular b) Parallel
c) Oblique d) None of these

6) In Dot product of unit vector in cylindrical and rectangular coordinate system for $a_y \ . a_\varphi$ is _____.
a) $-\cos\varphi$ b) $-\sin\varphi$
c) $\sin\varphi$ d) $\cos\varphi$

7) The unit of electric field intensity E is _____.
a) $\mathrm{N/C}$ b) $\mathrm{J/C}$
c) $\mathrm{N.M/C}$ d) $\mathrm{V/M}$

8) The electric field due to electric dipole is _____.
a) proportional to distance from dipole
b) proportional to square of distance from dipole
c) proportional to inverse square of distance from dipole
d) proportional to inverse cube of distance from dipole

9) Vectors $A = -3a_x + 2a_y + a_z$ and $B = 5a_x + 6a_y + 3a_z$ are _____.
a) Parallel
b) Perpendicular
c) At an angle 35°
d) None of these

10) The force between two charges is $120\ \mathrm{N}$. If the distance between the charge is doubled. Then force will be _____.
a) $60\ \mathrm{N}$
b) $30\ \mathrm{N}$
c) $40\ \mathrm{N}$
d) $240\ \mathrm{N}$

11) The relative permittivity of free space is given by _____.
a) 1
b) 10
c) 100
d) 1000

12) Work done in electric field is _____.
a) $\mathrm{W = Q/V}$
b) $\mathrm{W = V/Q}$
c) $\mathrm{W = QV}$
d) None of the above

13) The units of capacitance are _____.
a) volts/coulomb
b) coulombs/volt
c) ohms
d) henry/Wb

14) Relation between electric field intensity and permittivity is given by ____.
a) $D = \epsilon E$
b) $E = D\epsilon$
c) $D = E/\epsilon$
d) $E = \epsilon/d$

Seat No.	

Set **R**

T. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April - 2026
Electromagnetic Engineering (BTN07504)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All Questions are compulsory.
2) Figures to the right indicates full marks.

SECTION – I

Q.2 Attempt Any Four. **16**

a) Show that $\nabla . D = \rho_V$.

b) If $\emptyset = 3x^2y - y^3\ z^2$ find the gradient of $\emptyset$ at a point $(1, -2, 1)$.

c) Derive Laplace and Poisson Equations from Gauss' law.

d) Parallel plate capacitor has conducting plates of area 0.04m^2. The plates are separated by a dielectric material whose relative permittivity is 2 with plate separation of 1 cm.
Find:
i) Its capacitance
ii) Charge on plates if $\text{V} = 10\text{V}$.

e) Find force on $100\ \mu\text{C}$ charge at $(0, 0, 3)$ m if four like charges of $20\ \mu\text{C}$ are located on x and y axis at ± 4 m.

Q.3 Solve Any Two. **12**

a) If $D = 4xy\ a_x + 2(x^2 + z^2)a_y + 4yz\ a_z\ \text{C/m}^2$. Evaluate surface integral to find total charge enclosed in the rectangular parallelepiped $0 < x < 2, 0 < y < 3, 0 < z < 5$ m.

b) State Gauss law with mathematical expression and it's any two applications in detail.

c) Three-point charges $Q_1 = 10^{-6}\text{C}, Q_2 = 10^{-6}\text{C}, Q_3 = 0.5 \times 10^{-6}\text{C}$, are located at corners of equilateral triangle of 50 cm side. Determine magnitude and direction of force on Q_3.

SECTION – II

Q.4 Attempt Any Four. **16**

a) A current filament of $3a_x$ lies along x axis. Find H component at $P(-1,3,2)$.

b) Derive an expression for inductance of toroid.

c) State and explain Biot-Savart law.

d) Derive the Maxwell's equation from Faraday's law for static field in integral and point form.

e) Derive an expression for energy density in magnetic field.

Q.5 Attempt Any Two. **12**

a) Derive expression for boundary conditions in magnetic field.

b) Evaluate both sides of Stroke's theorem for the field $H = (y^2z/x)a_x + (0.5y^2z^2/x^2)az$ and find current in a_y direction crossing the square surface in the plane $y = 2$, bounded by $x = z = 1$ and $x = z = 2$.

c) Derive the Maxwell's equation from Ampere's law for static and harmonically varying field's in integral and point form.

SLR-QH-575

Seat No.	

Set S

T. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April - 2026
Electromagnetic Engineering (BTN07504)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in first 30 Minutes in Answer Book Each question carries one mark.
2) All questions are compulsory.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Give the correct option for the following questions. 14

1) The force between two charges is $120\ \mathrm{N}$. If the distance between the charge is doubled. Then force will be _____.
a) $60\ \mathrm{N}$ b) $30\ \mathrm{N}$
c) $40\ \mathrm{N}$ d) $240\ \mathrm{N}$

2) The relative permittivity of free space is given by _____.
a) 1 b) 10
c) 100 d) 1000

3) Work done in electric field is _____.
a) $\mathrm{W} = \mathrm{Q}/\mathrm{V}$ b) $\mathrm{W} = \mathrm{V}/\mathrm{Q}$
c) $\mathrm{W} = \mathrm{QV}$ d) None of the above

4) The units of capacitance are _____.
a) volts/coulomb b) coulombs/volt
c) ohms d) henry/Wb

5) Relation between electric field intensity and permittivity is given by ____.
a) $D = \epsilon E$ b) $E = D\epsilon$
c) $D = E/\epsilon$ d) $E = \epsilon/d$

6) Magnetic vector potential for volume current is expressed as _____.
a) $B = \nabla \times A$ b) $A = \nabla \times B$
c) $B = \nabla . A$ d) $A = \nabla . B$

7) The Stoke's theorem can be used to find which of the following?
a) Area enclosed by a function in the given region
b) Volume enclosed by a function in the given region
c) Linear distance
d) Curl of the function

8) Lorentz force equation is _____.

a) $F = Q \times [E + V \times B]$ b) $F = Q\ [E + V \times B]$

c) $F = Q\ V + E \times B$ d) $F = Q\ [B + V \times E]$

9) Magnetic boundary condition is that the normal component of magnetic flux density is _____ across the boundary.

a) Unity b) Zero

c) Non-continuous d) Continuous

10) If dot product of two vectors is zero then vectors are _____.

a) Perpendicular b) Parallel

c) Oblique d) None of these

11) In Dot product of unit vector in cylindrical and rectangular coordinate system for $a_y \ .a_\varphi$ is _____.

a) $-\cos\varphi$ b) $-\sin\varphi$

c) $\sin\varphi$ d) $\cos\varphi$

12) The unit of electric field intensity E is _____.

a) $\mathrm{N/C}$ b) $\mathrm{J/C}$

c) $\mathrm{N.M/C}$ d) $\mathrm{V/M}$

13) The electric field due to electric dipole is _____.

a) proportional to distance from dipole

b) proportional to square of distance from dipole

c) proportional to inverse square of distance from dipole

d) proportional to inverse cube of distance from dipole

14) Vectors $A = -3a_x + 2a_y + a_z$ and $B = 5a_x + 6a_y + 3a_z$ are _____.

a) Parallel b) Perpendicular

c) At an angle 35° d) None of these

Seat No.		Set	S

T. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April - 2026
Electromagnetic Engineering (BTN07504)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All Questions are compulsory.
2) Figures to the right indicates full marks.

SECTION – I

Q.2 Attempt Any Four. **16**

a) Show that $\nabla . D = \rho_V$.

b) If $\emptyset = 3x^2y - y^3\ z^2$ find the gradient of $\emptyset$ at a point $(1, -2, 1)$.

c) Derive Laplace and Poisson Equations from Gauss' law.

d) Parallel plate capacitor has conducting plates of area 0.04m^2. The plates are separated by a dielectric material whose relative permittivity is 2 with plate separation of 1 cm.
Find:
i) Its capacitance
ii) Charge on plates if $\text{V} = 10\text{V}$.

e) Find force on $100\ \mu\text{C}$ charge at $(0, 0, 3)$ m if four like charges of $20\ \mu\text{C}$ are located on x and y axis at ± 4 m.

Q.3 Solve Any Two. **12**

a) If $D = 4xy\ a_x + 2(x^2 + z^2)a_y + 4yz\ a_z\ \text{C/m}^2$. Evaluate surface integral to find total charge enclosed in the rectangular parallelepiped $0 < x < 2, 0 < y < 3, 0 < z < 5$ m.

b) State Gauss law with mathematical expression and it's any two applications in detail.

c) Three-point charges $Q_1 = 10^{-6}\text{C}, Q_2 = 10^{-6}\text{C}, Q_3 = 0.5 \times 10^{-6}\text{C}$, are located at corners of equilateral triangle of 50 cm side. Determine magnitude and direction of force on Q_3.

SECTION – II

Q.4 Attempt Any Four. **16**

a) A current filament of $3a_x$ lies along x axis. Find H component at $P(-1,3,2)$.

b) Derive an expression for inductance of toroid.

c) State and explain Biot-Savart law.

d) Derive the Maxwell's equation from Faraday's law for static field in integral and point form.

e) Derive an expression for energy density in magnetic field.

Q.5 Attempt Any Two. **12**

a) Derive expression for boundary conditions in magnetic field.

b) Evaluate both sides of Stroke's theorem for the field $H = (y^2z/x)a_x + (0.5y^2z^2/x^2)az$ and find current in a_y direction crossing the square surface in the plane $y = 2$, bounded by $x = z = 1$ and $x = z = 2$.

c) Derive the Maxwell's equation from Ampere's law for static and harmonically varying field's in integral and point form.

SLR-QH-577

Seat No.	

Set P

T. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Advanced Electrical Machines (BTN07513)

Day & Date: Tuesday, 12-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) In BLDC motor field winding is kept on _____.
a) Stator b) Rotor
c) Can be placed anywhere d) Absent

2) In BLDC motor driver module, we do not require _____.
a) SCRs b) Power transistors
c) FETs d) Transistors

3) Typical brushless motor doesn't have _____.
a) Commutator b) Permanent magnet
c) Electronic controller d) Fixed armature

4) The speed of a BLDC motor can be controlled by _____.
a) Changing input DC voltage b) Changing temperature
c) Changing wind direction d) Cannot be controlled

5) The low-torque synchronous cannot be used for _____.
a) torque transmission b) error detection
c) instrument servos d) robot arm positioning

6) For torque transmission over a long distance with the help of electrical wires only, which of the following two synchronous are used?
a) CX and CT b) CX and CR
c) CX and CD d) CT and CD

7) Which of the following synchronous are used for error detection in a servo control system?
a) control transmitter b) control transformer
c) control receiver d) Both (a) and (b)

8) What is the angle between stator direct axis and quadrature axis?
a) 90° b) 0°
c) 45° d) 60°

9) Space angle, θr is measured between stator d-axis and _____.
a) quadrature axis b) direct d-axis
c) long rotor axis d) None of the mentioned

10) A reluctance motor _____.
a) is self-starting b) is constant speed motor
c) needs no d.c. excitation d) All of the above

11) For which of the applications a reluctance motor is preferred _____.
a) electric shavers b) refrigerators
c) signaling and timing devices d) lifts and hoists

12) A variable reluctance stepper motor is constructed of _____ material with salient poles.
a) Paramagnetic b) Ferromagnetic
c) Diamagnetic d) Non-magnetic

13) If a hybrid stepper motor has a rotor pitch of 36° and a step angle of 9°, the number of its phases must be _____.
a) 4 b) 2
c) 3 d) 6

14) A stepping motor is a _____ device.
a) Mechanical b) Electrical
c) Analogue d) Incremental

Seat No.	

Set **P**

T. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Advanced Electrical Machines (BTN07513)

Day & Date: Tuesday, 12-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All Questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.
4) Draw neat diagrams whenever necessary.

SECTION – I

Q.2 Attempt Any Four the following. **16**

a) With the help of neat diagram explain the construction and working of a synchronous reluctance motor.

b) Draw and explain the torque-speed characteristics of synchronous reluctance motor.

c) What are the merits and demerits of stepper motor?

d) Explain the Static and Dynamic characteristics of stepper motor.

e) With the help of neat diagram explain the construction and working of a switched reluctance motor.

Q.3 Attempt Any Two the following. **12**

a) Explain the power semiconductor switching circuits of switched reluctance motor and state the advantages and disadvantages switched reluctance motor.

b) Explain the construction and working of multi-stack variable reluctance stepper motor.

c) With the help of neat labeled diagram, explain the construction and working of variable reluctance stepper motor. Also state the applications of this motor.

SECTION – II

Q.4 Attempt Any Four the following. **16**

a) Explain the Power and control circuit of permanent magnet BLDC motor.

b) Explain with neat diagram Microprocessor based control for permanent magnet synchronous motor.

c) Derive torque equation of permanent magnet BLDC motor.

d) Explain the construction of permanent magnet BLDC motor.

e) State advantages, disadvantages and applications of permanent magnet BLDC motor.

Q.5 Attempt Any Two the following. **12**

a) Draw and explain torque-speed characteristics permanent magnet synchronous motor, also explain phasor diagram.

b) Explain self-control and vector control of permanent magnet synchronous motor.

c) Explain classification of permanent magnet BLDC motor.

Seat No.	

Set **Q**

T. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Advanced Electrical Machines (BTN07513)

Day & Date: Tuesday, 12-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) What is the angle between stator direct axis and quadrature axis?
a) 90° b) 0°
c) 45° d) 60°

2) Space angle, θr is measured between stator d-axis and _____.
a) quadrature axis b) direct d-axis
c) long rotor axis d) None of the mentioned

3) A reluctance motor _____.
a) is self-starting b) is constant speed motor
c) needs no d.c. excitation d) All of the above

4) For which of the applications a reluctance motor is preferred _____.
a) electric shavers b) refrigerators
c) signaling and timing devices d) lifts and hoists

5) A variable reluctance stepper motor is constructed of _____ material with salient poles.
a) Paramagnetic b) Ferromagnetic
c) Diamagnetic d) Non-magnetic

6) If a hybrid stepper motor has a rotor pitch of 36° and a step angle of 9°, the number of its phases must be _____.
a) 4 b) 2
c) 3 d) 6

7) A stepping motor is a _____ device.
a) Mechanical b) Electrical
c) Analogue d) Incremental

8) In BLDC motor field winding is kept on _____.
a) Stator b) Rotor
c) Can be placed anywhere d) Absent

9) In BLDC motor driver module, we do not require _____.
a) SCRs b) Power transistors
c) FETs d) Transistors

10) Typical brushless motor doesn't have _____.
a) Commutator b) Permanent magnet
c) Electronic controller d) Fixed armature

11) The speed of a BLDC motor can be controlled by _____.
a) Changing input DC voltage b) Changing temperature
c) Changing wind direction d) Cannot be controlled

12) The low-torque synchronous cannot be used for _____.
a) torque transmission b) error detection
c) instrument servos d) robot arm positioning

13) For torque transmission over a long distance with the help of electrical wires only, which of the following two synchronous are used?
a) CX and CT b) CX and CR
c) CX and CD d) CT and CD

14) Which of the following synchronous are used for error detection in a servo control system?
a) control transmitter b) control transformer
c) control receiver d) Both (a) and (b)

Seat No.	

Set **Q**

T. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Advanced Electrical Machines (BTN07513)

Day & Date: Tuesday, 12-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All Questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.
4) Draw neat diagrams whenever necessary.

SECTION – I

Q.2 Attempt Any Four the following. **16**

a) With the help of neat diagram explain the construction and working of a synchronous reluctance motor.

b) Draw and explain the torque-speed characteristics of synchronous reluctance motor.

c) What are the merits and demerits of stepper motor?

d) Explain the Static and Dynamic characteristics of stepper motor.

e) With the help of neat diagram explain the construction and working of a switched reluctance motor.

Q.3 Attempt Any Two the following. **12**

a) Explain the power semiconductor switching circuits of switched reluctance motor and state the advantages and disadvantages switched reluctance motor.

b) Explain the construction and working of multi-stack variable reluctance stepper motor.

c) With the help of neat labeled diagram, explain the construction and working of variable reluctance stepper motor. Also state the applications of this motor.

SECTION – II

Q.4 Attempt Any Four the following. **16**

a) Explain the Power and control circuit of permanent magnet BLDC motor.

b) Explain with neat diagram Microprocessor based control for permanent magnet synchronous motor.

c) Derive torque equation of permanent magnet BLDC motor.

d) Explain the construction of permanent magnet BLDC motor.

e) State advantages, disadvantages and applications of permanent magnet BLDC motor.

Q.5 Attempt Any Two the following. **12**

a) Draw and explain torque-speed characteristics permanent magnet synchronous motor, also explain phasor diagram.

b) Explain self-control and vector control of permanent magnet synchronous motor.

c) Explain classification of permanent magnet BLDC motor.

Seat No.	

Set | **R**

T. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Advanced Electrical Machines (BTN07513)

Day & Date: Tuesday, 12-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) For which of the applications a reluctance motor is preferred _____.
a) electric shavers b) refrigerators
c) signaling and timing devices d) lifts and hoists

2) A variable reluctance stepper motor is constructed of _____ material with salient poles.
a) Paramagnetic b) Ferromagnetic
c) Diamagnetic d) Non-magnetic

3) If a hybrid stepper motor has a rotor pitch of 36° and a step angle of 9°, the number of its phases must be _____.
a) 4 b) 2
c) 3 d) 6

4) A stepping motor is a _____ device.
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c) Analogue d) Incremental

5) In BLDC motor field winding is kept on _____.
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c) Can be placed anywhere d) Absent

6) In BLDC motor driver module, we do not require _____.
a) SCRs b) Power transistors
c) FETs d) Transistors

7) Typical brushless motor doesn't have _____.
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c) Electronic controller d) Fixed armature

8) The speed of a BLDC motor can be controlled by _____.
a) Changing input DC voltage b) Changing temperature
c) Changing wind direction d) Cannot be controlled

9) The low-torque synchronous cannot be used for _____.
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c) instrument servos d) robot arm positioning

10) For torque transmission over a long distance with the help of electrical wires only, which of the following two synchronous are used?
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c) CX and CD d) CT and CD

11) Which of the following synchronous are used for error detection in a servo control system?
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12) What is the angle between stator direct axis and quadrature axis?
a) 90° b) 0°
c) 45° d) 60°

13) Space angle, θr is measured between stator d-axis and _____.
a) quadrature axis b) direct d-axis
c) long rotor axis d) None of the mentioned

14) A reluctance motor _____.
a) is self-starting b) is constant speed motor
c) needs no d.c. excitation d) All of the above

Seat No.	

Set **R**

T. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Advanced Electrical Machines (BTN07513)

Day & Date: Tuesday, 12-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All Questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.
4) Draw neat diagrams whenever necessary.

SECTION – I

Q.2 Attempt Any Four the following. **16**

a) With the help of neat diagram explain the construction and working of a synchronous reluctance motor.

b) Draw and explain the torque-speed characteristics of synchronous reluctance motor.

c) What are the merits and demerits of stepper motor?

d) Explain the Static and Dynamic characteristics of stepper motor.

e) With the help of neat diagram explain the construction and working of a switched reluctance motor.

Q.3 Attempt Any Two the following. **12**

a) Explain the power semiconductor switching circuits of switched reluctance motor and state the advantages and disadvantages switched reluctance motor.

b) Explain the construction and working of multi-stack variable reluctance stepper motor.

c) With the help of neat labeled diagram, explain the construction and working of variable reluctance stepper motor. Also state the applications of this motor.

SECTION – II

Q.4 Attempt Any Four the following. **16**

a) Explain the Power and control circuit of permanent magnet BLDC motor.

b) Explain with neat diagram Microprocessor based control for permanent magnet synchronous motor.

c) Derive torque equation of permanent magnet BLDC motor.

d) Explain the construction of permanent magnet BLDC motor.

e) State advantages, disadvantages and applications of permanent magnet BLDC motor.

Q.5 Attempt Any Two the following. **12**

a) Draw and explain torque-speed characteristics permanent magnet synchronous motor, also explain phasor diagram.

b) Explain self-control and vector control of permanent magnet synchronous motor.

c) Explain classification of permanent magnet BLDC motor.

Seat No.		Set	S

T. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Advanced Electrical Machines (BTN07513)

Day & Date: Tuesday, 12-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) For torque transmission over a long distance with the help of electrical wires only, which of the following two synchronous are used?
a) CX and CT b) CX and CR
c) CX and CD d) CT and CD

2) Which of the following synchronous are used for error detection in a servo control system?
a) control transmitter b) control transformer
c) control receiver d) Both (a) and (b)

3) What is the angle between stator direct axis and quadrature axis?
a) 90° b) 0°
c) 45° d) 60°

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c) long rotor axis d) None of the mentioned

5) A reluctance motor _____.
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c) needs no d.c. excitation d) All of the above

6) For which of the applications a reluctance motor is preferred _____.
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c) signaling and timing devices d) lifts and hoists

7) A variable reluctance stepper motor is constructed of _____ material with salient poles.

a) Paramagnetic b) Ferromagnetic
c) Diamagnetic d) Non-magnetic

8) If a hybrid stepper motor has a rotor pitch of 36° and a step angle of 9°, the number of its phases must be _____.

a) 4 b) 2
c) 3 d) 6

9) A stepping motor is a _____ device.

a) Mechanical b) Electrical
c) Analogue d) Incremental

10) In BLDC motor field winding is kept on _____.

a) Stator b) Rotor
c) Can be placed anywhere d) Absent

11) In BLDC motor driver module, we do not require _____.

a) SCRs b) Power transistors
c) FETs d) Transistors

12) Typical brushless motor doesn't have _____.

a) Commutator b) Permanent magnet
c) Electronic controller d) Fixed armature

13) The speed of a BLDC motor can be controlled by _____.

a) Changing input DC voltage b) Changing temperature
c) Changing wind direction d) Cannot be controlled

14) The low-torque synchronous cannot be used for _____.

a) torque transmission b) error detection
c) instrument servos d) robot arm positioning

Seat No.	

Set **S**

T. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Advanced Electrical Machines (BTN07513)

Day & Date: Tuesday, 12-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All Questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.
4) Draw neat diagrams whenever necessary.

SECTION – I

Q.2 Attempt Any Four the following. **16**

a) With the help of neat diagram explain the construction and working of a synchronous reluctance motor.

b) Draw and explain the torque-speed characteristics of synchronous reluctance motor.

c) What are the merits and demerits of stepper motor?

d) Explain the Static and Dynamic characteristics of stepper motor.

e) With the help of neat diagram explain the construction and working of a switched reluctance motor.

Q.3 Attempt Any Two the following. **12**

a) Explain the power semiconductor switching circuits of switched reluctance motor and state the advantages and disadvantages switched reluctance motor.

b) Explain the construction and working of multi-stack variable reluctance stepper motor.

c) With the help of neat labeled diagram, explain the construction and working of variable reluctance stepper motor. Also state the applications of this motor.

SECTION – II

Q.4 Attempt Any Four the following. **16**

a) Explain the Power and control circuit of permanent magnet BLDC motor.

b) Explain with neat diagram Microprocessor based control for permanent magnet synchronous motor.

c) Derive torque equation of permanent magnet BLDC motor.

d) Explain the construction of permanent magnet BLDC motor.

e) State advantages, disadvantages and applications of permanent magnet BLDC motor.

Q.5 Attempt Any Two the following. **12**

a) Draw and explain torque-speed characteristics permanent magnet synchronous motor, also explain phasor diagram.

b) Explain self-control and vector control of permanent magnet synchronous motor.

c) Explain classification of permanent magnet BLDC motor.

SLR-QH-578

Seat No.		Set	P

T. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Business Ethics (BTN07514)

Day & Date: Tuesday, 12-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Conventional MCQ: **14**

1) _____ refers to the long term maintenance of systems.
a) Sustainability b) Globalization
c) Ethical Theories d) Morality

2) The moral principles, standards of behaviour, or set of values that guide a person's actions in the workplace is called _____.
a) Office place ethics b) factory place ethics
c) behavioural ethics d) work place ethics

3) Most companies begin the process of establishing organizational ethics programs by developing _____.
a) ethics training programs
b) code of conduct
c) ethics enforcement mechanisms
d) hidden agendas

4) _____ is concerned with the study of morality and the application of reason to elucidate specific rules and principles that determine morally acceptable courses of action.
a) Morality b) Ethical theories
c) Ethics d) All of the above

5) Sustainability can be regarded as comprising components _____.
a) environmental b) economic
c) social d) all of the above

6) In _____ ethical theories, different societies have different moral standards.
a) Descriptive b) Normative
c) Contemporary d) None of these

7) When we are referring to an individual's moral strength, which is determined by observing their pattern of actions over time is called _____.

a) Organizational factors b) Individual factors
c) Ethical issue intensity d) Opportunity

8) The degree to which corporate decisions, policies, activities, and impacts are acknowledged and made visible to relevant stakeholders is called as _____.

a) corporate transparency b) corporate accountability
c) corporate ethics d) none

9) Relevant information is made available in a timely and accessible manner, means _____.

a) accuracy b) faith
c) disclosure d) clarity

10) _____ means a worker's ability to control information about them and how it is used and shared.

a) Discrimination b) Health Testing
c) Fair wages d) Employee Privacy

11) Giving employees a larger scope for deciding how to organize their work is _____.

a) Job enlargement b) Job enrichment
c) both a) & b) d) None of the above

12) Social value creation is aim of _____.

a) Corporation b) Social enterprise
c) Civil society organization d) None

13) Ozone depletion, acid rains etc are outcomes of _____.

a) water pollution b) land pollution
c) sound pollution d) air pollution

14) Interviews, observation, focus groups and _____ are ways to do data collection.

a) forms and questionnaires b) testing
c) research d) analysis

Seat No.	

Set **P**

T. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Business Ethics (BTN07514)

Day & Date: Tuesday, 12-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All Questions are compulsory.
2) Figures to the right indicates full marks.

SECTION – I

Q.2 Solve Any Four. **16**

a) What is business ethics? Why it is important.

b) Define morality, ethics and ethical theory.

c) What is Social Accounting? Explain Social Accounting process with diagram.

d) Which are the Components of Business Ethics Management?

e) Explain in detail concept of Corporate citizenship.

f) Write a note on corporate accountability and transparency.

Q.3 Solve Any Two. **12**

a) What is globalization. Explain three issues of globalization.

b) Explain Context related factors in detail.

c) What is the nature of corporate social responsibilities?

SECTION – II

Q.4 Solve Any Four. **16**

a) Define the Rights of employees as stakeholders of the firm.

b) Differentiate between sectional CSO and promotional CSO.

c) What are the limitations of Business - CSO collaboration?

d) What are different types of environmental pollution?

e) Explain moral significance of Information Technology to business.

f) What are ethical issues in the relation between business and government?

Q.5 Solve Any Two. **12**

a) Discuss the ethical challenges of globalization and consumers at the global marketplace.

b) What are different purposes for boycotts in CSO tactics?

c) Write note on IT code of conduct.

SLR-QH-578

Seat No.	

Set Q

T. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Business Ethics (BTN07514)

Day & Date: Tuesday, 12-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Conventional MCQ: **14**

1) The degree to which corporate decisions, policies, activities, and impacts are acknowledged and made visible to relevant stakeholders is called as _____.
a) corporate transparency b) corporate accountability
c) corporate ethics d) none

2) Relevant information is made available in a timely and accessible manner, means _____.
a) accuracy b) faith
c) disclosure d) clarity

3) _____ means a worker's ability to control information about them and how it is used and shared.
a) Discrimination b) Health Testing
c) Fair wages d) Employee Privacy

4) Giving employees a larger scope for deciding how to organize their work is _____.
a) Job enlargement b) Job enrichment
c) both a) & b) d) None of the above

5) Social value creation is aim of _____.
a) Corporation b) Social enterprise
c) Civil society organization d) None

6) Ozone depletion, acid rains etc are outcomes of _____.
a) water pollution b) land pollution
c) sound pollution d) air pollution

7) Interviews, observation, focus groups and _____ are ways to do data collection.
a) forms and questionnaires b) testing
c) research d) analysis

8) _____ refers to the long term maintenance of systems.
a) Sustainability b) Globalization
c) Ethical Theories d) Morality

9) The moral principles, standards of behaviour, or set of values that guide a person's actions in the workplace is called _____.
a) Office place ethics b) factory place ethics
c) behavioural ethics d) work place ethics

10) Most companies begin the process of establishing organizational ethics programs by developing _____.
a) ethics training programs
b) code of conduct
c) ethics enforcement mechanisms
d) hidden agendas

11) _____ is concerned with the study of morality and the application of reason to elucidate specific rules and principles that determine morally acceptable courses of action.
a) Morality b) Ethical theories
c) Ethics d) All of the above

12) Sustainability can be regarded as comprising components _____.
a) environmental b) economic
c) social d) all of the above

13) In _____ ethical theories, different societies have different moral standards.
a) Descriptive b) Normative
c) Contemporary d) None of these

14) When we are referring to an individual's moral strength, which is determined by observing their pattern of actions over time is called _____.
a) Organizational factors b) Individual factors
c) Ethical issue intensity d) Opportunity

SLR-QH-578

Seat No.		Set	Q

T. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Business Ethics (BTN07514)

Day & Date: Tuesday, 12-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All Questions are compulsory.
2) Figures to the right indicates full marks.

SECTION – I

Q.2 Solve Any Four. **16**

a) What is business ethics? Why it is important.

b) Define morality, ethics and ethical theory.

c) What is Social Accounting? Explain Social Accounting process with diagram.

d) Which are the Components of Business Ethics Management?

e) Explain in detail concept of Corporate citizenship.

f) Write a note on corporate accountability and transparency.

Q.3 Solve Any Two. **12**

a) What is globalization. Explain three issues of globalization.

b) Explain Context related factors in detail.

c) What is the nature of corporate social responsibilities?

SECTION – II

Q.4 Solve Any Four. **16**

a) Define the Rights of employees as stakeholders of the firm.

b) Differentiate between sectional CSO and promotional CSO.

c) What are the limitations of Business - CSO collaboration?

d) What are different types of environmental pollution?

e) Explain moral significance of Information Technology to business.

f) What are ethical issues in the relation between business and government?

Q.5 Solve Any Two. **12**

a) Discuss the ethical challenges of globalization and consumers at the global marketplace.

b) What are different purposes for boycotts in CSO tactics?

c) Write note on IT code of conduct.

Seat No.	

Set R

T. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Business Ethics (BTN07514)

Day & Date: Tuesday, 12-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Conventional MCQ: **14**

1) Giving employees a larger scope for deciding how to organize their work is _____.
a) Job enlargement b) Job enrichment
c) both a) & b) d) None of the above

2) Social value creation is aim of _____.
a) Corporation b) Social enterprise
c) Civil society organization d) None

3) Ozone depletion, acid rains etc are outcomes of _____.
a) water pollution b) land pollution
c) sound pollution d) air pollution

4) Interviews, observation, focus groups and _____ are ways to do data collection.
a) forms and questionnaires b) testing
c) research d) analysis

5) _____ refers to the long term maintenance of systems.
a) Sustainability b) Globalization
c) Ethical Theories d) Morality

6) The moral principles, standards of behaviour, or set of values that guide a person's actions in the workplace is called _____.
a) Office place ethics b) factory place ethics
c) behavioural ethics d) work place ethics

7) Most companies begin the process of establishing organizational ethics programs by developing _____.
a) ethics training programs
b) code of conduct
c) ethics enforcement mechanisms
d) hidden agendas

8) _____ is concerned with the study of morality and the application of reason to elucidate specific rules and principles that determine morally acceptable courses of action.
a) Morality
b) Ethical theories
c) Ethics
d) All of the above

9) Sustainability can be regarded as comprising components _____.
a) environmental
b) economic
c) social
d) all of the above

10) In _____ ethical theories, different societies have different moral standards.
a) Descriptive
b) Normative
c) Contemporary
d) None of these

11) When we are referring to an individual's moral strength, which is determined by observing their pattern of actions over time is called _____.
a) Organizational factors
b) Individual factors
c) Ethical issue intensity
d) Opportunity

12) The degree to which corporate decisions, policies, activities, and impacts are acknowledged and made visible to relevant stakeholders is called as _____.
a) corporate transparency
b) corporate accountability
c) corporate ethics
d) none

13) Relevant information is made available in a timely and accessible manner, means _____.
a) accuracy
b) faith
c) disclosure
d) clarity

14) _____ means a worker's ability to control information about them and how it is used and shared.
a) Discrimination
b) Health Testing
c) Fair wages
d) Employee Privacy

Seat No.	

Set **R**

T. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Business Ethics (BTN07514)

Day & Date: Tuesday, 12-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All Questions are compulsory.
2) Figures to the right indicates full marks.

SECTION – I

Q.2 Solve Any Four. **16**

a) What is business ethics? Why it is important.

b) Define morality, ethics and ethical theory.

c) What is Social Accounting? Explain Social Accounting process with diagram.

d) Which are the Components of Business Ethics Management?

e) Explain in detail concept of Corporate citizenship.

f) Write a note on corporate accountability and transparency.

Q.3 Solve Any Two. **12**

a) What is globalization. Explain three issues of globalization.

b) Explain Context related factors in detail.

c) What is the nature of corporate social responsibilities?

SECTION – II

Q.4 Solve Any Four. **16**

a) Define the Rights of employees as stakeholders of the firm.

b) Differentiate between sectional CSO and promotional CSO.

c) What are the limitations of Business - CSO collaboration?

d) What are different types of environmental pollution?

e) Explain moral significance of Information Technology to business.

f) What are ethical issues in the relation between business and government?

Q.5 Solve Any Two. **12**

a) Discuss the ethical challenges of globalization and consumers at the global marketplace.

b) What are different purposes for boycotts in CSO tactics?

c) Write note on IT code of conduct.

Seat No.	

Set **S**

T. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Business Ethics (BTN07514)

Day & Date: Tuesday, 12-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Conventional MCQ: **14**

1) In _____ ethical theories, different societies have different moral standards.
a) Descriptive b) Normative
c) Contemporary d) None of these

2) When we are referring to an individual's moral strength, which is determined by observing their pattern of actions over time is called _____.
a) Organizational factors b) Individual factors
c) Ethical issue intensity d) Opportunity

3) The degree to which corporate decisions, policies, activities, and impacts are acknowledged and made visible to relevant stakeholders is called as _____.
a) corporate transparency b) corporate accountability
c) corporate ethics d) none

4) Relevant information is made available in a timely and accessible manner, means _____.
a) accuracy b) faith
c) disclosure d) clarity

5) _____ means a worker's ability to control information about them and how it is used and shared.
a) Discrimination b) Health Testing
c) Fair wages d) Employee Privacy

6) Giving employees a larger scope for deciding how to organize their work is _____.
a) Job enlargement b) Job enrichment
c) both a) & b) d) None of the above

7) Social value creation is aim of _____.
a) Corporation b) Social enterprise
c) Civil society organization d) None

8) Ozone depletion, acid rains etc are outcomes of _____.
a) water pollution b) land pollution
c) sound pollution d) air pollution

9) Interviews, observation, focus groups and _____ are ways to do data collection.
a) forms and questionnaires b) testing
c) research d) analysis

10) _____ refers to the long term maintenance of systems.
a) Sustainability b) Globalization
c) Ethical Theories d) Morality

11) The moral principles, standards of behaviour, or set of values that guide a person's actions in the workplace is called _____.
a) Office place ethics b) factory place ethics
c) behavioural ethics d) work place ethics

12) Most companies begin the process of establishing organizational ethics programs by developing _____.
a) ethics training programs
b) code of conduct
c) ethics enforcement mechanisms
d) hidden agendas

13) _____ is concerned with the study of morality and the application of reason to elucidate specific rules and principles that determine morally acceptable courses of action.
a) Morality b) Ethical theories
c) Ethics d) All of the above

14) Sustainability can be regarded as comprising components _____.
a) environmental b) economic
c) social d) all of the above

SLR-QH-578

Seat No.		Set	S

T. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Business Ethics (BTN07514)

Day & Date: Tuesday, 12-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All Questions are compulsory.
2) Figures to the right indicates full marks.

SECTION – I

Q.2 Solve Any Four. **16**

a) What is business ethics? Why it is important.

b) Define morality, ethics and ethical theory.

c) What is Social Accounting? Explain Social Accounting process with diagram.

d) Which are the Components of Business Ethics Management?

e) Explain in detail concept of Corporate citizenship.

f) Write a note on corporate accountability and transparency.

Q.3 Solve Any Two. **12**

a) What is globalization. Explain three issues of globalization.

b) Explain Context related factors in detail.

c) What is the nature of corporate social responsibilities?

SECTION – II

Q.4 Solve Any Four. **16**

a) Define the Rights of employees as stakeholders of the firm.

b) Differentiate between sectional CSO and promotional CSO.

c) What are the limitations of Business - CSO collaboration?

d) What are different types of environmental pollution?

e) Explain moral significance of Information Technology to business.

f) What are ethical issues in the relation between business and government?

Q.5 Solve Any Two. **12**

a) Discuss the ethical challenges of globalization and consumers at the global marketplace.

b) What are different purposes for boycotts in CSO tactics?

c) Write note on IT code of conduct.

SLR-QH-579

Seat No.		Set	P

T. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Managerial Economics (BTN07515)

Day & Date: Tuesday, 12-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) Which of the following is the best definition of managerial economics? Managerial economics is _____.
a) a distinct field of economic theory
b) a field that applies economic theory and the tools of decision science
c) a field that combines economic theory and mathematics
d) none of the above

2) Which of the following is defined as the study of the aggregate economy studied as a whole?
a) Mathematical economics b) Econometrics
c) Macroeconomics d) Microeconomics

3) Managerial economics generally refers to the integration of economic theory with business _____.
a) Ethics b) Management
c) Practice d) All of the above

4) Which of the following would NOT be a determinant of demand?
a) the price of related goods
b) income
c) tastes
d) the prices of the inputs used to produce the good

5) Other things equal, when the price of a good rises, the quantity supplied of the good also rises. This is the _____.
a) law of increasing costs b) law of diminishing returns
c) law of supply d) law of demand

6) When the price is higher than the equilibrium price, _____.
   a) a shortage will exist
   b) buyers desire to purchase more than is produced
   c) sellers desire to produce and sell more than buyers wish to purchase
   d) quantity demanded equals quantity supplied

7) If the price elasticity of demand for a good is 0.75 i.e. (less than one), the demand for the good can be described as _____.
   a) normal
   b) elastic
   c) inferior
   d) inelastic

8) A positive cross elasticity of demand coefficient indicates that _____.
   a) a product is an inferior good
   b) a product is a normal good
   c) two products are substitute goods
   d) two products are complementary goods

9) Time series patterns that repeat themselves after a period of days or weeks are called _____.
   a) random variation
   b) trend
   c) cycles
   d) seasonality

10) In time series, which of the following cannot be predicted?
   a) large increases in demand
   b) technological trends
   c) seasonal fluctuations
   d) random fluctuations

11) Short run is a period of time over which at least one factor must _____.
   a) Remain flexible
   b) Remain fixed
   c) Variable
   d) None of the above

12) If the short-run average variable costs of production for a firm are rising, then this indicates that _____.
   a) average total costs are at a maximum
   b) average fixed costs are constant
   c) marginal costs are above average variable costs
   d) average variable costs are below average fixed costs

13) Perfectly competitive firms are price takers because _____.
   a) each firm is very large
   b) there are no good substitutes for their goods
   c) many other firms produce identical products
   d) their demand curves are downward sloping

14) The demand curve faced by a monopolistically competitive firm is _____.
   a) Perfectly elastic
   b) Elastic
   c) Unit elastic
   d) Inelastic

SLR-QH-579

Seat No.	

Set P

T. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Managerial Economics (BTN07515)

Day & Date: Tuesday, 12-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All Questions are compulsory.
2) Figures to the right indicates full marks.

SECTION – I

Q.2 Solve Any Four. **16**

a) Explain the concept economics and managerial economics.

b) State & explain the law of demand and law of supply.

c) Explain economics contribution to managerial decision.

d) Explain the concept Price ceilings and Price floors.

e) Explain the concept elasticity of demand in detail.

f) Explain the concept income elasticity of demand.

Q.3 Solve Any Two. **12**

a) Explain the following terms:
i) Microeconomics
ii) Macroeconomics

b) Explain demand utility and consumer demand analysis.

c) Explain the impact of price elasticity on total revenue and marginal revenue.

SECTION – II

Q.4 Solve Any Four. **16**

a) Describe Survey Methods for demand forecasting.

b) Explain linear Regression method for demand forecasting.

c) What is production? Explain the concept of production function.

d) Explain breakeven analysis. Also state the limitations of breakeven analysis.

e) What is market? Explain the various types of market.

f) Explain the concept supply side of market.

Q.5 Solve Any Two. **12**

a) Explain Linear Programming (LP). Also state the advantages and limitations of LP Techniques.

b) State and explain the characteristics of market structure.

c) Explain following costs of Production:

i) Incremental Costs and Sunk Costs

ii) Historical and Replacement Costs

iii) Private and Social Costs

Seat No.	

Set Q

T. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Managerial Economics (BTN07515)

Day & Date: Tuesday, 12-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. 14

1) A positive cross elasticity of demand coefficient indicates that _____.
a) a product is an inferior good
b) a product is a normal good
c) two products are substitute goods
d) two products are complementary goods

2) Time series patterns that repeat themselves after a period of days or weeks are called _____.
a) random variation b) trend
c) cycles d) seasonality

3) In time series, which of the following cannot be predicted?
a) large increases in demand b) technological trends
c) seasonal fluctuations d) random fluctuations

4) Short run is a period of time over which at least one factor must _____.
a) Remain flexible b) Remain fixed
c) Variable d) None of the above

5) If the short-run average variable costs of production for a firm are rising, then this indicates that _____.
a) average total costs are at a maximum
b) average fixed costs are constant
c) marginal costs are above average variable costs
d) average variable costs are below average fixed costs

6) Perfectly competitive firms are price takers because _____.
a) each firm is very large
b) there are no good substitutes for their goods
c) many other firms produce identical products
d) their demand curves are downward sloping

7) The demand curve faced by a monopolistically competitive firm is _____.
a) Perfectly elastic
b) Elastic
c) Unit elastic
d) Inelastic

8) Which of the following is the best definition of managerial economics? Managerial economics is _____.
a) a distinct field of economic theory
b) a field that applies economic theory and the tools of decision science
c) a field that combines economic theory and mathematics
d) none of the above

9) Which of the following is defined as the study of the aggregate economy studied as a whole?
a) Mathematical economics
b) Econometrics
c) Macroeconomics
d) Microeconomics

10) Managerial economics generally refers to the integration of economic theory with business _____.
a) Ethics
b) Management
c) Practice
d) All of the above

11) Which of the following would NOT be a determinant of demand?
a) the price of related goods
b) income
c) tastes
d) the prices of the inputs used to produce the good

12) Other things equal, when the price of a good rises, the quantity supplied of the good also rises. This is the _____.
a) law of increasing costs
b) law of diminishing returns
c) law of supply
d) law of demand

13) When the price is higher than the equilibrium price, _____.
a) a shortage will exist
b) buyers desire to purchase more than is produced
c) sellers desire to produce and sell more than buyers wish to purchase
d) quantity demanded equals quantity supplied

14) If the price elasticity of demand for a good is 0.75 i.e. (less than one), the demand for the good can be described as _____.
a) normal
b) elastic
c) inferior
d) inelastic

SLR-QH-579

Seat No.	

Set Q

T. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Managerial Economics (BTN07515)

Day & Date: Tuesday, 12-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All Questions are compulsory.
2) Figures to the right indicates full marks.

SECTION – I

Q.2 Solve Any Four. **16**

a) Explain the concept economics and managerial economics.

b) State & explain the law of demand and law of supply.

c) Explain economics contribution to managerial decision.

d) Explain the concept Price ceilings and Price floors.

e) Explain the concept elasticity of demand in detail.

f) Explain the concept income elasticity of demand.

Q.3 Solve Any Two. **12**

a) Explain the following terms:
i) Microeconomics
ii) Macroeconomics

b) Explain demand utility and consumer demand analysis.

c) Explain the impact of price elasticity on total revenue and marginal revenue.

SECTION – II

Q.4 Solve Any Four. **16**

a) Describe Survey Methods for demand forecasting.

b) Explain linear Regression method for demand forecasting.

c) What is production? Explain the concept of production function.

d) Explain breakeven analysis. Also state the limitations of breakeven analysis.

e) What is market? Explain the various types of market.

f) Explain the concept supply side of market.

Q.5 Solve Any Two. **12**

a) Explain Linear Programming (LP). Also state the advantages and limitations of LP Techniques.

b) State and explain the characteristics of market structure.

c) Explain following costs of Production:

i) Incremental Costs and Sunk Costs

ii) Historical and Replacement Costs

iii) Private and Social Costs

Seat No.		Set	R

T. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Managerial Economics (BTN07515)

Day & Date: Tuesday, 12-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) Short run is a period of time over which at least one factor must _____.
a) Remain flexible b) Remain fixed
c) Variable d) None of the above

2) If the short-run average variable costs of production for a firm are rising, then this indicates that _____.
a) average total costs are at a maximum
b) average fixed costs are constant
c) marginal costs are above average variable costs
d) average variable costs are below average fixed costs

3) Perfectly competitive firms are price takers because _____.
a) each firm is very large
b) there are no good substitutes for their goods
c) many other firms produce identical products
d) their demand curves are downward sloping

4) The demand curve faced by a monopolistically competitive firm is _____.
a) Perfectly elastic b) Elastic
c) Unit elastic d) Inelastic

5) Which of the following is the best definition of managerial economics? Managerial economics is _____.
a) a distinct field of economic theory
b) a field that applies economic theory and the tools of decision science
c) a field that combines economic theory and mathematics
d) none of the above

6) Which of the following is defined as the study of the aggregate economy studied as a whole?
a) Mathematical economics
b) Econometrics
c) Macroeconomics
d) Microeconomics

7) Managerial economics generally refers to the integration of economic theory with business _____.
a) Ethics
b) Management
c) Practice
d) All of the above

8) Which of the following would NOT be a determinant of demand?
a) the price of related goods
b) income
c) tastes
d) the prices of the inputs used to produce the good

9) Other things equal, when the price of a good rises, the quantity supplied of the good also rises. This is the _____.
a) law of increasing costs
b) law of diminishing returns
c) law of supply
d) law of demand

10) When the price is higher than the equilibrium price, _____.
a) a shortage will exist
b) buyers desire to purchase more than is produced
c) sellers desire to produce and sell more than buyers wish to purchase
d) quantity demanded equals quantity supplied

11) If the price elasticity of demand for a good is 0.75 i.e. (less than one), the demand for the good can be described as _____.
a) normal
b) elastic
c) inferior
d) inelastic

12) A positive cross elasticity of demand coefficient indicates that _____.
a) a product is an inferior good
b) a product is a normal good
c) two products are substitute goods
d) two products are complementary goods

13) Time series patterns that repeat themselves after a period of days or weeks are called _____.
a) random variation
b) trend
c) cycles
d) seasonality

14) In time series, which of the following cannot be predicted?
a) large increases in demand
b) technological trends
c) seasonal fluctuations
d) random fluctuations

SLR-QH-579

Seat No.	

Set R

T. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Managerial Economics (BTN07515)

Day & Date: Tuesday, 12-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All Questions are compulsory.
2) Figures to the right indicates full marks.

SECTION – I

Q.2 Solve Any Four. **16**

a) Explain the concept economics and managerial economics.

b) State & explain the law of demand and law of supply.

c) Explain economics contribution to managerial decision.

d) Explain the concept Price ceilings and Price floors.

e) Explain the concept elasticity of demand in detail.

f) Explain the concept income elasticity of demand.

Q.3 Solve Any Two. **12**

a) Explain the following terms:
i) Microeconomics
ii) Macroeconomics

b) Explain demand utility and consumer demand analysis.

c) Explain the impact of price elasticity on total revenue and marginal revenue.

SECTION – II

Q.4 Solve Any Four. **16**

a) Describe Survey Methods for demand forecasting.

b) Explain linear Regression method for demand forecasting.

c) What is production? Explain the concept of production function.

d) Explain breakeven analysis. Also state the limitations of breakeven analysis.

e) What is market? Explain the various types of market.

f) Explain the concept supply side of market.

Q.5 Solve Any Two. **12**

a) Explain Linear Programming (LP). Also state the advantages and limitations of LP Techniques.

b) State and explain the characteristics of market structure.

c) Explain following costs of Production:

i) Incremental Costs and Sunk Costs

ii) Historical and Replacement Costs

iii) Private and Social Costs

Seat No.		Set	S

T. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Managerial Economics (BTN07515)

Day & Date: Tuesday, 12-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) When the price is higher than the equilibrium price, _____.
a) a shortage will exist
b) buyers desire to purchase more than is produced
c) sellers desire to produce and sell more than buyers wish to purchase
d) quantity demanded equals quantity supplied

2) If the price elasticity of demand for a good is 0.75 i.e. (less than one), the demand for the good can be described as _____.
a) normal b) elastic
c) inferior d) inelastic

3) A positive cross elasticity of demand coefficient indicates that _____.
a) a product is an inferior good
b) a product is a normal good
c) two products are substitute goods
d) two products are complementary goods

4) Time series patterns that repeat themselves after a period of days or weeks are called _____.
a) random variation b) trend
c) cycles d) seasonality

5) In time series, which of the following cannot be predicted?
a) large increases in demand b) technological trends
c) seasonal fluctuations d) random fluctuations

6) Short run is a period of time over which at least one factor must _____.
a) Remain flexible
b) Remain fixed
c) Variable
d) None of the above

7) If the short-run average variable costs of production for a firm are rising, then this indicates that _____.
a) average total costs are at a maximum
b) average fixed costs are constant
c) marginal costs are above average variable costs
d) average variable costs are below average fixed costs

8) Perfectly competitive firms are price takers because _____.
a) each firm is very large
b) there are no good substitutes for their goods
c) many other firms produce identical products
d) their demand curves are downward sloping

9) The demand curve faced by a monopolistically competitive firm is _____.
a) Perfectly elastic
b) Elastic
c) Unit elastic
d) Inelastic

10) Which of the following is the best definition of managerial economics? Managerial economics is _____.
a) a distinct field of economic theory
b) a field that applies economic theory and the tools of decision science
c) a field that combines economic theory and mathematics
d) none of the above

11) Which of the following is defined as the study of the aggregate economy studied as a whole?
a) Mathematical economics
b) Econometrics
c) Macroeconomics
d) Microeconomics

12) Managerial economics generally refers to the integration of economic theory with business _____.
a) Ethics
b) Management
c) Practice
d) All of the above

13) Which of the following would NOT be a determinant of demand?
a) the price of related goods
b) income
c) tastes
d) the prices of the inputs used to produce the good

14) Other things equal, when the price of a good rises, the quantity supplied of the good also rises. This is the _____.
a) law of increasing costs
b) law of diminishing returns
c) law of supply
d) law of demand

SLR-QH-579

Seat No.	

Set S

T. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Managerial Economics (BTN07515)

Day & Date: Tuesday, 12-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All Questions are compulsory.
2) Figures to the right indicates full marks.

SECTION – I

Q.2 Solve Any Four. **16**

a) Explain the concept economics and managerial economics.

b) State & explain the law of demand and law of supply.

c) Explain economics contribution to managerial decision.

d) Explain the concept Price ceilings and Price floors.

e) Explain the concept elasticity of demand in detail.

f) Explain the concept income elasticity of demand.

Q.3 Solve Any Two. **12**

a) Explain the following terms:
i) Microeconomics
ii) Macroeconomics

b) Explain demand utility and consumer demand analysis.

c) Explain the impact of price elasticity on total revenue and marginal revenue.

SECTION – II

Q.4 Solve Any Four. **16**

a) Describe Survey Methods for demand forecasting.

b) Explain linear Regression method for demand forecasting.

c) What is production? Explain the concept of production function.

d) Explain breakeven analysis. Also state the limitations of breakeven analysis.

e) What is market? Explain the various types of market.

f) Explain the concept supply side of market.

Q.5 Solve Any Two. **12**

a) Explain Linear Programming (LP). Also state the advantages and limitations of LP Techniques.

b) State and explain the characteristics of market structure.

c) Explain following costs of Production:

i) Incremental Costs and Sunk Costs

ii) Historical and Replacement Costs

iii) Private and Social Costs

SLR-QH-580

Seat No.		Set	P

T. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Smart Energy Management System (BTN07516)

Day & Date: Thursday, 14-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary and mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options and rewrite the sentence. **14**

1) Smart grids primarily differ from conventional grids due to _____.
a) Higher transmission voltage
b) Bidirectional flow of power and information
c) Use of only renewable sources
d) More distribution transformers

2) Which of the following is a key technology in next-generation smart grids?
a) Manual metering
b) SCADA and communication networks
c) Mechanical relays
d) Oil-cooled circuit breakers

3) Decision-making tools in smart grids are mainly used for _____.
a) Manual switching only
b) Estimation, scheduling, and management
c) Increasing losses
d) Disconnecting consumers

4) Which is NOT a type of energy storage medium?
a) Pumped hydro b) Flywheel
c) Supercapacitor d) Diesel generator

5) Demand Side Management (DSM) focuses on _____.
a) Increasing peak demand
b) Reducing system efficiency
c) Shaping consumer load profiles
d) Increasing generation capacity only

6) Demand Response is mainly related to _____.
a) Increasing electricity price permanently
b) Automatic customer disconnection
c) Changing load behavior based on pricing signals
d) Installing more substations

7) Which technique is widely used for forecasting in SEMS?
a) Manual charting
b) Optimization algorithms
c) Mechanical analysis
d) Oil testing

8) Grid computing in smart grids is used for _____.
a) Soil testing
b) Security, reliability, and market analysis
c) Manual billing
d) Cable insulation

9) From passive to active distribution grids means _____.
a) Only increasing conductor size
b) Adding distributed generation and automation
c) Decreasing the number of loads
d) Replacing transformers with capacitors

10) ToU, RTP, and CPP are _____.
a) Transformer cooling system
b) Tariff structures for metering
c) Protection schemes
d) Voltage regulation techniques

11) AMI stands for _____.
a) Automatic Meter Indicator
b) Advanced Metering Infrastructure
c) Automatic Machine Intelligence
d) Advanced Monitoring Interface

12) PHEV refers to _____.
a) Public High-Energy Vehicle
b) Plug-in Hybrid Electric Vehicle
c) Peak Hour Energy Voltage
d) Partial Home Energy Voltage

13) Smart city components do NOT include _____.
a) Smart parking
b) Smart payments
c) Smart vending
d) Manual metering

14) Smart home systems mainly help in _____.
a) Increasing energy wastage
b) Automating appliances and improving energy efficiency
c) Disconnecting loads permanently
d) Replacing distribution transformers

SLR-QH-580

Seat No.	

Set P

T. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Smart Energy Management System (BTN07516)

Day & Date: Thursday, 14-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All Questions are compulsory.
2) Figures to the right indicates full marks.

SECTION – I

Q.2 Attempt Any Four of the following. **16**

a) Define a smart grid. List any four key components of a smart grid.

b) Explain the role of communication technologies in smart grid operation.

c) Write short notes on:
i) Scheduling in smart grids
ii) Grid estimation

d) Differentiate between Transmission and Distribution network modeling.

e) Write a short note on Demand Response (DR) and its importance.

f) Explain data mining techniques used in Smart Energy Management Systems.

Q.3 Attempt Any Two of the following. **12**

a) Describe the various types of storage mediums and compare distribution-level and grid-scale storage.

b) Explain Demand Side Management (DSM) in detail. Discuss tools, rules, and DSM practices.

c) Explain the operating principles and models of smart grid components with suitable diagrams.

d) Discuss the key technologies used in generation, networks, and loads in next-generation smart grids.

SECTION – II

Q.4 Attempt Any Four of the following. **16**

a) Explain the importance of metering for industrial customers.

b) Write a short note on Plug-in Hybrid Electric Vehicles (PHEV) in smart grids.

c) Describe the role of smart lighting systems used in smart homes.

d) What is the difference between passive and active distribution networks?

e) Describe substation automation.

f) Write short notes on Time-of-Use (ToU), Real-Time Pricing (RTP), and Critical Peak Pricing (CPP)

Q.5 Attempt Any Two of the following. **12**

a) Explain distribution grid characteristics including assets, topology, and transition from passive to active grids.

b) Describe Advanced Metering Infrastructure (AMI) and smart meters with a detailed block diagram.

c) Explain demand response and demand-side management applications at the DSO (Distribution System Operator) level.

d) Explain various components of smart cities and describe integrated approaches for smart city energy management.

Seat No.	

Set **Q**

T. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Smart Energy Management System (BTN07516)

Day & Date: Thursday, 14-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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3) Figures to the right indicates full marks.
4) Assume suitable data if necessary and mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options and rewrite the sentence. **14**

1) Grid computing in smart grids is used for _____.
a) Soil testing
b) Security, reliability, and market analysis
c) Manual billing
d) Cable insulation

2) From passive to active distribution grids means _____.
a) Only increasing conductor size
b) Adding distributed generation and automation
c) Decreasing the number of loads
d) Replacing transformers with capacitors

3) ToU, RTP, and CPP are _____.
a) Transformer cooling system
b) Tariff structures for metering
c) Protection schemes
d) Voltage regulation techniques

4) AMI stands for _____.
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c) Smart vending d) Manual metering

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b) Automating appliances and improving energy efficiency
c) Disconnecting loads permanently
d) Replacing distribution transformers

8) Smart grids primarily differ from conventional grids due to _____.
a) Higher transmission voltage
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9) Which of the following is a key technology in next-generation smart grids?
a) Manual metering
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a) Manual switching only
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d) Disconnecting consumers

11) Which is NOT a type of energy storage medium?
a) Pumped hydro b) Flywheel
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a) Increasing peak demand
b) Reducing system efficiency
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d) Increasing generation capacity only

13) Demand Response is mainly related to _____.
a) Increasing electricity price permanently
b) Automatic customer disconnection
c) Changing load behavior based on pricing signals
d) Installing more substations

14) Which technique is widely used for forecasting in SEMS?
a) Manual charting b) Optimization algorithms
c) Mechanical analysis d) Oil testing

Seat No.	

Set **Q**

T. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Smart Energy Management System (BTN07516)

Day & Date: Thursday, 14-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All Questions are compulsory.
2) Figures to the right indicates full marks.

SECTION – I

Q.2 Attempt Any Four of the following. **16**

a) Define a smart grid. List any four key components of a smart grid.

b) Explain the role of communication technologies in smart grid operation.

c) Write short notes on:
i) Scheduling in smart grids
ii) Grid estimation

d) Differentiate between Transmission and Distribution network modeling.

e) Write a short note on Demand Response (DR) and its importance.

f) Explain data mining techniques used in Smart Energy Management Systems.

Q.3 Attempt Any Two of the following. **12**

a) Describe the various types of storage mediums and compare distribution-level and grid-scale storage.

b) Explain Demand Side Management (DSM) in detail. Discuss tools, rules, and DSM practices.

c) Explain the operating principles and models of smart grid components with suitable diagrams.

d) Discuss the key technologies used in generation, networks, and loads in next-generation smart grids.

SECTION – II

Q.4 Attempt Any Four of the following. **16**

a) Explain the importance of metering for industrial customers.

b) Write a short note on Plug-in Hybrid Electric Vehicles (PHEV) in smart grids.

c) Describe the role of smart lighting systems used in smart homes.

d) What is the difference between passive and active distribution networks?

e) Describe substation automation.

f) Write short notes on Time-of-Use (ToU), Real-Time Pricing (RTP), and Critical Peak Pricing (CPP)

Q.5 Attempt Any Two of the following. **12**

a) Explain distribution grid characteristics including assets, topology, and transition from passive to active grids.

b) Describe Advanced Metering Infrastructure (AMI) and smart meters with a detailed block diagram.

c) Explain demand response and demand-side management applications at the DSO (Distribution System Operator) level.

d) Explain various components of smart cities and describe integrated approaches for smart city energy management.

Seat No.	

Set R

T. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Smart Energy Management System (BTN07516)

Day & Date: Thursday, 14-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary and mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14

1) AMI stands for _____.
a) Automatic Meter Indicator
b) Advanced Metering Infrastructure
c) Automatic Machine Intelligence
d) Advanced Monitoring Interface

2) PHEV refers to _____.
a) Public High-Energy Vehicle
b) Plug-in Hybrid Electric Vehicle
c) Peak Hour Energy Voltage
d) Partial Home Energy Voltage

3) Smart city components do NOT include _____.
a) Smart parking b) Smart payments
c) Smart vending d) Manual metering

4) Smart home systems mainly help in _____.
a) Increasing energy wastage
b) Automating appliances and improving energy efficiency
c) Disconnecting loads permanently
d) Replacing distribution transformers

5) Smart grids primarily differ from conventional grids due to _____.
a) Higher transmission voltage
b) Bidirectional flow of power and information
c) Use of only renewable sources
d) More distribution transformers

6) Which of the following is a key technology in next-generation smart grids?
a) Manual metering
b) SCADA and communication networks
c) Mechanical relays
d) Oil-cooled circuit breakers

7) Decision-making tools in smart grids are mainly used for _____.
a) Manual switching only
b) Estimation, scheduling, and management
c) Increasing losses
d) Disconnecting consumers

8) Which is NOT a type of energy storage medium?
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9) Demand Side Management (DSM) focuses on _____.
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11) Which technique is widely used for forecasting in SEMS?
a) Manual charting b) Optimization algorithms
c) Mechanical analysis d) Oil testing

12) Grid computing in smart grids is used for _____.
a) Soil testing
b) Security, reliability, and market analysis
c) Manual billing
d) Cable insulation

13) From passive to active distribution grids means _____.
a) Only increasing conductor size
b) Adding distributed generation and automation
c) Decreasing the number of loads
d) Replacing transformers with capacitors

14) ToU, RTP, and CPP are _____.
a) Transformer cooling system
b) Tariff structures for metering
c) Protection schemes
d) Voltage regulation techniques

SLR-QH-580

Seat No.	

Set R

T. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Smart Energy Management System (BTN07516)

Day & Date: Thursday, 14-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All Questions are compulsory.
2) Figures to the right indicates full marks.

SECTION – I

Q.2 Attempt Any Four of the following. **16**

a) Define a smart grid. List any four key components of a smart grid.

b) Explain the role of communication technologies in smart grid operation.

c) Write short notes on:
i) Scheduling in smart grids
ii) Grid estimation

d) Differentiate between Transmission and Distribution network modeling.

e) Write a short note on Demand Response (DR) and its importance.

f) Explain data mining techniques used in Smart Energy Management Systems.

Q.3 Attempt Any Two of the following. **12**

a) Describe the various types of storage mediums and compare distribution-level and grid-scale storage.

b) Explain Demand Side Management (DSM) in detail. Discuss tools, rules, and DSM practices.

c) Explain the operating principles and models of smart grid components with suitable diagrams.

d) Discuss the key technologies used in generation, networks, and loads in next-generation smart grids.

SECTION – II

Q.4 Attempt Any Four of the following. **16**

a) Explain the importance of metering for industrial customers.

b) Write a short note on Plug-in Hybrid Electric Vehicles (PHEV) in smart grids.

c) Describe the role of smart lighting systems used in smart homes.

d) What is the difference between passive and active distribution networks?

e) Describe substation automation.

f) Write short notes on Time-of-Use (ToU), Real-Time Pricing (RTP), and Critical Peak Pricing (CPP)

Q.5 Attempt Any Two of the following. **12**

a) Explain distribution grid characteristics including assets, topology, and transition from passive to active grids.

b) Describe Advanced Metering Infrastructure (AMI) and smart meters with a detailed block diagram.

c) Explain demand response and demand-side management applications at the DSO (Distribution System Operator) level.

d) Explain various components of smart cities and describe integrated approaches for smart city energy management.

Seat No.		Set	S

T. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Smart Energy Management System (BTN07516)

Day & Date: Thursday, 14-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary and mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options and rewrite the sentence. **14**

1) Demand Response is mainly related to _____.
a) Increasing electricity price permanently
b) Automatic customer disconnection
c) Changing load behavior based on pricing signals
d) Installing more substations

2) Which technique is widely used for forecasting in SEMS?
a) Manual charting b) Optimization algorithms
c) Mechanical analysis d) Oil testing

3) Grid computing in smart grids is used for _____.
a) Soil testing
b) Security, reliability, and market analysis
c) Manual billing
d) Cable insulation

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b) Adding distributed generation and automation
c) Decreasing the number of loads
d) Replacing transformers with capacitors

5) ToU, RTP, and CPP are _____.
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b) Tariff structures for metering
c) Protection schemes
d) Voltage regulation techniques

6) AMI stands for _____.
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b) Plug-in Hybrid Electric Vehicle
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a) Manual metering
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c) Mechanical relays
d) Oil-cooled circuit breakers

12) Decision-making tools in smart grids are mainly used for _____.
a) Manual switching only
b) Estimation, scheduling, and management
c) Increasing losses
d) Disconnecting consumers

13) Which is NOT a type of energy storage medium?
a) Pumped hydro
b) Flywheel
c) Supercapacitor
d) Diesel generator

14) Demand Side Management (DSM) focuses on _____.
a) Increasing peak demand
b) Reducing system efficiency
c) Shaping consumer load profiles
d) Increasing generation capacity only

SLR-QH-580

Seat No.		Set	S

T. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Smart Energy Management System (BTN07516)

Day & Date: Thursday, 14-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All Questions are compulsory.
2) Figures to the right indicates full marks.

SECTION – I

Q.2 Attempt Any Four of the following. **16**

a) Define a smart grid. List any four key components of a smart grid.

b) Explain the role of communication technologies in smart grid operation.

c) Write short notes on:
i) Scheduling in smart grids
ii) Grid estimation

d) Differentiate between Transmission and Distribution network modeling.

e) Write a short note on Demand Response (DR) and its importance.

f) Explain data mining techniques used in Smart Energy Management Systems.

Q.3 Attempt Any Two of the following. **12**

a) Describe the various types of storage mediums and compare distribution-level and grid-scale storage.

b) Explain Demand Side Management (DSM) in detail. Discuss tools, rules, and DSM practices.

c) Explain the operating principles and models of smart grid components with suitable diagrams.

d) Discuss the key technologies used in generation, networks, and loads in next-generation smart grids.

SECTION – II

Q.4 Attempt Any Four of the following. **16**

a) Explain the importance of metering for industrial customers.

b) Write a short note on Plug-in Hybrid Electric Vehicles (PHEV) in smart grids.

c) Describe the role of smart lighting systems used in smart homes.

d) What is the difference between passive and active distribution networks?

e) Describe substation automation.

f) Write short notes on Time-of-Use (ToU), Real-Time Pricing (RTP), and Critical Peak Pricing (CPP)

Q.5 Attempt Any Two of the following. **12**

a) Explain distribution grid characteristics including assets, topology, and transition from passive to active grids.

b) Describe Advanced Metering Infrastructure (AMI) and smart meters with a detailed block diagram.

c) Explain demand response and demand-side management applications at the DSO (Distribution System Operator) level.

d) Explain various components of smart cities and describe integrated approaches for smart city energy management.

SLR-QH-581

Seat No.	

Set P

T. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Electric Motors and Controls for Electric Vehicle (BTN07517)

Day & Date: Thursday, 14-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary and mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose correct answer. **14**

1) In a Switched Reluctance Motor (SRM), the stator is designed with _____ poles to facilitate efficient operation.
a) Salient b) Smooth
c) Permanent Magnet d) Non-Salient

2) Which component is responsible for detecting the rotor position in a BLDC motor?
a) Commutator b) Hall Effect Sensor
c) Rotor Windings d) Stator

3) What does the principle of phase control in DC motors involve?
a) Varying the armature resistance
b) Adjusting the field current
c) Controlling the phase angle of the AC supply
d) Modulating the PWM signal

4) For continuous conduction of single phase fully controlled rectifier the firing angle will be?
a) greater than 90-degree b) less than 90-degrees
c) equal to 120 degree d) at any angle

5) Stator voltage control for speed control of induction motors is suitable for _____.
a) Fan and pump drives b) Drive of a crane
c) Running it as generator d) Constant load drive

6) In the speed control of slip ring IM using slip power recovery scheme _____.
a) the efficiency increases but power factor decreases
b) the efficiency improves but power remains constant
c) Power factor improves but efficiency decreases
d) Both power factor and efficiency improve

7) CSI are suitable for supplying power to _____.
a) R-L Load
b) Inductive load
c) Capacitive load
d) None of the above

8) _____ method relies on keeping V/f ratio constant so as to maintain air gap flux at constant value.
a) Scalar Control
b) Vector Control
c) Torque Control
d) None of the above

9) _____ is a technique that allows you to instantaneously control the motor magnetic flux and its electromagnetic torque in a decoupled way.
a) Scalar Control
b) Vector Control
c) Direct Torque Control
d) None of the above

10) Space vector modulation is responsible for generating pulse width modulated signals to control the switches of an inverter _____.
a) generating pulse width modulated signals to control the switches of an inverter
b) generating pulse width modulated signals only
c) control the switches of an inverter only
d) None of the above

11) _____ analysis of an IM allows decoupled analysis where the flux and torque component can be independently controlled?
a) Scalar Control
b) Vector Control
c) V/F Control
d) None of the above

12) The Field Oriented Control (FOC) enables the induction machine being controlled alike the _____.
a) Separately excited DC Machine
b) Permanent magnet DC Machine
c) Switched reluctance machine
d) Stepper motor

13) Power split mode of hybrid electric vehicle control uses _____.
a) Series & Parallel control topology
b) Only Series control topology
c) Only Parallel control topology
d) None of the above

14) Which of the following control loops used by Direct torque control _____.

a) speed control loop
b) torque control loop
c) Both a & b
d) None of the above

Seat No.		Set	P

T. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Electric Motors and Controls for Electric Vehicle (BTN07517)

Day & Date: Thursday, 14-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All Questions are compulsory.
2) Figures to the right indicates full marks.
3) Assume suitable data if necessary and mention it clearly.

SECTION – I

Q.2 Attempt (Any Four). **16**

a) Discuss the challenges in designing a Switched Reluctance Motor for automotive applications.

b) Discuss the Semi converter controller for DC motor drive.

c) Describe Mechanical coupling in Parallel HEDT and its impact on Drive Train performance.

d) Define V/f control and explain its significance in induction motor operation.

e) Analyze the requirement for slip and stator voltage compensation in induction motors.

f) Explain the concept of Peak Power Source (PPS) in Series HEDT and its significance.

Q.3 Attempt (Any Two). **12**

a) Explain the concept of a dual converter in DC motor drives with neat sketches.

b) What is BLDC Motor, how it is different from Conventional DC Motor? Explain significance of Back emf.

c) Compare and contrast the performance characteristics of Class C and Class D choppers when used to control a DC motor.

SECTION – II

Q.4 Attempt Any Four of the following. **16**

a) Explain in detail Indirect/Feed forward vector control of induction machine.

b) Explain principle of direct vector control of induction machine.

c) Explain Vehicle supervisory control in detail.

d) Describe the torque expression with stator and rotor fluxes in case of Direct Torque control of Induction machine.

e) Explain the hybrid mode of control of electric vehicle.

f) Describe space vector modulation control in case of induction machine.

Q.5 Attempt Any Two of the following. **12**

a) Explain different mode selection strategy of control of electric vehicle.

b) Explain in detail theory and dc drive analogy of field-oriented control of Induction Machine.

c) Explain with block diagram Direct Torque of induction motor.

SLR-QH-581

Seat No.	

Set Q

T. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Electric Motors and Controls for Electric Vehicle (BTN07517)

Day & Date: Thursday, 14-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary and mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose correct answer. **14**

1) _____ method relies on keeping V/f ratio constant so as to maintain air gap flux at constant value.
a) Scalar Control b) Vector Control
c) Torque Control d) None of the above

2) _____ is a technique that allows you to instantaneously control the motor magnetic flux and its electromagnetic torque in a decoupled way.
a) Scalar Control b) Vector Control
c) Direct Torque Control d) None of the above

3) Space vector modulation is responsible for generating pulse width modulated signals to control the switches of an inverter _____.
a) generating pulse width modulated signals to control the switches of an inverter
b) generating pulse width modulated signals only
c) control the switches of an inverter only
d) None of the above

4) _____ analysis of an IM allows decoupled analysis where the flux and torque component can be independently controlled?
a) Scalar Control b) Vector Control
c) V/F Control d) None of the above

5) The Field Oriented Control (FOC) enables the induction machine being controlled alike the _____.
a) Separately excited DC Machine
b) Permanent magnet DC Machine
c) Switched reluctance machine
d) Stepper motor

6) Power split mode of hybrid electric vehicle control uses _____.
a) Series & Parallel control topology
b) Only Series control topology
c) Only Parallel control topology
d) None of the above

7) Which of the following control loops used by Direct torque control _____.
a) speed control loop
b) torque control loop
c) Both a & b
d) None of the above

8) In a Switched Reluctance Motor (SRM), the stator is designed with _____ poles to facilitate efficient operation.
a) Salient
b) Smooth
c) Permanent Magnet
d) Non-Salient

9) Which component is responsible for detecting the rotor position in a BLDC motor?
a) Commutator
b) Hall Effect Sensor
c) Rotor Windings
d) Stator

10) What does the principle of phase control in DC motors involve?
a) Varying the armature resistance
b) Adjusting the field current
c) Controlling the phase angle of the AC supply
d) Modulating the PWM signal

11) For continuous conduction of single phase fully controlled rectifier the firing angle will be?
a) greater than 90-degree
b) less than 90-degrees
c) equal to 120 degree
d) at any angle

12) Stator voltage control for speed control of induction motors is suitable for _____.
a) Fan and pump drives
b) Drive of a crane
c) Running it as generator
d) Constant load drive

13) In the speed control of slip ring IM using slip power recovery scheme _____.
a) the efficiency increases but power factor decreases
b) the efficiency improves but power remains constant
c) Power factor improves but efficiency decreases
d) Both power factor and efficiency improve

14) CSI are suitable for supplying power to _____.
a) R-L Load
b) Inductive load
c) Capacitive load
d) None of the above

Seat No.	

Set **Q**

T. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Electric Motors and Controls for Electric Vehicle (BTN07517)

Day & Date: Thursday, 14-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All Questions are compulsory.
2) Figures to the right indicates full marks.
3) Assume suitable data if necessary and mention it clearly.

SECTION – I

Q.2 Attempt (Any Four). **16**

a) Discuss the challenges in designing a Switched Reluctance Motor for automotive applications.

b) Discuss the Semi converter controller for DC motor drive.

c) Describe Mechanical coupling in Parallel HEDT and its impact on Drive Train performance.

d) Define V/f control and explain its significance in induction motor operation.

e) Analyze the requirement for slip and stator voltage compensation in induction motors.

f) Explain the concept of Peak Power Source (PPS) in Series HEDT and its significance.

Q.3 Attempt (Any Two). **12**

a) Explain the concept of a dual converter in DC motor drives with neat sketches.

b) What is BLDC Motor, how it is different from Conventional DC Motor? Explain significance of Back emf.

c) Compare and contrast the performance characteristics of Class C and Class D choppers when used to control a DC motor.

SECTION – II

Q.4 Attempt Any Four of the following. **16**

a) Explain in detail Indirect/Feed forward vector control of induction machine.

b) Explain principle of direct vector control of induction machine.

c) Explain Vehicle supervisory control in detail.

d) Describe the torque expression with stator and rotor fluxes in case of Direct Torque control of Induction machine.

e) Explain the hybrid mode of control of electric vehicle.

f) Describe space vector modulation control in case of induction machine.

Q.5 Attempt Any Two of the following. **12**

a) Explain different mode selection strategy of control of electric vehicle.

b) Explain in detail theory and dc drive analogy of field-oriented control of Induction Machine.

c) Explain with block diagram Direct Torque of induction motor.

SLR-QH-581

Seat No.		Set	R

T. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Electric Motors and Controls for Electric Vehicle (BTN07517)

Day & Date: Thursday, 14-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary and mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose correct answer. **14**

1) _____ analysis of an IM allows decoupled analysis where the flux and torque component can be independently controlled?
a) Scalar Control b) Vector Control
c) V/F Control d) None of the above

2) The Field Oriented Control (FOC) enables the induction machine being controlled alike the _____.
a) Separately excited DC Machine
b) Permanent magnet DC Machine
c) Switched reluctance machine
d) Stepper motor

3) Power split mode of hybrid electric vehicle control uses _____.
a) Series & Parallel control topology
b) Only Series control topology
c) Only Parallel control topology
d) None of the above

4) Which of the following control loops used by Direct torque control _____.
a) speed control loop b) torque control loop
c) Both a & b d) None of the above

5) In a Switched Reluctance Motor (SRM), the stator is designed with _____ poles to facilitate efficient operation.
a) Salient b) Smooth
c) Permanent Magnet d) Non-Salient

6) Which component is responsible for detecting the rotor position in a BLDC motor?
a) Commutator
b) Hall Effect Sensor
c) Rotor Windings
d) Stator

7) What does the principle of phase control in DC motors involve?
a) Varying the armature resistance
b) Adjusting the field current
c) Controlling the phase angle of the AC supply
d) Modulating the PWM signal

8) For continuous conduction of single phase fully controlled rectifier the firing angle will be?
a) greater than 90-degree
b) less than 90-degrees
c) equal to 120 degree
d) at any angle

9) Stator voltage control for speed control of induction motors is suitable for _____.
a) Fan and pump drives
b) Drive of a crane
c) Running it as generator
d) Constant load drive

10) In the speed control of slip ring IM using slip power recovery scheme _____.
a) the efficiency increases but power factor decreases
b) the efficiency improves but power remains constant
c) Power factor improves but efficiency decreases
d) Both power factor and efficiency improve

11) CSI are suitable for supplying power to _____.
a) R-L Load
b) Inductive load
c) Capacitive load
d) None of the above

12) _____ method relies on keeping V/f ratio constant so as to maintain air gap flux at constant value.
a) Scalar Control
b) Vector Control
c) Torque Control
d) None of the above

13) _____ is a technique that allows you to instantaneously control the motor magnetic flux and its electromagnetic torque in a decoupled way.
a) Scalar Control
b) Vector Control
c) Direct Torque Control
d) None of the above

14) Space vector modulation is responsible for generating pulse width modulated signals to control the switches of an inverter _____.
a) generating pulse width modulated signals to control the switches of an inverter
b) generating pulse width modulated signals only
c) control the switches of an inverter only
d) None of the above

Seat No.	

Set **R**

T. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Electric Motors and Controls for Electric Vehicle (BTN07517)

Day & Date: Thursday, 14-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All Questions are compulsory.
2) Figures to the right indicates full marks.
3) Assume suitable data if necessary and mention it clearly.

SECTION – I

Q.2 Attempt (Any Four). **16**

a) Discuss the challenges in designing a Switched Reluctance Motor for automotive applications.

b) Discuss the Semi converter controller for DC motor drive.

c) Describe Mechanical coupling in Parallel HEDT and its impact on Drive Train performance.

d) Define V/f control and explain its significance in induction motor operation.

e) Analyze the requirement for slip and stator voltage compensation in induction motors.

f) Explain the concept of Peak Power Source (PPS) in Series HEDT and its significance.

Q.3 Attempt (Any Two). **12**

a) Explain the concept of a dual converter in DC motor drives with neat sketches.

b) What is BLDC Motor, how it is different from Conventional DC Motor? Explain significance of Back emf.

c) Compare and contrast the performance characteristics of Class C and Class D choppers when used to control a DC motor.

SECTION – II

Q.4 Attempt Any Four of the following. **16**

a) Explain in detail Indirect/Feed forward vector control of induction machine.

b) Explain principle of direct vector control of induction machine.

c) Explain Vehicle supervisory control in detail.

d) Describe the torque expression with stator and rotor fluxes in case of Direct Torque control of Induction machine.

e) Explain the hybrid mode of control of electric vehicle.

f) Describe space vector modulation control in case of induction machine.

Q.5 Attempt Any Two of the following. **12**

a) Explain different mode selection strategy of control of electric vehicle.

b) Explain in detail theory and dc drive analogy of field-oriented control of Induction Machine.

c) Explain with block diagram Direct Torque of induction motor.

SLR-QH-581

Seat No.		Set	S

T. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Electric Motors and Controls for Electric Vehicle (BTN07517)

Day & Date: Thursday, 14-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary and mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose correct answer. **14**

1) In the speed control of slip ring IM using slip power recovery scheme _____.
a) the efficiency increases but power factor decreases
b) the efficiency improves but power remains constant
c) Power factor improves but efficiency decreases
d) Both power factor and efficiency improve

2) CSI are suitable for supplying power to _____.
a) R-L Load b) Inductive load
c) Capacitive load d) None of the above

3) _____ method relies on keeping V/f ratio constant so as to maintain air gap flux at constant value.
a) Scalar Control b) Vector Control
c) Torque Control d) None of the above

4) _____ is a technique that allows you to instantaneously control the motor magnetic flux and its electromagnetic torque in a decoupled way.
a) Scalar Control b) Vector Control
c) Direct Torque Control d) None of the above

5) Space vector modulation is responsible for generating pulse width modulated signals to control the switches of an inverter _____.
a) generating pulse width modulated signals to control the switches of an inverter
b) generating pulse width modulated signals only
c) control the switches of an inverter only
d) None of the above

6) _____ analysis of an IM allows decoupled analysis where the flux and torque component can be independently controlled?
a) Scalar Control
b) Vector Control
c) V/F Control
d) None of the above

7) The Field Oriented Control (FOC) enables the induction machine being controlled alike the _____.
a) Separately excited DC Machine
b) Permanent magnet DC Machine
c) Switched reluctance machine
d) Stepper motor

8) Power split mode of hybrid electric vehicle control uses _____.
a) Series & Parallel control topology
b) Only Series control topology
c) Only Parallel control topology
d) None of the above

9) Which of the following control loops used by Direct torque control _____.
a) speed control loop
b) torque control loop
c) Both a & b
d) None of the above

10) In a Switched Reluctance Motor (SRM), the stator is designed with _____ poles to facilitate efficient operation.
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b) Smooth
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11) Which component is responsible for detecting the rotor position in a BLDC motor?
a) Commutator
b) Hall Effect Sensor
c) Rotor Windings
d) Stator

12) What does the principle of phase control in DC motors involve?
a) Varying the armature resistance
b) Adjusting the field current
c) Controlling the phase angle of the AC supply
d) Modulating the PWM signal

13) For continuous conduction of single phase fully controlled rectifier the firing angle will be?
a) greater than 90-degree
b) less than 90-degrees
c) equal to 120 degree
d) at any angle

14) Stator voltage control for speed control of induction motors is suitable for _____.
a) Fan and pump drives
b) Drive of a crane
c) Running it as generator
d) Constant load drive

SLR-QH-581

Seat No.		Set	S

T. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Electric Motors and Controls for Electric Vehicle (BTN07517)

Day & Date: Thursday, 14-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All Questions are compulsory.
2) Figures to the right indicates full marks.
3) Assume suitable data if necessary and mention it clearly.

SECTION – I

Q.2 Attempt (Any Four). **16**

a) Discuss the challenges in designing a Switched Reluctance Motor for automotive applications.

b) Discuss the Semi converter controller for DC motor drive.

c) Describe Mechanical coupling in Parallel HEDT and its impact on Drive Train performance.

d) Define V/f control and explain its significance in induction motor operation.

e) Analyze the requirement for slip and stator voltage compensation in induction motors.

f) Explain the concept of Peak Power Source (PPS) in Series HEDT and its significance.

Q.3 Attempt (Any Two). **12**

a) Explain the concept of a dual converter in DC motor drives with neat sketches.

b) What is BLDC Motor, how it is different from Conventional DC Motor? Explain significance of Back emf.

c) Compare and contrast the performance characteristics of Class C and Class D choppers when used to control a DC motor.

SECTION – II

Q.4 Attempt Any Four of the following. **16**

a) Explain in detail Indirect/Feed forward vector control of induction machine.

b) Explain principle of direct vector control of induction machine.

c) Explain Vehicle supervisory control in detail.

d) Describe the torque expression with stator and rotor fluxes in case of Direct Torque control of Induction machine.

e) Explain the hybrid mode of control of electric vehicle.

f) Describe space vector modulation control in case of induction machine.

Q.5 Attempt Any Two of the following. **12**

a) Explain different mode selection strategy of control of electric vehicle.

b) Explain in detail theory and dc drive analogy of field-oriented control of Induction Machine.

c) Explain with block diagram Direct Torque of induction motor.

SLR-QH-582

Seat No.	

Set P

T.Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Economics (BTN07506)

Day & Date: Sunday, 10-05-2026 Max. Marks: 50
Time: 10:00 AM To 12:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary and mention it clearly.

MCQ/Objective Type Questions

Duration: 20 Minutes Marks:10

Q.1 Choose the correct alternatives from the given options. 10

1) The most fundamental economic problem is _____.
a) Security
b) European countries buy more goods from foreigners than supply to foreigners
c) health
d) Scarcity

2) Money supply increases when inflation rises in the economy _____.
a) No change b) Decrease
c) Increase d) None of the these

3) The mix of inflation and stagnation is called _____.
a) Demand-pull inflation b) Cost-push inflation
c) Devaluation d) Stagflation

4) Which of the following is defined as the study of individual units in an economy?
a) Microeconomics
b) Macroeconomics
c) Income and employment theory
d) None of the above

5) Which of the following statements gives a true picture of the central problem of an economy?
a) How to produce
b) How to distribute the produced goods
c) What to produce
d) All of the above

6) Which of the following activities is not included in the calculation of the national income of a country?
   a) A maid working for a family on a full-time basis
   b) A lawyer conducting their law practice
   c) A housewife performing housework chores
   d) A dispensary rendering medical services

7) Which of the following statements is accurate about the relation between indirect taxes and subsidies?
   a) If the factor cost is greater than the market price, then indirect taxes are less than subsidies
   b) If the factor cost is greater than the market price, then indirect taxes are greater than subsidies
   c) If the factor cost is greater than the market price, then indirect taxes are equal to subsidies
   d) None of the above

8) Which of the following statements are true about the study of macroeconomics?
   a) It is a study of economics that deals with households, government, firms and demand-supply
   b) It is a study of economics that deals with households, government, firms and the external sector
   c) It is a study of economics that deals with price levels, profit, expenditure and cost
   d) None of the above

9) Which of the following is the relation that the law of demand defines?
   a) Income and price of a commodity
   b) Price and quantity of a commodity
   c) Income and quantity demanded
   d) Quantity demanded and quantity supplied

10) Which of the following measures are adopted to take care of inflation in an economy?
   a) Decrease in transfer payments along with a reduction in taxation
   b) Increase in transfer payments along with an increase in taxation
   c) Decrease in government expenditure along with an increase in taxation
   d) Increase in government expenditure along with a decrease in taxation

Seat No.	

Set **P**

T.Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New/Old) (CBCS)
Examination: March/April – 2026
Economics (BTN07506)

Day & Date: Sunday, 10-05-2026 Max. Marks: 40
Time: 10:00 AM To 12:00 PM

Instructions: 1) Attempt Any Four questions out of Q.2 to Q.7.
2) Figures at right indicate marks.

Q.2 Explain Basic Economic problems, Resource Constraints and Welfare maximization. **10**

Q.3 Explain Theory of Utility and Consumer's Choice, Theories of Demand, Supply and Market Equilibrium. **10**

Q.4 Explain an overview of Macroeconomics, measurement and determination of national income. **10**

Q.5 Explain International Trade, foreign exchange and balance payments. **10**

Q.6 Define central bank, discuss the function of central banking in India. **10**

Q.7 Define national income. Explain the methods of measuring national income. **10**

SLR-QH-582

Seat No.	

Set Q

T.Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Economics (BTN07506)

Day & Date: Sunday, 10-05-2026 Max. Marks: 50
Time: 10:00 AM To 12:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary and mention it clearly.

MCQ/Objective Type Questions

Duration: 20 Minutes Marks:10

Q.1 Choose the correct alternatives from the given options. 10

1) Which of the following activities is not included in the calculation of the national income of a country?
a) A maid working for a family on a full-time basis
b) A lawyer conducting their law practice
c) A housewife performing housework chores
d) A dispensary rendering medical services

2) Which of the following statements is accurate about the relation between indirect taxes and subsidies?
a) If the factor cost is greater than the market price, then indirect taxes are less than subsidies
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c) If the factor cost is greater than the market price, then indirect taxes are equal to subsidies
d) None of the above

3) Which of the following statements are true about the study of macroeconomics?
a) It is a study of economics that deals with households, government, firms and demand-supply
b) It is a study of economics that deals with households, government, firms and the external sector
c) It is a study of economics that deals with price levels, profit, expenditure and cost
d) None of the above

4) Which of the following is the relation that the law of demand defines?
   a) Income and price of a commodity
   b) Price and quantity of a commodity
   c) Income and quantity demanded
   d) Quantity demanded and quantity supplied

5) Which of the following measures are adopted to take care of inflation in an economy?
   a) Decrease in transfer payments along with a reduction in taxation
   b) Increase in transfer payments along with an increase in taxation
   c) Decrease in government expenditure along with an increase in taxation
   d) Increase in government expenditure along with a decrease in taxation

6) The most fundamental economic problem is _____.
   a) Security
   b) European countries buy more goods from foreigners than supply to foreigners
   c) health
   d) Scarcity

7) Money supply increases when inflation rises in the economy _____.
   a) No change
   b) Decrease
   c) Increase
   d) None of the these

8) The mix of inflation and stagnation is called _____.
   a) Demand-pull inflation
   b) Cost-push inflation
   c) Devaluation
   d) Stagflation

9) Which of the following is defined as the study of individual units in an economy?
   a) Microeconomics
   b) Macroeconomics
   c) Income and employment theory
   d) None of the above

10) Which of the following statements gives a true picture of the central problem of an economy?
   a) How to produce
   b) How to distribute the produced goods
   c) What to produce
   d) All of the above

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New/Old) (CBCS)
Examination: March/April – 2026
Economics (BTN07506)

Day & Date: Sunday, 10-05-2026 Max. Marks: 40
Time: 10:00 AM To 12:00 PM

Instructions: 1) Attempt Any Four questions out of Q.2 to Q.7.
2) Figures at right indicate marks.

Q.2 Explain Basic Economic problems, Resource Constraints and Welfare maximization. **10**

Q.3 Explain Theory of Utility and Consumer's Choice, Theories of Demand, Supply and Market Equilibrium. **10**

Q.4 Explain an overview of Macroeconomics, measurement and determination of national income. **10**

Q.5 Explain International Trade, foreign exchange and balance payments. **10**

Q.6 Define central bank, discuss the function of central banking in India. **10**

Q.7 Define national income. Explain the methods of measuring national income. **10**

SLR-QH-582

Seat No.	

Set R

T.Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Economics (BTN07506)

Day & Date: Sunday, 10-05-2026 Max. Marks: 50
Time: 10:00 AM To 12:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary and mention it clearly.

MCQ/Objective Type Questions

Duration: 20 Minutes Marks:10

Q.1 Choose the correct alternatives from the given options. 10

1) Which of the following is the relation that the law of demand defines?
a) Income and price of a commodity
b) Price and quantity of a commodity
c) Income and quantity demanded
d) Quantity demanded and quantity supplied

2) Which of the following measures are adopted to take care of inflation in an economy?
a) Decrease in transfer payments along with a reduction in taxation
b) Increase in transfer payments along with an increase in taxation
c) Decrease in government expenditure along with an increase in taxation
d) Increase in government expenditure along with a decrease in taxation

3) The most fundamental economic problem is _____.
a) Security
b) European countries buy more goods from foreigners than supply to foreigners
c) health
d) Scarcity

4) Money supply increases when inflation rises in the economy _____.
a) No change b) Decrease
c) Increase d) None of the these

5) The mix of inflation and stagnation is called _____.
   a) Demand-pull inflation
   b) Cost-push inflation
   c) Devaluation
   d) Stagflation

6) Which of the following is defined as the study of individual units in an economy?
   a) Microeconomics
   b) Macroeconomics
   c) Income and employment theory
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7) Which of the following statements gives a true picture of the central problem of an economy?
   a) How to produce
   b) How to distribute the produced goods
   c) What to produce
   d) All of the above

8) Which of the following activities is not included in the calculation of the national income of a country?
   a) A maid working for a family on a full-time basis
   b) A lawyer conducting their law practice
   c) A housewife performing housework chores
   d) A dispensary rendering medical services

9) Which of the following statements is accurate about the relation between indirect taxes and subsidies?
   a) If the factor cost is greater than the market price, then indirect taxes are less than subsidies
   b) If the factor cost is greater than the market price, then indirect taxes are greater than subsidies
   c) If the factor cost is greater than the market price, then indirect taxes are equal to subsidies
   d) None of the above

10) Which of the following statements are true about the study of macroeconomics?
   a) It is a study of economics that deals with households, government, firms and demand-supply
   b) It is a study of economics that deals with households, government, firms and the external sector
   c) It is a study of economics that deals with price levels, profit, expenditure and cost
   d) None of the above

Seat No.	

Set R

T.Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New/Old) (CBCS)
Examination: March/April – 2026
Economics (BTN07506)

Day & Date: Sunday, 10-05-2026 Max. Marks: 40
Time: 10:00 AM To 12:00 PM

Instructions: 1) Attempt Any Four questions out of Q.2 to Q.7.
2) Figures at right indicate marks.

Q.2 Explain Basic Economic problems, Resource Constraints and Welfare maximization. **10**

Q.3 Explain Theory of Utility and Consumer's Choice, Theories of Demand, Supply and Market Equilibrium. **10**

Q.4 Explain an overview of Macroeconomics, measurement and determination of national income. **10**

Q.5 Explain International Trade, foreign exchange and balance payments. **10**

Q.6 Define central bank, discuss the function of central banking in India. **10**

Q.7 Define national income. Explain the methods of measuring national income. **10**

Seat No.	

Set **S**

T.Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Economics (BTN07506)

Day & Date: Sunday, 10-05-2026 Max. Marks: 50
Time: 10:00 AM To 12:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary and mention it clearly.

MCQ/Objective Type Questions

Duration: 20 Minutes Marks:10

Q.1 Choose the correct alternatives from the given options. 10

1) The mix of inflation and stagnation is called _____.
a) Demand-pull inflation b) Cost-push inflation
c) Devaluation d) Stagflation

2) Which of the following is defined as the study of individual units in an economy?
a) Microeconomics
b) Macroeconomics
c) Income and employment theory
d) None of the above

3) Which of the following statements gives a true picture of the central problem of an economy?
a) How to produce
b) How to distribute the produced goods
c) What to produce
d) All of the above

4) Which of the following activities is not included in the calculation of the national income of a country?
a) A maid working for a family on a full-time basis
b) A lawyer conducting their law practice
c) A housewife performing housework chores
d) A dispensary rendering medical services

5) Which of the following statements is accurate about the relation between indirect taxes and subsidies?
   a) If the factor cost is greater than the market price, then indirect taxes are less than subsidies
   b) If the factor cost is greater than the market price, then indirect taxes are greater than subsidies
   c) If the factor cost is greater than the market price, then indirect taxes are equal to subsidies
   d) None of the above

6) Which of the following statements are true about the study of macroeconomics?
   a) It is a study of economics that deals with households, government, firms and demand-supply
   b) It is a study of economics that deals with households, government, firms and the external sector
   c) It is a study of economics that deals with price levels, profit, expenditure and cost
   d) None of the above

7) Which of the following is the relation that the law of demand defines?
   a) Income and price of a commodity
   b) Price and quantity of a commodity
   c) Income and quantity demanded
   d) Quantity demanded and quantity supplied

8) Which of the following measures are adopted to take care of inflation in an economy?
   a) Decrease in transfer payments along with a reduction in taxation
   b) Increase in transfer payments along with an increase in taxation
   c) Decrease in government expenditure along with an increase in taxation
   d) Increase in government expenditure along with a decrease in taxation

9) The most fundamental economic problem is _____.
   a) Security
   b) European countries buy more goods from foreigners than supply to foreigners
   c) health
   d) Scarcity

10) Money supply increases when inflation rises in the economy _____.
   a) No change
   b) Decrease
   c) Increase
   d) None of the these

SLR-QH-582

Seat No.	

Set | **S**

T.Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New/Old) (CBCS)
Examination: March/April – 2026
Economics (BTN07506)

Day & Date: Sunday, 10-05-2026 Max. Marks: 40
Time: 10:00 AM To 12:00 PM

Instructions: 1) Attempt Any Four questions out of Q.2 to Q.7.
2) Figures at right indicate marks.

Q.2 Explain Basic Economic problems, Resource Constraints and Welfare maximization. **10**

Q.3 Explain Theory of Utility and Consumer's Choice, Theories of Demand, Supply and Market Equilibrium. **10**

Q.4 Explain an overview of Macroeconomics, measurement and determination of national income. **10**

Q.5 Explain International Trade, foreign exchange and balance payments. **10**

Q.6 Define central bank, discuss the function of central banking in India. **10**

Q.7 Define national income. Explain the methods of measuring national income. **10**

SLR-QH-583

Seat No.	

Set P

T.Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Intellectual Property Rights for Technology Development and Management (BTN07507)

Day & Date: Sunday, 10-05-2026 Max. Marks: 50
Time: 10:00 AM To 12:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume additional data if required and state it clearly.

MCQ/Objective Type Questions

Duration: 20 Minutes Marks:10

Q.1 Choose the correct alternatives from the options and rewrite the sentence. **10**

1) What is the term of Patent?
a) 35 years b) 25 years
c) 20 years d) 15 years

2) The term 'Intellectual Property Rights' covers _____.
a) Copyrights b) Know-how
c) Trade dress d) All of these

3) Who fills the invention disclosure form (IDF)?
a) Inventor b) Patent Attorney
c) Assignee d) Patent Searcher

4) Intellectual Property Rights (IPR) protects the use of information and ideas that are of _____.
a) Ethical value b) Moral value
c) Social value d) Commercial value

5) The following can be patented _____.
a) Machine b) Process
c) Composition of matter d) All of these

6) The first Patent Law was enacted in India in the year _____.
a) 1856 b) 1880
c) 1905 d) 1850

7) In which article is intellectual property rights outlined?
a) Article 15 b) Article 27
c) Article 13 d) Article 20

8) In patent law “technical advancement” means _____.
a) diffusion of technology
b) technical improvement in existing knowledge
c) existing knowledge in the domain
d) market value of the technology

9) All of the following are examples of intellectual property protections except _____.
a) Copyright b) Patents
c) Contracts d) Trademarks

10) What is copyright meant for?
a) Film work b) Books
c) Essay d) All of these

SLR-QH-583

Seat No.	

Set P

T.Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New/Old) (CBCS)
Examination: March/April – 2026
Intellectual Property Rights for Technology Development and Management (BTN07507)

Day & Date: Sunday, 10-05-2026 Max. Marks: 40
Time: 10:00 AM To 12:00 PM

Instructions: 1) All questions are compulsory.
2) Figures at right indicate marks.
3) Assumes additional data, if required and state it clearly.

Q.2 Attempt following questions. (Any Two) **20**

a) What are Intellectual Property Rights? How it is useful for engineers?

b) Write a detailed note on copyright issues in creative works.

c) Explain in detail importance of intellectual property in project planning.

Q.3 Write short notes. (Any Four) **20**

a) IPR & Electronic Commerce

b) Concepts of Valuation of IP

c) TRIPS & Access to Medicines

d) Protection of Traditional knowledge

e) Concepts of confidentiality and information security

f) Role of WTO in protecting Intellectual Property Rights

SLR-QH-583

Seat No.	

Set Q

T.Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Intellectual Property Rights for Technology Development and Management (BTN07507)

Day & Date: Sunday, 10-05-2026 Max. Marks: 50
Time: 10:00 AM To 12:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume additional data if required and state it clearly.

MCQ/Objective Type Questions

Duration: 20 Minutes Marks:10

Q.1 Choose the correct alternatives from the options and rewrite the sentence. **10**

1) The first Patent Law was enacted in India in the year _____.
a) 1856 b) 1880
c) 1905 d) 1850

2) In which article is intellectual property rights outlined?
a) Article 15 b) Article 27
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c) existing knowledge in the domain
d) market value of the technology

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5) What is copyright meant for?
a) Film work b) Books
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6) What is the term of Patent?
a) 35 years b) 25 years
c) 20 years d) 15 years

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   a) Copyrights
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   c) Trade dress
   d) All of these

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   b) Patent Attorney
   c) Assignee
   d) Patent Searcher

9) Intellectual Property Rights (IPR) protects the use of information and ideas that are of _____.
   a) Ethical value
   b) Moral value
   c) Social value
   d) Commercial value

10) The following can be patented _____.
   a) Machine
   b) Process
   c) Composition of matter
   d) All of these

SLR-QH-583

Seat No.	

Set Q

T.Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New/Old) (CBCS)
Examination: March/April – 2026
Intellectual Property Rights for Technology Development and Management (BTN07507)

Day & Date: Sunday, 10-05-2026 Max. Marks: 40
Time: 10:00 AM To 12:00 PM

Instructions: 1) All questions are compulsory.
2) Figures at right indicate marks.
3) Assumes additional data, if required and state it clearly.

Q.2 Attempt following questions. (Any Two) **20**

a) What are Intellectual Property Rights? How it is useful for engineers?

b) Write a detailed note on copyright issues in creative works.

c) Explain in detail importance of intellectual property in project planning.

Q.3 Write short notes. (Any Four) **20**

a) IPR & Electronic Commerce

b) Concepts of Valuation of IP

c) TRIPS & Access to Medicines

d) Protection of Traditional knowledge

e) Concepts of confidentiality and information security

f) Role of WTO in protecting Intellectual Property Rights

SLR-QH-583

Seat No.		Set	R

T.Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Intellectual Property Rights for Technology Development and Management (BTN07507)

Day & Date: Sunday, 10-05-2026 Max. Marks: 50
Time: 10:00 AM To 12:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume additional data if required and state it clearly.

MCQ/Objective Type Questions

Duration: 20 Minutes Marks:10

Q.1 Choose the correct alternatives from the options and rewrite the sentence. **10**

1) All of the following are examples of intellectual property protections except _____.
a) Copyright b) Patents
c) Contracts d) Trademarks

2) What is copyright meant for?
a) Film work b) Books
c) Essay d) All of these

3) What is the term of Patent?
a) 35 years b) 25 years
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c) 1905 d) 1850

9) In which article is intellectual property rights outlined?
a) Article 15 b) Article 27
c) Article 13 d) Article 20

10) In patent law “technical advancement” means _____.
a) diffusion of technology
b) technical improvement in existing knowledge
c) existing knowledge in the domain
d) market value of the technology

SLR-QH-583

Seat No.		Set	R

T.Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New/Old) (CBCS)
Examination: March/April – 2026
Intellectual Property Rights for Technology Development and Management (BTN07507)

Day & Date: Sunday, 10-05-2026 Max. Marks: 40
Time: 10:00 AM To 12:00 PM

Instructions: 1) All questions are compulsory.
2) Figures at right indicate marks.
3) Assumes additional data, if required and state it clearly.

Q.2 Attempt following questions. (Any Two) **20**

a) What are Intellectual Property Rights? How it is useful for engineers?

b) Write a detailed note on copyright issues in creative works.

c) Explain in detail importance of intellectual property in project planning.

Q.3 Write short notes. (Any Four) **20**

a) IPR & Electronic Commerce

b) Concepts of Valuation of IP

c) TRIPS & Access to Medicines

d) Protection of Traditional knowledge

e) Concepts of confidentiality and information security

f) Role of WTO in protecting Intellectual Property Rights

SLR-QH-583

Seat No.		Set	S

T.Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Intellectual Property Rights for Technology Development and Management (BTN07507)

Day & Date: Sunday, 10-05-2026 Max. Marks: 50
Time: 10:00 AM To 12:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume additional data if required and state it clearly.

MCQ/Objective Type Questions

Duration: 20 Minutes Marks:10

Q.1 Choose the correct alternatives from the options and rewrite the sentence. **10**

1) Who fills the invention disclosure form (IDF)?
a) Inventor b) Patent Attorney
c) Assignee d) Patent Searcher

2) Intellectual Property Rights (IPR) protects the use of information and ideas that are of _____.
a) Ethical value b) Moral value
c) Social value d) Commercial value

3) The following can be patented _____.
a) Machine b) Process
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a) Article 15 b) Article 27
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6) In patent law "technical advancement" means _____.
a) diffusion of technology
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a) Copyright
b) Patents
c) Contracts
d) Trademarks

8) What is copyright meant for?

a) Film work
b) Books
c) Essay
d) All of these

9) What is the term of Patent?

a) 35 years
b) 25 years
c) 20 years
d) 15 years

10) The term 'Intellectual Property Rights' covers _____.

a) Copyrights
b) Know-how
c) Trade dress
d) All of these

SLR-QH-583

Seat No.		Set	S

T.Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New/Old) (CBCS)
Examination: March/April – 2026
Intellectual Property Rights for Technology Development and Management (BTN07507)

Day & Date: Sunday, 10-05-2026 Max. Marks: 40
Time: 10:00 AM To 12:00 PM

Instructions: 1) All questions are compulsory.
2) Figures at right indicate marks.
3) Assumes additional data, if required and state it clearly.

Q.2 Attempt following questions. (Any Two) **20**

a) What are Intellectual Property Rights? How it is useful for engineers?

b) Write a detailed note on copyright issues in creative works.

c) Explain in detail importance of intellectual property in project planning.

Q.3 Write short notes. (Any Four) **20**

a) IPR & Electronic Commerce

b) Concepts of Valuation of IP

c) TRIPS & Access to Medicines

d) Protection of Traditional knowledge

e) Concepts of confidentiality and information security

f) Role of WTO in protecting Intellectual Property Rights

SLR-QH-584

Seat No.	

Set P

T.Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Introduction to Sociology (BTN07508)

Day & Date: Sunday, 10-05-2026 Max. Marks: 50
Time: 10:00 AM To 12:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 20 Minutes Marks:10

Q.1 Choose the correct Answer. **10**

1) The major component of demography are _____.
a) Mortality b) Fertility
c) Migration d) All of these

2) The word sociology is made up of two words. These are _____.
a) Societies and logy b) Societia and logistia
c) Socious and logos d) Socia and logos

3) Who is the father of Sociology?
a) Karl Max b) Herbert Spencer
c) Auguste Comte d) Charles Darwin

4) In which year the term sociology was coined?
a) 1798 b) 1815
c) 1839 d) 1857

5) India occupies _____ rank among the population of the different countries of world.
a) Third b) First
c) Forth d) Second

6) Name of state having highest percentage of literacy level.
a) West Bengal b) Panjab
c) Kerala d) Maharashtra

7) Functions of Social Institutes is _____.
   a) To meet fundamental needs of society
   b) To improve the Society
   c) To meet the needs of Family
   d) None of above

8) Social change is change in _____.
   a) Society
   b) Community
   c) Individual
   d) Education

9) Which is recognised as one of the first environmental movements in country?
   a) Chipko Movement
   b) Kisan Movement
   c) Loksatta Movement
   d) Narmada Bachao Andolan

10) Science that deals with the relationship between living organism with their physical environment and each other is called _____.
   a) Ecosystem
   b) Biodiversity
   c) Environment
   d) Ecology

Seat No.	

Set **P**

T.Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New/Old) (CBCS)
Examination: March/April – 2026
Introduction to Sociology (BTN07508)

Day & Date: Sunday, 10-05-2026 Max. Marks: 40
Time: 10:00 AM To 12:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicates full marks.

Q.2 Solve Any Four.

a) Explain with detail trends of Urbanization in developing countries and world. **10**

b) What is Sociology? And explain with concept like social structure, role, norms, values, etc. **10**

c) Explain in detail social institutions for marriage, family, cast, tribe. Explain formal and informal organization. **10**

d) Explain with detail Social Movements like protest, reformist, radical in India. **10**

e) Explain with detail processes of social change like Modernization, Industrialization, Environmental & Ecological changes & development. **10**

f) Explain in detail demographic change in India & World along with Human Ecology. **10**

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Introduction to Sociology (BTN07508)

Day & Date: Sunday, 10-05-2026 Max. Marks: 50
Time: 10:00 AM To 12:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 20 Minutes Marks:10

Q.1 Choose the correct Answer. **10**

1) Name of state having highest percentage of literacy level.
a) West Bengal b) Panjab
c) Kerala d) Maharashtra

2) Functions of Social Institutes is _____.
a) To meet fundamental needs of society
b) To improve the Society
c) To meet the needs of Family
d) None of above

3) Social change is change in _____.
a) Society b) Community
c) Individual d) Education

4) Which is recognised as one of the first environmental movements in country?
a) Chipko Movement b) Kisan Movement
c) Loksatta Movement d) Narmada Bachao Andolan

5) Science that deals with the relationship between living organism with their physical environment and each other is called _____.
a) Ecosystem b) Biodiversity
c) Environment d) Ecology

6) The major component of demography are _____.
a) Mortality b) Fertility
c) Migration d) All of these

7) The word sociology is made up of two words. These are _____.
a) Societies and logy
b) Societia and logistia
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c) Auguste Comte
d) Charles Darwin

9) In which year the term sociology was coined?
a) 1798
b) 1815
c) 1839
d) 1857

10) India occupies _____ rank among the population of the different countries of world.
a) Third
b) First
c) Forth
d) Second

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New/Old) (CBCS)
Examination: March/April – 2026
Introduction to Sociology (BTN07508)

Day & Date: Sunday, 10-05-2026 Max. Marks: 40
Time: 10:00 AM To 12:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicates full marks.

Q.2 Solve Any Four.

a) Explain with detail trends of Urbanization in developing countries and world. **10**

b) What is Sociology? And explain with concept like social structure, role, norms, values, etc. **10**

c) Explain in detail social institutions for marriage, family, cast, tribe. Explain formal and informal organization. **10**

d) Explain with detail Social Movements like protest, reformist, radical in India. **10**

e) Explain with detail processes of social change like Modernization, Industrialization, Environmental & Ecological changes & development. **10**

f) Explain in detail demographic change in India & World along with Human Ecology. **10**

Seat No.	

Set **R**

T.Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Introduction to Sociology (BTN07508)

Day & Date: Sunday, 10-05-2026 Max. Marks: 50
Time: 10:00 AM To 12:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 20 Minutes Marks:10

Q.1 Choose the correct Answer. **10**

1) Which is recognised as one of the first environmental movements in country?
a) Chipko Movement b) Kisan Movement
c) Loksatta Movement d) Narmada Bachao Andolan

2) Science that deals with the relationship between living organism with their physical environment and each other is called _____.
a) Ecosystem b) Biodiversity
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9) Functions of Social Institutes is _____.

a) To meet fundamental needs of society
b) To improve the Society
c) To meet the needs of Family
d) None of above

10) Social change is change in _____.

a) Society b) Community
c) Individual d) Education

Seat No.	

Set **R**

T.Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New/Old) (CBCS)
Examination: March/April – 2026
Introduction to Sociology (BTN07508)

Day & Date: Sunday, 10-05-2026 Max. Marks: 40
Time: 10:00 AM To 12:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicates full marks.

Q.2 Solve Any Four.

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e) Explain with detail processes of social change like Modernization, Industrialization, Environmental & Ecological changes & development. **10**

f) Explain in detail demographic change in India & World along with Human Ecology. **10**

Seat No.	

Set **S**

T.Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Introduction to Sociology (BTN07508)

Day & Date: Sunday, 10-05-2026 Max. Marks: 50
Time: 10:00 AM To 12:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 20 Minutes Marks:10

Q.1 Choose the correct Answer. **10**

1) Who is the father of Sociology?
a) Karl Max b) Herbert Spencer
c) Auguste Comte d) Charles Darwin

2) In which year the term sociology was coined?
a) 1798 b) 1815
c) 1839 d) 1857

3) India occupies _____ rank among the population of the different countries of world.
a) Third b) First
c) Forth d) Second

4) Name of state having highest percentage of literacy level.
a) West Bengal b) Panjab
c) Kerala d) Maharashtra

5) Functions of Social Institutes is _____.
a) To meet fundamental needs of society
b) To improve the Society
c) To meet the needs of Family
d) None of above

6) Social change is change in _____.
a) Society b) Community
c) Individual d) Education

7) Which is recognised as one of the first environmental movements in country?

a) Chipko Movement
b) Kisan Movement
c) Loksatta Movement
d) Narmada Bachao Andolan

8) Science that deals with the relationship between living organism with their physical environment and each other is called _____.

a) Ecosystem
b) Biodiversity
c) Environment
d) Ecology

9) The major component of demography are _____.

a) Mortality
b) Fertility
c) Migration
d) All of these

10) The word sociology is made up of two words. These are _____.

a) Societies and logy
b) Societia and logistia
c) Socious and logos
d) Socia and logos

Seat No.	

Set **S**

T.Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New/Old) (CBCS)
Examination: March/April – 2026
Introduction to Sociology (BTN07508)

Day & Date: Sunday, 10-05-2026 Max. Marks: 40
Time: 10:00 AM To 12:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicates full marks.

Q.2 Solve Any Four.

a) Explain with detail trends of Urbanization in developing countries and world. **10**

b) What is Sociology? And explain with concept like social structure, role, norms, values, etc. **10**

c) Explain in detail social institutions for marriage, family, cast, tribe. Explain formal and informal organization. **10**

d) Explain with detail Social Movements like protest, reformist, radical in India. **10**

e) Explain with detail processes of social change like Modernization, Industrialization, Environmental & Ecological changes & development. **10**

f) Explain in detail demographic change in India & World along with Human Ecology. **10**

SLR-QH-585

Seat No.	

Set P

T.Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Stress and Coping (BTN07509)

Day & Date: Sunday, 10-05-2026 Max. Marks: 50
Time: 10:00 AM To 12:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 20 Minutes Marks:10

Q.1 Multiple Choice Questions. **10**

1) The adrenal glands responsible to produce harmones in response to stress are located _____.
a) in the brain
b) at the top of the kidneys
c) in the stomach
d) to the left of the heart

2) The fight or flight response is instigated by the _____.
a) hypothalamus
b) hippocampus
c) cerebellum
d) pons

3) Which of the following statements is true?
a) The stress response is nonspecific
b) Different kinds of stressors produce exactly the same response
c) Different people respond to the same stressor differently
d) All of the above

4) When is a person more likely to have difficulty in coping with a stressful situation?
a) When he is over the age of fifty
b) When he expects a positive outcome
c) When he thinks he does not have control over the situation
d) When he has a good social support network

5) Anxiety, Depression, Exhaustion, Irritability are _____.
a) Physical symptoms of stress
b) Emotional symptoms of stress
c) Behavioural symptoms of stress
d) Cognitive symptoms of stress

6) Which of the following causes positive stress?
a) Illness
b) Loss of Family Member
c) Getting promotion at workplace
d) All of the above

7) Which of the following are the physical symptoms of anxiety?
a) Racing heart
b) Sweaty palms
c) Flushed cheeks
d) All of the above

8) _____ skills are very important in managing the effects of stress.
a) Interpersonal
b) Time Management
c) Communication
d) Problem solving

9) Taking care of and supporting yourself during stressful times include all of the following except _____.
a) Talking with someone about the stress
b) Providing some downtime for yourself
c) Suppressing true feelings
d) Creating an emotional outlet

10) Which one is not considered as Environmental stressors?
a) Weather
b) Traffic
c) Financial problems
d) Substandard housing

SLR-QH-585

Seat No.	

Set P

T.Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Stress and Coping (BTN07509)

Day & Date: Sunday, 10-05-2026 Max. Marks: 40
Time: 10:00 AM To 12:00 PM

Instructions: 1) Solve Any Four from Q. No. 2 to Q. No. 7.
2) Figures to the right indicate full marks.

Q.2 Comment on following Stress Management techniques. **10**
- **a)** Relaxation
- **b)** Meditation
- **c)** Cognitive restructuring
- **d)** Self-control
- **e)** Time management

Q.3 What do you mean by Stress? Describe the Current & Historical status of stress in India. **10**

Q.4 Comment any 5 psychological consequences of stress in brief. **10**

Q.5 Describe the role of social support in mitigating stress. **10**

Q.6 Explain in detail the various personality sources of stress. Explain Type A and Type B Personality factors causing stress. **10**

Q.7 Discuss the nature of stress response. Write short note on following: **10**
- **a)** Chronic Stress
- **b)** Emotional Stress
- **c)** Physical Stress
- **d)** Acute Stress

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Stress and Coping (BTN07509)

Day & Date: Sunday, 10-05-2026 Max. Marks: 50
Time: 10:00 AM To 12:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 20 Minutes Marks:10

Q.1 Multiple Choice Questions. **10**

1) Which of the following causes positive stress?
a) Illness
b) Loss of Family Member
c) Getting promotion at workplace
d) All of the above

2) Which of the following are the physical symptoms of anxiety?
a) Racing heart b) Sweaty palms
c) Flushed cheeks d) All of the above

3) _____ skills are very important in managing the effects of stress.
a) Interpersonal b) Time Management
c) Communication d) Problem solving

4) Taking care of and supporting yourself during stressful times include all of the following except _____.
a) Talking with someone about the stress
b) Providing some downtime for yourself
c) Suppressing true feelings
d) Creating an emotional outlet

5) Which one is not considered as Environmental stressors?
a) Weather b) Traffic
c) Financial problems d) Substandard housing

6) The adrenal glands responsible to produce harmones in response to stress are located _____.
a) in the brain b) at the top of the kidneys
c) in the stomach d) to the left of the heart

7) The fight or flight response is instigated by the _____.
   a) hypothalamus
   b) hippocampus
   c) cerebellum
   d) pons

8) Which of the following statements is true?
   a) The stress response is nonspecific
   b) Different kinds of stressors produce exactly the same response
   c) Different people respond to the same stressor differently
   d) All of the above

9) When is a person more likely to have difficulty in coping with a stressful situation?
   a) When he is over the age of fifty
   b) When he expects a positive outcome
   c) When he thinks he does not have control over the situation
   d) When he has a good social support network

10) Anxiety, Depression, Exhaustion, Irritability are _____.
   a) Physical symptoms of stress
   b) Emotional symptoms of stress
   c) Behavioural symptoms of stress
   d) Cognitive symptoms of stress

SLR-QH-585

Seat No.	

Set Q

T.Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Stress and Coping (BTN07509)

Day & Date: Sunday, 10-05-2026 Max. Marks: 40
Time: 10:00 AM To 12:00 PM

Instructions: 1) Solve Any Four from Q. No. 2 to Q. No. 7.
2) Figures to the right indicate full marks.

Q.2 Comment on following Stress Management techniques. **10**
- **a)** Relaxation
- **b)** Meditation
- **c)** Cognitive restructuring
- **d)** Self-control
- **e)** Time management

Q.3 What do you mean by Stress? Describe the Current & Historical status of stress in India. **10**

Q.4 Comment any 5 psychological consequences of stress in brief. **10**

Q.5 Describe the role of social support in mitigating stress. **10**

Q.6 Explain in detail the various personality sources of stress. Explain Type A and Type B Personality factors causing stress. **10**

Q.7 Discuss the nature of stress response. Write short note on following: **10**
- **a)** Chronic Stress
- **b)** Emotional Stress
- **c)** Physical Stress
- **d)** Acute Stress

SLR-QH-585

Seat No.	

Set R

T.Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Stress and Coping (BTN07509)

Day & Date: Sunday, 10-05-2026 Max. Marks: 50
Time: 10:00 AM To 12:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 20 Minutes Marks:10

Q.1 Multiple Choice Questions. **10**

1) Taking care of and supporting yourself during stressful times include all of the following except _____.
a) Talking with someone about the stress
b) Providing some downtime for yourself
c) Suppressing true feelings
d) Creating an emotional outlet

2) Which one is not considered as Environmental stressors?
a) Weather b) Traffic
c) Financial problems d) Substandard housing

3) The adrenal glands responsible to produce harmones in response to stress are located _____.
a) in the brain b) at the top of the kidneys
c) in the stomach d) to the left of the heart

4) The fight or flight response is instigated by the _____.
a) hypothalamus b) hippocampus
c) cerebellum d) pons

5) Which of the following statements is true?
a) The stress response is nonspecific
b) Different kinds of stressors produce exactly the same response
c) Different people respond to the same stressor differently
d) All of the above

6) When is a person more likely to have difficulty in coping with a stressful situation?
   a) When he is over the age of fifty
   b) When he expects a positive outcome
   c) When he thinks he does not have control over the situation
   d) When he has a good social support network

7) Anxiety, Depression, Exhaustion, Irritability are _____.
   a) Physical symptoms of stress
   b) Emotional symptoms of stress
   c) Behavioural symptoms of stress
   d) Cognitive symptoms of stress

8) Which of the following causes positive stress?
   a) Illness
   b) Loss of Family Member
   c) Getting promotion at workplace
   d) All of the above

9) Which of the following are the physical symptoms of anxiety?
   a) Racing heart
   b) Sweaty palms
   c) Flushed cheeks
   d) All of the above

10) _____ skills are very important in managing the effects of stress.
   a) Interpersonal
   b) Time Management
   c) Communication
   d) Problem solving

SLR-QH-585

Seat No.	

Set R

T.Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Stress and Coping (BTN07509)

Day & Date: Sunday, 10-05-2026 Max. Marks: 40
Time: 10:00 AM To 12:00 PM

Instructions: 1) Solve Any Four from Q. No. 2 to Q. No. 7.
2) Figures to the right indicate full marks.

Q.2 Comment on following Stress Management techniques. **10**
- **a)** Relaxation
- **b)** Meditation
- **c)** Cognitive restructuring
- **d)** Self-control
- **e)** Time management

Q.3 What do you mean by Stress? Describe the Current & Historical status of stress in India. **10**

Q.4 Comment any 5 psychological consequences of stress in brief. **10**

Q.5 Describe the role of social support in mitigating stress. **10**

Q.6 Explain in detail the various personality sources of stress. Explain Type A and Type B Personality factors causing stress. **10**

Q.7 Discuss the nature of stress response. Write short note on following: **10**
- **a)** Chronic Stress
- **b)** Emotional Stress
- **c)** Physical Stress
- **d)** Acute Stress

SLR-QH-585

Seat No.	

Set S

T.Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Stress and Coping (BTN07509)

Day & Date: Sunday, 10-05-2026 Max. Marks: 50
Time: 10:00 AM To 12:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 20 Minutes Marks:10

Q.1 Multiple Choice Questions. **10**

1) Which of the following statements is true?
a) The stress response is nonspecific
b) Different kinds of stressors produce exactly the same response
c) Different people respond to the same stressor differently
d) All of the above

2) When is a person more likely to have difficulty in coping with a stressful situation?
a) When he is over the age of fifty
b) When he expects a positive outcome
c) When he thinks he does not have control over the situation
d) When he has a good social support network

3) Anxiety, Depression, Exhaustion, Irritability are _____.
a) Physical symptoms of stress
b) Emotional symptoms of stress
c) Behavioural symptoms of stress
d) Cognitive symptoms of stress

4) Which of the following causes positive stress?
a) Illness
b) Loss of Family Member
c) Getting promotion at workplace
d) All of the above

5) Which of the following are the physical symptoms of anxiety?
a) Racing heart b) Sweaty palms
c) Flushed cheeks d) All of the above

6) _____ skills are very important in managing the effects of stress.
a) Interpersonal
b) Time Management
c) Communication
d) Problem solving

7) Taking care of and supporting yourself during stressful times include all of the following except _____.
a) Talking with someone about the stress
b) Providing some downtime for yourself
c) Suppressing true feelings
d) Creating an emotional outlet

8) Which one is not considered as Environmental stressors?
a) Weather
b) Traffic
c) Financial problems
d) Substandard housing

9) The adrenal glands responsible to produce harmones in response to stress are located _____.
a) in the brain
b) at the top of the kidneys
c) in the stomach
d) to the left of the heart

10) The fight or flight response is instigated by the _____.
a) hypothalamus
b) hippocampus
c) cerebellum
d) pons

SLR-QH-585

Seat No.	

Set S

T.Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New/Old) (CBCS) Examination: March/April – 2026
Stress and Coping (BTN07509)

Day & Date: Sunday, 10-05-2026 Max. Marks: 40
Time: 10:00 AM To 12:00 PM

Instructions: 1) Solve Any Four from Q. No. 2 to Q. No. 7.
2) Figures to the right indicate full marks.

Q.2 Comment on following Stress Management techniques. **10**
- **a)** Relaxation
- **b)** Meditation
- **c)** Cognitive restructuring
- **d)** Self-control
- **e)** Time management

Q.3 What do you mean by Stress? Describe the Current & Historical status of stress in India. **10**

Q.4 Comment any 5 psychological consequences of stress in brief. **10**

Q.5 Describe the role of social support in mitigating stress. **10**

Q.6 Explain in detail the various personality sources of stress. Explain Type A and Type B Personality factors causing stress. **10**

Q.7 Discuss the nature of stress response. Write short note on following: **10**
- **a)** Chronic Stress
- **b)** Emotional Stress
- **c)** Physical Stress
- **d)** Acute Stress

SLR-QH-587

Seat No.	

Set P

T.Y. (B.Tech.) (Electrical Engineering) (Sem - II) (New) (CBCS)
Examination: March/April – 2026
Electric Traction & Utilization (EEPCC-10)

Day & Date: Friday, 15-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) A train is required to maintain a high schedule speed between two stations with frequent stops. Which of the following traction characteristics is most desirable?
a) Low acceleration and high retardation
b) High acceleration and high retardation
c) Low acceleration and low retardation
d) Constant speed only

2) In a trapezoidal speed-time curve, the area under the curve represents _____.
a) Distance traveled b) Acceleration
c) Energy consumed d) Power output

3) The term specific energy consumption in traction is defined as ____.
a) Energy per unit time b) Energy per unit mass
c) Energy per tonne-km d) Energy per distance

4) The main drawback of DC series motor in traction is _____.
a) Low starting torque
b) Poor speed control at no load
c) High efficiency
d) Simple construction

5) In bridge transition**,** the purpose is to _____.
a) Increase voltage
b) Smooth transition between series and parallel connections
c) Reduce braking
d) Increase load

6) Energy Conservation means _____.
   a) Producing more energy
   b) Reducing wastage of energy
   c) Storing electricity only
   d) Using energy without control

7) For textile industries**,** motors are generally selected based on _____.
   a) Variable speed requirement and smooth operation
   b) High starting torque only
   c) No speed control
   d) High noise

8) Machine tools require motors with _____.
   a) Fixed speed only
   b) Wide speed control and precision
   c) Low efficiency
   d) High vibration

9) Induction heating works on the principle of _____.
   a) Resistance heating
   b) Radiation
   c) Chemical reaction
   d) Eddy current generation

10) Which heating method is best suited for uniform heating of non-conducting materials?
   a) Resistance heating
   b) Induction heating
   c) Dielectric heating
   d) Arc heating

11) In electric welding, the major advantage is _____.
   a) Low efficiency
   b) High precision and strength of joints
   c) Slow process
   d) High fuel consumption

12) The maintenance factor in illumination accounts for _____.
   a) Voltage variation
   b) Lamp aging and dirt accumulation
   c) Power loss
   d) Current fluctuation

13) Mercury vapor lamps are preferred because _____.
   a) Low life
   b) Low illumination
   c) High cost only
   d) High efficiency and long life

14) The primary objective of energy conservation in industries is to ____.
   a) Increase energy use
   b) Reduce production
   c) Increase manpower
   d) Minimize energy losses and cost

SLR-QH-587

Seat No.	

Set P

T.Y. (B.Tech.) (Electrical Engineering) (Sem - II) (New) (CBCS)
Examination: March/April – 2026
Electric Traction & Utilization (EEPCC-10)

Day & Date: Friday, 15-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Solve Any Four. **16**

a) Draw and explain speed time curve for main line services.
b) Desirable characteristic of traction motors.
c) Explain regenerative breaking system in traction system.
d) Write short note on motor selection in textile industries.
e) Explain Al application in Traction.

Q.3 Solve Any Two. **12**

a) Derive an expression for Trapezoidal Speed-Time Curve.
b) Explain series-parallel control of traction motors.
c) Write note on motor selection in sugar mills.

SECTION – II

Q.4 Solve Any Four. **16**

a) Comparison between tungsten filament lamps and fluorescent tubes.
b) State advantages and disadvantages electrical welding.
c) Explain Al application in utilization.
d) Explain factors to be considered for the design of illumination scheme.
e) Write a note on need of Energy Conservation.

Q.5 Solve Any Two. **12**

a) Describe with the help of a neat diagram the construction and working of a high-pressure mercury vapour lamp.
b) Explain Energy Conservation in Industries.
c) Explain direct resistance and indirect resistance heating.

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Electrical Engineering) (Sem - II) (New) (CBCS)
Examination: March/April – 2026
Electric Traction & Utilization (EEPCC-10)

Day & Date: Friday, 15-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. **14**

1) Machine tools require motors with _____.
a) Fixed speed only
b) Wide speed control and precision
c) Low efficiency
d) High vibration

2) Induction heating works on the principle of _____.
a) Resistance heating b) Radiation
c) Chemical reaction d) Eddy current generation

3) Which heating method is best suited for uniform heating of non-conducting materials?
a) Resistance heating b) Induction heating
c) Dielectric heating d) Arc heating

4) In electric welding, the major advantage is _____.
a) Low efficiency
b) High precision and strength of joints
c) Slow process
d) High fuel consumption

5) The maintenance factor in illumination accounts for _____.
a) Voltage variation
b) Lamp aging and dirt accumulation
c) Power loss
d) Current fluctuation

6) Mercury vapor lamps are preferred because _____.
   a) Low life
   b) Low illumination
   c) High cost only
   d) High efficiency and long life

7) The primary objective of energy conservation in industries is to ____.
   a) Increase energy use
   b) Reduce production
   c) Increase manpower
   d) Minimize energy losses and cost

8) A train is required to maintain a high schedule speed between two stations with frequent stops. Which of the following traction characteristics is most desirable?
   a) Low acceleration and high retardation
   b) High acceleration and high retardation
   c) Low acceleration and low retardation
   d) Constant speed only

9) In a trapezoidal speed-time curve, the area under the curve represents _____.
   a) Distance traveled
   b) Acceleration
   c) Energy consumed
   d) Power output

10) The term specific energy consumption in traction is defined as ____.
   a) Energy per unit time
   b) Energy per unit mass
   c) Energy per tonne-km
   d) Energy per distance

11) The main drawback of DC series motor in traction is _____.
   a) Low starting torque
   b) Poor speed control at no load
   c) High efficiency
   d) Simple construction

12) In bridge transition**,** the purpose is to _____.
   a) Increase voltage
   b) Smooth transition between series and parallel connections
   c) Reduce braking
   d) Increase load

13) Energy Conservation means _____.
   a) Producing more energy
   b) Reducing wastage of energy
   c) Storing electricity only
   d) Using energy without control

14) For textile industries**,** motors are generally selected based on _____.
   a) Variable speed requirement and smooth operation
   b) High starting torque only
   c) No speed control
   d) High noise

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Electrical Engineering) (Sem - II) (New) (CBCS)
Examination: March/April – 2026
Electric Traction & Utilization (EEPCC-10)

Day & Date: Friday, 15-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Solve Any Four. **16**

a) Draw and explain speed time curve for main line services.

b) Desirable characteristic of traction motors.

c) Explain regenerative breaking system in traction system.

d) Write short note on motor selection in textile industries.

e) Explain Al application in Traction.

Q.3 Solve Any Two. **12**

a) Derive an expression for Trapezoidal Speed-Time Curve.

b) Explain series-parallel control of traction motors.

c) Write note on motor selection in sugar mills.

SECTION – II

Q.4 Solve Any Four. **16**

a) Comparison between tungsten filament lamps and fluorescent tubes.

b) State advantages and disadvantages electrical welding.

c) Explain Al application in utilization.

d) Explain factors to be considered for the design of illumination scheme.

e) Write a note on need of Energy Conservation.

Q.5 Solve Any Two. **12**

a) Describe with the help of a neat diagram the construction and working of a high-pressure mercury vapour lamp.

b) Explain Energy Conservation in Industries.

c) Explain direct resistance and indirect resistance heating.

Seat No.	

Set **R**

T.Y. (B.Tech.) (Electrical Engineering) (Sem - II) (New) (CBCS)
Examination: March/April – 2026
Electric Traction & Utilization (EEPCC-10)

Day & Date: Friday, 15-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) In electric welding, the major advantage is _____.
a) Low efficiency
b) High precision and strength of joints
c) Slow process
d) High fuel consumption

2) The maintenance factor in illumination accounts for _____.
a) Voltage variation
b) Lamp aging and dirt accumulation
c) Power loss
d) Current fluctuation

3) Mercury vapor lamps are preferred because _____.
a) Low life
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5) A train is required to maintain a high schedule speed between two stations with frequent stops. Which of the following traction characteristics is most desirable?
a) Low acceleration and high retardation
b) High acceleration and high retardation
c) Low acceleration and low retardation
d) Constant speed only

6) In a trapezoidal speed-time curve, the area under the curve represents _____.
a) Distance traveled b) Acceleration
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7) The term specific energy consumption in traction is defined as ____.
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9) In bridge transition**,** the purpose is to _____.
a) Increase voltage
b) Smooth transition between series and parallel connections
c) Reduce braking
d) Increase load

10) Energy Conservation means _____.
a) Producing more energy
b) Reducing wastage of energy
c) Storing electricity only
d) Using energy without control

11) For textile industries**,** motors are generally selected based on _____.
a) Variable speed requirement and smooth operation
b) High starting torque only
c) No speed control
d) High noise

12) Machine tools require motors with _____.
a) Fixed speed only
b) Wide speed control and precision
c) Low efficiency
d) High vibration

13) Induction heating works on the principle of _____.
a) Resistance heating b) Radiation
c) Chemical reaction d) Eddy current generation

14) Which heating method is best suited for uniform heating of non-conducting materials?
a) Resistance heating b) Induction heating
c) Dielectric heating d) Arc heating

Seat No.	

Set **R**

T.Y. (B.Tech.) (Electrical Engineering) (Sem - II) (New) (CBCS)
Examination: March/April – 2026
Electric Traction & Utilization (EEPCC-10)

Day & Date: Friday, 15-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Solve Any Four. **16**

a) Draw and explain speed time curve for main line services.

b) Desirable characteristic of traction motors.

c) Explain regenerative breaking system in traction system.

d) Write short note on motor selection in textile industries.

e) Explain Al application in Traction.

Q.3 Solve Any Two. **12**

a) Derive an expression for Trapezoidal Speed-Time Curve.

b) Explain series-parallel control of traction motors.

c) Write note on motor selection in sugar mills.

SECTION – II

Q.4 Solve Any Four. **16**

a) Comparison between tungsten filament lamps and fluorescent tubes.

b) State advantages and disadvantages electrical welding.

c) Explain Al application in utilization.

d) Explain factors to be considered for the design of illumination scheme.

e) Write a note on need of Energy Conservation.

Q.5 Solve Any Two. **12**

a) Describe with the help of a neat diagram the construction and working of a high-pressure mercury vapour lamp.

b) Explain Energy Conservation in Industries.

c) Explain direct resistance and indirect resistance heating.

SLR-QH-587

Seat No.	

Set S

T.Y. (B.Tech.) (Electrical Engineering) (Sem - II) (New) (CBCS)
Examination: March/April – 2026
Electric Traction & Utilization (EEPCC-10)

Day & Date: Friday, 15-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. **14**

1) Energy Conservation means _____.
a) Producing more energy
b) Reducing wastage of energy
c) Storing electricity only
d) Using energy without control

2) For textile industries**,** motors are generally selected based on _____.
a) Variable speed requirement and smooth operation
b) High starting torque only
c) No speed control
d) High noise

3) Machine tools require motors with _____.
a) Fixed speed only
b) Wide speed control and precision
c) Low efficiency
d) High vibration

4) Induction heating works on the principle of _____.
a) Resistance heating b) Radiation
c) Chemical reaction d) Eddy current generation

5) Which heating method is best suited for uniform heating of non-conducting materials?
a) Resistance heating b) Induction heating
c) Dielectric heating d) Arc heating

6) In electric welding, the major advantage is _____.
   a) Low efficiency
   b) High precision and strength of joints
   c) Slow process
   d) High fuel consumption

7) The maintenance factor in illumination accounts for _____.
   a) Voltage variation
   b) Lamp aging and dirt accumulation
   c) Power loss
   d) Current fluctuation

8) Mercury vapor lamps are preferred because _____.
   a) Low life
   b) Low illumination
   c) High cost only
   d) High efficiency and long life

9) The primary objective of energy conservation in industries is to ____.
   a) Increase energy use
   b) Reduce production
   c) Increase manpower
   d) Minimize energy losses and cost

10) A train is required to maintain a high schedule speed between two stations with frequent stops. Which of the following traction characteristics is most desirable?
   a) Low acceleration and high retardation
   b) High acceleration and high retardation
   c) Low acceleration and low retardation
   d) Constant speed only

11) In a trapezoidal speed-time curve, the area under the curve represents _____.
   a) Distance traveled
   b) Acceleration
   c) Energy consumed
   d) Power output

12) The term specific energy consumption in traction is defined as ____.
   a) Energy per unit time
   b) Energy per unit mass
   c) Energy per tonne-km
   d) Energy per distance

13) The main drawback of DC series motor in traction is _____.
   a) Low starting torque
   b) Poor speed control at no load
   c) High efficiency
   d) Simple construction

14) In bridge transition**,** the purpose is to _____.
   a) Increase voltage
   b) Smooth transition between series and parallel connections
   c) Reduce braking
   d) Increase load

SLR-QH-587

Seat No.	

Set S

T.Y. (B.Tech.) (Electrical Engineering) (Sem - II) (New) (CBCS)
Examination: March/April – 2026
Electric Traction & Utilization (EEPCC-10)

Day & Date: Friday, 15-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Solve Any Four. **16**

a) Draw and explain speed time curve for main line services.

b) Desirable characteristic of traction motors.

c) Explain regenerative breaking system in traction system.

d) Write short note on motor selection in textile industries.

e) Explain Al application in Traction.

Q.3 Solve Any Two. **12**

a) Derive an expression for Trapezoidal Speed-Time Curve.

b) Explain series-parallel control of traction motors.

c) Write note on motor selection in sugar mills.

SECTION – II

Q.4 Solve Any Four. **16**

a) Comparison between tungsten filament lamps and fluorescent tubes.

b) State advantages and disadvantages electrical welding.

c) Explain Al application in utilization.

d) Explain factors to be considered for the design of illumination scheme.

e) Write a note on need of Energy Conservation.

Q.5 Solve Any Two. **12**

a) Describe with the help of a neat diagram the construction and working of a high-pressure mercury vapour lamp.

b) Explain Energy Conservation in Industries.

c) Explain direct resistance and indirect resistance heating.

SLR-QH-588

Seat No.	

Set P

T. Y. (B.Tech.) (Electrical Engineering) (Sem - II) (New) (CBCS)
Examination: Marh/April – 2026
Power Electronics & Industrial Drives (EEPCC-11)

Day & Date: Monday, 18-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data whenever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternative from the options. 14

1) SCR is mainly used for _____.
a) Signal amplification b) High-frequency oscillation
c) Power control d) Data storage

2) A TRIAC can be turned on with _____.
a) Positive voltage at the gate terminal
b) Negative voltage at the gate terminal
c) Either a) or b)
d) None of the above

3) Thyristor can be protected from over voltages by using _____.
a) Voltage clamping device b) Fuse
c) Heat sink d) Snubber circuit

4) Which circuit gives inherent freewheeling action?
a) Half wave converter b) Semi converter
c) Full converter d) None of the above

5) Phase control in rectifiers is achieved by varying _____.
a) Supply voltage b) Load resistance
c) Firing angle of SCR d) Frequency

6) The output of a single-phase half-bridge inverter on R load is ideally _____.
a) A sine wave b) A square wave
c) A triangular wave d) Constant dc

7) Which inverter is commonly used in UPS systems?
a) Current source inverter b) Voltage source inverter
c) Resonant inverter d) Cycloconverter

8) During regenerative braking mode, back emf is _____supply voltage.
a) Less than b) Greater than
c) Equal to d) None of the above

9) When motor torque is greater than load torque, the motor will _____.
a) Stop b) Run at constant speed
c) Decelerate d) Accelerate

10) Speed control of a DC motor in a DC drive is achieved by controlling _____.
a) Armature voltage b) Field current
c) Armature resistance d) All of the above

11) Which converter is required for four-quadrant DC drive operation?
a) Half-wave rectifier b) Single-quadrant chopper
c) Dual converter d) Diode bridge

12) Which braking method dissipates energy as heat?
a) Regenerative braking b) Dynamic braking
c) Plugging d) Regenerative and plugging

13) For variable speed application the suitable motor is _____.
a) Squirrel cage I.M. b) Slip ring I.M.
c) Both a) and b) d) None of the above

14) Speed control of an induction motor in AC drives is mainly achieved by controlling _____.
a) Voltage only b) Frequency only
c) Voltage and frequency d) Rotor resistance

SLR-QH-588

Seat No.	

Set P

T. Y. (B.Tech.) (Electrical Engineering) (Sem - II) (New) (CBCS)
Examination: Marh/April – 2026
Power Electronics & Industrial Drives (EEPCC-11)

Day & Date: Monday, 18-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All Questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Solve. (Any Four) **16**

a) Explain turn-on methods of SCR.

b) Draw and explain characteristics of DIAC and TRIAC.

c) Draw and explain single phase full wave-controlled rectifier with 'RL' load with proper waveform.

d) Draw and explain two-quadrant chopper with modes of operation.

e) Draw and explain single phase full bridge inverter with 'RL' load with proper wave.

f) Explain the on-off type AC voltage controller.

Q.3 Solve. (Any Two) **12**

a) Draw and explain static V-I characteristics of SCR. Define latching and holding current.

b) Draw and explain three phase fully controlled rectifier with R load with proper waveform.

c) Draw and explain the 120 degree conduction mode of three phase inverter with proper wave.

Section – II

Q.4 Solve. (Any Four) **16**

a) Draw the block diagram of the electric drive system and describe each block in detail.

b) Describe the different types of electrical drives.

c) Draw and explain closed loop speed control of dc motor drives.

d) Explain stator voltage control of three phase induction motor.

e) Explain PWM inverter fed induction motor drive with waveforms.

f) Differentiate between AC Drives and DC Drives.

Q.5 Solve. (Any Two) **12**

a) Explain the dynamics of electrical drives with the fundamental torque equation.

b) Describe in detail the different types of electrical braking system used in DC drives.

c) Describe in detail V/f control methods used in three phase induction motor drives.

SLR-QH-588

Seat No.	

Set Q

T. Y. (B.Tech.) (Electrical Engineering) (Sem - II) (New) (CBCS)
Examination: Marh/April – 2026
Power Electronics & Industrial Drives (EEPCC-11)

Day & Date: Monday, 18-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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3) Figures to the right indicates full marks.
4) Assume suitable data whenever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternative from the options. 14

1) During regenerative braking mode, back emf is _____supply voltage.
a) Less than b) Greater than
c) Equal to d) None of the above

2) When motor torque is greater than load torque, the motor will _____.
a) Stop b) Run at constant speed
c) Decelerate d) Accelerate

3) Speed control of a DC motor in a DC drive is achieved by controlling _____.
a) Armature voltage b) Field current
c) Armature resistance d) All of the above

4) Which converter is required for four-quadrant DC drive operation?
a) Half-wave rectifier b) Single-quadrant chopper
c) Dual converter d) Diode bridge

5) Which braking method dissipates energy as heat?
a) Regenerative braking b) Dynamic braking
c) Plugging d) Regenerative and plugging

6) For variable speed application the suitable motor is _____.
a) Squirrel cage I.M. b) Slip ring I.M.
c) Both a) and b) d) None of the above

7) Speed control of an induction motor in AC drives is mainly achieved by controlling _____.
a) Voltage only
b) Frequency only
c) Voltage and frequency
d) Rotor resistance

8) SCR is mainly used for _____.
a) Signal amplification
b) High-frequency oscillation
c) Power control
d) Data storage

9) A TRIAC can be turned on with _____.
a) Positive voltage at the gate terminal
b) Negative voltage at the gate terminal
c) Either a) or b)
d) None of the above

10) Thyristor can be protected from over voltages by using _____.
a) Voltage clamping device
b) Fuse
c) Heat sink
d) Snubber circuit

11) Which circuit gives inherent freewheeling action?
a) Half wave converter
b) Semi converter
c) Full converter
d) None of the above

12) Phase control in rectifiers is achieved by varying _____.
a) Supply voltage
b) Load resistance
c) Firing angle of SCR
d) Frequency

13) The output of a single-phase half-bridge inverter on R load is ideally _____.
a) A sine wave
b) A square wave
c) A triangular wave
d) Constant dc

14) Which inverter is commonly used in UPS systems?
a) Current source inverter
b) Voltage source inverter
c) Resonant inverter
d) Cycloconverter

SLR-QH-588

Seat No.	

Set Q

T. Y. (B.Tech.) (Electrical Engineering) (Sem - II) (New) (CBCS)
Examination: Marh/April – 2026
Power Electronics & Industrial Drives (EEPCC-11)

Day & Date: Monday, 18-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All Questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Solve. (Any Four) **16**

a) Explain turn-on methods of SCR.

b) Draw and explain characteristics of DIAC and TRIAC.

c) Draw and explain single phase full wave-controlled rectifier with 'RL' load with proper waveform.

d) Draw and explain two-quadrant chopper with modes of operation.

e) Draw and explain single phase full bridge inverter with 'RL' load with proper wave.

f) Explain the on-off type AC voltage controller.

Q.3 Solve. (Any Two) **12**

a) Draw and explain static V-I characteristics of SCR. Define latching and holding current.

b) Draw and explain three phase fully controlled rectifier with R load with proper waveform.

c) Draw and explain the 120 degree conduction mode of three phase inverter with proper wave.

Section – II

Q.4 Solve. (Any Four) **16**

a) Draw the block diagram of the electric drive system and describe each block in detail.

b) Describe the different types of electrical drives.

c) Draw and explain closed loop speed control of dc motor drives.

d) Explain stator voltage control of three phase induction motor.

e) Explain PWM inverter fed induction motor drive with waveforms.

f) Differentiate between AC Drives and DC Drives.

Q.5 Solve. (Any Two) **12**

a) Explain the dynamics of electrical drives with the fundamental torque equation.

b) Describe in detail the different types of electrical braking system used in DC drives.

c) Describe in detail V/f control methods used in three phase induction motor drives.

Seat No.	

Set **R**

T. Y. (B.Tech.) (Electrical Engineering) (Sem - II) (New) (CBCS)
Examination: Marh/April – 2026
Power Electronics & Industrial Drives (EEPCC-11)

Day & Date: Monday, 18-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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3) Figures to the right indicates full marks.
4) Assume suitable data whenever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternative from the options. 14

1) Which converter is required for four-quadrant DC drive operation?
a) Half-wave rectifier b) Single-quadrant chopper
c) Dual converter d) Diode bridge

2) Which braking method dissipates energy as heat?
a) Regenerative braking b) Dynamic braking
c) Plugging d) Regenerative and plugging

3) For variable speed application the suitable motor is _____.
a) Squirrel cage I.M. b) Slip ring I.M.
c) Both a) and b) d) None of the above

4) Speed control of an induction motor in AC drives is mainly achieved by controlling _____.
a) Voltage only b) Frequency only
c) Voltage and frequency d) Rotor resistance

5) SCR is mainly used for _____.
a) Signal amplification b) High-frequency oscillation
c) Power control d) Data storage

6) A TRIAC can be turned on with _____.
a) Positive voltage at the gate terminal
b) Negative voltage at the gate terminal
c) Either a) or b)
d) None of the above

7) Thyristor can be protected from over voltages by using _____.
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c) Heat sink d) Snubber circuit

8) Which circuit gives inherent freewheeling action?
a) Half wave converter b) Semi converter
c) Full converter d) None of the above

9) Phase control in rectifiers is achieved by varying _____.
a) Supply voltage b) Load resistance
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10) The output of a single-phase half-bridge inverter on R load is ideally _____.
a) A sine wave b) A square wave
c) A triangular wave d) Constant dc

11) Which inverter is commonly used in UPS systems?
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14) Speed control of a DC motor in a DC drive is achieved by controlling _____.
a) Armature voltage b) Field current
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Seat No.	

Set **R**

T. Y. (B.Tech.) (Electrical Engineering) (Sem - II) (New) (CBCS)
Examination: Marh/April – 2026
Power Electronics & Industrial Drives (EEPCC-11)

Day & Date: Monday, 18-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All Questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Solve. (Any Four) **16**

a) Explain turn-on methods of SCR.

b) Draw and explain characteristics of DIAC and TRIAC.

c) Draw and explain single phase full wave-controlled rectifier with 'RL' load with proper waveform.

d) Draw and explain two-quadrant chopper with modes of operation.

e) Draw and explain single phase full bridge inverter with 'RL' load with proper wave.

f) Explain the on-off type AC voltage controller.

Q.3 Solve. (Any Two) **12**

a) Draw and explain static V-I characteristics of SCR. Define latching and holding current.

b) Draw and explain three phase fully controlled rectifier with R load with proper waveform.

c) Draw and explain the 120 degree conduction mode of three phase inverter with proper wave.

Section – II

Q.4 Solve. (Any Four) **16**

a) Draw the block diagram of the electric drive system and describe each block in detail.

b) Describe the different types of electrical drives.

c) Draw and explain closed loop speed control of dc motor drives.

d) Explain stator voltage control of three phase induction motor.

e) Explain PWM inverter fed induction motor drive with waveforms.

f) Differentiate between AC Drives and DC Drives.

Q.5 Solve. (Any Two) **12**

a) Explain the dynamics of electrical drives with the fundamental torque equation.

b) Describe in detail the different types of electrical braking system used in DC drives.

c) Describe in detail V/f control methods used in three phase induction motor drives.

SLR-QH-588

Seat No.	

Set S

T. Y. (B.Tech.) (Electrical Engineering) (Sem - II) (New) (CBCS)
Examination: Marh/April – 2026
Power Electronics & Industrial Drives (EEPCC-11)

Day & Date: Monday, 18-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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3) Figures to the right indicates full marks.
4) Assume suitable data whenever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternative from the options. 14

1) The output of a single-phase half-bridge inverter on R load is ideally _____.
a) A sine wave b) A square wave
c) A triangular wave d) Constant dc

2) Which inverter is commonly used in UPS systems?
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c) Resonant inverter d) Cycloconverter

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c) Equal to d) None of the above

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c) Decelerate d) Accelerate

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6) Which converter is required for four-quadrant DC drive operation?
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c) Dual converter d) Diode bridge

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10) SCR is mainly used for _____.
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c) Power control d) Data storage

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a) Positive voltage at the gate terminal
b) Negative voltage at the gate terminal
c) Either a) or b)
d) None of the above

12) Thyristor can be protected from over voltages by using _____.
a) Voltage clamping device b) Fuse
c) Heat sink d) Snubber circuit

13) Which circuit gives inherent freewheeling action?
a) Half wave converter b) Semi converter
c) Full converter d) None of the above

14) Phase control in rectifiers is achieved by varying _____.
a) Supply voltage b) Load resistance
c) Firing angle of SCR d) Frequency

SLR-QH-588

Seat No.	

Set S

T. Y. (B.Tech.) (Electrical Engineering) (Sem - II) (New) (CBCS)
Examination: Marh/April – 2026
Power Electronics & Industrial Drives (EEPCC-11)

Day & Date: Monday, 18-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All Questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Solve. (Any Four) **16**

a) Explain turn-on methods of SCR.

b) Draw and explain characteristics of DIAC and TRIAC.

c) Draw and explain single phase full wave-controlled rectifier with 'RL' load with proper waveform.

d) Draw and explain two-quadrant chopper with modes of operation.

e) Draw and explain single phase full bridge inverter with 'RL' load with proper wave.

f) Explain the on-off type AC voltage controller.

Q.3 Solve. (Any Two) **12**

a) Draw and explain static V-I characteristics of SCR. Define latching and holding current.

b) Draw and explain three phase fully controlled rectifier with R load with proper waveform.

c) Draw and explain the 120 degree conduction mode of three phase inverter with proper wave.

Section – II

Q.4 Solve. (Any Four) **16**

a) Draw the block diagram of the electric drive system and describe each block in detail.

b) Describe the different types of electrical drives.

c) Draw and explain closed loop speed control of dc motor drives.

d) Explain stator voltage control of three phase induction motor.

e) Explain PWM inverter fed induction motor drive with waveforms.

f) Differentiate between AC Drives and DC Drives.

Q.5 Solve. (Any Two) **12**

a) Explain the dynamics of electrical drives with the fundamental torque equation.

b) Describe in detail the different types of electrical braking system used in DC drives.

c) Describe in detail V/f control methods used in three phase induction motor drives.

SLR-QH-589

Seat No.	

Set P

T.Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Advanced Control System (EEPCC-12)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Assertion (A): The zeroes on the real axis near the origin are generally avoided in design.
Reason (R): In a sluggish system, the introduction of zeroes can improve the transient response.
a) Both A and R are true, and R is the correct explanation of A
b) Both A and R are true, but R is not the correct explanation of A
c) A is true, but R is false
d) A is false, but R is true

2) Maximum phase lead occurs at frequency _____.
a) $\omega = \frac{1}{T}$ b) $\omega = \frac{1}{\alpha T}$
c) $\omega = \frac{1}{\sqrt{\alpha} T}$ d) $\omega = \alpha T$

3) The phase lag-lead network is introduced in the output _____.
a) lag at all frequencies
b) lag at high frequencies and lead at low frequencies
c) lag at low frequencies and lead at high frequencies
d) None of the above

4) Due to which of the following reasons, excessive bandwidth in the control system should be avoided _____.
a) It leads to a slow speed of response
b) It leads to low relative stability
c) Noise is proportional to bandwidth
d) None of the above

5) For a lead compensator with $\alpha = 0.1$, the maximum phase lead is approximately _____.
a) 20° b) 30°
c) 45° d) 65°

6) In phase-plane analysis, trajectories represent _____.
a) Time response
b) State variables
c) Frequency response
d) Gain

7) A saddle point is _____.
a) Stable
b) Unstable
c) Marginal
d) May be stable or unstable

8) An observer is used to _____.
a) Control input
b) Estimate unmeasured states
c) Increase gain
d) Reduce noise

9) The transfer function $Y(s)/U(s)$ of a system described by the state equations $dx/dt = -2x + 2u$ and $y(t) = 0.5x$ is _____.
a) $0.5/(s-2)$
b) $1/(s-2)$
c) $0.5/(s+2)$
d) $1/(s+2)$

10) The transfer function of a zero-order hold is _____.
a) $1 - e^{Ts}$
b) $1 - e^{-Ts}$
c) $\frac{1-e^{Ts}}{s}$
d) $\frac{1-e^{-Ts}}{s}$

11) For pole at $z = 1.2 \rightarrow$ system is _____.
a) Stable
b) Unstable
c) Marginal
d) Oscillatory

12) Juri's test is a discrete equivalent of _____.
a) Nyquist
b) Routh-Hurwitz
c) Bode
d) Root locus

13) If the rank of the controllability matrix $= 1$ for a 2nd order system, the system is _____.
a) Controllable
b) Not controllable
c) Observable
d) Stable

14) For a unity feedback system, the origin of the s-plane is mapped in the z-plane by the transformation $z = e^{sT}$ to which one of the following?
a) Origin
b) $1 + j0$
c) $-1 + j0$
d) $0 + j1$

Seat No.	

Set **P**

T.Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Advanced Control System (EEPCC-12)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw neat diagrams whenever necessary.
4) Assume suitable data if necessary.

Section – I

Q.2 Attempt the following. (Any Four) **16**

a) Derive the realization of a lag-lead compensator for an active circuit.

b) Write down the steps to design a lag compensator using root locus.

c) Write the design procedure for the lead compensator using the Bode plot method.

d) Explain the jump resonance phenomenon in nonlinear control systems

e) Determine the kind of singularity for the following differential equation.

$$\ddot{Y} - 0.3\,\dot{Y} + Y = 0$$

Q.3 Attempt the following. (Any Two) **12**

a) The forward path TF of a unity feedback control system is given by $G(s) = \frac{K}{s(s+2)(s+8)}$. Design a suitable lag compensator so that the system meets the following specifications.

i) Percentage overshoot $\leq 16\%$ for unit step input,

ii) Steady state error ≤ 0.125 for unit ramp input.

b) Design a lead compensator for a unity feedback system with OLTF $G(s) = \frac{K}{s(s+1)(s+5)}$ to satisfy the following specifications.

i) Kv $\geq$ 50

ii) Phase Margin $\geq$ 20°

c) Explain the stability of a non-linear control system.

Section – II

Q.4 Solve the following. (Any Four) **16**

a) The closed-loop poles (Eigen values) are to be located at $s = -3$, $s = -7$. Design a state variable feedback.
Given that $A = \begin{bmatrix} 0 & 1 \\ -20 & -9 \end{bmatrix}$ and $B = \begin{bmatrix} 0 \\ 1 \end{bmatrix}, C = [1 \quad 0]$

b) Consider a system having state model
$\begin{bmatrix} \dot{x}_1 \\ \dot{x}_2 \end{bmatrix} = \begin{bmatrix} -2 & -3 \\ 4 & 2 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \end{bmatrix} + \begin{bmatrix} 3 \\ 5 \end{bmatrix} u(t)$ & $Y = [1 \quad 1] \begin{bmatrix} x_1 \\ x_2 \end{bmatrix}$
with $D = 0$. Obtain the Transfer Function.

c) Determine the controllability of the system with state model

$$\begin{bmatrix} \dot{x}_1 \\ \dot{x}_2 \\ \dot{x}_3 \end{bmatrix} = \begin{bmatrix} 0 & 1 & 0 \\ 0 & 0 & 1 \\ 0 & -2 & -3 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix} + \begin{bmatrix} 0 \\ 0 \\ 10 \end{bmatrix} u$$

d) Describe Direct Substitution method for the evaluation of state feedback gain matrix.

e) Derive the pulse transfer function of closed loop system.

Q.5 Solve the following. (Any Two) **12**

a) A system is described by $\begin{bmatrix} \dot{x}_1 \\ \dot{x}_2 \\ \dot{x}_3 \end{bmatrix} = \begin{bmatrix} 0 & 1 & 0 \\ 0 & 0 & 1 \\ -1 & -5 & -6 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix} + \begin{bmatrix} 0 \\ 0 \\ 1 \end{bmatrix} u(t)$
Using state feedback control $u = -Kx$, it is desired to have closed poles are at $(-1 + j2), (-1 - j2), (-10)$.

Find the state feedback matrix using Ackermann's formula.

b) Obtain state transition matrix for the following system matrix
$A = \begin{bmatrix} 0 & 1 \\ -6 & -5 \end{bmatrix}$

c) Examine the stability of following characteristic equation:
$P(z) = z^4 - 1.2z^3 + 0.07z^2 + 0.3z - 0.08 = 0$

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Advanced Control System (EEPCC-12)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) An observer is used to _____.
a) Control input
b) Estimate unmeasured states
c) Increase gain
d) Reduce noise

2) The transfer function $Y(s)/U(s)$ of a system described by the state equations $dx/dt = -2x + 2u$ and $y(t) = 0.5x$ is _____.
a) $0.5/(s-2)$ b) $1/(s-2)$
c) $0.5/(s+2)$ d) $1/(s+2)$

3) The transfer function of a zero-order hold is _____.
a) $1 - e^{Ts}$ b) $1 - e^{-Ts}$
c) $\frac{1-e^{Ts}}{s}$ d) $\frac{1-e^{-Ts}}{s}$

4) For pole at $z = 1.2 \rightarrow$ system is _____.
a) Stable b) Unstable
c) Marginal d) Oscillatory

5) Juri's test is a discrete equivalent of _____.
a) Nyquist b) Routh-Hurwitz
c) Bode d) Root locus

6) If the rank of the controllability matrix $= 1$ for a 2nd order system, the system is _____.
a) Controllable b) Not controllable
c) Observable d) Stable

7) For a unity feedback system, the origin of the s-plane is mapped in the z-plane by the transformation $z = e^{sT}$ to which one of the following?

a) Origin
b) $1 + j0$
c) $-1 + j0$
d) $0 + j1$

8) Assertion (A): The zeroes on the real axis near the origin are generally avoided in design.
Reason (R): In a sluggish system, the introduction of zeroes can improve the transient response.

a) Both A and R are true, and R is the correct explanation of A
b) Both A and R are true, but R is not the correct explanation of A
c) A is true, but R is false
d) A is false, but R is true

9) Maximum phase lead occurs at frequency _____.

a) $\omega = \frac{1}{T}$
b) $\omega = \frac{1}{\alpha T}$
c) $\omega = \frac{1}{\sqrt{\alpha} T}$
d) $\omega = \alpha T$

10) The phase lag-lead network is introduced in the output _____.

a) lag at all frequencies
b) lag at high frequencies and lead at low frequencies
c) lag at low frequencies and lead at high frequencies
d) None of the above

11) Due to which of the following reasons, excessive bandwidth in the control system should be avoided _____.

a) It leads to a slow speed of response
b) It leads to low relative stability
c) Noise is proportional to bandwidth
d) None of the above

12) For a lead compensator with $\alpha = 0.1$, the maximum phase lead is approximately _____.

a) 20°
b) 30°
c) 45°
d) 65°

13) In phase-plane analysis, trajectories represent _____.

a) Time response
b) State variables
c) Frequency response
d) Gain

14) A saddle point is _____.

a) Stable
b) Unstable
c) Marginal
d) May be stable or unstable

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Advanced Control System (EEPCC-12)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw neat diagrams whenever necessary.
4) Assume suitable data if necessary.

Section – I

Q.2 Attempt the following. (Any Four) **16**

a) Derive the realization of a lag-lead compensator for an active circuit.

b) Write down the steps to design a lag compensator using root locus.

c) Write the design procedure for the lead compensator using the Bode plot method.

d) Explain the jump resonance phenomenon in nonlinear control systems

e) Determine the kind of singularity for the following differential equation.

$$\ddot{Y} - 0.3\,\dot{Y} + Y = 0$$

Q.3 Attempt the following. (Any Two) **12**

a) The forward path TF of a unity feedback control system is given by $G(s) = \frac{K}{s(s+2)(s+8)}$. Design a suitable lag compensator so that the system meets the following specifications.

i) Percentage overshoot $\leq 16\%$ for unit step input,

ii) Steady state error ≤ 0.125 for unit ramp input.

b) Design a lead compensator for a unity feedback system with OLTF $G(s) = \frac{K}{s(s+1)(s+5)}$ to satisfy the following specifications.

i) Kv $\geq$ 50

ii) Phase Margin $\geq$ 20°

c) Explain the stability of a non-linear control system.

Section – II

Q.4 Solve the following. (Any Four) **16**

a) The closed-loop poles (Eigen values) are to be located at $s = -3$, $s = -7$. Design a state variable feedback.
Given that $A = \begin{bmatrix} 0 & 1 \\ -20 & -9 \end{bmatrix}$ and $B = \begin{bmatrix} 0 \\ 1 \end{bmatrix}, C = [1 \quad 0]$

b) Consider a system having state model
$\begin{bmatrix} \dot{x}_1 \\ \dot{x}_2 \end{bmatrix} = \begin{bmatrix} -2 & -3 \\ 4 & 2 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \end{bmatrix} + \begin{bmatrix} 3 \\ 5 \end{bmatrix} u(t)$ & $Y = [1 \quad 1] \begin{bmatrix} x_1 \\ x_2 \end{bmatrix}$
with $D = 0$. Obtain the Transfer Function.

c) Determine the controllability of the system with state model

$$\begin{bmatrix} \dot{x}_1 \\ \dot{x}_2 \\ \dot{x}_3 \end{bmatrix} = \begin{bmatrix} 0 & 1 & 0 \\ 0 & 0 & 1 \\ 0 & -2 & -3 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix} + \begin{bmatrix} 0 \\ 0 \\ 10 \end{bmatrix} u$$

d) Describe Direct Substitution method for the evaluation of state feedback gain matrix.

e) Derive the pulse transfer function of closed loop system.

Q.5 Solve the following. (Any Two) **12**

a) A system is described by $\begin{bmatrix} \dot{x}_1 \\ \dot{x}_2 \\ \dot{x}_3 \end{bmatrix} = \begin{bmatrix} 0 & 1 & 0 \\ 0 & 0 & 1 \\ -1 & -5 & -6 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix} + \begin{bmatrix} 0 \\ 0 \\ 1 \end{bmatrix} u(t)$
Using state feedback control $u = -Kx$, it is desired to have closed poles are at $(-1 + j2), (-1 - j2), (-10)$.

Find the state feedback matrix using Ackermann's formula.

b) Obtain state transition matrix for the following system matrix
$A = \begin{bmatrix} 0 & 1 \\ -6 & -5 \end{bmatrix}$

c) Examine the stability of following characteristic equation:
$P(z) = z^4 - 1.2z^3 + 0.07z^2 + 0.3z - 0.08 = 0$

Seat No.	

Set **R**

T.Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Advanced Control System (EEPCC-12)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) For pole at $z = 1.2 \rightarrow$ system is _____.
a) Stable b) Unstable
c) Marginal d) Oscillatory

2) Juri's test is a discrete equivalent of _____.
a) Nyquist b) Routh-Hurwitz
c) Bode d) Root locus

3) If the rank of the controllability matrix $= 1$ for a 2nd order system, the system is _____.
a) Controllable b) Not controllable
c) Observable d) Stable

4) For a unity feedback system, the origin of the s-plane is mapped in the z-plane by the transformation $z = e^{sT}$ to which one of the following?
a) Origin b) $1 + j0$
c) $-1 + j0$ d) $0 + j1$

5) Assertion (A): The zeroes on the real axis near the origin are generally avoided in design.
Reason (R): In a sluggish system, the introduction of zeroes can improve the transient response.
a) Both A and R are true, and R is the correct explanation of A
b) Both A and R are true, but R is not the correct explanation of A
c) A is true, but R is false
d) A is false, but R is true

6) Maximum phase lead occurs at frequency _____.

a) $\omega = \frac{1}{T}$ b) $\omega = \frac{1}{\alpha T}$

c) $\omega = \frac{1}{\sqrt{\alpha} T}$ d) $\omega = \alpha T$

7) The phase lag-lead network is introduced in the output _____.

a) lag at all frequencies
b) lag at high frequencies and lead at low frequencies
c) lag at low frequencies and lead at high frequencies
d) None of the above

8) Due to which of the following reasons, excessive bandwidth in the control system should be avoided _____.

a) It leads to a slow speed of response
b) It leads to low relative stability
c) Noise is proportional to bandwidth
d) None of the above

9) For a lead compensator with $\alpha = 0.1$, the maximum phase lead is approximately _____.

a) 20° b) 30°

c) 45° d) 65°

10) In phase-plane analysis, trajectories represent _____.

a) Time response b) State variables

c) Frequency response d) Gain

11) A saddle point is _____.

a) Stable b) Unstable

c) Marginal d) May be stable or unstable

12) An observer is used to _____.

a) Control input
b) Estimate unmeasured states
c) Increase gain
d) Reduce noise

13) The transfer function $Y(s)/U(s)$ of a system described by the state equations $dx/dt = -2x + 2u$ and $y(t) = 0.5x$ is _____.

a) $0.5/(s-2)$ b) $1/(s-2)$

c) $0.5/(s+2)$ d) $1/(s+2)$

14) The transfer function of a zero-order hold is _____.

a) $1 - e^{Ts}$ b) $1 - e^{-Ts}$

c) $\frac{1-e^{Ts}}{s}$ d) $\frac{1-e^{-Ts}}{s}$

Seat No.	

Set **R**

T.Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Advanced Control System (EEPCC-12)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw neat diagrams whenever necessary.
4) Assume suitable data if necessary.

Section – I

Q.2 Attempt the following. (Any Four) **16**

a) Derive the realization of a lag-lead compensator for an active circuit.

b) Write down the steps to design a lag compensator using root locus.

c) Write the design procedure for the lead compensator using the Bode plot method.

d) Explain the jump resonance phenomenon in nonlinear control systems

e) Determine the kind of singularity for the following differential equation.

$$\ddot{Y} - 0.3\,\dot{Y} + Y = 0$$

Q.3 Attempt the following. (Any Two) **12**

a) The forward path TF of a unity feedback control system is given by $G(s) = \frac{K}{s(s+2)(s+8)}$. Design a suitable lag compensator so that the system meets the following specifications.

i) Percentage overshoot $\leq 16\%$ for unit step input,

ii) Steady state error ≤ 0.125 for unit ramp input.

b) Design a lead compensator for a unity feedback system with OLTF $G(s) = \frac{K}{s(s+1)(s+5)}$ to satisfy the following specifications.

i) Kv $\geq$ 50

ii) Phase Margin $\geq$ 20°

c) Explain the stability of a non-linear control system.

Section – II

Q.4 Solve the following. (Any Four) **16**

a) The closed-loop poles (Eigen values) are to be located at $s = -3$, $s = -7$. Design a state variable feedback.
Given that $A = \begin{bmatrix} 0 & 1 \\ -20 & -9 \end{bmatrix}$ and $B = \begin{bmatrix} 0 \\ 1 \end{bmatrix}, C = [1 \quad 0]$

b) Consider a system having state model
$\begin{bmatrix} \dot{x}_1 \\ \dot{x}_2 \end{bmatrix} = \begin{bmatrix} -2 & -3 \\ 4 & 2 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \end{bmatrix} + \begin{bmatrix} 3 \\ 5 \end{bmatrix} u(t)$ & $Y = [1 \quad 1] \begin{bmatrix} x_1 \\ x_2 \end{bmatrix}$
with $D = 0$. Obtain the Transfer Function.

c) Determine the controllability of the system with state model

$$\begin{bmatrix} \dot{x}_1 \\ \dot{x}_2 \\ \dot{x}_3 \end{bmatrix} = \begin{bmatrix} 0 & 1 & 0 \\ 0 & 0 & 1 \\ 0 & -2 & -3 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix} + \begin{bmatrix} 0 \\ 0 \\ 10 \end{bmatrix} u$$

d) Describe Direct Substitution method for the evaluation of state feedback gain matrix.

e) Derive the pulse transfer function of closed loop system.

Q.5 Solve the following. (Any Two) **12**

a) A system is described by $\begin{bmatrix} \dot{x}_1 \\ \dot{x}_2 \\ \dot{x}_3 \end{bmatrix} = \begin{bmatrix} 0 & 1 & 0 \\ 0 & 0 & 1 \\ -1 & -5 & -6 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix} + \begin{bmatrix} 0 \\ 0 \\ 1 \end{bmatrix} u(t)$
Using state feedback control $u = -Kx$, it is desired to have closed poles are at $(-1 + j2), (-1 - j2), (-10)$.

Find the state feedback matrix using Ackermann's formula.

b) Obtain state transition matrix for the following system matrix
$A = \begin{bmatrix} 0 & 1 \\ -6 & -5 \end{bmatrix}$

c) Examine the stability of following characteristic equation:
$P(z) = z^4 - 1.2z^3 + 0.07z^2 + 0.3z - 0.08 = 0$

Seat No.	

Set **S**

T.Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Advanced Control System (EEPCC-12)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) In phase-plane analysis, trajectories represent _____.
a) Time response b) State variables
c) Frequency response d) Gain

2) A saddle point is _____.
a) Stable b) Unstable
c) Marginal d) May be stable or unstable

3) An observer is used to _____.
a) Control input
b) Estimate unmeasured states
c) Increase gain
d) Reduce noise

4) The transfer function $Y(s)/U(s)$ of a system described by the state equations $dx/dt = -2x + 2u$ and $y(t) = 0.5x$ is _____.
a) $0.5/(s-2)$ b) $1/(s-2)$
c) $0.5/(s+2)$ d) $1/(s+2)$

5) The transfer function of a zero-order hold is _____.
a) $1 - e^{Ts}$ b) $1 - e^{-Ts}$
c) $\frac{1-e^{Ts}}{s}$ d) $\frac{1-e^{-Ts}}{s}$

6) For pole at $z = 1.2 \rightarrow$ system is _____.
a) Stable b) Unstable
c) Marginal d) Oscillatory

7) Juri's test is a discrete equivalent of _____.
a) Nyquist b) Routh-Hurwitz
c) Bode d) Root locus

8) If the rank of the controllability matrix $= 1$ for a 2nd order system, the system is _____.

a) Controllable
b) Not controllable
c) Observable
d) Stable

9) For a unity feedback system, the origin of the s-plane is mapped in the z-plane by the transformation $z = e^{sT}$ to which one of the following?

a) Origin
b) $1 + j0$
c) $-1 + j0$
d) $0 + j1$

10) Assertion (A): The zeroes on the real axis near the origin are generally avoided in design.
Reason (R): In a sluggish system, the introduction of zeroes can improve the transient response.

a) Both A and R are true, and R is the correct explanation of A
b) Both A and R are true, but R is not the correct explanation of A
c) A is true, but R is false
d) A is false, but R is true

11) Maximum phase lead occurs at frequency _____.

a) $\omega = \frac{1}{T}$
b) $\omega = \frac{1}{\alpha T}$
c) $\omega = \frac{1}{\sqrt{\alpha} T}$
d) $\omega = \alpha T$

12) The phase lag-lead network is introduced in the output _____.

a) lag at all frequencies
b) lag at high frequencies and lead at low frequencies
c) lag at low frequencies and lead at high frequencies
d) None of the above

13) Due to which of the following reasons, excessive bandwidth in the control system should be avoided _____.

a) It leads to a slow speed of response
b) It leads to low relative stability
c) Noise is proportional to bandwidth
d) None of the above

14) For a lead compensator with $\alpha = 0.1$, the maximum phase lead is approximately _____.

a) 20°
b) 30°
c) 45°
d) 65°

Seat No.	

Set **S**

T.Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Advanced Control System (EEPCC-12)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw neat diagrams whenever necessary.
4) Assume suitable data if necessary.

Section – I

Q.2 Attempt the following. (Any Four) **16**

a) Derive the realization of a lag-lead compensator for an active circuit.

b) Write down the steps to design a lag compensator using root locus.

c) Write the design procedure for the lead compensator using the Bode plot method.

d) Explain the jump resonance phenomenon in nonlinear control systems

e) Determine the kind of singularity for the following differential equation.

$$\ddot{Y} - 0.3\,\dot{Y} + Y = 0$$

Q.3 Attempt the following. (Any Two) **12**

a) The forward path TF of a unity feedback control system is given by $G(s) = \frac{K}{s(s+2)(s+8)}$. Design a suitable lag compensator so that the system meets the following specifications.

i) Percentage overshoot $\leq 16\%$ for unit step input,

ii) Steady state error ≤ 0.125 for unit ramp input.

b) Design a lead compensator for a unity feedback system with OLTF $G(s) = \frac{K}{s(s+1)(s+5)}$ to satisfy the following specifications.

i) Kv $\geq$ 50

ii) Phase Margin $\geq$ 20°

c) Explain the stability of a non-linear control system.

Section – II

Q.4 Solve the following. (Any Four) **16**

a) The closed-loop poles (Eigen values) are to be located at $s = -3$, $s = -7$. Design a state variable feedback.
Given that $A = \begin{bmatrix} 0 & 1 \\ -20 & -9 \end{bmatrix}$ and $B = \begin{bmatrix} 0 \\ 1 \end{bmatrix}, C = [1 \quad 0]$

b) Consider a system having state model
$\begin{bmatrix} \dot{x}_1 \\ \dot{x}_2 \end{bmatrix} = \begin{bmatrix} -2 & -3 \\ 4 & 2 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \end{bmatrix} + \begin{bmatrix} 3 \\ 5 \end{bmatrix} u(t)$ & $Y = [1 \quad 1] \begin{bmatrix} x_1 \\ x_2 \end{bmatrix}$
with $D = 0$. Obtain the Transfer Function.

c) Determine the controllability of the system with state model

$$\begin{bmatrix} \dot{x}_1 \\ \dot{x}_2 \\ \dot{x}_3 \end{bmatrix} = \begin{bmatrix} 0 & 1 & 0 \\ 0 & 0 & 1 \\ 0 & -2 & -3 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix} + \begin{bmatrix} 0 \\ 0 \\ 10 \end{bmatrix} u$$

d) Describe Direct Substitution method for the evaluation of state feedback gain matrix.

e) Derive the pulse transfer function of closed loop system.

Q.5 Solve the following. (Any Two) **12**

a) A system is described by $\begin{bmatrix} \dot{x}_1 \\ \dot{x}_2 \\ \dot{x}_3 \end{bmatrix} = \begin{bmatrix} 0 & 1 & 0 \\ 0 & 0 & 1 \\ -1 & -5 & -6 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix} + \begin{bmatrix} 0 \\ 0 \\ 1 \end{bmatrix} u(t)$
Using state feedback control $u = -Kx$, it is desired to have closed poles are at $(-1 + j2), (-1 - j2), (-10)$.

Find the state feedback matrix using Ackermann's formula.

b) Obtain state transition matrix for the following system matrix
$A = \begin{bmatrix} 0 & 1 \\ -6 & -5 \end{bmatrix}$

c) Examine the stability of following characteristic equation:
$P(z) = z^4 - 1.2z^3 + 0.07z^2 + 0.3z - 0.08 = 0$

SLR-QH-590

Seat No.	

Set P

T.Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Power System Operation and Control (EEPEC – 02A)

Day & Date: Friday, 22-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Solve the following: **14**

1) A synchronous capacitor can supply _____.
a) lagging vars only
b) leading vars only
c) both leading and lagging vars
d) neither leading vars nor lagging vars

2) The principle of incremental costs is used.
a) to decide the total plant capacity to be operated
b) to decide the load allocation between units in operation
c) to decide the sequence of adding units
d) all the above

3) A generating unit in a power system is generating 100 MW. It is known that transfer of 100 MW from this unit to the load centre causes a transmission loss of 15 MW. The penalty factor for this unit is _____.
a) 0.7 b) 0.85
c) 1.15 d) 1.43

4) The time required for a thermal unit to be brought online from a cold state is called _____.
a) Start-up time b) Shut-down time
c) Minimum up-time d) Banking time

5) Two alternators A and B are operating in parallel. If excitation of A is increased _____.
a) reactive power of A is increased while that of B is decreased
b) reactive power of A is increased while that of B is remains unchanged
c) reactive power of A is decreased
d) both real and reactive power of A are increased

6) A system has two sources having plant loadings P_1 and P_2. The transmission loss P_L is _____.

a) $P_1^2B_{11} + P_1P_2B_{12} + P_2^2B_{22}$ b) $2P_1^2B_{11} + P_1P_2B_{12} + 2P_2^2B_{22}$

c) $P_1^2 B_{11} + 2P_1P_2B_{12} + P_2^2B_{22}$ d) None of the above

7) The units for heat rate are _____.

a) k cal/k Wh b) k Wh/k cal

c) k cal/hour d) kW

8) The primary purpose of Load Frequency Control (LFC) is to maintain _____.

a) Voltage b) Constant frequency

c) Reactive power d) Line current

9) Var flows in a circuit _____.

a) from a point of higher voltage to that of lower voltage

b) from a point of lower voltage to that of higher voltage

c) without any effect on the voltage of terminals

d) none of these

10) In economic dispatch including transmission losses, the effect of increased penalty factor is to _____.

a) increase load on that generator

b) decrease load on that generator

c) keep the load on that generator constant

d) either a) or b)

11) In economic dispatch, the condition for optimum generation allocation neglecting line losses is that all units must operate at equal _____.

a) Fuel cost b) Incremental fuel cost

c) Efficiency d) Rated capacity

12) Automatic generation control (AGC) _____.

a) always requires a special and separate computer

b) can be provided by a special program in the SCADA master unit computer

c) cannot include transmission losses

d) cannot be relied in some cases

13) The voltage drop across a series capacitor bank is proportional to _____.

a) line current b) line voltage

c) size of conductor d) both line current and voltage

14) Security analysis is executed _____.

a) real time analysis b) pre contingency analysis

c) post contingency analysis d) None of them

Seat No.	

Set **P**

T.Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Power System Operation and Control (EEPEC – 02A)

Day & Date: Friday, 22-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

SECTION – I

Q.2 Attempt the following. (Any Four) **16**

a) Define the Unit Commitment. What are the constraints of Unit Commitment.

b) Derive the expression for the transmission loss in optimum scheduling.

c) State the necessity of maintaining a constant frequency for stable power system operation.

d) Write a short note on 'Automatic Load Dispatching'.

e) Explain the merits of the interconnection of power system network.

Q.3 Attempt the following. (Any Two) **12**

a) The fuel inputs F_1 and F_2 in kcal/hour for two units having output P_1 and P_2 MW are as under:

$F_1 = P_1 + 0.02P_1^2 + 20$

$F_2 = 1.2P_2 + 0.015P_2^2 + 10$

The maximum and minimum loads on the two units are 250 MW and 25 MW respectively. Find and pot the variation of load on each unit as a function of the total load which varies from 50 MW to 500 MW. Also plot incremental cost against total load.

b) Discuss the dynamic programming method to solar unit commitment program.

c) Derive the thermal heat terminology for the optimal scheduling and cost scheduling.

SECTION – II

Q.4 Attempt the following. (Any Four) **16**

a) Draw a block diagram, with illustrative transfer functions, of a single area load frequency control system.

b) Explain the system state classifications in power system security.

c) Explain the mechanism of load frequency control.

d) What is Voltage collapse? List out the different reasons and explain.

e) Explain the effect of rotor angle on voltage stability.

Q.5 Attempt the following. (Any Two) **12**

a) Describe the effect of thyristor-controlled static shunt compensation to meet the reactive power requirement in the power system.

b) Write a short note on security analysis and sensitivity factors.

c) Express the mathematical formulation of Voltage stability problem.

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Power System Operation and Control (EEPEC – 02A)

Day & Date: Friday, 22-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Solve the following: **14**

1) The primary purpose of Load Frequency Control (LFC) is to maintain _____.
a) Voltage b) Constant frequency
c) Reactive power d) Line current

2) Var flows in a circuit _____.
a) from a point of higher voltage to that of lower voltage
b) from a point of lower voltage to that of higher voltage
c) without any effect on the voltage of terminals
d) none of these

3) In economic dispatch including transmission losses, the effect of increased penalty factor is to _____.
a) increase load on that generator
b) decrease load on that generator
c) keep the load on that generator constant
d) either a) or b)

4) In economic dispatch, the condition for optimum generation allocation neglecting line losses is that all units must operate at equal _____.
a) Fuel cost b) Incremental fuel cost
c) Efficiency d) Rated capacity

5) Automatic generation control (AGC) _____.
a) always requires a special and separate computer
b) can be provided by a special program in the SCADA master unit computer
c) cannot include transmission losses
d) cannot be relied in some cases

6) The voltage drop across a series capacitor bank is proportional to _____.
a) line current
b) line voltage
c) size of conductor
d) both line current and voltage

7) Security analysis is executed _____.
a) real time analysis
b) pre contingency analysis
c) post contingency analysis
d) None of them

8) A synchronous capacitor can supply _____.
a) lagging vars only
b) leading vars only
c) both leading and lagging vars
d) neither leading vars nor lagging vars

9) The principle of incremental costs is used.
a) to decide the total plant capacity to be operated
b) to decide the load allocation between units in operation
c) to decide the sequence of adding units
d) all the above

10) A generating unit in a power system is generating 100 MW. It is known that transfer of 100 MW from this unit to the load centre causes a transmission loss of 15 MW. The penalty factor for this unit is _____.
a) 0.7
b) 0.85
c) 1.15
d) 1.43

11) The time required for a thermal unit to be brought online from a cold state is called _____.
a) Start-up time
b) Shut-down time
c) Minimum up-time
d) Banking time

12) Two alternators A and B are operating in parallel. If excitation of A is increased _____.
a) reactive power of A is increased while that of B is decreased
b) reactive power of A is increased while that of B is remains unchanged
c) reactive power of A is decreased
d) both real and reactive power of A are increased

13) A system has two sources having plant loadings P_1 and P_2. The transmission loss P_L is _____.
a) $P_1^2B_{11} + P_1P_2B_{12} + P_2^2B_{22}$
b) $2P_1^2B_{11} + P_1P_2B_{12} + 2P_2^2B_{22}$
c) $P_1^2 B_{11} + 2P_1P_2B_{12} + P_2^2B_{22}$
d) None of the above

14) The units for heat rate are _____.
a) k cal/k Wh
b) k Wh/k cal
c) k cal/hour
d) kW

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Power System Operation and Control (EEPEC – 02A)

Day & Date: Friday, 22-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

SECTION – I

Q.2 Attempt the following. (Any Four) **16**

a) Define the Unit Commitment. What are the constraints of Unit Commitment.

b) Derive the expression for the transmission loss in optimum scheduling.

c) State the necessity of maintaining a constant frequency for stable power system operation.

d) Write a short note on 'Automatic Load Dispatching'.

e) Explain the merits of the interconnection of power system network.

Q.3 Attempt the following. (Any Two) **12**

a) The fuel inputs F_1 and F_2 in kcal/hour for two units having output P_1 and P_2 MW are as under:

$F_1 = P_1 + 0.02P_1^2 + 20$

$F_2 = 1.2P_2 + 0.015P_2^2 + 10$

The maximum and minimum loads on the two units are 250 MW and 25 MW respectively. Find and pot the variation of load on each unit as a function of the total load which varies from 50 MW to 500 MW. Also plot incremental cost against total load.

b) Discuss the dynamic programming method to solar unit commitment program.

c) Derive the thermal heat terminology for the optimal scheduling and cost scheduling.

SECTION – II

Q.4 Attempt the following. (Any Four) **16**

a) Draw a block diagram, with illustrative transfer functions, of a single area load frequency control system.

b) Explain the system state classifications in power system security.

c) Explain the mechanism of load frequency control.

d) What is Voltage collapse? List out the different reasons and explain.

e) Explain the effect of rotor angle on voltage stability.

Q.5 Attempt the following. (Any Two) **12**

a) Describe the effect of thyristor-controlled static shunt compensation to meet the reactive power requirement in the power system.

b) Write a short note on security analysis and sensitivity factors.

c) Express the mathematical formulation of Voltage stability problem.

Seat No.	

Set **R**

T.Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Power System Operation and Control (EEPEC – 02A)

Day & Date: Friday, 22-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Solve the following: **14**

1) In economic dispatch, the condition for optimum generation allocation neglecting line losses is that all units must operate at equal _____.
a) Fuel cost b) Incremental fuel cost
c) Efficiency d) Rated capacity

2) Automatic generation control (AGC) _____.
a) always requires a special and separate computer
b) can be provided by a special program in the SCADA master unit computer
c) cannot include transmission losses
d) cannot be relied in some cases

3) The voltage drop across a series capacitor bank is proportional to _____.
a) line current b) line voltage
c) size of conductor d) both line current and voltage

4) Security analysis is executed _____.
a) real time analysis b) pre contingency analysis
c) post contingency analysis d) None of them

5) A synchronous capacitor can supply _____.
a) lagging vars only
b) leading vars only
c) both leading and lagging vars
d) neither leading vars nor lagging vars

6) The principle of incremental costs is used.
   a) to decide the total plant capacity to be operated
   b) to decide the load allocation between units in operation
   c) to decide the sequence of adding units
   d) all the above

7) A generating unit in a power system is generating 100 MW. It is known that transfer of 100 MW from this unit to the load centre causes a transmission loss of 15 MW. The penalty factor for this unit is _____.
   a) 0.7 b) 0.85
   c) 1.15 d) 1.43

8) The time required for a thermal unit to be brought online from a cold state is called _____.
   a) Start-up time b) Shut-down time
   c) Minimum up-time d) Banking time

9) Two alternators A and B are operating in parallel. If excitation of A is increased _____.
   a) reactive power of A is increased while that of B is decreased
   b) reactive power of A is increased while that of B is remains unchanged
   c) reactive power of A is decreased
   d) both real and reactive power of A are increased

10) A system has two sources having plant loadings P_1 and P_2. The transmission loss P_L is _____.
   a) $P_1^2B_{11} + P_1P_2B_{12} + P_2^2B_{22}$ b) $2P_1^2B_{11} + P_1P_2B_{12} + 2P_2^2B_{22}$
   c) $P_1^2\,B_{11} + 2P_1P_2B_{12} + P_2^2B_{22}$ d) None of the above

11) The units for heat rate are _____.
   a) k cal/k Wh b) k Wh/k cal
   c) k cal/hour d) kW

12) The primary purpose of Load Frequency Control (LFC) is to maintain _____.
   a) Voltage b) Constant frequency
   c) Reactive power d) Line current

13) Var flows in a circuit _____.
   a) from a point of higher voltage to that of lower voltage
   b) from a point of lower voltage to that of higher voltage
   c) without any effect on the voltage of terminals
   d) none of these

14) In economic dispatch including transmission losses, the effect of increased penalty factor is to _____.

a) increase load on that generator
b) decrease load on that generator
c) keep the load on that generator constant
d) either a) or b)

Seat No.	

Set **R**

T.Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Power System Operation and Control (EEPEC – 02A)

Day & Date: Friday, 22-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

SECTION – I

Q.2 Attempt the following. (Any Four) **16**

a) Define the Unit Commitment. What are the constraints of Unit Commitment.

b) Derive the expression for the transmission loss in optimum scheduling.

c) State the necessity of maintaining a constant frequency for stable power system operation.

d) Write a short note on 'Automatic Load Dispatching'.

e) Explain the merits of the interconnection of power system network.

Q.3 Attempt the following. (Any Two) **12**

a) The fuel inputs F_1 and F_2 in kcal/hour for two units having output P_1 and P_2 MW are as under:

$F_1 = P_1 + 0.02P_1^2 + 20$

$F_2 = 1.2P_2 + 0.015P_2^2 + 10$

The maximum and minimum loads on the two units are 250 MW and 25 MW respectively. Find and pot the variation of load on each unit as a function of the total load which varies from 50 MW to 500 MW. Also plot incremental cost against total load.

b) Discuss the dynamic programming method to solar unit commitment program.

c) Derive the thermal heat terminology for the optimal scheduling and cost scheduling.

SECTION – II

Q.4 Attempt the following. (Any Four) **16**

a) Draw a block diagram, with illustrative transfer functions, of a single area load frequency control system.

b) Explain the system state classifications in power system security.

c) Explain the mechanism of load frequency control.

d) What is Voltage collapse? List out the different reasons and explain.

e) Explain the effect of rotor angle on voltage stability.

Q.5 Attempt the following. (Any Two) **12**

a) Describe the effect of thyristor-controlled static shunt compensation to meet the reactive power requirement in the power system.

b) Write a short note on security analysis and sensitivity factors.

c) Express the mathematical formulation of Voltage stability problem.

Seat No.	

Set **S**

T.Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Power System Operation and Control (EEPEC – 02A)

Day & Date: Friday, 22-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Solve the following: **14**

1) A system has two sources having plant loadings P_1 and P_2. The transmission loss P_L is _____.
a) $P_1^2B_{11} + P_1P_2B_{12} + P_2^2B_{22}$ b) $2P_1^2B_{11} + P_1P_2B_{12} + 2P_2^2B_{22}$
c) $P_1^2 B_{11} + 2P_1P_2B_{12} + P_2^2B_{22}$ d) None of the above

2) The units for heat rate are _____.
a) k cal/k Wh b) k Wh/k cal
c) k cal/hour d) kW

3) The primary purpose of Load Frequency Control (LFC) is to maintain _____.
a) Voltage b) Constant frequency
c) Reactive power d) Line current

4) Var flows in a circuit _____.
a) from a point of higher voltage to that of lower voltage
b) from a point of lower voltage to that of higher voltage
c) without any effect on the voltage of terminals
d) none of these

5) In economic dispatch including transmission losses, the effect of increased penalty factor is to _____.
a) increase load on that generator
b) decrease load on that generator
c) keep the load on that generator constant
d) either a) or b)

6) In economic dispatch, the condition for optimum generation allocation neglecting line losses is that all units must operate at equal _____.
a) Fuel cost b) Incremental fuel cost
c) Efficiency d) Rated capacity

7) Automatic generation control (AGC) _____.
   a) always requires a special and separate computer
   b) can be provided by a special program in the SCADA master unit computer
   c) cannot include transmission losses
   d) cannot be relied in some cases

8) The voltage drop across a series capacitor bank is proportional to _____.
   a) line current
   b) line voltage
   c) size of conductor
   d) both line current and voltage

9) Security analysis is executed _____.
   a) real time analysis
   b) pre contingency analysis
   c) post contingency analysis
   d) None of them

10) A synchronous capacitor can supply _____.
   a) lagging vars only
   b) leading vars only
   c) both leading and lagging vars
   d) neither leading vars nor lagging vars

11) The principle of incremental costs is used.
   a) to decide the total plant capacity to be operated
   b) to decide the load allocation between units in operation
   c) to decide the sequence of adding units
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12) A generating unit in a power system is generating 100 MW. It is known that transfer of 100 MW from this unit to the load centre causes a transmission loss of 15 MW. The penalty factor for this unit is _____.
   a) 0.7
   b) 0.85
   c) 1.15
   d) 1.43

13) The time required for a thermal unit to be brought online from a cold state is called _____.
   a) Start-up time
   b) Shut-down time
   c) Minimum up-time
   d) Banking time

14) Two alternators A and B are operating in parallel. If excitation of A is increased _____.
   a) reactive power of A is increased while that of B is decreased
   b) reactive power of A is increased while that of B is remains unchanged
   c) reactive power of A is decreased
   d) both real and reactive power of A are increased

Seat No.	

Set **S**

T.Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Power System Operation and Control (EEPEC – 02A)

Day & Date: Friday, 22-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

SECTION – I

Q.2 Attempt the following. (Any Four) **16**

a) Define the Unit Commitment. What are the constraints of Unit Commitment.

b) Derive the expression for the transmission loss in optimum scheduling.

c) State the necessity of maintaining a constant frequency for stable power system operation.

d) Write a short note on 'Automatic Load Dispatching'.

e) Explain the merits of the interconnection of power system network.

Q.3 Attempt the following. (Any Two) **12**

a) The fuel inputs F_1 and F_2 in kcal/hour for two units having output P_1 and P_2 MW are as under:

$F_1 = P_1 + 0.02P_1^2 + 20$

$F_2 = 1.2P_2 + 0.015P_2^2 + 10$

The maximum and minimum loads on the two units are 250 MW and 25 MW respectively. Find and pot the variation of load on each unit as a function of the total load which varies from 50 MW to 500 MW. Also plot incremental cost against total load.

b) Discuss the dynamic programming method to solar unit commitment program.

c) Derive the thermal heat terminology for the optimal scheduling and cost scheduling.

SECTION – II

Q.4 Attempt the following. (Any Four) **16**

a) Draw a block diagram, with illustrative transfer functions, of a single area load frequency control system.

b) Explain the system state classifications in power system security.

c) Explain the mechanism of load frequency control.

d) What is Voltage collapse? List out the different reasons and explain.

e) Explain the effect of rotor angle on voltage stability.

Q.5 Attempt the following. (Any Two) **12**

a) Describe the effect of thyristor-controlled static shunt compensation to meet the reactive power requirement in the power system.

b) Write a short note on security analysis and sensitivity factors.

c) Express the mathematical formulation of Voltage stability problem.

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Seat No.	

Set P

T. Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS)
Examination: Marh/April – 2026
Electrical Machine Design (EEPEC – 02B)

Day & Date: Friday, 22-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data whenever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternative from the options. 14

1) Power transformers are designed to have maximum efficiency at _____.
a) Full load b) 50% load
c) 80% load d) no load

2) Maximum temperature limit for class B insulation is _____.
a) 105°C b) 120°C
c) 130° d) 155°C

3) The Major Consideration is to evolve a good Design is _____.
a) Compliance with performance laid down in Specification
b) Cost
c) Durability
d) All of above

4) Area of the window is _____ the window space factor.
a) Directly proportional to b) Inversely proportional to
c) Equal to d) None of the above

5) In transformer making yoke section about 15-20% larger than the limb section has an effect of _____.
a) Reducing yoke flux density b) Reducing the iron losses
c) both a) and b) above d) none of the above

6) The Output of a d.c machine is limited by _____.
a) peripheral velocity b) temperature rise
c) frequency of flux reversals d) Commutator

7) The electric loading in a DC machine is typically represented as _____.
a) Total flux per pole
b) Total ampere-conductors per meter of armature periphery
c) Flux density in the air gap
d) Number of armature slots

8) Compared to induction motors the air gap in d.c machine is _____.
a) Large
b) Small
c) Very small
d) Equal

9) Which type of slots are normaly used in induction motor _____?
a) Open
b) Semi enclosed
c) closed
d) Round

10) Slip ring are usually made of _____.
a) Copper
b) Carbon
c) Phosphors Bronze
d) Aluminium

11) The speed of a synchronous machine _____.
a) Increase with increase in load
b) Decrease with increase in load
c) Always remains constant
d) varies with power factor

12) Usual range of SCR for turbo generator is _____.
a) 1.0 to 1.5
b) 0.8 to 0.9
c) 0.5 to 0.6
d) 0.2 to 0.3

13) An induction motor will draw _____ magnetizing current for a _____ air gap length.
a) small, large
b) large, small
c) large, large
d) None of the above

14) A turbo machine is usually running at a speed of _____.
a) 15000 rpm
b) 1500 rpm
c) 5000 rpm
d) 3000 rpm

Seat No.		Set	P

T. Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS)
Examination: Marh/April – 2026
Electrical Machine Design (EEPEC – 02B)

Day & Date: Friday, 22-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All Questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

Section – I

Q.2 Solve. (Any Four) **16**

a) Derive the Expression for output equation for single phase core type transformer.

b) Describe the Classification of Insulating Materials.

c) Distinguish between core type and shell type transformer.

d) A 350 kw, 500V, 450 rpm, 6 pole dc generator is built with an armature diameter of 0.87m and a core length of 0.32m the lap wound armature has 660 conductor calculate the specific electric and magnetic loading.

e) Three phase, oil cooled core type transformer has following dimensions: distance between core centres 0.2m, height of window 0.24m, diameter of circumscribing circle 0.14m, the flux density in core 1.25wb/m^2, and current density in the conductor is 2.5A/mm^2 Estimate the KVA rating Assume a window space factor of 0.2 and core area factor 0.56, the core is two stepped.

Q.3 Solve. (Any Two) **12**

a) Derive the Expression for output equation for DC machine.

b) Derive an expression two stepped core.

c) A 5KW, 250V, 4 pole, 1500 rpm, shunt generator is designed to have a square pole face the loading are: average flux density in the gap is 0.42 wb/m^2, ampere conductor per metre 15000 find the main dimensions of the machine Assume full load efficiency 0.87 and ratio of pole arc to pole pitch is 0.66

Section – II

Q.4 Solve. (Any Four) **16**

a) Derive the output equation of three phase induction motor.

b) Explain the choice of specific magnetic loading for synchronous machine.

c) Derive an expression for rotor bars for three phase induction motor.

d) Find the current in the bars and end rings of a cage rotor of a 6 pole, three phase induction motor having 72 stator slots with 15 conductor in each slot if the stator current per phase is 20A and rotor slots are 55 hence find the suitable size of cage bars and end rings.

e) Estimate the KVA rating of a three phase, 50Hz, 2 pole, turbo machine having are length 160cm, peripheral speed 140m/sec ac = 525 per cm and Bav = 0.52 wb/m^2 Assume uniformly distributed winding Assume kw = 0.955

Q.5 Solve. (Any Two) **12**

a) Derive an expression for output equation of turbo alternator.

b) In the design of a 30HP, 3 phase, 440V, 960 RPM, 50 HZ delta connected induction motor, assume the specific electric loading of 25000ac/m, specific magnetic loading of 0.46 wb/m^2 full load efficiency 86%, P.f. 0.87 and estimate the following:

i) Stator Core Dimensions
ii) Number of stator slots and winding turns

c) A 500 KVA, 3.3KV, 50HZ, 600rpm, three phase salient pole stator connection alternator has 180 turns phase Estimate the length of air gap, if the average flux density is 0.54wb/m^2, the ratio of pole arc to pole pitch 0.65, the short circuit ratio 1.2 and gap extension coefficient 1.15 the mmf required for gap is 80% of no load field mmf winding factor 0.955

SLR-QH-591

Seat No.	

Set Q

T. Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS)
Examination: Marh/April – 2026
Electrical Machine Design (EEPEC – 02B)

Day & Date: Friday, 22-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data whenever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternative from the options. **14**

1) Compared to induction motors the air gap in d.c machine is _____.
a) Large b) Small
c) Very small d) Equal

2) Which type of slots are normaly used in induction motor _____?
a) Open b) Semi enclosed
c) closed d) Round

3) Slip ring are usually made of _____.
a) Copper b) Carbon
c) Phosphors Bronze d) Aluminium

4) The speed of a synchronous machine _____.
a) Increase with increase in load
b) Decrease with increase in load
c) Always remains constant
d) varies with power factor

5) Usual range of SCR for turbo generator is _____.
a) 1.0 to 1.5 b) 0.8 to 0.9
c) 0.5 to 0.6 d) 0.2 to 0.3

6) An induction motor will draw _____ magnetizing current for a _____ air gap length.
a) small, large b) large, small
c) large, large d) None of the above

7) A turbo machine is usually running at a speed of _____.
a) 15000 rpm b) 1500 rpm
c) 5000 rpm d) 3000 rpm

8) Power transformers are designed to have maximum efficiency at _____.
a) Full load b) 50% load
c) 80% load d) no load

9) Maximum temperature limit for class B insulation is _____.
a) 105°C b) 120°C
c) 130° d) 155°C

10) The Major Consideration is to evolve a good Design is _____.
a) Compliance with performance laid down in Specification
b) Cost
c) Durability
d) All of above

11) Area of the window is _____ the window space factor.
a) Directly proportional to b) Inversely proportional to
c) Equal to d) None of the above

12) In transformer making yoke section about 15-20% larger than the limb section has an effect of _____.
a) Reducing yoke flux density b) Reducing the iron losses
c) both a) and b) above d) none of the above

13) The Output of a d.c machine is limited by _____.
a) peripheral velocity b) temperature rise
c) frequency of flux reversals d) Commutator

14) The electric loading in a DC machine is typically represented as _____.
a) Total flux per pole
b) Total ampere-conductors per meter of armature periphery
c) Flux density in the air gap
d) Number of armature slots

Seat No.	

Set **Q**

T. Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS)
Examination: Marh/April – 2026
Electrical Machine Design (EEPEC – 02B)

Day & Date: Friday, 22-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All Questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

Section – I

Q.2 Solve. (Any Four) **16**

a) Derive the Expression for output equation for single phase core type transformer.

b) Describe the Classification of Insulating Materials.

c) Distinguish between core type and shell type transformer.

d) A 350 kw, 500V, 450 rpm, 6 pole dc generator is built with an armature diameter of 0.87m and a core length of 0.32m the lap wound armature has 660 conductor calculate the specific electric and magnetic loading.

e) Three phase, oil cooled core type transformer has following dimensions: distance between core centres 0.2m, height of window 0.24m, diameter of circumscribing circle 0.14m, the flux density in core 1.25wb/m^2, and current density in the conductor is 2.5A/mm^2 Estimate the KVA rating Assume a window space factor of 0.2 and core area factor 0.56, the core is two stepped.

Q.3 Solve. (Any Two) **12**

a) Derive the Expression for output equation for DC machine.

b) Derive an expression two stepped core.

c) A 5KW, 250V, 4 pole, 1500 rpm, shunt generator is designed to have a square pole face the loading are: average flux density in the gap is 0.42 wb/m^2, ampere conductor per metre 15000 find the main dimensions of the machine Assume full load efficiency 0.87 and ratio of pole arc to pole pitch is 0.66

Section – II

Q.4 Solve. (Any Four) **16**

a) Derive the output equation of three phase induction motor.

b) Explain the choice of specific magnetic loading for synchronous machine.

c) Derive an expression for rotor bars for three phase induction motor.

d) Find the current in the bars and end rings of a cage rotor of a 6 pole, three phase induction motor having 72 stator slots with 15 conductor in each slot if the stator current per phase is 20A and rotor slots are 55 hence find the suitable size of cage bars and end rings.

e) Estimate the KVA rating of a three phase, 50Hz, 2 pole, turbo machine having are length 160cm, peripheral speed 140m/sec ac = 525 per cm and Bav = 0.52 wb/m^2 Assume uniformly distributed winding Assume kw = 0.955

Q.5 Solve. (Any Two) **12**

a) Derive an expression for output equation of turbo alternator.

b) In the design of a 30HP, 3 phase, 440V, 960 RPM, 50 HZ delta connected induction motor, assume the specific electric loading of 25000ac/m, specific magnetic loading of 0.46 wb/m^2 full load efficiency 86%, P.f. 0.87 and estimate the following:

i) Stator Core Dimensions
ii) Number of stator slots and winding turns

c) A 500 KVA, 3.3KV, 50HZ, 600rpm, three phase salient pole stator connection alternator has 180 turns phase Estimate the length of air gap, if the average flux density is 0.54wb/m^2, the ratio of pole arc to pole pitch 0.65, the short circuit ratio 1.2 and gap extension coefficient 1.15 the mmf required for gap is 80% of no load field mmf winding factor 0.955

SLR-QH-591

Seat No.	

Set R

T. Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS)
Examination: Marh/April – 2026
Electrical Machine Design (EEPEC – 02B)

Day & Date: Friday, 22-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data whenever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternative from the options. 14

1) The speed of a synchronous machine _____.
a) Increase with increase in load
b) Decrease with increase in load
c) Always remains constant
d) varies with power factor

2) Usual range of SCR for turbo generator is _____.
a) 1.0 to 1.5 b) 0.8 to 0.9
c) 0.5 to 0.6 d) 0.2 to 0.3

3) An induction motor will draw _____ magnetizing current for a _____ air gap length.
a) small, large b) large, small
c) large, large d) None of the above

4) A turbo machine is usually running at a speed of _____.
a) 15000 rpm b) 1500 rpm
c) 5000 rpm d) 3000 rpm

5) Power transformers are designed to have maximum efficiency at _____.
a) Full load b) 50% load
c) 80% load d) no load

6) Maximum temperature limit for class B insulation is _____.
a) 105°C b) 120°C
c) 130° d) 155°C

7) The Major Consideration is to evolve a good Design is _____.
a) Compliance with performance laid down in Specification
b) Cost
c) Durability
d) All of above

8) Area of the window is _____ the window space factor.
a) Directly proportional to
b) Inversely proportional to
c) Equal to
d) None of the above

9) In transformer making yoke section about 15-20% larger than the limb section has an effect of _____.
a) Reducing yoke flux density
b) Reducing the iron losses
c) both a) and b) above
d) none of the above

10) The Output of a d.c machine is limited by _____.
a) peripheral velocity
b) temperature rise
c) frequency of flux reversals
d) Commutator

11) The electric loading in a DC machine is typically represented as _____.
a) Total flux per pole
b) Total ampere-conductors per meter of armature periphery
c) Flux density in the air gap
d) Number of armature slots

12) Compared to induction motors the air gap in d.c machine is _____.
a) Large
b) Small
c) Very small
d) Equal

13) Which type of slots are normaly used in induction motor _____?
a) Open
b) Semi enclosed
c) closed
d) Round

14) Slip ring are usually made of _____.
a) Copper
b) Carbon
c) Phosphors Bronze
d) Aluminium

SLR-QH-591

Seat No.	

Set R

T. Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS)
Examination: Marh/April – 2026
Electrical Machine Design (EEPEC – 02B)

Day & Date: Friday, 22-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All Questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

Section – I

Q.2 Solve. (Any Four) **16**

a) Derive the Expression for output equation for single phase core type transformer.

b) Describe the Classification of Insulating Materials.

c) Distinguish between core type and shell type transformer.

d) A 350 kw, 500V, 450 rpm, 6 pole dc generator is built with an armature diameter of 0.87m and a core length of 0.32m the lap wound armature has 660 conductor calculate the specific electric and magnetic loading.

e) Three phase, oil cooled core type transformer has following dimensions: distance between core centres 0.2m, height of window 0.24m, diameter of circumscribing circle 0.14m, the flux density in core 1.25wb/m^2, and current density in the conductor is 2.5A/mm^2 Estimate the KVA rating Assume a window space factor of 0.2 and core area factor 0.56, the core is two stepped.

Q.3 Solve. (Any Two) **12**

a) Derive the Expression for output equation for DC machine.

b) Derive an expression two stepped core.

c) A 5KW, 250V, 4 pole, 1500 rpm, shunt generator is designed to have a square pole face the loading are: average flux density in the gap is 0.42 wb/m^2, ampere conductor per metre 15000 find the main dimensions of the machine Assume full load efficiency 0.87 and ratio of pole arc to pole pitch is 0.66

Section – II

Q.4 Solve. (Any Four) **16**

a) Derive the output equation of three phase induction motor.

b) Explain the choice of specific magnetic loading for synchronous machine.

c) Derive an expression for rotor bars for three phase induction motor.

d) Find the current in the bars and end rings of a cage rotor of a 6 pole, three phase induction motor having 72 stator slots with 15 conductor in each slot if the stator current per phase is 20A and rotor slots are 55 hence find the suitable size of cage bars and end rings.

e) Estimate the KVA rating of a three phase, 50Hz, 2 pole, turbo machine having are length 160cm, peripheral speed 140m/sec ac = 525 per cm and Bav = 0.52 wb/m^2 Assume uniformly distributed winding Assume kw = 0.955

Q.5 Solve. (Any Two) **12**

a) Derive an expression for output equation of turbo alternator.

b) In the design of a 30HP, 3 phase, 440V, 960 RPM, 50 HZ delta connected induction motor, assume the specific electric loading of 25000ac/m, specific magnetic loading of 0.46 wb/m^2 full load efficiency 86%, P.f. 0.87 and estimate the following:

i) Stator Core Dimensions
ii) Number of stator slots and winding turns

c) A 500 KVA, 3.3KV, 50HZ, 600rpm, three phase salient pole stator connection alternator has 180 turns phase Estimate the length of air gap, if the average flux density is 0.54wb/m^2, the ratio of pole arc to pole pitch 0.65, the short circuit ratio 1.2 and gap extension coefficient 1.15 the mmf required for gap is 80% of no load field mmf winding factor 0.955

Seat No.	

Set **S**

T. Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS)
Examination: Marh/April – 2026
Electrical Machine Design (EEPEC – 02B)

Day & Date: Friday, 22-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data whenever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternative from the options. **14**

1) The Output of a d.c machine is limited by _____.
a) peripheral velocity b) temperature rise
c) frequency of flux reversals d) Commutator

2) The electric loading in a DC machine is typically represented as _____.
a) Total flux per pole
b) Total ampere-conductors per meter of armature periphery
c) Flux density in the air gap
d) Number of armature slots

3) Compared to induction motors the air gap in d.c machine is _____.
a) Large b) Small
c) Very small d) Equal

4) Which type of slots are normaly used in induction motor _____?
a) Open b) Semi enclosed
c) closed d) Round

5) Slip ring are usually made of _____.
a) Copper b) Carbon
c) Phosphors Bronze d) Aluminium

6) The speed of a synchronous machine _____.
a) Increase with increase in load
b) Decrease with increase in load
c) Always remains constant
d) varies with power factor

7) Usual range of SCR for turbo generator is _____.
a) 1.0 to 1.5 b) 0.8 to 0.9
c) 0.5 to 0.6 d) 0.2 to 0.3

8) An induction motor will draw _____ magnetizing current for a _____ air gap length.
a) small, large b) large, small
c) large, large d) None of the above

9) A turbo machine is usually running at a speed of _____.
a) 15000 rpm b) 1500 rpm
c) 5000 rpm d) 3000 rpm

10) Power transformers are designed to have maximum efficiency at _____.
a) Full load b) 50% load
c) 80% load d) no load

11) Maximum temperature limit for class B insulation is _____.
a) 105°C b) 120°C
c) 130° d) 155°C

12) The Major Consideration is to evolve a good Design is _____.
a) Compliance with performance laid down in Specification
b) Cost
c) Durability
d) All of above

13) Area of the window is _____ the window space factor.
a) Directly proportional to b) Inversely proportional to
c) Equal to d) None of the above

14) In transformer making yoke section about 15-20% larger than the limb section has an effect of _____.
a) Reducing yoke flux density b) Reducing the iron losses
c) both a) and b) above d) none of the above

SLR-QH-591

Seat No.		Set	S

T. Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS)
Examination: Marh/April – 2026
Electrical Machine Design (EEPEC – 02B)

Day & Date: Friday, 22-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All Questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

Section – I

Q.2 Solve. (Any Four) **16**

a) Derive the Expression for output equation for single phase core type transformer.

b) Describe the Classification of Insulating Materials.

c) Distinguish between core type and shell type transformer.

d) A 350 kw, 500V, 450 rpm, 6 pole dc generator is built with an armature diameter of 0.87m and a core length of 0.32m the lap wound armature has 660 conductor calculate the specific electric and magnetic loading.

e) Three phase, oil cooled core type transformer has following dimensions: distance between core centres 0.2m, height of window 0.24m, diameter of circumscribing circle 0.14m, the flux density in core 1.25wb/m^2, and current density in the conductor is 2.5A/mm^2 Estimate the KVA rating Assume a window space factor of 0.2 and core area factor 0.56, the core is two stepped.

Q.3 Solve. (Any Two) **12**

a) Derive the Expression for output equation for DC machine.

b) Derive an expression two stepped core.

c) A 5KW, 250V, 4 pole, 1500 rpm, shunt generator is designed to have a square pole face the loading are: average flux density in the gap is 0.42 wb/m^2, ampere conductor per metre 15000 find the main dimensions of the machine Assume full load efficiency 0.87 and ratio of pole arc to pole pitch is 0.66

Section – II

Q.4 Solve. (Any Four) **16**

a) Derive the output equation of three phase induction motor.

b) Explain the choice of specific magnetic loading for synchronous machine.

c) Derive an expression for rotor bars for three phase induction motor.

d) Find the current in the bars and end rings of a cage rotor of a 6 pole, three phase induction motor having 72 stator slots with 15 conductor in each slot if the stator current per phase is 20A and rotor slots are 55 hence find the suitable size of cage bars and end rings.

e) Estimate the KVA rating of a three phase, 50Hz, 2 pole, turbo machine having are length 160cm, peripheral speed 140m/sec ac = 525 per cm and Bav = 0.52 wb/m^2 Assume uniformly distributed winding Assume kw = 0.955

Q.5 Solve. (Any Two) **12**

a) Derive an expression for output equation of turbo alternator.

b) In the design of a 30HP, 3 phase, 440V, 960 RPM, 50 HZ delta connected induction motor, assume the specific electric loading of 25000ac/m, specific magnetic loading of 0.46 wb/m^2 full load efficiency 86%, P.f. 0.87 and estimate the following:

i) Stator Core Dimensions
ii) Number of stator slots and winding turns

c) A 500 KVA, 3.3KV, 50HZ, 600rpm, three phase salient pole stator connection alternator has 180 turns phase Estimate the length of air gap, if the average flux density is 0.54wb/m^2, the ratio of pole arc to pole pitch 0.65, the short circuit ratio 1.2 and gap extension coefficient 1.15 the mmf required for gap is 80% of no load field mmf winding factor 0.955

SLR-QH-594

Seat No.	

Set P

T.Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Extra High Voltage AC Transmission (EEPEC – 03B)

Day & Date: Monday, 25-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) Third mode of propagation is called as _____.
a) Line to ground b) Phase to phase
c) Homopolar d) Inter-phase

2) The positive sequence reactance per phase in ohms/km in 750 kV transmission line is _____.
a) 0.272 b) 0.227
c) 0.722 d) None of these

3) The function of steel wire in an ACSR conductor is to _____.
a) Compensate for skin effect
b) Take care of surges
c) Provide additional mechanical strength
d) Reduce inductance

4) Operating 750 KV line gives AN at a level of _____.
a) 50 dB b) 55.4 dB
c) 52 dB d) 58.5 dB

5) Which type of corona discharge gives interference to radio broadcast?
a) Pulse type b) Pulse less type
c) Glow corona d) None of the above

6) The crest time of pulse properties for positive cycle is _____.
a) 20 ns b) 30 ns
c) 40 ns d) 50 ns

7) Refraction coefficient of voltage (KT) for open ended line _____.
a) $+2$ b) 1
c) -1 d) 0

8) With the single frequency transients, the ratio of peak restriking voltage/time between voltage zero and peak voltage is known as _____.
   a) Recovery voltage
   b) Restriking voltage
   c) Rate of rise restriking voltage
   d) Active recovery voltage

9) On a lightly loaded transmission line _____.
   a) Receiving end voltage can exceed sending end voltage
   b) Receiving end voltage can't exceed sending end voltage
   c) Capacitive charging current is reduced
   d) None of these

10) System which suffers from maximum voltage fluctuations is _____.
   a) Ring type
   b) Mesh type
   c) Radial type
   d) None of these

11) For the same voltage boost, the reactive power capacity is more for a _____.
   a) Shunt capacitor
   b) Series capacitors
   c) It is same for both series and shunt
   d) None of these

12) If the shunt admittance of the transmission line is neglected, the maximum power will occur when torque angle _____.
   a) 45°
   b) -90^0
   c) 90°
   d) 180^0

13) Which among these is/are the fundamental economical principles that influence/s the design of transmission lines?
   a) Economic choice of conductor size
   b) Economic choice of transmission voltage
   c) Both a) and b)
   d) Economic choice of transmission line length

14) Air blast circuit breakers for 400 kV power system are design to operate in _____.
   a) 5 sec
   b) 0.5 sec
   c) 0.1 sec
   d) 50 milliseconds

Seat No.	

Set **P**

T.Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Extra High Voltage AC Transmission (EEPEC – 03B)

Day & Date: Monday, 25-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Solve the following. (Any Four) **16**

a) Explain in detail advantages and disadvantages of high voltage.

b) Explain the relation between temperature rise and current carrying capacity of EHVAC line.

c) Explain the charge potential relations of multi-conductor lines.

d) Explain attenuation of travelling waves on transmission line.

e) Explain reflection and refraction of travelling waves.

f) Derive differential equations and solutions for general case in travelling waves.

Q.3 Solve the following. (Any Two) **12**

a) Explain the different mechanical considerations in EHV line performance.

b) Derive the expression $P_c = \frac{1}{2}KC(V_m^2 - V_0^2)$ for the energy loss from charge-voltage diagram.

c) What is standing wave? Derive equation for open ended line double exponential response.

Section – II

Q.4 Solve the following. (Any Four) **16**

a) Explain sinusoidal excitation lumped parameter circuit.

b) Explain ferro-resonance over voltages.

c) Explain the term power circle diagram and its use.

d) Describe static reactive compensating system.

e) Explain the factors under steady state in design of EHV lines.

f) Explain line insulation design based upon transient overvoltage in detail.

Q.5 Solve the following. (Any Two) **12**

a) Explain the methods used for reduction of switching surge over voltages in EHV systems.

b) A 100 MV A 230kV 50 Hz transformer has $X_t = 12\%$ and is connected to a line 200 km long which has an inductance of 1 mH/km. The filter, connected to the LV 33 kV side of the transformer, is required to suppress the 5th harmonic generated by the TCR to 1% of I_n. Calculate the value of filter capacitor if the filter inductance used is 2mH.

c) Describe conductor-tower, conductor-ground and conductor-conductor clearances.

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Extra High Voltage AC Transmission (EEPEC – 03B)

Day & Date: Monday, 25-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) With the single frequency transients, the ratio of peak restriking voltage/time between voltage zero and peak voltage is known as _____.
a) Recovery voltage
b) Restriking voltage
c) Rate of rise restriking voltage
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2) On a lightly loaded transmission line _____.
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3) System which suffers from maximum voltage fluctuations is _____.
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4) For the same voltage boost, the reactive power capacity is more for a _____.
a) Shunt capacitor
b) Series capacitors
c) It is same for both series and shunt
d) None of these

5) If the shunt admittance of the transmission line is neglected, the maximum power will occur when torque angle _____.
a) 45° b) -90^0
c) 90° d) 180^0

6) Which among these is/are the fundamental economical principles that influence/s the design of transmission lines?
   a) Economic choice of conductor size
   b) Economic choice of transmission voltage
   c) Both a) and b)
   d) Economic choice of transmission line length

7) Air blast circuit breakers for 400 kV power system are design to operate in _____.
   a) 5 sec
   b) 0.5 sec
   c) 0.1 sec
   d) 50 milliseconds

8) Third mode of propagation is called as _____.
   a) Line to ground
   b) Phase to phase
   c) Homopolar
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9) The positive sequence reactance per phase in ohms/km in 750 kV transmission line is _____.
   a) 0.272
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   c) 0.722
   d) None of these

10) The function of steel wire in an ACSR conductor is to _____.
   a) Compensate for skin effect
   b) Take care of surges
   c) Provide additional mechanical strength
   d) Reduce inductance

11) Operating 750 KV line gives AN at a level of _____.
   a) 50 dB
   b) 55.4 dB
   c) 52 dB
   d) 58.5 dB

12) Which type of corona discharge gives interference to radio broadcast?
   a) Pulse type
   b) Pulse less type
   c) Glow corona
   d) None of the above

13) The crest time of pulse properties for positive cycle is _____.
   a) 20 ns
   b) 30 ns
   c) 40 ns
   d) 50 ns

14) Refraction coefficient of voltage (KT) for open ended line _____.
   a) $+2$
   b) 1
   c) -1
   d) 0

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Extra High Voltage AC Transmission (EEPEC – 03B)

Day & Date: Monday, 25-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Solve the following. (Any Four) **16**

a) Explain in detail advantages and disadvantages of high voltage.

b) Explain the relation between temperature rise and current carrying capacity of EHVAC line.

c) Explain the charge potential relations of multi-conductor lines.

d) Explain attenuation of travelling waves on transmission line.

e) Explain reflection and refraction of travelling waves.

f) Derive differential equations and solutions for general case in travelling waves.

Q.3 Solve the following. (Any Two) **12**

a) Explain the different mechanical considerations in EHV line performance.

b) Derive the expression $P_c = \frac{1}{2}KC(V_m^2 - V_0^2)$ for the energy loss from charge-voltage diagram.

c) What is standing wave? Derive equation for open ended line double exponential response.

Section – II

Q.4 Solve the following. (Any Four) **16**

a) Explain sinusoidal excitation lumped parameter circuit.

b) Explain ferro-resonance over voltages.

c) Explain the term power circle diagram and its use.

d) Describe static reactive compensating system.

e) Explain the factors under steady state in design of EHV lines.

f) Explain line insulation design based upon transient overvoltage in detail.

Q.5 Solve the following. (Any Two) **12**

a) Explain the methods used for reduction of switching surge over voltages in EHV systems.

b) A 100 MV A 230kV 50 Hz transformer has $X_t = 12\%$ and is connected to a line 200 km long which has an inductance of 1 mH/km. The filter, connected to the LV 33 kV side of the transformer, is required to suppress the 5th harmonic generated by the TCR to 1% of I_n. Calculate the value of filter capacitor if the filter inductance used is 2mH.

c) Describe conductor-tower, conductor-ground and conductor-conductor clearances.

Seat No.	

Set **R**

T.Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Extra High Voltage AC Transmission (EEPEC – 03B)

Day & Date: Monday, 25-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) For the same voltage boost, the reactive power capacity is more for a _____.
a) Shunt capacitor
b) Series capacitors
c) It is same for both series and shunt
d) None of these

2) If the shunt admittance of the transmission line is neglected, the maximum power will occur when torque angle _____.
a) 45° b) -90^0
c) 90° d) 180^0

3) Which among these is/are the fundamental economical principles that influence/s the design of transmission lines?
a) Economic choice of conductor size
b) Economic choice of transmission voltage
c) Both a) and b)
d) Economic choice of transmission line length

4) Air blast circuit breakers for 400 kV power system are design to operate in _____.
a) 5 sec b) 0.5 sec
c) 0.1 sec d) 50 milliseconds

5) Third mode of propagation is called as _____.
a) Line to ground b) Phase to phase
c) Homopolar d) Inter-phase

6) The positive sequence reactance per phase in ohms/km in 750 kV transmission line is _____.
   a) 0.272 b) 0.227
   c) 0.722 d) None of these

7) The function of steel wire in an ACSR conductor is to _____.
   a) Compensate for skin effect
   b) Take care of surges
   c) Provide additional mechanical strength
   d) Reduce inductance

8) Operating 750 KV line gives AN at a level of _____.
   a) 50 dB b) 55.4 dB
   c) 52 dB d) 58.5 dB

9) Which type of corona discharge gives interference to radio broadcast?
   a) Pulse type b) Pulse less type
   c) Glow corona d) None of the above

10) The crest time of pulse properties for positive cycle is _____.
   a) 20 ns b) 30 ns
   c) 40 ns d) 50 ns

11) Refraction coefficient of voltage (KT) for open ended line _____.
   a) $+2$ b) 1
   c) -1 d) 0

12) With the single frequency transients, the ratio of peak restriking voltage/time between voltage zero and peak voltage is known as _____.
   a) Recovery voltage
   b) Restriking voltage
   c) Rate of rise restriking voltage
   d) Active recovery voltage

13) On a lightly loaded transmission line _____.
   a) Receiving end voltage can exceed sending end voltage
   b) Receiving end voltage can't exceed sending end voltage
   c) Capacitive charging current is reduced
   d) None of these

14) System which suffers from maximum voltage fluctuations is _____.
   a) Ring type b) Mesh type
   c) Radial type d) None of these

Seat No.	

Set R

T.Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Extra High Voltage AC Transmission (EEPEC – 03B)

Day & Date: Monday, 25-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Solve the following. (Any Four) **16**

a) Explain in detail advantages and disadvantages of high voltage.

b) Explain the relation between temperature rise and current carrying capacity of EHVAC line.

c) Explain the charge potential relations of multi-conductor lines.

d) Explain attenuation of travelling waves on transmission line.

e) Explain reflection and refraction of travelling waves.

f) Derive differential equations and solutions for general case in travelling waves.

Q.3 Solve the following. (Any Two) **12**

a) Explain the different mechanical considerations in EHV line performance.

b) Derive the expression $P_c = \frac{1}{2}KC(V_m^2 - V_0^2)$ for the energy loss from charge-voltage diagram.

c) What is standing wave? Derive equation for open ended line double exponential response.

Section – II

Q.4 Solve the following. (Any Four) **16**

a) Explain sinusoidal excitation lumped parameter circuit.

b) Explain ferro-resonance over voltages.

c) Explain the term power circle diagram and its use.

d) Describe static reactive compensating system.

e) Explain the factors under steady state in design of EHV lines.

f) Explain line insulation design based upon transient overvoltage in detail.

Q.5 Solve the following. (Any Two) **12**

a) Explain the methods used for reduction of switching surge over voltages in EHV systems.

b) A 100 MV A 230kV 50 Hz transformer has $X_t = 12\%$ and is connected to a line 200 km long which has an inductance of 1 mH/km. The filter, connected to the LV 33 kV side of the transformer, is required to suppress the 5th harmonic generated by the TCR to 1% of I_n. Calculate the value of filter capacitor if the filter inductance used is 2mH.

c) Describe conductor-tower, conductor-ground and conductor-conductor clearances.

Seat No.	

Set **S**

T.Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Extra High Voltage AC Transmission (EEPEC – 03B)

Day & Date: Monday, 25-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) The crest time of pulse properties for positive cycle is _____.
a) 20 ns b) 30 ns
c) 40 ns d) 50 ns

2) Refraction coefficient of voltage (KT) for open ended line _____.
a) $+2$ b) 1
c) -1 d) 0

3) With the single frequency transients, the ratio of peak restriking voltage/time between voltage zero and peak voltage is known as _____.
a) Recovery voltage
b) Restriking voltage
c) Rate of rise restriking voltage
d) Active recovery voltage

4) On a lightly loaded transmission line _____.
a) Receiving end voltage can exceed sending end voltage
b) Receiving end voltage can't exceed sending end voltage
c) Capacitive charging current is reduced
d) None of these

5) System which suffers from maximum voltage fluctuations is _____.
a) Ring type b) Mesh type
c) Radial type d) None of these

6) For the same voltage boost, the reactive power capacity is more for a _____.
a) Shunt capacitor
b) Series capacitors
c) It is same for both series and shunt
d) None of these

7) If the shunt admittance of the transmission line is neglected, the maximum power will occur when torque angle _____.
a) 45° b) -90^0
c) 90° d) 180^0

8) Which among these is/are the fundamental economical principles that influence/s the design of transmission lines?
a) Economic choice of conductor size
b) Economic choice of transmission voltage
c) Both a) and b)
d) Economic choice of transmission line length

9) Air blast circuit breakers for 400 kV power system are design to operate in _____.
a) 5 sec b) 0.5 sec
c) 0.1 sec d) 50 milliseconds

10) Third mode of propagation is called as _____.
a) Line to ground b) Phase to phase
c) Homopolar d) Inter-phase

11) The positive sequence reactance per phase in ohms/km in 750 kV transmission line is _____.
a) 0.272 b) 0.227
c) 0.722 d) None of these

12) The function of steel wire in an ACSR conductor is to _____.
a) Compensate for skin effect
b) Take care of surges
c) Provide additional mechanical strength
d) Reduce inductance

13) Operating 750 KV line gives AN at a level of _____.
a) 50 dB b) 55.4 dB
c) 52 dB d) 58.5 dB

14) Which type of corona discharge gives interference to radio broadcast?
a) Pulse type b) Pulse less type
c) Glow corona d) None of the above

Seat No.	

Set **S**

T.Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Extra High Voltage AC Transmission (EEPEC – 03B)

Day & Date: Monday, 25-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Solve the following. (Any Four) **16**

a) Explain in detail advantages and disadvantages of high voltage.

b) Explain the relation between temperature rise and current carrying capacity of EHVAC line.

c) Explain the charge potential relations of multi-conductor lines.

d) Explain attenuation of travelling waves on transmission line.

e) Explain reflection and refraction of travelling waves.

f) Derive differential equations and solutions for general case in travelling waves.

Q.3 Solve the following. (Any Two) **12**

a) Explain the different mechanical considerations in EHV line performance.

b) Derive the expression $P_c = \frac{1}{2}KC(V_m^2 - V_0^2)$ for the energy loss from charge-voltage diagram.

c) What is standing wave? Derive equation for open ended line double exponential response.

Section – II

Q.4 Solve the following. (Any Four) **16**

a) Explain sinusoidal excitation lumped parameter circuit.

b) Explain ferro-resonance over voltages.

c) Explain the term power circle diagram and its use.

d) Describe static reactive compensating system.

e) Explain the factors under steady state in design of EHV lines.

f) Explain line insulation design based upon transient overvoltage in detail.

Q.5 Solve the following. (Any Two) **12**

a) Explain the methods used for reduction of switching surge over voltages in EHV systems.

b) A 100 MV A 230kV 50 Hz transformer has $X_t = 12\%$ and is connected to a line 200 km long which has an inductance of 1 mH/km. The filter, connected to the LV 33 kV side of the transformer, is required to suppress the 5th harmonic generated by the TCR to 1% of I_n. Calculate the value of filter capacitor if the filter inductance used is 2mH.

c) Describe conductor-tower, conductor-ground and conductor-conductor clearances.

SLR-QH-595

Seat No.	

Set P

T.Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Energy Storage System (EEPEC – 03C)

Day & Date: Monday, 25-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternative from the options. **14**

1) The main purpose of an Energy Storage System (ESS) in power systems is to _____.
a) Increase transmission line length
b) Store excess electrical energy for later use
c) Reduce power factor
d) Increase generator speed

2) Which of the following is a key general consideration while selecting an ESS?
a) Color of Battery b) Brand Name
c) Shape of Storage Device d) Energy Density

3) Which ESS type stores energy in the form of kinetic energy?
a) Battery storage b) Pumped hydro storage
c) Flywheel energy storage d) Hydrogen storage

4) TES improves power plant performance by _____.
a) Increasing peak load demand
b) Allowing load shifting and peak shaving
c) Increasing transmission losses
d) Stopping generation during peak hours

5) The main purpose of Thermal Energy Storage (TES) is _____.
a) Increase fuel consumption
b) Store heat or cold for later use
c) Generate electricity directly
d) Reduce turbine speed

6) The electrolyte used in a lead-acid battery is _____.
a) Sulfuric acid
b) Potassium hydroxide
c) Sodium chloride
d) Distilled water

7) In flow batteries, energy is stored in _____.
a) Solid electrodes only
b) Flywheel
c) Compressed air
d) Liquid electrolytes stored in tanks

8) The electrolyte in a battery is used to _____.
a) Store electrons
b) Provide mechanical support
c) Allow ion movement
d) Increase voltage

9) SoC represents _____.
a) Total capacity
b) Remaining charge
c) Maximum voltage
d) Internal resistance

10) Supercapacitors store energy using _____.
a) Electrostatic field
b) Chemical reaction
c) Magnetic field
d) Heat

11) Storage is needed in isolated systems due to _____.
a) Constant generation
b) Intermittent renewable sources
c) Low voltage
d) High current

12) In pumped hydro, energy is stored as _____.
a) Electrical energy
b) Chemical energy
c) Gravitational potential energy
d) Thermal energy

13) Isolated systems are also called _____.
a) Grid systems
b) Standalone systems
c) Hybrid systems
d) Central systems

14) Main function of Virtual Power Plant (VPP) is _____.
a) Increase losses
b) Coordinate distributed energy resources
c) Stop renewable integration
d) Manual operation

Seat No.	

Set **P**

T.Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Energy Storage System (EEPEC – 03C)

Day & Date: Monday, 25-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

Section – I

Q.2 Solve the following. (Any Four) **16**

a) List and explain briefly any four types of energy storage systems.

b) Explain the term Power Transformation System (PTS) and Central Store (CS) in energy storage systems.

c) Explain Pumped Hydro Compressed Air Mechanical energy storage system.

d) Describe general considerations for thermal energy storage system.

e) What are flow batteries? Mention their key features.

f) Explain SMES (Superconducting Magnetic Energy Storage).

Q.3 Solve the following. (Any Two) **12**

a) Explain the concept of energy and power balance in a storage unit with suitable equations.

b) Explain in detail hydrogen to synthetic methane energy storage system.

c) Explain in detail the construction and working of a Lead-acid battery.

Section – II

Q.4 Solve the following. (Any Four) **16**

a) What is a supercapacitor? State two advantages and two limitations of supercapacitors.

b) Define isolated and grid-connected renewable power system.

c) Explain the role of storage in solar photovoltaic systems.

d) Define and explain in brief power quality and stability in renewable energy systems.

e) Explain Grid to Vehicle (G2V) and Vehicle to Grid (V2G) concept with one application.

f) Define Hybrid Energy Storage System (HESS) and advantages of hybrid energy storage over single storage systems.

Q.5 Solve the following. (Any Two) **12**

a) Explain in detail the following battery parameters: C-rating, SoC, DoD, Specific Energy, Specific Power.

b) Discuss the challenges and importance of storage in tidal and wave energy systems.

c) Explain various parameters and control strategies used in Battery SCADA.

SLR-QH-595

Seat No.	

Set Q

T.Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Energy Storage System (EEPEC – 03C)

Day & Date: Monday, 25-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternative from the options. **14**

1) The electrolyte in a battery is used to _____.
a) Store electrons
b) Provide mechanical support
c) Allow ion movement
d) Increase voltage

2) SoC represents _____.
a) Total capacity b) Remaining charge
c) Maximum voltage d) Internal resistance

3) Supercapacitors store energy using _____.
a) Electrostatic field b) Chemical reaction
c) Magnetic field d) Heat

4) Storage is needed in isolated systems due to _____.
a) Constant generation
b) Intermittent renewable sources
c) Low voltage
d) High current

5) In pumped hydro, energy is stored as _____.
a) Electrical energy
b) Chemical energy
c) Gravitational potential energy
d) Thermal energy

6) Isolated systems are also called _____.
a) Grid systems b) Standalone systems
c) Hybrid systems d) Central systems

7) Main function of Virtual Power Plant (VPP) is _____.
   a) Increase losses
   b) Coordinate distributed energy resources
   c) Stop renewable integration
   d) Manual operation

8) The main purpose of an Energy Storage System (ESS) in power systems is to _____.
   a) Increase transmission line length
   b) Store excess electrical energy for later use
   c) Reduce power factor
   d) Increase generator speed

9) Which of the following is a key general consideration while selecting an ESS?
   a) Color of Battery
   b) Brand Name
   c) Shape of Storage Device
   d) Energy Density

10) Which ESS type stores energy in the form of kinetic energy?
   a) Battery storage
   b) Pumped hydro storage
   c) Flywheel energy storage
   d) Hydrogen storage

11) TES improves power plant performance by _____.
   a) Increasing peak load demand
   b) Allowing load shifting and peak shaving
   c) Increasing transmission losses
   d) Stopping generation during peak hours

12) The main purpose of Thermal Energy Storage (TES) is _____.
   a) Increase fuel consumption
   b) Store heat or cold for later use
   c) Generate electricity directly
   d) Reduce turbine speed

13) The electrolyte used in a lead-acid battery is _____.
   a) Sulfuric acid
   b) Potassium hydroxide
   c) Sodium chloride
   d) Distilled water

14) In flow batteries, energy is stored in _____.
   a) Solid electrodes only
   b) Flywheel
   c) Compressed air
   d) Liquid electrolytes stored in tanks

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Energy Storage System (EEPEC – 03C)

Day & Date: Monday, 25-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

Section – I

Q.2 Solve the following. (Any Four) **16**

a) List and explain briefly any four types of energy storage systems.

b) Explain the term Power Transformation System (PTS) and Central Store (CS) in energy storage systems.

c) Explain Pumped Hydro Compressed Air Mechanical energy storage system.

d) Describe general considerations for thermal energy storage system.

e) What are flow batteries? Mention their key features.

f) Explain SMES (Superconducting Magnetic Energy Storage).

Q.3 Solve the following. (Any Two) **12**

a) Explain the concept of energy and power balance in a storage unit with suitable equations.

b) Explain in detail hydrogen to synthetic methane energy storage system.

c) Explain in detail the construction and working of a Lead-acid battery.

Section – II

Q.4 Solve the following. (Any Four) **16**

a) What is a supercapacitor? State two advantages and two limitations of supercapacitors.

b) Define isolated and grid-connected renewable power system.

c) Explain the role of storage in solar photovoltaic systems.

d) Define and explain in brief power quality and stability in renewable energy systems.

e) Explain Grid to Vehicle (G2V) and Vehicle to Grid (V2G) concept with one application.

f) Define Hybrid Energy Storage System (HESS) and advantages of hybrid energy storage over single storage systems.

Q.5 Solve the following. (Any Two) **12**

a) Explain in detail the following battery parameters: C-rating, SoC, DoD, Specific Energy, Specific Power.

b) Discuss the challenges and importance of storage in tidal and wave energy systems.

c) Explain various parameters and control strategies used in Battery SCADA.

SLR-QH-595

Seat No.	

Set R

T.Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Energy Storage System (EEPEC – 03C)

Day & Date: Monday, 25-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternative from the options. **14**

1) Storage is needed in isolated systems due to _____.
a) Constant generation
b) Intermittent renewable sources
c) Low voltage
d) High current

2) In pumped hydro, energy is stored as _____.
a) Electrical energy
b) Chemical energy
c) Gravitational potential energy
d) Thermal energy

3) Isolated systems are also called _____.
a) Grid systems b) Standalone systems
c) Hybrid systems d) Central systems

4) Main function of Virtual Power Plant (VPP) is _____.
a) Increase losses
b) Coordinate distributed energy resources
c) Stop renewable integration
d) Manual operation

5) The main purpose of an Energy Storage System (ESS) in power systems is to _____.
a) Increase transmission line length
b) Store excess electrical energy for later use
c) Reduce power factor
d) Increase generator speed

6) Which of the following is a key general consideration while selecting an ESS?
a) Color of Battery
b) Brand Name
c) Shape of Storage Device
d) Energy Density

7) Which ESS type stores energy in the form of kinetic energy?
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a) Store electrons
b) Provide mechanical support
c) Allow ion movement
d) Increase voltage

13) SoC represents _____.
a) Total capacity
b) Remaining charge
c) Maximum voltage
d) Internal resistance

14) Supercapacitors store energy using _____.
a) Electrostatic field
b) Chemical reaction
c) Magnetic field
d) Heat

Seat No.	

Set **R**

T.Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Energy Storage System (EEPEC – 03C)

Day & Date: Monday, 25-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

Section – I

Q.2 Solve the following. (Any Four) **16**

a) List and explain briefly any four types of energy storage systems.

b) Explain the term Power Transformation System (PTS) and Central Store (CS) in energy storage systems.

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e) What are flow batteries? Mention their key features.

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Q.3 Solve the following. (Any Two) **12**

a) Explain the concept of energy and power balance in a storage unit with suitable equations.

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c) Explain in detail the construction and working of a Lead-acid battery.

Section – II

Q.4 Solve the following. (Any Four) **16**

a) What is a supercapacitor? State two advantages and two limitations of supercapacitors.

b) Define isolated and grid-connected renewable power system.

c) Explain the role of storage in solar photovoltaic systems.

d) Define and explain in brief power quality and stability in renewable energy systems.

e) Explain Grid to Vehicle (G2V) and Vehicle to Grid (V2G) concept with one application.

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a) Explain in detail the following battery parameters: C-rating, SoC, DoD, Specific Energy, Specific Power.

b) Discuss the challenges and importance of storage in tidal and wave energy systems.

c) Explain various parameters and control strategies used in Battery SCADA.

SLR-QH-595

Seat No.	

Set S

T.Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Energy Storage System (EEPEC – 03C)

Day & Date: Monday, 25-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternative from the options. **14**

1) The electrolyte used in a lead-acid battery is _____.
a) Sulfuric acid b) Potassium hydroxide
c) Sodium chloride d) Distilled water

2) In flow batteries, energy is stored in _____.
a) Solid electrodes only
b) Flywheel
c) Compressed air
d) Liquid electrolytes stored in tanks

3) The electrolyte in a battery is used to _____.
a) Store electrons
b) Provide mechanical support
c) Allow ion movement
d) Increase voltage

4) SoC represents _____.
a) Total capacity b) Remaining charge
c) Maximum voltage d) Internal resistance

5) Supercapacitors store energy using _____.
a) Electrostatic field b) Chemical reaction
c) Magnetic field d) Heat

6) Storage is needed in isolated systems due to _____.
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b) Intermittent renewable sources
c) Low voltage
d) High current

7) In pumped hydro, energy is stored as _____.
a) Electrical energy
b) Chemical energy
c) Gravitational potential energy
d) Thermal energy

8) Isolated systems are also called _____.
a) Grid systems
b) Standalone systems
c) Hybrid systems
d) Central systems

9) Main function of Virtual Power Plant (VPP) is _____.
a) Increase losses
b) Coordinate distributed energy resources
c) Stop renewable integration
d) Manual operation

10) The main purpose of an Energy Storage System (ESS) in power systems is to _____.
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b) Store excess electrical energy for later use
c) Reduce power factor
d) Increase generator speed

11) Which of the following is a key general consideration while selecting an ESS?
a) Color of Battery
b) Brand Name
c) Shape of Storage Device
d) Energy Density

12) Which ESS type stores energy in the form of kinetic energy?
a) Battery storage
b) Pumped hydro storage
c) Flywheel energy storage
d) Hydrogen storage

13) TES improves power plant performance by _____.
a) Increasing peak load demand
b) Allowing load shifting and peak shaving
c) Increasing transmission losses
d) Stopping generation during peak hours

14) The main purpose of Thermal Energy Storage (TES) is _____.
a) Increase fuel consumption
b) Store heat or cold for later use
c) Generate electricity directly
d) Reduce turbine speed

Seat No.		Set	S

T.Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Energy Storage System (EEPEC – 03C)

Day & Date: Monday, 25-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

Section – I

Q.2 Solve the following. (Any Four) **16**

a) List and explain briefly any four types of energy storage systems.

b) Explain the term Power Transformation System (PTS) and Central Store (CS) in energy storage systems.

c) Explain Pumped Hydro Compressed Air Mechanical energy storage system.

d) Describe general considerations for thermal energy storage system.

e) What are flow batteries? Mention their key features.

f) Explain SMES (Superconducting Magnetic Energy Storage).

Q.3 Solve the following. (Any Two) **12**

a) Explain the concept of energy and power balance in a storage unit with suitable equations.

b) Explain in detail hydrogen to synthetic methane energy storage system.

c) Explain in detail the construction and working of a Lead-acid battery.

Section – II

Q.4 Solve the following. (Any Four) **16**

a) What is a supercapacitor? State two advantages and two limitations of supercapacitors.

b) Define isolated and grid-connected renewable power system.

c) Explain the role of storage in solar photovoltaic systems.

d) Define and explain in brief power quality and stability in renewable energy systems.

e) Explain Grid to Vehicle (G2V) and Vehicle to Grid (V2G) concept with one application.

f) Define Hybrid Energy Storage System (HESS) and advantages of hybrid energy storage over single storage systems.

Q.5 Solve the following. (Any Two) **12**

a) Explain in detail the following battery parameters: C-rating, SoC, DoD, Specific Energy, Specific Power.

b) Discuss the challenges and importance of storage in tidal and wave energy systems.

c) Explain various parameters and control strategies used in Battery SCADA.

SLR-QH-596

Seat No.	

Set P

T.Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Signal & System (EEPEC – 03D)

Day & Date: Monday, 25-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if required.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) The signal $x(t) = 1$ for $t > 0$,
$= -1$ for $t < 0$ and
$= 0$ for $t = 0$, then the signal $x(t)$ is _____ function.

a) Unit step b) Unit Ramp
c) Impulse d) Signum

2) A signal is called causal if _____.

a) It exists only for $t < 0$ b) It exists only for $t \geq 0$
c) It is periodic d) It is odd

3) The derivative of the unit step signal $u(t)$ is _____.

a) Ramp signal b) Exponential signal
c) Unit impulse signal d) Sinusoidal signal

4) Which of the following systems is non-causal?

a) $y[n] = x[n] + x[n-1]$ b) $y[n] = x[n-2]$
c) $y[n] = x[n+1]$ d) $y[n] = 3x[n]$

5) $y(t) = x(t) + x(t-2)$, this system is _____.

a) Static and non-causal b) Dynamic and causal
c) Static and causal d) Dynamic and non-causal

6) A CT-LTI system is BIBO stable if _____.

a) $\int_{-\infty}^{\infty} |h(t)| dt < \infty$ b) $\int_{-\infty}^{\infty} h(t) dt = 0$
c) $h(t) = 1$ d) $h(t) = u(t)$

7) DT LTI system stability condition is _____.

a) $\sum h\,[n] = 0$ b) $\sum |h[n]| < \infty$

c) $h[n] = 1$ d) $h[n] = \delta[n]$

8) The region of convergence (ROC) of a Z-transform is _____.

a) Set of values where $X(z) = 0$

b) Set of values of z or which the Z-transform converges

c) Set of poles only

d) Set of zeros only

9) The linearity property of Z-transform states _____.

a) $Z\{ax_1[n] + bx_2[n]\} = aX_1(z) + bX_2(z)$

b) $Z\{x_1[n]x_2[n]\} = X_1(z) + X_2(z)$

c) $Z\{x[n-k]\} = z^{-k}X(z)$

d) $Z\{nx[n]\} = nX(z)$

10) The Fourier Transform of a continuous-time signal $x(t)$ is defined as _____.

a) $X(\omega) = \int_{-\infty}^{\infty} x\,(t)e^{-j\omega t}\,dt$ b) $X(\omega) = \sum_{n=-\infty}^{\infty} x\,[n]e^{-j\omega n}$

c) $X(s) = \int_{0}^{\infty} x\,(t)e^{-st}\,dt$ d) $X(z) = \sum_{n=-\infty}^{\infty} x\,[n]z^{-n}$

11) Parseval's theorem relates _____.

a) Time shifting and frequency shifting

b) Signal energy in time domain and frequency domain

c) Convolution and multiplication

d) Linearity and scaling

12) DTFT can be obtained by evaluating Z-transform at _____.

a) $z = 0$ b) $z = e^{j\omega}$

c) $z = 1$ d) $z = \infty$

13) Fourier Transform exists if _____.

a) Signal is absolutely integrable b) Signal is periodic

c) Signal is random d) Signal is causal

14) FFT algorithms include _____.

a) Radix-2 b) Laplace

c) Z-transform d) Sampling

Seat No.	

Set P

T.Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS)
Examination: March/April - 2026
Signal & System (EEPEC – 03D)

Day & Date: Monday, 25-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

SECTION – I

Q.2 Attempt the following. (Any Four) **16**

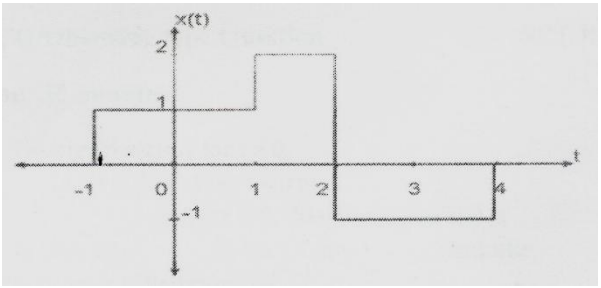
a) Explain the following signals
i) Periodic and aperiodic
ii) Even and odd

b) The impulse response of a LTI system is $h(n) = \{1,2,1,-1\}$ determine the response of the system to the input $x(n) = \{-1,2,1\}$

c) Explain
i) Linear and nonlinear system
ii) Time variant and time invariant system

d) Determine whether the signal $x(t) = e^{-3t}\,u(t)$ is power or energy signal.

e) Find the Even and Odd Part of the signal.



Q.3 Attempt the following. (Any Two) **12**

a) Find the convolution of the sequences $x_1(n) = \{1,-1,2,3\}$, $x_2(n) = \{1,-2,3,-1\}$ by matrix and tabular method.

b) For a DT sequence $X[n] = \{1,1,2,2,-1,1,-2\}$ perform the following operations
i) $[n+2]$
ii) $[-n+3]$
iii) $X[3n-3]$

c) Explain properties of CT-LTI system.

SECTION – II

Q.4 Attempt the following. (Any Four) **16**

a) Find the IDFT of sequence $x[k] = \{1, 1 - j2, -1, 1 + j2\}$

b) Find the Fourier Transform of the signal $\delta(t)$.

c) Explain the properties of region of convergence.

d) Evaluate the 4-point DFT of a sequence $x[n] = \{0, 2, 4, 6\}$

e) Find the Z-Transform and ROC for the signal $x(n) = a^n.u(n)$

Q.5 Attempt the following. (Any Two) **12**

a) Find the inverse Z transform by using long division method $X(Z) = Z + 1/Z^{2-}3Z + 2$

i) if $x(n)$ is causal

ii) $x(n)$ is anticausal

b) Explain following properties for Continuous Time Fourier Transform.

i) Linearity

ii) Frequency shifting

iii) Time shifting

c) Find 8 Point DFT of the sequence $x(n) = \{1, 2, 1, 2\}$

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Signal & System (EEPEC – 03D)

Day & Date: Monday, 25-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if required.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) The region of convergence (ROC) of a Z-transform is _____.
a) Set of values where $X(z) = 0$
b) Set of values of z or which the Z-transform converges
c) Set of poles only
d) Set of zeros only

2) The linearity property of Z-transform states _____.
a) $Z\{ax_1[n] + bx_2[n]\} = aX_1(z) + bX_2(z)$
b) $Z\{x_1[n]x_2[n]\} = X_1(z) + X_2(z)$
c) $Z\{x[n-k]\} = z^{-k}X(z)$
d) $Z\{nx[n]\} = nX(z)$

3) The Fourier Transform of a continuous-time signal $x(t)$ is defined as _____.
a) $X(\omega) = \int_{-\infty}^{\infty} x(t)e^{-j\omega t}\,dt$
b) $X(\omega) = \sum_{n=-\infty}^{\infty} x[n]e^{-j\omega n}$
c) $X(s) = \int_{0}^{\infty} x(t)e^{-st}\,dt$
d) $X(z) = \sum_{n=-\infty}^{\infty} x[n]z^{-n}$

4) Parseval's theorem relates _____.
a) Time shifting and frequency shifting
b) Signal energy in time domain and frequency domain
c) Convolution and multiplication
d) Linearity and scaling

5) DTFT can be obtained by evaluating Z-transform at _____.
a) $z = 0$
b) $z = e^{j\omega}$
c) $z = 1$
d) $z = \infty$

6) Fourier Transform exists if _____.
a) Signal is absolutely integrable b) Signal is periodic
c) Signal is random d) Signal is causal

7) FFT algorithms include _____.
a) Radix-2 b) Laplace
c) Z-transform d) Sampling

8) The signal $x(t) = 1$ for $t > 0$,
$= -1$ for $t < 0$ and
$= 0$ for $t = 0$, then the signal $x(t)$ is _____ function.
a) Unit step b) Unit Ramp
c) Impulse d) Signum

9) A signal is called causal if _____.
a) It exists only for $t < 0$ b) It exists only for $t \geq 0$
c) It is periodic d) It is odd

10) The derivative of the unit step signal $u(t)$ is _____.
a) Ramp signal b) Exponential signal
c) Unit impulse signal d) Sinusoidal signal

11) Which of the following systems is non-causal?
a) $y[n] = x[n] + x[n-1]$ b) $y[n] = x[n-2]$
c) $y[n] = x[n+1]$ d) $y[n] = 3x[n]$

12) $y(t) = x(t) + x(t-2)$, this system is _____.
a) Static and non-causal b) Dynamic and causal
c) Static and causal d) Dynamic and non-causal

13) A CT-LTI system is BIBO stable if _____.
a) $\int_{-\infty}^{\infty} |h(t)| dt < \infty$ b) $\int_{-\infty}^{\infty} h(t) dt = 0$
c) $h(t) = 1$ d) $h(t) = u(t)$

14) DT LTI system stability condition is _____.
a) $\sum h[n] = 0$ b) $\sum |h[n]| < \infty$
c) $h[n] = 1$ d) $h[n] = \delta[n]$

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS)
Examination: March/April - 2026
Signal & System (EEPEC – 03D)

Day & Date: Monday, 25-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

SECTION – I

Q.2 Attempt the following. (Any Four) **16**

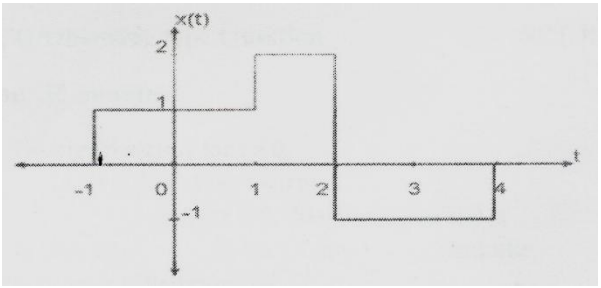
a) Explain the following signals
i) Periodic and aperiodic
ii) Even and odd

b) The impulse response of a LTI system is $h(n) = \{1,2,1,-1\}$ determine the response of the system to the input $x(n) = \{-1,2,1\}$

c) Explain
i) Linear and nonlinear system
ii) Time variant and time invariant system

d) Determine whether the signal $x(t) = e^{-3t}\,u(t)$ is power or energy signal.

e) Find the Even and Odd Part of the signal.



Q.3 Attempt the following. (Any Two) **12**

a) Find the convolution of the sequences $x_1(n) = \{1,-1,2,3\}$, $x_2(n) = \{1,-2,3,-1\}$ by matrix and tabular method.

b) For a DT sequence $X[n] = \{1,1,2,2,-1,1,-2\}$ perform the following operations
i) $[n+2]$
ii) $[-n+3]$
iii) $X[3n-3]$

c) Explain properties of CT-LTI system.

SECTION – II

Q.4 Attempt the following. (Any Four) **16**

a) Find the IDFT of sequence $x[k] = \{1, 1 - j2, -1, 1 + j2\}$

b) Find the Fourier Transform of the signal $\delta(t)$.

c) Explain the properties of region of convergence.

d) Evaluate the 4-point DFT of a sequence $x[n] = \{0, 2, 4, 6\}$

e) Find the Z-Transform and ROC for the signal $x(n) = a^n.u(n)$

Q.5 Attempt the following. (Any Two) **12**

a) Find the inverse Z transform by using long division method $X(Z) = Z + 1/Z^{2-}3Z + 2$

i) if $x(n)$ is causal

ii) $x(n)$ is anticausal

b) Explain following properties for Continuous Time Fourier Transform.

i) Linearity

ii) Frequency shifting

iii) Time shifting

c) Find 8 Point DFT of the sequence $x(n) = \{1, 2, 1, 2\}$

Seat No.	

Set **R**

T.Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Signal & System (EEPEC – 03D)

Day & Date: Monday, 25-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if required.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Parseval's theorem relates _____.
a) Time shifting and frequency shifting
b) Signal energy in time domain and frequency domain
c) Convolution and multiplication
d) Linearity and scaling

2) DTFT can be obtained by evaluating Z-transform at _____.
a) $z = 0$ b) $z = e^{j\omega}$
c) $z = 1$ d) $z = \infty$

3) Fourier Transform exists if _____.
a) Signal is absolutely integrable b) Signal is periodic
c) Signal is random d) Signal is causal

4) FFT algorithms include _____.
a) Radix-2 b) Laplace
c) Z-transform d) Sampling

5) The signal $x(t) = 1$ for $t > 0$,
$= -1$ for $t < 0$ and
$= 0$ for $t = 0$, then the signal $x(t)$ is _____ function.
a) Unit step b) Unit Ramp
c) Impulse d) Signum

6) A signal is called causal if _____.
a) It exists only for $t < 0$ b) It exists only for $t \geq 0$
c) It is periodic d) It is odd

7) The derivative of the unit step signal $u(t)$ is _____.

a) Ramp signal
b) Exponential signal
c) Unit impulse signal
d) Sinusoidal signal

8) Which of the following systems is non-causal?

a) $y[n] = x[n] + x[n-1]$
b) $y[n] = x[n-2]$
c) $y[n] = x[n+1]$
d) $y[n] = 3x[n]$

9) $y(t) = x(t) + x(t-2)$, this system is _____.

a) Static and non-causal
b) Dynamic and causal
c) Static and causal
d) Dynamic and non-causal

10) A CT-LTI system is BIBO stable if _____.

a) $\int_{-\infty}^{\infty} |h(t)| dt < \infty$
b) $\int_{-\infty}^{\infty} h(t) dt = 0$
c) $h(t) = 1$
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11) DT LTI system stability condition is _____.

a) $\sum h[n] = 0$
b) $\sum |h[n]| < \infty$
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d) $h[n] = \delta[n]$

12) The region of convergence (ROC) of a Z-transform is _____.

a) Set of values where $X(z) = 0$
b) Set of values of z or which the Z-transform converges
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13) The linearity property of Z-transform states _____.

a) $Z\{ax_1[n] + bx_2[n]\} = aX_1(z) + bX_2(z)$
b) $Z\{x_1[n]x_2[n]\} = X_1(z) + X_2(z)$
c) $Z\{x[n-k]\} = z^{-k}X(z)$
d) $Z\{nx[n]\} = nX(z)$

14) The Fourier Transform of a continuous-time signal $x(t)$ is defined as _____.

a) $X(\omega) = \int_{-\infty}^{\infty} x(t) e^{-j\omega t} dt$
b) $X(\omega) = \sum_{n=-\infty}^{\infty} x[n] e^{-j\omega n}$
c) $X(s) = \int_{0}^{\infty} x(t) e^{-st} dt$
d) $X(z) = \sum_{n=-\infty}^{\infty} x[n] z^{-n}$

Seat No.	

Set R

T.Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS)
Examination: March/April - 2026
Signal & System (EEPEC – 03D)

Day & Date: Monday, 25-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

SECTION – I

Q.2 Attempt the following. (Any Four) **16**

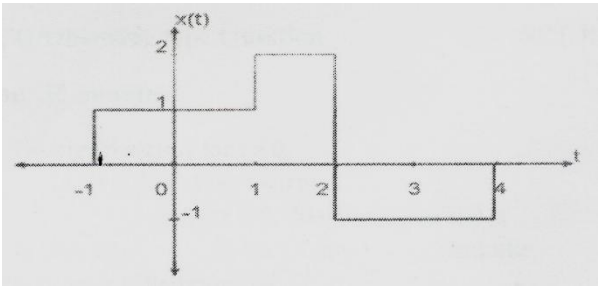
a) Explain the following signals
i) Periodic and aperiodic
ii) Even and odd

b) The impulse response of a LTI system is $h(n) = \{1,2,1,-1\}$ determine the response of the system to the input $x(n) = \{-1,2,1\}$

c) Explain
i) Linear and nonlinear system
ii) Time variant and time invariant system

d) Determine whether the signal $x(t) = e^{-3t}\,u(t)$ is power or energy signal.

e) Find the Even and Odd Part of the signal.



Q.3 Attempt the following. (Any Two) **12**

a) Find the convolution of the sequences $x_1(n) = \{1,-1,2,3\}$, $x_2(n) = \{1,-2,3,-1\}$ by matrix and tabular method.

b) For a DT sequence $X[n] = \{1,1,2,2,-1,1,-2\}$ perform the following operations
i) $[n+2]$
ii) $[-n+3]$
iii) $X[3n-3]$

c) Explain properties of CT-LTI system.

SECTION – II

Q.4 Attempt the following. (Any Four) **16**

a) Find the IDFT of sequence $x[k] = \{1, 1 - j2, -1, 1 + j2\}$

b) Find the Fourier Transform of the signal $\delta(t)$.

c) Explain the properties of region of convergence.

d) Evaluate the 4-point DFT of a sequence $x[n] = \{0, 2, 4, 6\}$

e) Find the Z-Transform and ROC for the signal $x(n) = a^n.u(n)$

Q.5 Attempt the following. (Any Two) **12**

a) Find the inverse Z transform by using long division method $X(Z) = Z + 1/Z^{2-}3Z + 2$

i) if $x(n)$ is causal

ii) $x(n)$ is anticausal

b) Explain following properties for Continuous Time Fourier Transform.

i) Linearity

ii) Frequency shifting

iii) Time shifting

c) Find 8 Point DFT of the sequence $x(n) = \{1, 2, 1, 2\}$

Seat No.	

Set **S**

T.Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Signal & System (EEPEC – 03D)

Day & Date: Monday, 25-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if required.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) A CT-LTI system is BIBO stable if _____.
a) $\int_{-\infty}^{\infty}|h(t)|dt < \infty$ b) $\int_{-\infty}^{\infty} h(t)dt = 0$
c) $h(t) = 1$ d) $h(t) = u(t)$

2) DT LTI system stability condition is _____.
a) $\sum h\,[n] = 0$ b) $\sum|h[n]| < \infty$
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3) The region of convergence (ROC) of a Z-transform is _____.
a) Set of values where $X(z) = 0$
b) Set of values of z or which the Z-transform converges
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4) The linearity property of Z-transform states _____.
a) $Z\{ax_1[n] + bx_2[n]\} = aX_1(z) + bX_2(z)$
b) $Z\{x_1[n]x_2[n]\} = X_1(z) + X_2(z)$
c) $Z\{x[n-k]\} = z^{-k}X(z)$
d) $Z\{nx[n]\} = nX(z)$

5) The Fourier Transform of a continuous-time signal $x(t)$ is defined as _____.
a) $X(\omega) = \int_{-\infty}^{\infty} x\,(t)e^{-j\omega t}\,dt$ b) $X(\omega) = \sum_{n=-\infty}^{\infty} x\,[n]e^{-j\omega n}$
c) $X(s) = \int_{0}^{\infty} x\,(t)e^{-st}\,dt$ d) $X(z) = \sum_{n=-\infty}^{\infty} x\,[n]z^{-n}$

6) Parseval's theorem relates _____.
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b) Signal energy in time domain and frequency domain
c) Convolution and multiplication
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7) DTFT can be obtained by evaluating Z-transform at _____.
a) $z = 0$ b) $z = e^{j\omega}$
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8) Fourier Transform exists if _____.
a) Signal is absolutely integrable b) Signal is periodic
c) Signal is random d) Signal is causal

9) FFT algorithms include _____.
a) Radix-2 b) Laplace
c) Z-transform d) Sampling

10) The signal $x(t) = 1$ for $t > 0$,
$= -1$ for $t < 0$ and
$= 0$ for $t = 0$, then the signal $x(t)$ is _____ function.
a) Unit step b) Unit Ramp
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11) A signal is called causal if _____.
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12) The derivative of the unit step signal $u(t)$ is _____.
a) Ramp signal b) Exponential signal
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13) Which of the following systems is non-causal?
a) $y[n] = x[n] + x[n-1]$ b) $y[n] = x[n-2]$
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14) $y(t) = x(t) + x(t-2)$, this system is _____.
a) Static and non-causal b) Dynamic and causal
c) Static and causal d) Dynamic and non-causal

Seat No.	

Set **S**

T.Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS)
Examination: March/April - 2026
Signal & System (EEPEC – 03D)

Day & Date: Monday, 25-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

SECTION – I

Q.2 Attempt the following. (Any Four) **16**

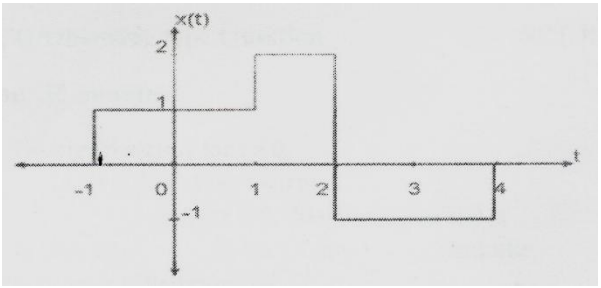
a) Explain the following signals
i) Periodic and aperiodic
ii) Even and odd

b) The impulse response of a LTI system is $h(n) = \{1,2,1,-1\}$ determine the response of the system to the input $x(n) = \{-1,2,1\}$

c) Explain
i) Linear and nonlinear system
ii) Time variant and time invariant system

d) Determine whether the signal $x(t) = e^{-3t}\,u(t)$ is power or energy signal.

e) Find the Even and Odd Part of the signal.



Q.3 Attempt the following. (Any Two) **12**

a) Find the convolution of the sequences $x_1(n) = \{1,-1,2,3\}$, $x_2(n) = \{1,-2,3,-1\}$ by matrix and tabular method.

b) For a DT sequence $X[n] = \{1,1,2,2,-1,1,-2\}$ perform the following operations
i) $[n+2]$
ii) $[-n+3]$
iii) $X[3n-3]$

c) Explain properties of CT-LTI system.

SECTION – II

Q.4 Attempt the following. (Any Four) **16**

a) Find the IDFT of sequence $x[k] = \{1, 1 - j2, -1, 1 + j2\}$

b) Find the Fourier Transform of the signal $\delta(t)$.

c) Explain the properties of region of convergence.

d) Evaluate the 4-point DFT of a sequence $x[n] = \{0, 2, 4, 6\}$

e) Find the Z-Transform and ROC for the signal $x(n) = a^n.u(n)$

Q.5 Attempt the following. (Any Two) **12**

a) Find the inverse Z transform by using long division method $X(Z) = Z + 1/Z^{2-}3Z + 2$

i) if $x(n)$ is causal

ii) $x(n)$ is anticausal

b) Explain following properties for Continuous Time Fourier Transform.

i) Linearity

ii) Frequency shifting

iii) Time shifting

c) Find 8 Point DFT of the sequence $x(n) = \{1, 2, 1, 2\}$

SLR-QH-597

Seat No.	

Set P

T.Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Honors in Electrical Vehicle
Testing and Certification of Electric and Hybrid Vehicles (EEHn-04A)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if required.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Vehicles having at least four wheels and used for the carriage of passengers, this category of vehicle is _____.
a) L b) M
c) N d) O

2) What is vehicle homologation?
a) The process of vehicle design
b) The process of certifying a vehicle's compliance with regulations and standards
c) The process of manufacturing a vehicle
d) The process of selling a vehicle

3) What is the primary purpose of Hardware-in-the-Loop (HiL) testing in the context of EVs and HEVs?
a) Testing physical hardware components of vehicles
b) Simulating vehicle behavior in a virtual environment
c) Charging the vehicle's battery
d) Conducting emissions testing

4) Rear view mirrors in a vehicle are mainly intended to _____.
a) Improve vehicle aesthetics
b) Reduce aerodynamic drag
c) Provide visibility of rear traffic
d) Support lane changing sensors

5) External projections on vehicles are regulated to _____.
   a) Increase vehicle styling options
   b) Improve crashworthiness
   c) Prevent injury to pedestrians
   d) Reduce vehicle weight

6) What is running resistance of the vehicle?
   a) Rolling resistance
   b) Aerodynamic resistance
   c) Sum of rolling and aerodynamic resistance
   d) Traction force

7) The skidding of vehicles, while sudden brakes are applied, is avoided through _____.
   a) antilock braking system
   b) engine management system
   c) automatic car parking system
   d) driving system

8) What is the primary purpose of a demist test in a vehicle?
   a) To evaluate the vehicle's audio system
   b) To assess the effectiveness of the demisting system in clearing condensation and fog from the windshield
   c) To measure the vehicle's fuel efficiency
   d) To check the tire pressure

9) Fuel tank testing for metallic and plastic tanks ensures _____.
   a) Improved fuel quality
   b) Resistance to leakage, impact, and pressure
   c) Attractive design
   d) Reduced fuel cost

10) Toughened safety glass differs from laminated glass because it _____.
   a) Does not break at all
   b) Breaks into small, blunt pieces
   c) Cracks but remains intact
   d) Is used only in windscreens

11) Safety belt assemblies are tested primarily for _____.
   a) Color and texture
   b) Tensile strength and locking performance
   c) Weight reduction
   d) Comfort level

12) Safety requirements of traction batteries mainly focus on _____.
a) Battery color
b) Electrical, thermal, and mechanical safety
c) Weight reduction
d) Cost effectiveness

13) Hybrid Electric Vehicles (HEVs) in M and N category are primarily tested for _____.
a) Aesthetic design
b) Structural strength only
c) Emission, safety and electrical performance
d) Color and body finish

14) Electric propulsion kits used for vehicle conversion must comply with _____.
a) Building codes
b) Vehicle safety and electrical standards
c) Telecom standards
d) Consumer electronics rules

Seat No.	

Set **P**

T.Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Honors in Electrical Vehicle
Testing and Certification of Electric and Hybrid Vehicles (EEHn-04A)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

Section – I

Q.2 Solve the following. (Any Four) **16**

a) Define homologation. Explain the Process of Vehicle Homologation in India.

b) Explain M, N, and O layouts of vehicle classification.

c) Describe rear view mirror installation process.

d) Describe the electric vehicle safety norms in-detail.

e) Explain the Hood Latch test of vehicle.

f) Describe dynamic testing of vehicle. Explain the factors affecting dynamic testing.

Q.3 Solve the following. (Any Two) **12**

a) Explain following regulations of vehicle in detail:
i) Automotive Industry Standards (AIS)
ii) Central Motor Vehicles Rules (CMVR)

b) Explain the arrangement of foot controls for M1 type vehicle.

c) Describe requirements of brake performance with anti-lock braking system.

Section – II

Q.4 Solve the following. (Any Four) **16**

a) Describe the horn testing process.

b) Describe tire & wheel rim test of vehicle.

c) Explain crash test with dummies.

d) Discuss accelerator control system test of vehicle.

e) State and explain hybrid electric vehicles tests (M and N category).

f) Explain tests for Hybrid Electric System Intended for Retro-fitment on Vehicles of M and N Category (GVW < 3500 kg).

Q.5 Solve the following. (Any Two) **12**

a) Discuss about the various interior fittings of a vehicle and its testing.

b) Explain Seat anchorages & head restraints test of vehicle.

c) Describe the requirements of Electric Vehicle Conductive AC charging system.

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Honors in Electrical Vehicle
Testing and Certification of Electric and Hybrid Vehicles (EEHn-04A)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if required.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) What is the primary purpose of a demist test in a vehicle?
a) To evaluate the vehicle's audio system
b) To assess the effectiveness of the demisting system in clearing condensation and fog from the windshield
c) To measure the vehicle's fuel efficiency
d) To check the tire pressure

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a) Improved fuel quality
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c) Attractive design
d) Reduced fuel cost

3) Toughened safety glass differs from laminated glass because it _____.
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b) Breaks into small, blunt pieces
c) Cracks but remains intact
d) Is used only in windscreens

4) Safety belt assemblies are tested primarily for _____.
a) Color and texture
b) Tensile strength and locking performance
c) Weight reduction
d) Comfort level

5) Safety requirements of traction batteries mainly focus on _____.
   a) Battery color
   b) Electrical, thermal, and mechanical safety
   c) Weight reduction
   d) Cost effectiveness

6) Hybrid Electric Vehicles (HEVs) in M and N category are primarily tested for _____.
   a) Aesthetic design
   b) Structural strength only
   c) Emission, safety and electrical performance
   d) Color and body finish

7) Electric propulsion kits used for vehicle conversion must comply with _____.
   a) Building codes
   b) Vehicle safety and electrical standards
   c) Telecom standards
   d) Consumer electronics rules

8) Vehicles having at least four wheels and used for the carriage of passengers, this category of vehicle is _____.
   a) L
   b) M
   c) N
   d) O

9) What is vehicle homologation?
   a) The process of vehicle design
   b) The process of certifying a vehicle's compliance with regulations and standards
   c) The process of manufacturing a vehicle
   d) The process of selling a vehicle

10) What is the primary purpose of Hardware-in-the-Loop (HiL) testing in the context of EVs and HEVs?
   a) Testing physical hardware components of vehicles
   b) Simulating vehicle behavior in a virtual environment
   c) Charging the vehicle's battery
   d) Conducting emissions testing

11) Rear view mirrors in a vehicle are mainly intended to _____.
   a) Improve vehicle aesthetics
   b) Reduce aerodynamic drag
   c) Provide visibility of rear traffic
   d) Support lane changing sensors

12) External projections on vehicles are regulated to _____.
   a) Increase vehicle styling options
   b) Improve crashworthiness
   c) Prevent injury to pedestrians
   d) Reduce vehicle weight

13) What is running resistance of the vehicle?
   a) Rolling resistance
   b) Aerodynamic resistance
   c) Sum of rolling and aerodynamic resistance
   d) Traction force

14) The skidding of vehicles, while sudden brakes are applied, is avoided through _____.
   a) antilock braking system
   b) engine management system
   c) automatic car parking system
   d) driving system

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Honors in Electrical Vehicle
Testing and Certification of Electric and Hybrid Vehicles (EEHn-04A)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

Section – I

Q.2 Solve the following. (Any Four) **16**

a) Define homologation. Explain the Process of Vehicle Homologation in India.

b) Explain M, N, and O layouts of vehicle classification.

c) Describe rear view mirror installation process.

d) Describe the electric vehicle safety norms in-detail.

e) Explain the Hood Latch test of vehicle.

f) Describe dynamic testing of vehicle. Explain the factors affecting dynamic testing.

Q.3 Solve the following. (Any Two) **12**

a) Explain following regulations of vehicle in detail:
i) Automotive Industry Standards (AIS)
ii) Central Motor Vehicles Rules (CMVR)

b) Explain the arrangement of foot controls for M1 type vehicle.

c) Describe requirements of brake performance with anti-lock braking system.

Section – II

Q.4 Solve the following. (Any Four) **16**

a) Describe the horn testing process.

b) Describe tire & wheel rim test of vehicle.

c) Explain crash test with dummies.

d) Discuss accelerator control system test of vehicle.

e) State and explain hybrid electric vehicles tests (M and N category).

f) Explain tests for Hybrid Electric System Intended for Retro-fitment on Vehicles of M and N Category (GVW < 3500 kg).

Q.5 Solve the following. (Any Two) **12**

a) Discuss about the various interior fittings of a vehicle and its testing.

b) Explain Seat anchorages & head restraints test of vehicle.

c) Describe the requirements of Electric Vehicle Conductive AC charging system.

Seat No.	

Set **R**

T.Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Honors in Electrical Vehicle
Testing and Certification of Electric and Hybrid Vehicles (EEHn-04A)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if required.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Safety belt assemblies are tested primarily for _____.
a) Color and texture
b) Tensile strength and locking performance
c) Weight reduction
d) Comfort level

2) Safety requirements of traction batteries mainly focus on _____.
a) Battery color
b) Electrical, thermal, and mechanical safety
c) Weight reduction
d) Cost effectiveness

3) Hybrid Electric Vehicles (HEVs) in M and N category are primarily tested for _____.
a) Aesthetic design
b) Structural strength only
c) Emission, safety and electrical performance
d) Color and body finish

4) Electric propulsion kits used for vehicle conversion must comply with _____.
a) Building codes
b) Vehicle safety and electrical standards
c) Telecom standards
d) Consumer electronics rules

5) Vehicles having at least four wheels and used for the carriage of passengers, this category of vehicle is _____.

a) L b) M
c) N d) O

6) What is vehicle homologation?

a) The process of vehicle design
b) The process of certifying a vehicle's compliance with regulations and standards
c) The process of manufacturing a vehicle
d) The process of selling a vehicle

7) What is the primary purpose of Hardware-in-the-Loop (HiL) testing in the context of EVs and HEVs?

a) Testing physical hardware components of vehicles
b) Simulating vehicle behavior in a virtual environment
c) Charging the vehicle's battery
d) Conducting emissions testing

8) Rear view mirrors in a vehicle are mainly intended to _____.

a) Improve vehicle aesthetics
b) Reduce aerodynamic drag
c) Provide visibility of rear traffic
d) Support lane changing sensors

9) External projections on vehicles are regulated to _____.

a) Increase vehicle styling options
b) Improve crashworthiness
c) Prevent injury to pedestrians
d) Reduce vehicle weight

10) What is running resistance of the vehicle?

a) Rolling resistance
b) Aerodynamic resistance
c) Sum of rolling and aerodynamic resistance
d) Traction force

11) The skidding of vehicles, while sudden brakes are applied, is avoided through _____.

a) antilock braking system
b) engine management system
c) automatic car parking system
d) driving system

12) What is the primary purpose of a demist test in a vehicle?
a) To evaluate the vehicle's audio system
b) To assess the effectiveness of the demisting system in clearing condensation and fog from the windshield
c) To measure the vehicle's fuel efficiency
d) To check the tire pressure

13) Fuel tank testing for metallic and plastic tanks ensures _____.
a) Improved fuel quality
b) Resistance to leakage, impact, and pressure
c) Attractive design
d) Reduced fuel cost

14) Toughened safety glass differs from laminated glass because it _____.
a) Does not break at all
b) Breaks into small, blunt pieces
c) Cracks but remains intact
d) Is used only in windscreens

Seat No.	

Set **R**

T.Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Honors in Electrical Vehicle
Testing and Certification of Electric and Hybrid Vehicles (EEHn-04A)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

Section – I

Q.2 Solve the following. (Any Four) **16**

a) Define homologation. Explain the Process of Vehicle Homologation in India.

b) Explain M, N, and O layouts of vehicle classification.

c) Describe rear view mirror installation process.

d) Describe the electric vehicle safety norms in-detail.

e) Explain the Hood Latch test of vehicle.

f) Describe dynamic testing of vehicle. Explain the factors affecting dynamic testing.

Q.3 Solve the following. (Any Two) **12**

a) Explain following regulations of vehicle in detail:
i) Automotive Industry Standards (AIS)
ii) Central Motor Vehicles Rules (CMVR)

b) Explain the arrangement of foot controls for M1 type vehicle.

c) Describe requirements of brake performance with anti-lock braking system.

Section – II

Q.4 Solve the following. (Any Four) **16**

a) Describe the horn testing process.

b) Describe tire & wheel rim test of vehicle.

c) Explain crash test with dummies.

d) Discuss accelerator control system test of vehicle.

e) State and explain hybrid electric vehicles tests (M and N category).

f) Explain tests for Hybrid Electric System Intended for Retro-fitment on Vehicles of M and N Category (GVW < 3500 kg).

Q.5 Solve the following. (Any Two) **12**

a) Discuss about the various interior fittings of a vehicle and its testing.

b) Explain Seat anchorages & head restraints test of vehicle.

c) Describe the requirements of Electric Vehicle Conductive AC charging system.

Seat No.	

Set **S**

T.Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Honors in Electrical Vehicle
Testing and Certification of Electric and Hybrid Vehicles (EEHn-04A)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if required.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) What is running resistance of the vehicle?
a) Rolling resistance
b) Aerodynamic resistance
c) Sum of rolling and aerodynamic resistance
d) Traction force

2) The skidding of vehicles, while sudden brakes are applied, is avoided through _____.
a) antilock braking system
b) engine management system
c) automatic car parking system
d) driving system

3) What is the primary purpose of a demist test in a vehicle?
a) To evaluate the vehicle's audio system
b) To assess the effectiveness of the demisting system in clearing condensation and fog from the windshield
c) To measure the vehicle's fuel efficiency
d) To check the tire pressure

4) Fuel tank testing for metallic and plastic tanks ensures _____.
a) Improved fuel quality
b) Resistance to leakage, impact, and pressure
c) Attractive design
d) Reduced fuel cost

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   c) Cracks but remains intact
   d) Is used only in windscreens

6) Safety belt assemblies are tested primarily for _____.
   a) Color and texture
   b) Tensile strength and locking performance
   c) Weight reduction
   d) Comfort level

7) Safety requirements of traction batteries mainly focus on _____.
   a) Battery color
   b) Electrical, thermal, and mechanical safety
   c) Weight reduction
   d) Cost effectiveness

8) Hybrid Electric Vehicles (HEVs) in M and N category are primarily tested for _____.
   a) Aesthetic design
   b) Structural strength only
   c) Emission, safety and electrical performance
   d) Color and body finish

9) Electric propulsion kits used for vehicle conversion must comply with _____.
   a) Building codes
   b) Vehicle safety and electrical standards
   c) Telecom standards
   d) Consumer electronics rules

10) Vehicles having at least four wheels and used for the carriage of passengers, this category of vehicle is _____.
   a) L
   b) M
   c) N
   d) O

11) What is vehicle homologation?
   a) The process of vehicle design
   b) The process of certifying a vehicle's compliance with regulations and standards
   c) The process of manufacturing a vehicle
   d) The process of selling a vehicle

12) What is the primary purpose of Hardware-in-the-Loop (HiL) testing in the context of EVs and HEVs?

a) Testing physical hardware components of vehicles
b) Simulating vehicle behavior in a virtual environment
c) Charging the vehicle's battery
d) Conducting emissions testing

13) Rear view mirrors in a vehicle are mainly intended to _____.

a) Improve vehicle aesthetics
b) Reduce aerodynamic drag
c) Provide visibility of rear traffic
d) Support lane changing sensors

14) External projections on vehicles are regulated to _____.

a) Increase vehicle styling options
b) Improve crashworthiness
c) Prevent injury to pedestrians
d) Reduce vehicle weight

Seat No.	

Set **S**

T.Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Honors in Electrical Vehicle
Testing and Certification of Electric and Hybrid Vehicles (EEHn-04A)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

Section – I

Q.2 Solve the following. (Any Four) **16**

a) Define homologation. Explain the Process of Vehicle Homologation in India.

b) Explain M, N, and O layouts of vehicle classification.

c) Describe rear view mirror installation process.

d) Describe the electric vehicle safety norms in-detail.

e) Explain the Hood Latch test of vehicle.

f) Describe dynamic testing of vehicle. Explain the factors affecting dynamic testing.

Q.3 Solve the following. (Any Two) **12**

a) Explain following regulations of vehicle in detail:
i) Automotive Industry Standards (AIS)
ii) Central Motor Vehicles Rules (CMVR)

b) Explain the arrangement of foot controls for M1 type vehicle.

c) Describe requirements of brake performance with anti-lock braking system.

Section – II

Q.4 Solve the following. (Any Four) **16**

a) Describe the horn testing process.

b) Describe tire & wheel rim test of vehicle.

c) Explain crash test with dummies.

d) Discuss accelerator control system test of vehicle.

e) State and explain hybrid electric vehicles tests (M and N category).

f) Explain tests for Hybrid Electric System Intended for Retro-fitment on Vehicles of M and N Category (GVW < 3500 kg).

Q.5 Solve the following. (Any Two) **12**

a) Discuss about the various interior fittings of a vehicle and its testing.

b) Explain Seat anchorages & head restraints test of vehicle.

c) Describe the requirements of Electric Vehicle Conductive AC charging system.

SLR-QH-599

Seat No.		Set	P

T. Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Electrical Machine Design (BTN07601)

Day & Date: Friday, 15-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options and rewrite the sentence. **14**

1) Multi stepped core is used in a transformer to _____.
a) increase output b) increase efficiency
c) decrease cost of copper d) All of the above

2) The value of specific electric loading of induction motor is in the range of _____.
a) 40 to 400 amps. Cond./m
b) 400 to 4000 amp. Cond./m
c) 5000 to 45000 amp. Cond./m
d) 30000 to 100,000 amp. Cond./m

3) With what component is the output equation of DC machines related to?
a) Power b) Voltage
c) Current d) Losses

4) What can be found out using the output equation of the DC machine?
a) Main dimensions b) Angle of rotation
c) Losses d) Efficiency

5) What are the components of the main dimensions of output equation of DC machine?
a) Diameter b) Length
c) Diameter and Length d) Pole Pitch

6) What is the range of frequency during the selection of number of poles?
a) 20−50 Hz b) 25−40 Hz
c) 25−50 Hz d) >50 Hz

7) What is the ratio of the net core area to the area of the circumscribing circle in square cores?
a) 0.58 b) 0.64
c) 0.70 d) 0.80

8) Which type of core construction uses more iron in construction?
a) Core type b) Shell type
c) Both a & b d) None of the above

9) Which is not limitation on electrical machine Design?
a) Saturation b) Current Density
c) Temperature d) None of the Above

10) Which is Major Consideration in electrical machine design?
a) Saturation b) Temperature
c) Insulation d) All of the above

11) Which is not a design problem of electrical machines?
a) Electromagnetic design b) Dielectric design
c) Thermal Design d) None of the above

12) The ratio of effective iron (Core) area to overall iron (Core) area is usually _____.
a) less than 1.0 b) greater than 1.0
c) equal to 1.0 d) None of the above

13) In the design of I.M. to incorporate the design feature of good power factor what should be the ratio of core length to pole pitch?
a) 1.5 to 2.0 b) 1.3−1.8
c) 1.0−1.25 d) 1.1−1.6

14) The area of circumscribing circle is more effectively utilized by _____.
a) decreasing the number of steps
b) rectangular core
c) increasing the number of steps
d) None of the above

Seat No.	

Set **P**

T. Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Electrical Machine Design (BTN07601)

Day & Date: Friday, 15-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All Questions are compulsory.
2) Figures to the right indicates full marks.

Section – I

Q.2 Attempt Any Four. **16**

a) What are the electrical machine design limitations? Explain it in brief.

b) For square core transformer show that Ai = 0.45d^2

c) Explain in brief various factors normally consider in the design of electrical machine.

d) In case transformer, show that $Et = K\sqrt{Q}$ where, $Et = emf$ per turn, $Q = KVA$ rating of transformer, State what are the factors on which value of K depends?

e) Determine the dimension of core and yoke for a 200 kVA, 50 Hz, 1 phase core type transformer. A cruciform core is used with distance between adjacent limbs equal to 1.6 times the width of core lamination. Assume voltage per turn 14 V, maximum flux density 1.1 Wb/m^2, window space factor = 0.32, current density 3A/mm^2 and stacking factor = 0.9. The net iron area is 0.56 d^2 in a cruciform core where 'd' is the diameter of circumscribing circle. Also, the width of largest stamping is 0.85 d.

Q.3 Attempt Any Two. **12**

a) Design an adequate cooling arrangement for a 1250 KVA 6600/400 V, 50 Hz, 3 phase Delta/Star, oil immersed natural cool transformer with following data:
i) Winding temperature not to exceed 40 degrees centigrade
ii) Total loss at full load is 13.1 Kw.
iii) Tank dimensions, length × width × height = (0.65×1.55×1.85) m
sketch the diagram to shows the tube arrangement.

b) Determine the dimension of core and yoke for a 200 KVA, 50Hz, 1 phase core type transformer, a cruciform core is used with distance between adjacent limbs equal to 1.6 times the width of core lamination. Assume voltage per turn 14 V, maximum flux density 1.1 Wb/m^2, window space factor = 0.32, current density 3A/mm^2 and stacking factor = 0.9. The net iron area is 0.56 d^2 where 'd' is the diameter of circumscribing circle. Also, the width of largest stamping is 0.85 d.

c) Find the suitable values diameter and length armature of the core for 200Kw, 250V, 6 pole, 1000 r.p.m., D.C. generator having 91% efficiency. Assume an average flux density in the air of about 0.87 Wb/m^2 and amp. Cond. Per meter to be 31000. The ratio of core length to pole pitch is 0.75. and the ratio of pole arc to pole pitch is 0.67.

Section – II

Q.4 Attempt Any Four. **16**

a) Discuss the effect of air gap length of 3-ph induction motor on following factor.

i) Power factor
ii) Overload capacity
iii) Pulsation loss and noise
iv) Unbalanced magnetic pull

b) Discuss the choice of specific electric loading and specific magnetic loading of Induction machine.

c) Calculate the length of air gap of a 15 kW, 400 V, 50 Hz, delta connected 1440 r.p.m., induction motor having both full load efficiency and power factor as 0.88 each. Assume Bav 0.45 Tesla, ac = 23000 amp. Cond. Per meter, ratio of pole arc to pole pitch = 0.85.

d) Determine the D and L of a 70 HP, 415V. 3 phase 50Hz star connected, 6 pole induction motor for which ac = 30,000 amp. lond / m and Bav = 0.51 Wb/m2. Take n = 90% and p.f = 0.91. Assume T = L. Estimate the number of stator conductors required for a winding in which the conductors are connected in 2 parallel paths. Choose a suitable number of conductors per slot, so that the slot loading does not exceed 750 amp. conductors.

e) Explain the separation of D & L for Synchronous Machine.

Q.5 Attempt Any Two. **12**

a) A 11 KW 3Phase, 6 Pole 50Hz, 220VStar Connected Induction Motor has 54 slots each containing 9 conductors calculate bar and end current. If the no. of rotor bars is 64, if the machine has efficiency of 0.85, the rotor mmf is assumed as 85 percent of stator mmf, also find, bar and end ring cross section if the current density of 5 A/mm^2

b) Find the main dimensions of a 100 MVA, 11 KV, 50 Hz, 40 pole salient pole generator. Assume specific magnetic loading 0.65 Wb/m^2 specific electric loading 40000 Ac/m. the peripheral speed should not exceed 60 m/s.

c) Derive the output equation of Synchronous machine. Also state output coefficient, state factors affecting on size of Synchronous machine.

Seat No.		Set	Q

T. Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Electrical Machine Design (BTN07601)

Day & Date: Friday, 15-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options and rewrite the sentence. **14**

1) Which type of core construction uses more iron in construction?
a) Core type b) Shell type
c) Both a & b d) None of the above

2) Which is not limitation on electrical machine Design?
a) Saturation b) Current Density
c) Temperature d) None of the Above

3) Which is Major Consideration in electrical machine design?
a) Saturation b) Temperature
c) Insulation d) All of the above

4) Which is not a design problem of electrical machines?
a) Electromagnetic design b) Dielectric design
c) Thermal Design d) None of the above

5) The ratio of effective iron (Core) area to overall iron (Core) area is usually _____.
a) less than 1.0 b) greater than 1.0
c) equal to 1.0 d) None of the above

6) In the design of I.M. to incorporate the design feature of good power factor what should be the ratio of core length to pole pitch?
a) 1.5 to 2.0 b) 1.3−1.8
c) 1.0−1.25 d) 1.1−1.6

7) The area of circumscribing circle is more effectively utilized by _____.
a) decreasing the number of steps
b) rectangular core
c) increasing the number of steps
d) None of the above

8) Multi stepped core is used in a transformer to _____.
a) increase output
b) increase efficiency
c) decrease cost of copper
d) All of the above

9) The value of specific electric loading of induction motor is in the range of _____.
a) 40 to 400 amps. Cond./m
b) 400 to 4000 amp. Cond./m
c) 5000 to 45000 amp. Cond./m
d) 30000 to 100,000 amp. Cond./m

10) With what component is the output equation of DC machines related to?
a) Power
b) Voltage
c) Current
d) Losses

11) What can be found out using the output equation of the DC machine?
a) Main dimensions
b) Angle of rotation
c) Losses
d) Efficiency

12) What are the components of the main dimensions of output equation of DC machine?
a) Diameter
b) Length
c) Diameter and Length
d) Pole Pitch

13) What is the range of frequency during the selection of number of poles?
a) 20−50 Hz
b) 25−40 Hz
c) 25−50 Hz
d) >50 Hz

14) What is the ratio of the net core area to the area of the circumscribing circle in square cores?
a) 0.58
b) 0.64
c) 0.70
d) 0.80

Seat No.	

Set **Q**

T. Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Electrical Machine Design (BTN07601)

Day & Date: Friday, 15-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All Questions are compulsory.
2) Figures to the right indicates full marks.

Section – I

Q.2 Attempt Any Four. **16**

a) What are the electrical machine design limitations? Explain it in brief.

b) For square core transformer show that Ai = 0.45d^2

c) Explain in brief various factors normally consider in the design of electrical machine.

d) In case transformer, show that $Et = K\sqrt{Q}$ where, $Et = emf$ per turn, $Q = KVA$ rating of transformer, State what are the factors on which value of K depends?

e) Determine the dimension of core and yoke for a 200 kVA, 50 Hz, 1 phase core type transformer. A cruciform core is used with distance between adjacent limbs equal to 1.6 times the width of core lamination. Assume voltage per turn 14 V, maximum flux density 1.1 Wb/m^2, window space factor = 0.32, current density 3A/mm^2 and stacking factor = 0.9. The net iron area is 0.56 d^2 in a cruciform core where 'd' is the diameter of circumscribing circle. Also, the width of largest stamping is 0.85 d.

Q.3 Attempt Any Two. **12**

a) Design an adequate cooling arrangement for a 1250 KVA 6600/400 V, 50 Hz, 3 phase Delta/Star, oil immersed natural cool transformer with following data:
i) Winding temperature not to exceed 40 degrees centigrade
ii) Total loss at full load is 13.1 Kw.
iii) Tank dimensions, length × width × height = (0.65×1.55×1.85) m
sketch the diagram to shows the tube arrangement.

b) Determine the dimension of core and yoke for a 200 KVA, 50Hz, 1 phase core type transformer, a cruciform core is used with distance between adjacent limbs equal to 1.6 times the width of core lamination. Assume voltage per turn 14 V, maximum flux density 1.1 Wb/m^2, window space factor = 0.32, current density 3A/mm^2 and stacking factor = 0.9. The net iron area is 0.56 d^2 where 'd' is the diameter of circumscribing circle. Also, the width of largest stamping is 0.85 d.

c) Find the suitable values diameter and length armature of the core for 200Kw, 250V, 6 pole, 1000 r.p.m., D.C. generator having 91% efficiency. Assume an average flux density in the air of about 0.87 Wb/m^2 and amp. Cond. Per meter to be 31000. The ratio of core length to pole pitch is 0.75. and the ratio of pole arc to pole pitch is 0.67.

Section – II

Q.4 Attempt Any Four. **16**

a) Discuss the effect of air gap length of 3-ph induction motor on following factor.

i) Power factor
ii) Overload capacity
iii) Pulsation loss and noise
iv) Unbalanced magnetic pull

b) Discuss the choice of specific electric loading and specific magnetic loading of Induction machine.

c) Calculate the length of air gap of a 15 kW, 400 V, 50 Hz, delta connected 1440 r.p.m., induction motor having both full load efficiency and power factor as 0.88 each. Assume Bav 0.45 Tesla, ac = 23000 amp. Cond. Per meter, ratio of pole arc to pole pitch = 0.85.

d) Determine the D and L of a 70 HP, 415V. 3 phase 50Hz star connected, 6 pole induction motor for which ac = 30,000 amp. lond / m and Bav = 0.51 Wb/m2. Take n = 90% and p.f = 0.91. Assume T = L. Estimate the number of stator conductors required for a winding in which the conductors are connected in 2 parallel paths. Choose a suitable number of conductors per slot, so that the slot loading does not exceed 750 amp. conductors.

e) Explain the separation of D & L for Synchronous Machine.

Q.5 Attempt Any Two. **12**

a) A 11 KW 3Phase, 6 Pole 50Hz, 220VStar Connected Induction Motor has 54 slots each containing 9 conductors calculate bar and end current. If the no. of rotor bars is 64, if the machine has efficiency of 0.85, the rotor mmf is assumed as 85 percent of stator mmf, also find, bar and end ring cross section if the current density of 5 A/mm^2

b) Find the main dimensions of a 100 MVA, 11 KV, 50 Hz, 40 pole salient pole generator. Assume specific magnetic loading 0.65 Wb/m^2 specific electric loading 40000 Ac/m. the peripheral speed should not exceed 60 m/s.

c) Derive the output equation of Synchronous machine. Also state output coefficient, state factors affecting on size of Synchronous machine.

Seat No.		Set	R

T. Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Electrical Machine Design (BTN07601)

Day & Date: Friday, 15-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options and rewrite the sentence. **14**

1) Which is not a design problem of electrical machines?
a) Electromagnetic design b) Dielectric design
c) Thermal Design d) None of the above

2) The ratio of effective iron (Core) area to overall iron (Core) area is usually _____.
a) less than 1.0 b) greater than 1.0
c) equal to 1.0 d) None of the above

3) In the design of I.M. to incorporate the design feature of good power factor what should be the ratio of core length to pole pitch?
a) 1.5 to 2.0 b) 1.3−1.8
c) 1.0−1.25 d) 1.1−1.6

4) The area of circumscribing circle is more effectively utilized by _____.
a) decreasing the number of steps
b) rectangular core
c) increasing the number of steps
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5) Multi stepped core is used in a transformer to _____.
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a) 40 to 400 amps. Cond./m
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7) With what component is the output equation of DC machines related to?
a) Power b) Voltage
c) Current d) Losses

8) What can be found out using the output equation of the DC machine?
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9) What are the components of the main dimensions of output equation of DC machine?
a) Diameter b) Length
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a) 20−50 Hz b) 25−40 Hz
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a) 0.58 b) 0.64
c) 0.70 d) 0.80

12) Which type of core construction uses more iron in construction?
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13) Which is not limitation on electrical machine Design?
a) Saturation b) Current Density
c) Temperature d) None of the Above

14) Which is Major Consideration in electrical machine design?
a) Saturation b) Temperature
c) Insulation d) All of the above

Seat No.	

Set **R**

T. Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Electrical Machine Design (BTN07601)

Day & Date: Friday, 15-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All Questions are compulsory.
2) Figures to the right indicates full marks.

Section – I

Q.2 Attempt Any Four. **16**

a) What are the electrical machine design limitations? Explain it in brief.

b) For square core transformer show that Ai = 0.45d^2

c) Explain in brief various factors normally consider in the design of electrical machine.

d) In case transformer, show that $Et = K\sqrt{Q}$ where, $Et = emf$ per turn, $Q = KVA$ rating of transformer, State what are the factors on which value of K depends?

e) Determine the dimension of core and yoke for a 200 kVA, 50 Hz, 1 phase core type transformer. A cruciform core is used with distance between adjacent limbs equal to 1.6 times the width of core lamination. Assume voltage per turn 14 V, maximum flux density 1.1 Wb/m^2, window space factor = 0.32, current density 3A/mm^2 and stacking factor = 0.9. The net iron area is 0.56 d^2 in a cruciform core where 'd' is the diameter of circumscribing circle. Also, the width of largest stamping is 0.85 d.

Q.3 Attempt Any Two. **12**

a) Design an adequate cooling arrangement for a 1250 KVA 6600/400 V, 50 Hz, 3 phase Delta/Star, oil immersed natural cool transformer with following data:
i) Winding temperature not to exceed 40 degrees centigrade
ii) Total loss at full load is 13.1 Kw.
iii) Tank dimensions, length × width × height = (0.65×1.55×1.85) m
sketch the diagram to shows the tube arrangement.

b) Determine the dimension of core and yoke for a 200 KVA, 50Hz, 1 phase core type transformer, a cruciform core is used with distance between adjacent limbs equal to 1.6 times the width of core lamination. Assume voltage per turn 14 V, maximum flux density 1.1 Wb/m^2, window space factor = 0.32, current density 3A/mm^2 and stacking factor = 0.9. The net iron area is 0.56 d^2 where 'd' is the diameter of circumscribing circle. Also, the width of largest stamping is 0.85 d.

c) Find the suitable values diameter and length armature of the core for 200Kw, 250V, 6 pole, 1000 r.p.m., D.C. generator having 91% efficiency. Assume an average flux density in the air of about 0.87 Wb/m^2 and amp. Cond. Per meter to be 31000. The ratio of core length to pole pitch is 0.75. and the ratio of pole arc to pole pitch is 0.67.

Section – II

Q.4 Attempt Any Four. **16**

a) Discuss the effect of air gap length of 3-ph induction motor on following factor.

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ii) Overload capacity
iii) Pulsation loss and noise
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b) Discuss the choice of specific electric loading and specific magnetic loading of Induction machine.

c) Calculate the length of air gap of a 15 kW, 400 V, 50 Hz, delta connected 1440 r.p.m., induction motor having both full load efficiency and power factor as 0.88 each. Assume Bav 0.45 Tesla, ac = 23000 amp. Cond. Per meter, ratio of pole arc to pole pitch = 0.85.

d) Determine the D and L of a 70 HP, 415V. 3 phase 50Hz star connected, 6 pole induction motor for which ac = 30,000 amp. lond / m and Bav = 0.51 Wb/m2. Take n = 90% and p.f = 0.91. Assume T = L. Estimate the number of stator conductors required for a winding in which the conductors are connected in 2 parallel paths. Choose a suitable number of conductors per slot, so that the slot loading does not exceed 750 amp. conductors.

e) Explain the separation of D & L for Synchronous Machine.

Q.5 Attempt Any Two. **12**

a) A 11 KW 3Phase, 6 Pole 50Hz, 220VStar Connected Induction Motor has 54 slots each containing 9 conductors calculate bar and end current. If the no. of rotor bars is 64, if the machine has efficiency of 0.85, the rotor mmf is assumed as 85 percent of stator mmf, also find, bar and end ring cross section if the current density of 5 A/mm^2

b) Find the main dimensions of a 100 MVA, 11 KV, 50 Hz, 40 pole salient pole generator. Assume specific magnetic loading 0.65 Wb/m^2 specific electric loading 40000 Ac/m. the peripheral speed should not exceed 60 m/s.

c) Derive the output equation of Synchronous machine. Also state output coefficient, state factors affecting on size of Synchronous machine.

Seat No.		Set	S

T. Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Electrical Machine Design (BTN07601)

Day & Date: Friday, 15-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
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4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options and rewrite the sentence. **14**

1) What is the range of frequency during the selection of number of poles?
a) 20−50 Hz b) 25−40 Hz
c) 25−50 Hz d) >50 Hz

2) What is the ratio of the net core area to the area of the circumscribing circle in square cores?
a) 0.58 b) 0.64
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3) Which type of core construction uses more iron in construction?
a) Core type b) Shell type
c) Both a & b d) None of the above

4) Which is not limitation on electrical machine Design?
a) Saturation b) Current Density
c) Temperature d) None of the Above

5) Which is Major Consideration in electrical machine design?
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6) Which is not a design problem of electrical machines?
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9) The area of circumscribing circle is more effectively utilized by _____.

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10) Multi stepped core is used in a transformer to _____.

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11) The value of specific electric loading of induction motor is in the range of _____.

a) 40 to 400 amps. Cond./m
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d) 30000 to 100,000 amp. Cond./m

12) With what component is the output equation of DC machines related to?

a) Power b) Voltage
c) Current d) Losses

13) What can be found out using the output equation of the DC machine?

a) Main dimensions b) Angle of rotation
c) Losses d) Efficiency

14) What are the components of the main dimensions of output equation of DC machine?

a) Diameter b) Length
c) Diameter and Length d) Pole Pitch

Seat No.	

Set **S**

T. Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Electrical Machine Design (BTN07601)

Day & Date: Friday, 15-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All Questions are compulsory.
2) Figures to the right indicates full marks.

Section – I

Q.2 Attempt Any Four. **16**

a) What are the electrical machine design limitations? Explain it in brief.

b) For square core transformer show that Ai = 0.45d^2

c) Explain in brief various factors normally consider in the design of electrical machine.

d) In case transformer, show that $Et = K\sqrt{Q}$ where, $Et = emf$ per turn, $Q = KVA$ rating of transformer, State what are the factors on which value of K depends?

e) Determine the dimension of core and yoke for a 200 kVA, 50 Hz, 1 phase core type transformer. A cruciform core is used with distance between adjacent limbs equal to 1.6 times the width of core lamination. Assume voltage per turn 14 V, maximum flux density 1.1 Wb/m^2, window space factor = 0.32, current density 3A/mm^2 and stacking factor = 0.9. The net iron area is 0.56 d^2 in a cruciform core where 'd' is the diameter of circumscribing circle. Also, the width of largest stamping is 0.85 d.

Q.3 Attempt Any Two. **12**

a) Design an adequate cooling arrangement for a 1250 KVA 6600/400 V, 50 Hz, 3 phase Delta/Star, oil immersed natural cool transformer with following data:
i) Winding temperature not to exceed 40 degrees centigrade
ii) Total loss at full load is 13.1 Kw.
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c) Find the suitable values diameter and length armature of the core for 200Kw, 250V, 6 pole, 1000 r.p.m., D.C. generator having 91% efficiency. Assume an average flux density in the air of about 0.87 Wb/m^2 and amp. Cond. Per meter to be 31000. The ratio of core length to pole pitch is 0.75. and the ratio of pole arc to pole pitch is 0.67.

Section – II

Q.4 Attempt Any Four. **16**

a) Discuss the effect of air gap length of 3-ph induction motor on following factor.

i) Power factor
ii) Overload capacity
iii) Pulsation loss and noise
iv) Unbalanced magnetic pull

b) Discuss the choice of specific electric loading and specific magnetic loading of Induction machine.

c) Calculate the length of air gap of a 15 kW, 400 V, 50 Hz, delta connected 1440 r.p.m., induction motor having both full load efficiency and power factor as 0.88 each. Assume Bav 0.45 Tesla, ac = 23000 amp. Cond. Per meter, ratio of pole arc to pole pitch = 0.85.

d) Determine the D and L of a 70 HP, 415V. 3 phase 50Hz star connected, 6 pole induction motor for which ac = 30,000 amp. lond / m and Bav = 0.51 Wb/m2. Take n = 90% and p.f = 0.91. Assume T = L. Estimate the number of stator conductors required for a winding in which the conductors are connected in 2 parallel paths. Choose a suitable number of conductors per slot, so that the slot loading does not exceed 750 amp. conductors.

e) Explain the separation of D & L for Synchronous Machine.

Q.5 Attempt Any Two. **12**

a) A 11 KW 3Phase, 6 Pole 50Hz, 220VStar Connected Induction Motor has 54 slots each containing 9 conductors calculate bar and end current. If the no. of rotor bars is 64, if the machine has efficiency of 0.85, the rotor mmf is assumed as 85 percent of stator mmf, also find, bar and end ring cross section if the current density of 5 A/mm^2

b) Find the main dimensions of a 100 MVA, 11 KV, 50 Hz, 40 pole salient pole generator. Assume specific magnetic loading 0.65 Wb/m^2 specific electric loading 40000 Ac/m. the peripheral speed should not exceed 60 m/s.

c) Derive the output equation of Synchronous machine. Also state output coefficient, state factors affecting on size of Synchronous machine.

SLR-QH-600

Seat No.	

Set P

T. Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Electrical Utilization (BTN07602)

Day & Date: Monday, 18-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Give the correct option for the following questions. 14

1) Overload capacity of diesel engines is usually restricted to _____.
a) 1% b) 10%
c) 25% d) 50%

2) Power supply frequency for 25 kV single phase system is _____.
a) 161 b) 25
c) 50 d) 60

3) The coefficient of adhesion is highest when _____.
a) The rails are dry b) The rails are oiled
c) The rails ark wet with dew d) The rails are dusty

4) Method of speed control used on 25 kV, 50 Hz single phase traction is _____.
a) Tap changing control of transformer
b) Reduced current method
c) Series parallel operation of motors
d) Any of the above

5) Quadrilateral speed-time curve is the closer approximation for _____.
a) Main line service b) Suburban service
c) Urban service d) Urban and suburban

6) Which motor has relatively wider range of speed control?
a) D.C. shunt motor b) Synchronous motor
c) Slip ring I.M. d) Squirrel cage I.M.

7) Heating of non-conducting materials can be done by _____.
a) Arc heating
b) Induction heating
c) Dielectric heating
d) Resistance heating

8) The welding transformer used in resistance welding will _____.
a) Step up current
b) Step down current
c) Step up voltage
d) Step up power

9) In case of induction heating, which of the following parameter is of high value?
a) Frequency
b) Current
c) Voltage
d) Capacitance

10) For arc heating, the electrodes are made of _____.
a) Copper
b) Aluminum
c) Graphite
d) ACSR conductor

11) One lumen per square meter is the same as _____.
a) One lux
b) One candela
c) One foot candle
d) One lumen meter

12) Which of the following lamp gives nearly monochromatic light?
a) Sodium vapor lamp
b) GLS lamp
c) Tube light
d) Mercury vapor lamp

13) Which of the following is an example of Renewable Energy source?
a) Coal
b) Petrol
c) LPG
d) Wind

14) Which type of energy is used by wind turbines to make electricity?
a) Potential energy
b) Chemical energy
c) Kinetic energy
d) Geothermal energy

SLR-QH-600

Seat No.		Set	P

T. Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Electrical Utilization (BTN07602)

Day & Date: Monday, 18-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All Questions are compulsory.
2) Figures to the right indicates full marks.

SECTION – I

Q.2 Solve Any Four. **16**

a) Define dead weight, accelerating weight and adhesive weight.

b) Desirable characteristic of traction motors.

c) Explain shunt and bridge transition, electrical breaking system.

d) Write short note on motor selection in Cranes and Lifts.

e) Write short note on metro system.

Q.3 Solve Any Two. **12**

a) Derive an expression for quadrilateral speed time curve.

b) Explain control equipment and auxiliary equipment in traction system.

c) Write note on motor selection in textile industries.

SECTION – II

Q.4 Solve Any Four. **16**

a) Explain factors to be considered for design of illumination scheme.

b) State advantages and disadvantages electrical heating.

c) Describe with the help of a neat diagram the construction and working of a high-pressure Sodium vapour lamp.

d) Explain the basic principles of light control.

e) Explain the principles of Energy Conservation.

Q.5 Solve Any Two. **12**

a) Explain Energy Conservation in Transport and Agriculture.

b) Explain Energy Conservation in Industries.

c) Explain resistance welding and its types.

SLR-QH-600

Seat No.	

Set Q

T. Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Electrical Utilization (BTN07602)

Day & Date: Monday, 18-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Give the correct option for the following questions. 14

1) The welding transformer used in resistance welding will _____.
a) Step up current b) Step down current
c) Step up voltage d) Step up power

2) In case of induction heating, which of the following parameter is of high value?
a) Frequency b) Current
c) Voltage d) Capacitance

3) For arc heating, the electrodes are made of _____.
a) Copper b) Aluminum
c) Graphite d) ACSR conductor

4) One lumen per square meter is the same as _____.
a) One lux b) One candela
c) One foot candle d) One lumen meter

5) Which of the following lamp gives nearly monochromatic light?
a) Sodium vapor lamp b) GLS lamp
c) Tube light d) Mercury vapor lamp

6) Which of the following is an example of Renewable Energy source?
a) Coal b) Petrol
c) LPG d) Wind

7) Which type of energy is used by wind turbines to make electricity?
a) Potential energy b) Chemical energy
c) Kinetic energy d) Geothermal energy

8) Overload capacity of diesel engines is usually restricted to _____.
a) 1% b) 10%
c) 25% d) 50%

9) Power supply frequency for 25 kV single phase system is _____.
a) 161 b) 25
c) 50 d) 60

10) The coefficient of adhesion is highest when _____.
a) The rails are dry b) The rails are oiled
c) The rails ark wet with dew d) The rails are dusty

11) Method of speed control used on 25 kV, 50 Hz single phase traction is _____.
a) Tap changing control of transformer
b) Reduced current method
c) Series parallel operation of motors
d) Any of the above

12) Quadrilateral speed-time curve is the closer approximation for _____.
a) Main line service b) Suburban service
c) Urban service d) Urban and suburban

13) Which motor has relatively wider range of speed control?
a) D.C. shunt motor b) Synchronous motor
c) Slip ring I.M. d) Squirrel cage I.M.

14) Heating of non-conducting materials can be done by _____.
a) Arc heating b) Induction heating
c) Dielectric heating d) Resistance heating

SLR-QH-600

Seat No.	

Set Q

T. Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Electrical Utilization (BTN07602)

Day & Date: Monday, 18-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All Questions are compulsory.
2) Figures to the right indicates full marks.

SECTION – I

Q.2 Solve Any Four. **16**

a) Define dead weight, accelerating weight and adhesive weight.

b) Desirable characteristic of traction motors.

c) Explain shunt and bridge transition, electrical breaking system.

d) Write short note on motor selection in Cranes and Lifts.

e) Write short note on metro system.

Q.3 Solve Any Two. **12**

a) Derive an expression for quadrilateral speed time curve.

b) Explain control equipment and auxiliary equipment in traction system.

c) Write note on motor selection in textile industries.

SECTION – II

Q.4 Solve Any Four. **16**

a) Explain factors to be considered for design of illumination scheme.

b) State advantages and disadvantages electrical heating.

c) Describe with the help of a neat diagram the construction and working of a high-pressure Sodium vapour lamp.

d) Explain the basic principles of light control.

e) Explain the principles of Energy Conservation.

Q.5 Solve Any Two. **12**

a) Explain Energy Conservation in Transport and Agriculture.

b) Explain Energy Conservation in Industries.

c) Explain resistance welding and its types.

SLR-QH-600

Seat No.	

Set R

T. Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Electrical Utilization (BTN07602)

Day & Date: Monday, 18-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Give the correct option for the following questions. 14

1) One lumen per square meter is the same as _____.
a) One lux b) One candela
c) One foot candle d) One lumen meter

2) Which of the following lamp gives nearly monochromatic light?
a) Sodium vapor lamp b) GLS lamp
c) Tube light d) Mercury vapor lamp

3) Which of the following is an example of Renewable Energy source?
a) Coal b) Petrol
c) LPG d) Wind

4) Which type of energy is used by wind turbines to make electricity?
a) Potential energy b) Chemical energy
c) Kinetic energy d) Geothermal energy

5) Overload capacity of diesel engines is usually restricted to _____.
a) 1% b) 10%
c) 25% d) 50%

6) Power supply frequency for 25 kV single phase system is _____.
a) 161 b) 25
c) 50 d) 60

7) The coefficient of adhesion is highest when _____.
a) The rails are dry b) The rails are oiled
c) The rails ark wet with dew d) The rails are dusty

8) Method of speed control used on 25 kV, 50 Hz single phase traction is _____.
a) Tap changing control of transformer
b) Reduced current method
c) Series parallel operation of motors
d) Any of the above

9) Quadrilateral speed-time curve is the closer approximation for _____.
a) Main line service
b) Suburban service
c) Urban service
d) Urban and suburban

10) Which motor has relatively wider range of speed control?
a) D.C. shunt motor
b) Synchronous motor
c) Slip ring I.M.
d) Squirrel cage I.M.

11) Heating of non-conducting materials can be done by _____.
a) Arc heating
b) Induction heating
c) Dielectric heating
d) Resistance heating

12) The welding transformer used in resistance welding will _____.
a) Step up current
b) Step down current
c) Step up voltage
d) Step up power

13) In case of induction heating, which of the following parameter is of high value?
a) Frequency
b) Current
c) Voltage
d) Capacitance

14) For arc heating, the electrodes are made of _____.
a) Copper
b) Aluminum
c) Graphite
d) ACSR conductor

SLR-QH-600

Seat No.	

Set R

T. Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Electrical Utilization (BTN07602)

Day & Date: Monday, 18-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All Questions are compulsory.
2) Figures to the right indicates full marks.

SECTION – I

Q.2 Solve Any Four. **16**

a) Define dead weight, accelerating weight and adhesive weight.

b) Desirable characteristic of traction motors.

c) Explain shunt and bridge transition, electrical breaking system.

d) Write short note on motor selection in Cranes and Lifts.

e) Write short note on metro system.

Q.3 Solve Any Two. **12**

a) Derive an expression for quadrilateral speed time curve.

b) Explain control equipment and auxiliary equipment in traction system.

c) Write note on motor selection in textile industries.

SECTION – II

Q.4 Solve Any Four. **16**

a) Explain factors to be considered for design of illumination scheme.

b) State advantages and disadvantages electrical heating.

c) Describe with the help of a neat diagram the construction and working of a high-pressure Sodium vapour lamp.

d) Explain the basic principles of light control.

e) Explain the principles of Energy Conservation.

Q.5 Solve Any Two. **12**

a) Explain Energy Conservation in Transport and Agriculture.

b) Explain Energy Conservation in Industries.

c) Explain resistance welding and its types.

SLR-QH-600

Seat No.	

Set S

T. Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Electrical Utilization (BTN07602)

Day & Date: Monday, 18-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Give the correct option for the following questions. 14

1) Which motor has relatively wider range of speed control?
a) D.C. shunt motor b) Synchronous motor
c) Slip ring I.M. d) Squirrel cage I.M.

2) Heating of non-conducting materials can be done by _____.
a) Arc heating b) Induction heating
c) Dielectric heating d) Resistance heating

3) The welding transformer used in resistance welding will _____.
a) Step up current b) Step down current
c) Step up voltage d) Step up power

4) In case of induction heating, which of the following parameter is of high value?
a) Frequency b) Current
c) Voltage d) Capacitance

5) For arc heating, the electrodes are made of _____.
a) Copper b) Aluminum
c) Graphite d) ACSR conductor

6) One lumen per square meter is the same as _____.
a) One lux b) One candela
c) One foot candle d) One lumen meter

7) Which of the following lamp gives nearly monochromatic light?
a) Sodium vapor lamp b) GLS lamp
c) Tube light d) Mercury vapor lamp

8) Which of the following is an example of Renewable Energy source?
a) Coal b) Petrol
c) LPG d) Wind

9) Which type of energy is used by wind turbines to make electricity?
a) Potential energy b) Chemical energy
c) Kinetic energy d) Geothermal energy

10) Overload capacity of diesel engines is usually restricted to _____.
a) 1% b) 10%
c) 25% d) 50%

11) Power supply frequency for 25 kV single phase system is _____.
a) 161 b) 25
c) 50 d) 60

12) The coefficient of adhesion is highest when _____.
a) The rails are dry b) The rails are oiled
c) The rails ark wet with dew d) The rails are dusty

13) Method of speed control used on 25 kV, 50 Hz single phase traction is _____.
a) Tap changing control of transformer
b) Reduced current method
c) Series parallel operation of motors
d) Any of the above

14) Quadrilateral speed-time curve is the closer approximation for _____.
a) Main line service b) Suburban service
c) Urban service d) Urban and suburban

SLR-QH-600

Seat No.	

Set S

T. Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Electrical Utilization (BTN07602)

Day & Date: Monday, 18-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All Questions are compulsory.
2) Figures to the right indicates full marks.

SECTION – I

Q.2 Solve Any Four. **16**

a) Define dead weight, accelerating weight and adhesive weight.

b) Desirable characteristic of traction motors.

c) Explain shunt and bridge transition, electrical breaking system.

d) Write short note on motor selection in Cranes and Lifts.

e) Write short note on metro system.

Q.3 Solve Any Two. **12**

a) Derive an expression for quadrilateral speed time curve.

b) Explain control equipment and auxiliary equipment in traction system.

c) Write note on motor selection in textile industries.

SECTION – II

Q.4 Solve Any Four. **16**

a) Explain factors to be considered for design of illumination scheme.

b) State advantages and disadvantages electrical heating.

c) Describe with the help of a neat diagram the construction and working of a high-pressure Sodium vapour lamp.

d) Explain the basic principles of light control.

e) Explain the principles of Energy Conservation.

Q.5 Solve Any Two. **12**

a) Explain Energy Conservation in Transport and Agriculture.

b) Explain Energy Conservation in Industries.

c) Explain resistance welding and its types.

SLR-QH-601

Seat No.	

Set P

T. Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Power Electronics & Industrial Drives (BTN07603)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data whenever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options and rewrite the sentence. **14**

1) The minimum current below which SCR can turn off is called _____.
a) Trigger current b) Holding current
c) Junction current d) Break over current

2) Power electronics converters used to _____.
a) Control the speed b) Control the power
c) Control the current d) None

3) The output voltage of AC voltage regulators can be _____.
a) Variable b) Constant
c) Either of a) or b) d) None of these

4) The load voltage of a chopper can be controlled by varying the ____.
a) Duty cycle b) Firing angle
c) Reactor position d) Extinction angle

5) The angle at which SCR turns on is called _____.
a) On angle b) Conduction angle
c) Firing angle d) Extinction angle

6) Single-phase half-bridge inverters require _____.
a) Two-wire ac supply b) Two wire dc supply
c) Three-wire ac supply d) Three-wire dc supply

7) In a single-phase half-wave thyristor circuit with R load & Vs=Vmsinωt, the maximum value of the load current can be given by _____.
a) Vm/R b) Vs/R
c) Vm/2 d) Vs/2

8) In BLDC Motors the Hall effect sensor is used _____.
a) As rotor Voltage sensor b) As rotor position sensor
c) As rotor current sensor d) All of the above

9) Type E Chopper is used for obtaining which type of operating mode?
a) Reverse motoring mode b) Motoring Mode
c) Reverse regenerative mode d) None of these

10) In the multi-quadrant operation of a hoist, Reverse motoring is at _____ quadrant.
a) First b) Second
c) Third d) Four

11) Electrical Drives includes _____.
a) Power Electronics b) Electrical Machines
c) Control Systems d) All of the above

12) Construction of Brushless DC Motor is exactly similar to the _____.
a) Conventional DC motor
b) Trapezoidal Permanent Magnet A C motor
c) Permanent magnet synchronous motor
d) Totally different construction

13) _____ duty cycle consists of frequent on-load and off-load periods.
a) Continuous Duty with constant Load
b) Continuous Duty with Variable Load
c) Short Time duty
d) Intermittent duty

14) An elevator drive is required to operate in _____.
a) One quadrant only b) Two quadrant
c) Three quadrant d) Four quadrant

Seat No.	

Set **P**

T. Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Power Electronics & Industrial Drives (BTN07603)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All Questions are compulsory.
2) Figures to the right indicates full marks.
3) Draw neat diagrams whenever necessary.

SECTION – I

Q.2 Attempt the following. (Any Four) **16**

a) Describe in details turn on methods of SCR.

b) Draw and explain single phase half wave-controlled rectifier with 'RL' load with proper wave form.

c) Draw the static V-I characteristics of SCR. Explain effect of gate current on anode current.

d) Draw and explain step down chopper with proper wave form?

e) What are the types of AC controllers? Explain the phase angle control regulator.

f) A single phase fully controlled converter connected a resistive load of 12 ohm, has an average output voltage of 220 volts at firing angle of 0 deg. Calculate the average output voltage and average output current at a firing angle of 30 deg.

Q.3 Attempt the following. (Any Two) **12**

a) Draw and explain three phases fully controlled rectifier with R Load with proper waveform.

b) Draw and explain three-phase bridge inverters with R Load with 120 conduction modes.

c) Draw and explain buck/boost regulator with waveform

SECTION – II

Q.4 Attempt the following. (Any Four) **16**

a) Write the comparison between AC Drives and DC Drives.

b) Draw the block diagram of the Electrical Drive system and explain each block.

c) Write factors on which the choice of electric drive depends.

d) Explain different types of torques in drives

e) Explain the chopper-fed DC separately excited motor in motoring mode.

f) With neat diagram explains the stator voltage control of an induction motor.

Q.5 Attempt the following. (Any Two) **12**

a) With the help of a neat sketch, explain multi-quadrant operation chopper-controlled dc drives.

b) With a neat sketch explain the VSI feed induction motor drive also draw a block diagram for closed-loop control.

c) With neat sketch & waveform explain single phase fully controlled rectifier fed separately excited D.C. motor drive

SLR-QH-601

Seat No.	

Set Q

T. Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Power Electronics & Industrial Drives (BTN07603)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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3) Figures to the right indicates full marks.
4) Assume suitable data whenever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options and rewrite the sentence. **14**

1) In BLDC Motors the Hall effect sensor is used _____.
a) As rotor Voltage sensor b) As rotor position sensor
c) As rotor current sensor d) All of the above

2) Type E Chopper is used for obtaining which type of operating mode?
a) Reverse motoring mode b) Motoring Mode
c) Reverse regenerative mode d) None of these

3) In the multi-quadrant operation of a hoist, Reverse motoring is at _____ quadrant.
a) First b) Second
c) Third d) Four

4) Electrical Drives includes _____.
a) Power Electronics b) Electrical Machines
c) Control Systems d) All of the above

5) Construction of Brushless DC Motor is exactly similar to the _____.
a) Conventional DC motor
b) Trapezoidal Permanent Magnet A C motor
c) Permanent magnet synchronous motor
d) Totally different construction

6) _____ duty cycle consists of frequent on-load and off-load periods.
a) Continuous Duty with constant Load
b) Continuous Duty with Variable Load
c) Short Time duty
d) Intermittent duty

7) An elevator drive is required to operate in _____.
a) One quadrant only b) Two quadrant
c) Three quadrant d) Four quadrant

8) The minimum current below which SCR can turn off is called _____.
a) Trigger current b) Holding current
c) Junction current d) Break over current

9) Power electronics converters used to _____.
a) Control the speed b) Control the power
c) Control the current d) None

10) The output voltage of AC voltage regulators can be _____.
a) Variable b) Constant
c) Either of a) or b) d) None of these

11) The load voltage of a chopper can be controlled by varying the ____.
a) Duty cycle b) Firing angle
c) Reactor position d) Extinction angle

12) The angle at which SCR turns on is called _____.
a) On angle b) Conduction angle
c) Firing angle d) Extinction angle

13) Single-phase half-bridge inverters require _____.
a) Two-wire ac supply b) Two wire dc supply
c) Three-wire ac supply d) Three-wire dc supply

14) In a single-phase half-wave thyristor circuit with R load & $V_s=V_m\sin\omega t$, the maximum value of the load current can be given by _____.
a) Vm/R b) Vs/R
c) Vm/2 d) Vs/2

SLR-QH-601

Seat No.	

Set Q

T. Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Power Electronics & Industrial Drives (BTN07603)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All Questions are compulsory.
2) Figures to the right indicates full marks.
3) Draw neat diagrams whenever necessary.

SECTION – I

Q.2 Attempt the following. (Any Four) **16**

a) Describe in details turn on methods of SCR.

b) Draw and explain single phase half wave-controlled rectifier with 'RL' load with proper wave form.

c) Draw the static V-I characteristics of SCR. Explain effect of gate current on anode current.

d) Draw and explain step down chopper with proper wave form?

e) What are the types of AC controllers? Explain the phase angle control regulator.

f) A single phase fully controlled converter connected a resistive load of 12 ohm, has an average output voltage of 220 volts at firing angle of 0 deg. Calculate the average output voltage and average output current at a firing angle of 30 deg.

Q.3 Attempt the following. (Any Two) **12**

a) Draw and explain three phases fully controlled rectifier with R Load with proper waveform.

b) Draw and explain three-phase bridge inverters with R Load with 120 conduction modes.

c) Draw and explain buck/boost regulator with waveform

SECTION – II

Q.4 Attempt the following. (Any Four) **16**

a) Write the comparison between AC Drives and DC Drives.

b) Draw the block diagram of the Electrical Drive system and explain each block.

c) Write factors on which the choice of electric drive depends.

d) Explain different types of torques in drives

e) Explain the chopper-fed DC separately excited motor in motoring mode.

f) With neat diagram explains the stator voltage control of an induction motor.

Q.5 Attempt the following. (Any Two) **12**

a) With the help of a neat sketch, explain multi-quadrant operation chopper-controlled dc drives.

b) With a neat sketch explain the VSI feed induction motor drive also draw a block diagram for closed-loop control.

c) With neat sketch & waveform explain single phase fully controlled rectifier fed separately excited D.C. motor drive

Seat No.	

Set R

T. Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Power Electronics & Industrial Drives (BTN07603)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data whenever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options and rewrite the sentence. **14**

1) Electrical Drives includes _____.
a) Power Electronics b) Electrical Machines
c) Control Systems d) All of the above

2) Construction of Brushless DC Motor is exactly similar to the _____.
a) Conventional DC motor
b) Trapezoidal Permanent Magnet A C motor
c) Permanent magnet synchronous motor
d) Totally different construction

3) _____ duty cycle consists of frequent on-load and off-load periods.
a) Continuous Duty with constant Load
b) Continuous Duty with Variable Load
c) Short Time duty
d) Intermittent duty

4) An elevator drive is required to operate in _____.
a) One quadrant only b) Two quadrant
c) Three quadrant d) Four quadrant

5) The minimum current below which SCR can turn off is called _____.
a) Trigger current b) Holding current
c) Junction current d) Break over current

6) Power electronics converters used to _____.
a) Control the speed b) Control the power
c) Control the current d) None

7) The output voltage of AC voltage regulators can be _____.
a) Variable b) Constant
c) Either of a) or b) d) None of these

8) The load voltage of a chopper can be controlled by varying the ____.
a) Duty cycle b) Firing angle
c) Reactor position d) Extinction angle

9) The angle at which SCR turns on is called _____.
a) On angle b) Conduction angle
c) Firing angle d) Extinction angle

10) Single-phase half-bridge inverters require _____.
a) Two-wire ac supply b) Two wire dc supply
c) Three-wire ac supply d) Three-wire dc supply

11) In a single-phase half-wave thyristor circuit with R load & $Vs=Vm\sin\omega t$, the maximum value of the load current can be given by _____.
a) Vm/R b) Vs/R
c) Vm/2 d) Vs/2

12) In BLDC Motors the Hall effect sensor is used _____.
a) As rotor Voltage sensor b) As rotor position sensor
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13) Type E Chopper is used for obtaining which type of operating mode?
a) Reverse motoring mode b) Motoring Mode
c) Reverse regenerative mode d) None of these

14) In the multi-quadrant operation of a hoist, Reverse motoring is at _____ quadrant.
a) First b) Second
c) Third d) Four

Seat No.	

Set **R**

T. Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Power Electronics & Industrial Drives (BTN07603)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All Questions are compulsory.
2) Figures to the right indicates full marks.
3) Draw neat diagrams whenever necessary.

SECTION – I

Q.2 Attempt the following. (Any Four) **16**

a) Describe in details turn on methods of SCR.

b) Draw and explain single phase half wave-controlled rectifier with 'RL' load with proper wave form.

c) Draw the static V-I characteristics of SCR. Explain effect of gate current on anode current.

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e) What are the types of AC controllers? Explain the phase angle control regulator.

f) A single phase fully controlled converter connected a resistive load of 12 ohm, has an average output voltage of 220 volts at firing angle of 0 deg. Calculate the average output voltage and average output current at a firing angle of 30 deg.

Q.3 Attempt the following. (Any Two) **12**

a) Draw and explain three phases fully controlled rectifier with R Load with proper waveform.

b) Draw and explain three-phase bridge inverters with R Load with 120 conduction modes.

c) Draw and explain buck/boost regulator with waveform

SECTION – II

Q.4 Attempt the following. (Any Four) **16**

a) Write the comparison between AC Drives and DC Drives.

b) Draw the block diagram of the Electrical Drive system and explain each block.

c) Write factors on which the choice of electric drive depends.

d) Explain different types of torques in drives

e) Explain the chopper-fed DC separately excited motor in motoring mode.

f) With neat diagram explains the stator voltage control of an induction motor.

Q.5 Attempt the following. (Any Two) **12**

a) With the help of a neat sketch, explain multi-quadrant operation chopper-controlled dc drives.

b) With a neat sketch explain the VSI feed induction motor drive also draw a block diagram for closed-loop control.

c) With neat sketch & waveform explain single phase fully controlled rectifier fed separately excited D.C. motor drive

SLR-QH-601

Seat No.	

Set S

T. Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Power Electronics & Industrial Drives (BTN07603)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data whenever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options and rewrite the sentence. **14**

1) Single-phase half-bridge inverters require _____.
a) Two-wire ac supply b) Two wire dc supply
c) Three-wire ac supply d) Three-wire dc supply

2) In a single-phase half-wave thyristor circuit with R load & $Vs=Vm\sin\omega t$, the maximum value of the load current can be given by _____.
a) Vm/R b) Vs/R
c) Vm/2 d) Vs/2

3) In BLDC Motors the Hall effect sensor is used _____.
a) As rotor Voltage sensor b) As rotor position sensor
c) As rotor current sensor d) All of the above

4) Type E Chopper is used for obtaining which type of operating mode?
a) Reverse motoring mode b) Motoring Mode
c) Reverse regenerative mode d) None of these

5) In the multi-quadrant operation of a hoist, Reverse motoring is at _____ quadrant.
a) First b) Second
c) Third d) Four

6) Electrical Drives includes _____.
a) Power Electronics b) Electrical Machines
c) Control Systems d) All of the above

7) Construction of Brushless DC Motor is exactly similar to the _____.
a) Conventional DC motor
b) Trapezoidal Permanent Magnet A C motor
c) Permanent magnet synchronous motor
d) Totally different construction

8) _____ duty cycle consists of frequent on-load and off-load periods.
a) Continuous Duty with constant Load
b) Continuous Duty with Variable Load
c) Short Time duty
d) Intermittent duty

9) An elevator drive is required to operate in _____.
a) One quadrant only
b) Two quadrant
c) Three quadrant
d) Four quadrant

10) The minimum current below which SCR can turn off is called _____.
a) Trigger current
b) Holding current
c) Junction current
d) Break over current

11) Power electronics converters used to _____.
a) Control the speed
b) Control the power
c) Control the current
d) None

12) The output voltage of AC voltage regulators can be _____.
a) Variable
b) Constant
c) Either of a) or b)
d) None of these

13) The load voltage of a chopper can be controlled by varying the ____.
a) Duty cycle
b) Firing angle
c) Reactor position
d) Extinction angle

14) The angle at which SCR turns on is called _____.
a) On angle
b) Conduction angle
c) Firing angle
d) Extinction angle

Seat No.	

Set **S**

T. Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Power Electronics & Industrial Drives (BTN07603)

Day & Date: Wednesday, 20-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All Questions are compulsory.
2) Figures to the right indicates full marks.
3) Draw neat diagrams whenever necessary.

SECTION – I

Q.2 Attempt the following. (Any Four) **16**

a) Describe in details turn on methods of SCR.

b) Draw and explain single phase half wave-controlled rectifier with 'RL' load with proper wave form.

c) Draw the static V-I characteristics of SCR. Explain effect of gate current on anode current.

d) Draw and explain step down chopper with proper wave form?

e) What are the types of AC controllers? Explain the phase angle control regulator.

f) A single phase fully controlled converter connected a resistive load of 12 ohm, has an average output voltage of 220 volts at firing angle of 0 deg. Calculate the average output voltage and average output current at a firing angle of 30 deg.

Q.3 Attempt the following. (Any Two) **12**

a) Draw and explain three phases fully controlled rectifier with R Load with proper waveform.

b) Draw and explain three-phase bridge inverters with R Load with 120 conduction modes.

c) Draw and explain buck/boost regulator with waveform

SECTION – II

Q.4 Attempt the following. (Any Four) **16**

a) Write the comparison between AC Drives and DC Drives.

b) Draw the block diagram of the Electrical Drive system and explain each block.

c) Write factors on which the choice of electric drive depends.

d) Explain different types of torques in drives

e) Explain the chopper-fed DC separately excited motor in motoring mode.

f) With neat diagram explains the stator voltage control of an induction motor.

Q.5 Attempt the following. (Any Two) **12**

a) With the help of a neat sketch, explain multi-quadrant operation chopper-controlled dc drives.

b) With a neat sketch explain the VSI feed induction motor drive also draw a block diagram for closed-loop control.

c) With neat sketch & waveform explain single phase fully controlled rectifier fed separately excited D.C. motor drive

SLR-QH-602

Seat No.	

Set P

T. Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Advanced Control Systems (BTN07604)

Day & Date: Friday, 22-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) The transfer function is $\frac{1+0.5s}{1+s}$. It represents a _____.

a) lead network b) lag network
c) lag-lead network d) proportional controller

2) A lead compensator improves primarily _____.

a) Steady-state accuracy b) Stability
c) Transient response d) Low-frequency gain

3) For a lag compensator network, the pole lies _____.

a) Left of zero b) Right of zero
c) At zero d) None

4) In state-space analysis, state vector represents _____.

a) Output variables b) Input variables
c) Energy storage variables d) Control inputs

5) A state model of a system is given by $\dot{x} = \begin{bmatrix} 0 & 1 \\ -2 & -3 \end{bmatrix}\begin{bmatrix} x_1 \\ x_2 \end{bmatrix} + \begin{bmatrix} 0 \\ 1 \end{bmatrix} u(t), Y = [1 \quad 0]x$. The Transfer function G(s) is _____.

a) $\frac{1}{s^2+3s+2}$ b) $\frac{s+3}{s^2+2s+1}$
c) $\frac{s+1}{s^2+3s+2}$ d) $\frac{1}{s+2}$

6) If the characteristic equation of matrix A is $s^3 + 5s^2 + 6s + 4 = 0$ then eigenvalues correspond to _____.

a) Zeros of transfer function
b) System poles
c) Zeros of A matrix
d) Gain constants

7) A system is completely controllable if _____.

a) det(Controllability matrix) = 0
b) Rank = n
c) Eigenvalues are positive
d) A matrix is diagonalizable

8) The eigen values of the matrix (A-BK) are called _____.

a) open loop poles
b) open loop zeros
c) regulator poles
d) None of these

9) The Ackermann's formula is used for finding _____.

a) Observability
b) Controllability
c) Feedback gain matrix
d) State vector

10) In state feedback control, state variable feedback affects _____.

a) Only output response
b) Pole locations of system
c) Input gain
d) Error constant

11) The describing function method is applied for _____.

a) Linear continuous systems
b) Nonlinear systems under sinusoidal input
c) Time-varying systems
d) Digital systems

12) The most common physical nonlinearity in control systems is _____.

a) Friction
b) Dead zone
c) Relay
d) All of these

13) For a discrete system to be stable, poles of F(z) should lie _____.

a) Inside the unit circle
b) On real axis
c) Outside unit circle
d) On imaginary axis

14) The transfer function of zero order hold is _____.

a) $1 - e^{Ts}$
b) $1 - e^{-Ts}$
c) $\frac{1 - e^{Ts}}{s}$
d) $\frac{1 - e^{-Ts}}{s}$

Seat No.	

Set **P**

T. Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Advanced Control Systems (BTN07604)

Day & Date: Friday, 22-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All Questions are compulsory.
2) Figures to the right indicates full marks.
3) Draw neat diagrams whenever necessary
4) Assumes suitable data if necessary.

SECTION – I

Q.2 Attempt the following. (Any Four) **16**

a) Derive the realization of lag compensator circuit using passive network.

b) Explain the procedure to design lead compensator using bode plot technique.

c) Explain the procedure to design lag-lead compensator using root locus method.

d) A feedback system is having the closed loop transfer function $T(s) = \frac{s^2+3s+3}{s^3+2s^2+3s+1}$ Construct a state model for the system.

e) Find the State transition matrix $\phi(t)$ using Laplace Transform method.

$$\begin{bmatrix} \dot{x}_1 \\ \dot{x}_2 \end{bmatrix} = \begin{bmatrix} 0 & -3 \\ 1 & -4 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \end{bmatrix}$$

Q.3 Attempt the following. **12**

a) The forward path TF of a unity feedback control system is given by $G(s) = \frac{k}{s(s+2)(s+8)}$. Design a suitable lag compensator so that the system meets the following specifications.
i) Percentage overshoot $\leq 16\%$ for unit step input,
ii) steady state error ≤ 0.125 for unit ramp input

b) Design a lead compensator for a unity feedback system with OLTF $G(s) = \frac{k}{s(s+1)(s+5)}$ to satisfy the following specifications
i) $Kv \geq 50$
ii) Phase Margin $\geq 20°$

OR

b) Check the controllability and observability of the state model given below:

$$\begin{bmatrix}\dot{X}_1\\ \dot{X}_2\\ \dot{X}_3\end{bmatrix}=\begin{bmatrix}-1 & -2 & -2\\ 0 & -1 & 1\\ 1 & 0 & -1\end{bmatrix}\begin{bmatrix}X_1\\ X_2\\ X_3\end{bmatrix}+\begin{bmatrix}2\\ 0\\ 1\end{bmatrix}u(t) \text{ and } y=\begin{bmatrix}1 & 1 & 0\end{bmatrix}\begin{bmatrix}X_1\\ X_2\\ X_3\end{bmatrix}$$

SECTION – II

Q.4 Attempt the following. (Any Four) **16**

a) Determine the kind of singularity for the following differential equation.

$\ddot{Y}+3\dot{Y}+2Y=0$

b) Explain the limit cycle phenomenon in the nonlinear control systems.

c) Derive the pulse transfer function of the closed loop system.

d) A linear system is described by the state model.

$\begin{bmatrix}\dot{X}_1\\ \dot{X}_2\end{bmatrix}=\begin{bmatrix}0 & 1\\ 0 & -2\end{bmatrix}\begin{bmatrix}X_1\\ X_2\end{bmatrix}+\begin{bmatrix}0\\ 4\end{bmatrix}u(t)$ and $y=\begin{bmatrix}1 & 0\end{bmatrix}\begin{bmatrix}X_1\\ X_2\end{bmatrix}$. Calculate the observer gain matrix so that the observer poles are at $s1,2=-8,-8$.

e) Explain the mapping between the s-plane and the Z-plane.

Q.5 Attempt the following. (Any Two) **12**

a) It is desired to place the closed-loop poles of the following system at $s=-1,-2,-2$ by a state feedback controller with the control $u=-kx$. Determine the state feedback gain matrix K.

$$\begin{bmatrix}\dot{X}_1\\ \dot{X}_2\\ \dot{X}_3\end{bmatrix}=\begin{bmatrix}0 & 1 & 0\\ 0 & 0 & 1\\ 1 & 0 & 0\end{bmatrix}\begin{bmatrix}X_1\\ X_2\\ X_3\end{bmatrix}+\begin{bmatrix}0\\ 0\\ 1\end{bmatrix}u(t)$$

b) Derive the describing function of the relay with dead-zone nonlinearity.

c) Test the stability of the polynomial.

$F(z)=z^5+2.6z^4-0.56z^3-2.05z^2+0.0775z+0.35$.

Develop Jury's Table $[(2n-3)$ rows$]$.

SLR-QH-602

Seat No.		Set	Q

T. Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Advanced Control Systems (BTN07604)

Day & Date: Friday, 22-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) The eigen values of the matrix (A-BK) are called _____.
a) open loop poles b) open loop zeros
c) regulator poles d) None of these

2) The Ackermann's formula is used for finding _____.
a) Observability b) Controllability
c) Feedback gain matrix d) State vector

3) In state feedback control, state variable feedback affects _____.
a) Only output response b) Pole locations of system
c) Input gain d) Error constant

4) The describing function method is applied for _____.
a) Linear continuous systems
b) Nonlinear systems under sinusoidal input
c) Time-varying systems
d) Digital systems

5) The most common physical nonlinearity in control systems is _____.
a) Friction b) Dead zone
c) Relay d) All of these

6) For a discrete system to be stable, poles of F(z) should lie _____.
a) Inside the unit circle b) On real axis
c) Outside unit circle d) On imaginary axis

7) The transfer function of zero order hold is _____.

a) $1 - e^{Ts}$ b) $1 - e^{-Ts}$

c) $\frac{1 - e^{Ts}}{s}$ d) $\frac{1 - e^{-Ts}}{s}$

8) The transfer function is $\frac{1+0.5s}{1+s}$. It represents a _____.

a) lead network b) lag network

c) lag-lead network d) proportional controller

9) A lead compensator improves primarily _____.

a) Steady-state accuracy b) Stability

c) Transient response d) Low-frequency gain

10) For a lag compensator network, the pole lies _____.

a) Left of zero b) Right of zero

c) At zero d) None

11) In state-space analysis, state vector represents _____.

a) Output variables b) Input variables

c) Energy storage variables d) Control inputs

12) A state model of a system is given by $\dot{x} = \begin{bmatrix} 0 & 1 \\ -2 & -3 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \end{bmatrix} + \begin{bmatrix} 0 \\ 1 \end{bmatrix} u(t), Y = [1 \quad 0]x$. The Transfer function G(s) is _____.

a) $\frac{1}{s^2 + 3s + 2}$ b) $\frac{s + 3}{s^2 + 2s + 1}$

c) $\frac{s + 1}{s^2 + 3s + 2}$ d) $\frac{1}{s + 2}$

13) If the characteristic equation of matrix A is $s^3 + 5s^2 + 6s + 4 = 0$ then eigenvalues correspond to _____.

a) Zeros of transfer function b) System poles

c) Zeros of A matrix d) Gain constants

14) A system is completely controllable if _____.

a) det(Controllability matrix) = 0 b) Rank = n

c) Eigenvalues are positive d) A matrix is diagonalizable

Seat No.	

Set **Q**

T. Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Advanced Control Systems (BTN07604)

Day & Date: Friday, 22-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All Questions are compulsory.
2) Figures to the right indicates full marks.
3) Draw neat diagrams whenever necessary
4) Assumes suitable data if necessary.

SECTION – I

Q.2 Attempt the following. (Any Four) **16**

a) Derive the realization of lag compensator circuit using passive network.

b) Explain the procedure to design lead compensator using bode plot technique.

c) Explain the procedure to design lag-lead compensator using root locus method.

d) A feedback system is having the closed loop transfer function $T(s) = \frac{s^2+3s+3}{s^3+2s^2+3s+1}$ Construct a state model for the system.

e) Find the State transition matrix $\phi(t)$ using Laplace Transform method.

$$\begin{bmatrix} \dot{x}_1 \\ \dot{x}_2 \end{bmatrix} = \begin{bmatrix} 0 & -3 \\ 1 & -4 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \end{bmatrix}$$

Q.3 Attempt the following. **12**

a) The forward path TF of a unity feedback control system is given by $G(s) = \frac{k}{s(s+2)(s+8)}$. Design a suitable lag compensator so that the system meets the following specifications.
i) Percentage overshoot $\leq 16\%$ for unit step input,
ii) steady state error ≤ 0.125 for unit ramp input

b) Design a lead compensator for a unity feedback system with OLTF $G(s) = \frac{k}{s(s+1)(s+5)}$ to satisfy the following specifications
i) $Kv \geq 50$
ii) Phase Margin $\geq 20°$

OR

b) Check the controllability and observability of the state model given below:

$$\begin{bmatrix}\dot{X}_1\\ \dot{X}_2\\ \dot{X}_3\end{bmatrix}=\begin{bmatrix}-1 & -2 & -2\\ 0 & -1 & 1\\ 1 & 0 & -1\end{bmatrix}\begin{bmatrix}X_1\\ X_2\\ X_3\end{bmatrix}+\begin{bmatrix}2\\ 0\\ 1\end{bmatrix}u(t) \text{ and } y=\begin{bmatrix}1 & 1 & 0\end{bmatrix}\begin{bmatrix}X_1\\ X_2\\ X_3\end{bmatrix}$$

SECTION – II

Q.4 Attempt the following. (Any Four) **16**

a) Determine the kind of singularity for the following differential equation.

$\ddot{Y}+3\dot{Y}+2Y=0$

b) Explain the limit cycle phenomenon in the nonlinear control systems.

c) Derive the pulse transfer function of the closed loop system.

d) A linear system is described by the state model.

$\begin{bmatrix}\dot{X}_1\\ \dot{X}_2\end{bmatrix}=\begin{bmatrix}0 & 1\\ 0 & -2\end{bmatrix}\begin{bmatrix}X_1\\ X_2\end{bmatrix}+\begin{bmatrix}0\\ 4\end{bmatrix}u(t)$ and $y=\begin{bmatrix}1 & 0\end{bmatrix}\begin{bmatrix}X_1\\ X_2\end{bmatrix}$. Calculate the observer gain matrix so that the observer poles are at $s1,2=-8,-8$.

e) Explain the mapping between the s-plane and the Z-plane.

Q.5 Attempt the following. (Any Two) **12**

a) It is desired to place the closed-loop poles of the following system at $s=-1,-2,-2$ by a state feedback controller with the control $u=-kx$. Determine the state feedback gain matrix K.

$$\begin{bmatrix}\dot{X}_1\\ \dot{X}_2\\ \dot{X}_3\end{bmatrix}=\begin{bmatrix}0 & 1 & 0\\ 0 & 0 & 1\\ 1 & 0 & 0\end{bmatrix}\begin{bmatrix}X_1\\ X_2\\ X_3\end{bmatrix}+\begin{bmatrix}0\\ 0\\ 1\end{bmatrix}u(t)$$

b) Derive the describing function of the relay with dead-zone nonlinearity.

c) Test the stability of the polynomial.

$F(z)=z^5+2.6z^4-0.56z^3-2.05z^2+0.0775z+0.35$.

Develop Jury's Table $[(2n-3)$ rows$]$.

Seat No.	

Set **R**

T. Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Advanced Control Systems (BTN07604)

Day & Date: Friday, 22-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) The describing function method is applied for _____.
a) Linear continuous systems
b) Nonlinear systems under sinusoidal input
c) Time-varying systems
d) Digital systems

2) The most common physical nonlinearity in control systems is _____.
a) Friction b) Dead zone
c) Relay d) All of these

3) For a discrete system to be stable, poles of F(z) should lie _____.
a) Inside the unit circle b) On real axis
c) Outside unit circle d) On imaginary axis

4) The transfer function of zero order hold is _____.
a) $1 - e^{Ts}$ b) $1 - e^{-Ts}$
c) $\frac{1 - e^{Ts}}{s}$ d) $\frac{1 - e^{-Ts}}{s}$

5) The transfer function is $\frac{1+0.5s}{1+s}$. It represents a _____.
a) lead network b) lag network
c) lag-lead network d) proportional controller

6) A lead compensator improves primarily _____.
a) Steady-state accuracy b) Stability
c) Transient response d) Low-frequency gain

7) For a lag compensator network, the pole lies _____.

a) Left of zero
b) Right of zero
c) At zero
d) None

8) In state-space analysis, state vector represents _____.

a) Output variables
b) Input variables
c) Energy storage variables
d) Control inputs

9) A state model of a system is given by $\dot{x} = \begin{bmatrix} 0 & 1 \\ -2 & -3 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \end{bmatrix} + \begin{bmatrix} 0 \\ 1 \end{bmatrix} u(t), Y = [1 \quad 0]x$. The Transfer function G(s) is _____.

a) $\frac{1}{s^2 + 3s + 2}$
b) $\frac{s + 3}{s^2 + 2s + 1}$
c) $\frac{s + 1}{s^2 + 3s + 2}$
d) $\frac{1}{s + 2}$

10) If the characteristic equation of matrix A is $s^3 + 5s^2 + 6s + 4 = 0$ then eigenvalues correspond to _____.

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b) System poles
c) Zeros of A matrix
d) Gain constants

11) A system is completely controllable if _____.

a) det(Controllability matrix) $= 0$
b) Rank $=$ n
c) Eigenvalues are positive
d) A matrix is diagonalizable

12) The eigen values of the matrix (A-BK) are called _____.

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b) open loop zeros
c) regulator poles
d) None of these

13) The Ackermann's formula is used for finding _____.

a) Observability
b) Controllability
c) Feedback gain matrix
d) State vector

14) In state feedback control, state variable feedback affects _____.

a) Only output response
b) Pole locations of system
c) Input gain
d) Error constant

Seat No.	

Set **R**

T. Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Advanced Control Systems (BTN07604)

Day & Date: Friday, 22-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All Questions are compulsory.
2) Figures to the right indicates full marks.
3) Draw neat diagrams whenever necessary
4) Assumes suitable data if necessary.

SECTION – I

Q.2 Attempt the following. (Any Four) **16**

a) Derive the realization of lag compensator circuit using passive network.

b) Explain the procedure to design lead compensator using bode plot technique.

c) Explain the procedure to design lag-lead compensator using root locus method.

d) A feedback system is having the closed loop transfer function $T(s) = \frac{s^2+3s+3}{s^3+2s^2+3s+1}$ Construct a state model for the system.

e) Find the State transition matrix $\phi(t)$ using Laplace Transform method.

$$\begin{bmatrix} \dot{x}_1 \\ \dot{x}_2 \end{bmatrix} = \begin{bmatrix} 0 & -3 \\ 1 & -4 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \end{bmatrix}$$

Q.3 Attempt the following. **12**

a) The forward path TF of a unity feedback control system is given by $G(s) = \frac{k}{s(s+2)(s+8)}$. Design a suitable lag compensator so that the system meets the following specifications.
i) Percentage overshoot $\leq 16\%$ for unit step input,
ii) steady state error ≤ 0.125 for unit ramp input

b) Design a lead compensator for a unity feedback system with OLTF $G(s) = \frac{k}{s(s+1)(s+5)}$ to satisfy the following specifications
i) $Kv \geq 50$
ii) Phase Margin $\geq 20°$

OR

b) Check the controllability and observability of the state model given below:

$$\begin{bmatrix}\dot{X}_1\\ \dot{X}_2\\ \dot{X}_3\end{bmatrix}=\begin{bmatrix}-1 & -2 & -2\\ 0 & -1 & 1\\ 1 & 0 & -1\end{bmatrix}\begin{bmatrix}X_1\\ X_2\\ X_3\end{bmatrix}+\begin{bmatrix}2\\ 0\\ 1\end{bmatrix}u(t) \text{ and } y=\begin{bmatrix}1 & 1 & 0\end{bmatrix}\begin{bmatrix}X_1\\ X_2\\ X_3\end{bmatrix}$$

SECTION – II

Q.4 Attempt the following. (Any Four) **16**

a) Determine the kind of singularity for the following differential equation.

$\ddot{Y}+3\dot{Y}\ +2Y=0$

b) Explain the limit cycle phenomenon in the nonlinear control systems.

c) Derive the pulse transfer function of the closed loop system.

d) A linear system is described by the state model.

$\begin{bmatrix}\dot{X}_1\\ \dot{X}_2\end{bmatrix}=\begin{bmatrix}0 & 1\\ 0 & -2\end{bmatrix}\begin{bmatrix}X_1\\ X_2\end{bmatrix}+\begin{bmatrix}0\\ 4\end{bmatrix}u(t)$ and $y=\begin{bmatrix}1 & 0\end{bmatrix}\begin{bmatrix}X_1\\ X_2\end{bmatrix}$. Calculate the observer gain matrix so that the observer poles are at $s1,2=-8,-8$.

e) Explain the mapping between the s-plane and the Z-plane.

Q.5 Attempt the following. (Any Two) **12**

a) It is desired to place the closed-loop poles of the following system at $s=-1,-2,-2$ by a state feedback controller with the control $u=-kx$. Determine the state feedback gain matrix K.

$$\begin{bmatrix}\dot{X}_1\\ \dot{X}_2\\ \dot{X}_3\end{bmatrix}=\begin{bmatrix}0 & 1 & 0\\ 0 & 0 & 1\\ 1 & 0 & 0\end{bmatrix}\begin{bmatrix}X_1\\ X_2\\ X_3\end{bmatrix}+\begin{bmatrix}0\\ 0\\ 1\end{bmatrix}u(t)$$

b) Derive the describing function of the relay with dead-zone nonlinearity.

c) Test the stability of the polynomial.

$F(z)=z^5+2.6z^4-0.56z^3-2.05z^2+0.0775z+0.35$.

Develop Jury's Table $[(2n-3)$ rows$]$.

Seat No.	

Set **S**

T. Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Advanced Control Systems (BTN07604)

Day & Date: Friday, 22-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) If the characteristic equation of matrix A is $s^3 + 5s^2 + 6s + 4 = 0$ then eigenvalues correspond to _____.
a) Zeros of transfer function b) System poles
c) Zeros of A matrix d) Gain constants

2) A system is completely controllable if _____.
a) det(Controllability matrix) = 0 b) Rank = n
c) Eigenvalues are positive d) A matrix is diagonalizable

3) The eigen values of the matrix (A-BK) are called _____.
a) open loop poles b) open loop zeros
c) regulator poles d) None of these

4) The Ackermann's formula is used for finding _____.
a) Observability b) Controllability
c) Feedback gain matrix d) State vector

5) In state feedback control, state variable feedback affects _____.
a) Only output response b) Pole locations of system
c) Input gain d) Error constant

6) The describing function method is applied for _____.
a) Linear continuous systems
b) Nonlinear systems under sinusoidal input
c) Time-varying systems
d) Digital systems

7) The most common physical nonlinearity in control systems is _____.

a) Friction
b) Dead zone
c) Relay
d) All of these

8) For a discrete system to be stable, poles of F(z) should lie _____.

a) Inside the unit circle
b) On real axis
c) Outside unit circle
d) On imaginary axis

9) The transfer function of zero order hold is _____.

a) $1 - e^{Ts}$
b) $1 - e^{-Ts}$
c) $\frac{1 - e^{Ts}}{s}$
d) $\frac{1 - e^{-Ts}}{s}$

10) The transfer function is $\frac{1+0.5s}{1+s}$. It represents a _____.

a) lead network
b) lag network
c) lag-lead network
d) proportional controller

11) A lead compensator improves primarily _____.

a) Steady-state accuracy
b) Stability
c) Transient response
d) Low-frequency gain

12) For a lag compensator network, the pole lies _____.

a) Left of zero
b) Right of zero
c) At zero
d) None

13) In state-space analysis, state vector represents _____.

a) Output variables
b) Input variables
c) Energy storage variables
d) Control inputs

14) A state model of a system is given by $\dot{x} = \begin{bmatrix} 0 & 1 \\ -2 & -3 \end{bmatrix}\begin{bmatrix} x_1 \\ x_2 \end{bmatrix} + \begin{bmatrix} 0 \\ 1 \end{bmatrix} u(t), Y = [1 \quad 0]x$. The Transfer function G(s) is _____.

a) $\frac{1}{s^2 + 3s + 2}$
b) $\frac{s + 3}{s^2 + 2s + 1}$
c) $\frac{s + 1}{s^2 + 3s + 2}$
d) $\frac{1}{s + 2}$

SLR-QH-602

Seat No.		Set	S

T. Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Advanced Control Systems (BTN07604)

Day & Date: Friday, 22-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All Questions are compulsory.
2) Figures to the right indicates full marks.
3) Draw neat diagrams whenever necessary
4) Assumes suitable data if necessary.

SECTION – I

Q.2 Attempt the following. (Any Four) **16**

a) Derive the realization of lag compensator circuit using passive network.

b) Explain the procedure to design lead compensator using bode plot technique.

c) Explain the procedure to design lag-lead compensator using root locus method.

d) A feedback system is having the closed loop transfer function $T(s) = \frac{s^2+3s+3}{s^3+2s^2+3s+1}$ Construct a state model for the system.

e) Find the State transition matrix $\phi(t)$ using Laplace Transform method.

$$\begin{bmatrix} \dot{x}_1 \\ \dot{x}_2 \end{bmatrix} = \begin{bmatrix} 0 & -3 \\ 1 & -4 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \end{bmatrix}$$

Q.3 Attempt the following. **12**

a) The forward path TF of a unity feedback control system is given by $G(s) = \frac{k}{s(s+2)(s+8)}$. Design a suitable lag compensator so that the system meets the following specifications.
i) Percentage overshoot $\leq 16\%$ for unit step input,
ii) steady state error ≤ 0.125 for unit ramp input

b) Design a lead compensator for a unity feedback system with OLTF $G(s) = \frac{k}{s(s+1)(s+5)}$ to satisfy the following specifications
i) $Kv \geq 50$
ii) Phase Margin $\geq 20°$

OR

b) Check the controllability and observability of the state model given below:

$$\begin{bmatrix}\dot{X}_1\\ \dot{X}_2\\ \dot{X}_3\end{bmatrix}=\begin{bmatrix}-1 & -2 & -2\\ 0 & -1 & 1\\ 1 & 0 & -1\end{bmatrix}\begin{bmatrix}X_1\\ X_2\\ X_3\end{bmatrix}+\begin{bmatrix}2\\ 0\\ 1\end{bmatrix}u(t) \text{ and } y=\begin{bmatrix}1 & 1 & 0\end{bmatrix}\begin{bmatrix}X_1\\ X_2\\ X_3\end{bmatrix}$$

SECTION – II

Q.4 Attempt the following. (Any Four) **16**

a) Determine the kind of singularity for the following differential equation.

$$\ddot{Y}+3\dot{Y}+2Y=0$$

b) Explain the limit cycle phenomenon in the nonlinear control systems.

c) Derive the pulse transfer function of the closed loop system.

d) A linear system is described by the state model.

$\begin{bmatrix}\dot{X}_1\\ \dot{X}_2\end{bmatrix}=\begin{bmatrix}0 & 1\\ 0 & -2\end{bmatrix}\begin{bmatrix}X_1\\ X_2\end{bmatrix}+\begin{bmatrix}0\\ 4\end{bmatrix}u(t)$ and $y=\begin{bmatrix}1 & 0\end{bmatrix}\begin{bmatrix}X_1\\ X_2\end{bmatrix}$. Calculate the observer gain matrix so that the observer poles are at $s1,2=-8,-8$.

e) Explain the mapping between the s-plane and the Z-plane.

Q.5 Attempt the following. (Any Two) **12**

a) It is desired to place the closed-loop poles of the following system at $s=-1,-2,-2$ by a state feedback controller with the control $u=-kx$. Determine the state feedback gain matrix K.

$$\begin{bmatrix}\dot{X}_1\\ \dot{X}_2\\ \dot{X}_3\end{bmatrix}=\begin{bmatrix}0 & 1 & 0\\ 0 & 0 & 1\\ 1 & 0 & 0\end{bmatrix}\begin{bmatrix}X_1\\ X_2\\ X_3\end{bmatrix}+\begin{bmatrix}0\\ 0\\ 1\end{bmatrix}u(t)$$

b) Derive the describing function of the relay with dead-zone nonlinearity.

c) Test the stability of the polynomial.

$F(z)=z^5+2.6z^4-0.56z^3-2.05z^2+0.0775z+0.35$.

Develop Jury's Table $[(2n-3)$ rows$]$.

SLR-QH-604

Seat No.		Set	P

T. Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Renewable Energy Sources (BTN07607)

Day & Date: Monday, 25-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the given options. 14

1) The amount of energy available in the wind at any instant is proportional to _____ of the wind speed.
a) Square root power of two b) Square root power of three
c) Square power d) Cube power

2) Compared to the fixed-dome model of a biogas plant, a floating drum-type plant is _____.
a) more efficient b) less efficient
c) equally efficient d) very cheap

3) _____ is called as the bio gas.
a) Bio ethanol b) Bio methane
c) Bio diesel d) Bio butanol

4) The geothermal energy is the _____ from the earth.
a) Heat b) Light
c) Photons d) Protons

5) In most hydrothermal fields, hot spots occur at a depth of about _____.
a) 10 km b) 10 m
c) 2 to 3 km d) 30 km ___

6) Small hydro plants (SHPs) have _____.
a) High head and small capacity
b) low head and small capacity
c) low head and large capacity
d) large head and large capacity

7) The minimum temperature difference between source and sink in an ocean required by a practical heat engine is _____.
a) 540°C b) 120°C
c) 10°C d) 20°C

8) Two-basin tidal schemes _____.
a) Are more economical than single basin schemes
b) Operate on ebb cycles in both basins
c) Produce less uniform power
d) Produce more uniform power

9) The standard value of solar constant is _____.
a) 1 KW/m^2 b) 1.367 KW/m^2
c) 1.5 KW/m^2 d) 5 KW/m^2

10) The radiation we receive on the earth's surface is _____.
a) terrestrial b) extra-terrestrial
c) diffuse d) beam

11) A solar thermal collector _____.
a) Collects the solar energy and reflects it back
b) Absorbs the solar radiation and dissipates it to the ambient
c) Collects and converts the solar energy in to electrical energy
d) Collects and converts the solar energy in to thermal energy and delivers it to the next stage of the system.

12) Which of the following is true for the renewable energy sources?
a) Highly polluting b) High waste disposal cost
c) Unreliable supply d) High running cost

13) Which statement is not true for FPC _____.
a) it utilizes beam
b) it diffuse radiation for heating
c) high water temperature is achieved
d) require less maintenance

14) The range of wind speed suitable for wind power generator is _____.
a) 0 to 5 m/s b) 5 to 25 m/s
c) 25 to 50 m/s d) 50 to 75 m/s

Seat No.	

Set **P**

T. Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Renewable Energy Sources (BTN07607)

Day & Date: Monday, 25-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All Questions are compulsory.
2) Figures to the right indicates full marks.
3) Assume suitable data if necessary.

Section – I

Q.2 Attempt the following. (Any Four) **16**

a) Explain the working principle of solar pond. Also state the applications of solar pond.

b) Brief the components of wind energy conversion system.

c) Explain physics of the sun with neat diagram.

d) Describe the working of pyrheliometer with neat diagram.

e) Explain the difference between concentrating collectors and flat plate type collectors.

f) State the types of advanced solar collectors. Explain any one.

Q.3 Attempt the following. (Any Two) **12**

a) Draw and explain the performance characteristics of wind mill.

b) Explain terrestrial and extra-terrestrial solar radiation with neat diagram.

c) Draw and explain any two types of concentrating solar collectors.

Section – II

Q.4 Attempt the following. (Any Four) **16**

a) Draw and describe the general layout of small hydro plant (SHP).

b) What is DEC? Explain the need for DEC.

c) Explain Aerobic and Anaerobic digestion.

d) Distinguish between fixed dome type & floating drum type biogas plant.

e) What is geothermal energy? State the selection criteria for geothermal power plant.

f) Describe the working of open cycle OTEC system.

Q.5 Attempt the following. (Any Two) **12**

a) Explain tidal energy conversion system with neat diagram. Also state the advantages and disadvantages of tidal power.

b) Draw & explain double chamber biogas plant.

c) Draw and describe dry steam geothermal power plant.

Seat No.	

Set **Q**

T. Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Renewable Energy Sources (BTN07607)

Day & Date: Monday, 25-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the given options. 14

1) Two-basin tidal schemes _____.
a) Are more economical than single basin schemes
b) Operate on ebb cycles in both basins
c) Produce less uniform power
d) Produce more uniform power

2) The standard value of solar constant is _____.
a) 1 KW/m^2 b) 1.367 KW/m^2
c) 1.5 KW/m^2 d) 5 KW/m^2

3) The radiation we receive on the earth's surface is _____.
a) terrestrial b) extra-terrestrial
c) diffuse d) beam

4) A solar thermal collector _____.
a) Collects the solar energy and reflects it back
b) Absorbs the solar radiation and dissipates it to the ambient
c) Collects and converts the solar energy in to electrical energy
d) Collects and converts the solar energy in to thermal energy and delivers it to the next stage of the system.

5) Which of the following is true for the renewable energy sources?
a) Highly polluting b) High waste disposal cost
c) Unreliable supply d) High running cost

6) Which statement is not true for FPC _____.
a) it utilizes beam
b) it diffuse radiation for heating
c) high water temperature is achieved
d) require less maintenance

7) The range of wind speed suitable for wind power generator is _____.
a) 0 to 5 m/s b) 5 to 25 m/s
c) 25 to 50 m/s d) 50 to 75 m/s

8) The amount of energy available in the wind at any instant is proportional to _____ of the wind speed.
a) Square root power of two b) Square root power of three
c) Square power d) Cube power

9) Compared to the fixed-dome model of a biogas plant, a floating drum-type plant is _____.
a) more efficient b) less efficient
c) equally efficient d) very cheap

10) _____ is called as the bio gas.
a) Bio ethanol b) Bio methane
c) Bio diesel d) Bio butanol

11) The geothermal energy is the _____ from the earth.
a) Heat b) Light
c) Photons d) Protons

12) In most hydrothermal fields, hot spots occur at a depth of about _____.
a) 10 km b) 10 m
c) 2 to 3 km d) 30 km ___

13) Small hydro plants (SHPs) have _____.
a) High head and small capacity
b) low head and small capacity
c) low head and large capacity
d) large head and large capacity

14) The minimum temperature difference between source and sink in an ocean required by a practical heat engine is _____.
a) 540°C b) 120°C
c) 10°C d) 20°C

Seat No.	

Set **Q**

T. Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Renewable Energy Sources (BTN07607)

Day & Date: Monday, 25-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All Questions are compulsory.
2) Figures to the right indicates full marks.
3) Assume suitable data if necessary.

Section – I

Q.2 Attempt the following. (Any Four) **16**

a) Explain the working principle of solar pond. Also state the applications of solar pond.

b) Brief the components of wind energy conversion system.

c) Explain physics of the sun with neat diagram.

d) Describe the working of pyrheliometer with neat diagram.

e) Explain the difference between concentrating collectors and flat plate type collectors.

f) State the types of advanced solar collectors. Explain any one.

Q.3 Attempt the following. (Any Two) **12**

a) Draw and explain the performance characteristics of wind mill.

b) Explain terrestrial and extra-terrestrial solar radiation with neat diagram.

c) Draw and explain any two types of concentrating solar collectors.

Section – II

Q.4 Attempt the following. (Any Four) **16**

a) Draw and describe the general layout of small hydro plant (SHP).

b) What is DEC? Explain the need for DEC.

c) Explain Aerobic and Anaerobic digestion.

d) Distinguish between fixed dome type & floating drum type biogas plant.

e) What is geothermal energy? State the selection criteria for geothermal power plant.

f) Describe the working of open cycle OTEC system.

Q.5 Attempt the following. (Any Two) **12**

a) Explain tidal energy conversion system with neat diagram. Also state the advantages and disadvantages of tidal power.

b) Draw & explain double chamber biogas plant.

c) Draw and describe dry steam geothermal power plant.

Seat No.	

Set R

T. Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Renewable Energy Sources (BTN07607)

Day & Date: Monday, 25-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the given options. 14

1) A solar thermal collector _____.
a) Collects the solar energy and reflects it back
b) Absorbs the solar radiation and dissipates it to the ambient
c) Collects and converts the solar energy in to electrical energy
d) Collects and converts the solar energy in to thermal energy and delivers it to the next stage of the system.

2) Which of the following is true for the renewable energy sources?
a) Highly polluting b) High waste disposal cost
c) Unreliable supply d) High running cost

3) Which statement is not true for FPC _____.
a) it utilizes beam
b) it diffuse radiation for heating
c) high water temperature is achieved
d) require less maintenance

4) The range of wind speed suitable for wind power generator is _____.
a) 0 to 5 m/s b) 5 to 25 m/s
c) 25 to 50 m/s d) 50 to 75 m/s

5) The amount of energy available in the wind at any instant is proportional to _____ of the wind speed.
a) Square root power of two b) Square root power of three
c) Square power d) Cube power

6) Compared to the fixed-dome model of a biogas plant, a floating drum-type plant is _____.
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c) equally efficient d) very cheap

7) _____ is called as the bio gas.
a) Bio ethanol b) Bio methane
c) Bio diesel d) Bio butanol

8) The geothermal energy is the _____ from the earth.
a) Heat b) Light
c) Photons d) Protons

9) In most hydrothermal fields, hot spots occur at a depth of about _____.
a) 10 km b) 10 m
c) 2 to 3 km d) 30 km ___

10) Small hydro plants (SHPs) have _____.
a) High head and small capacity
b) low head and small capacity
c) low head and large capacity
d) large head and large capacity

11) The minimum temperature difference between source and sink in an ocean required by a practical heat engine is _____.
a) 540°C b) 120°C
c) 10°C d) 20°C

12) Two-basin tidal schemes _____.
a) Are more economical than single basin schemes
b) Operate on ebb cycles in both basins
c) Produce less uniform power
d) Produce more uniform power

13) The standard value of solar constant is _____.
a) 1 KW/m^2 b) 1.367 KW/m^2
c) 1.5 KW/m^2 d) 5 KW/m^2

14) The radiation we receive on the earth's surface is _____.
a) terrestrial b) extra-terrestrial
c) diffuse d) beam

Seat No.	

Set **R**

T. Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Renewable Energy Sources (BTN07607)

Day & Date: Monday, 25-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All Questions are compulsory.
2) Figures to the right indicates full marks.
3) Assume suitable data if necessary.

Section – I

Q.2 Attempt the following. (Any Four) **16**

a) Explain the working principle of solar pond. Also state the applications of solar pond.

b) Brief the components of wind energy conversion system.

c) Explain physics of the sun with neat diagram.

d) Describe the working of pyrheliometer with neat diagram.

e) Explain the difference between concentrating collectors and flat plate type collectors.

f) State the types of advanced solar collectors. Explain any one.

Q.3 Attempt the following. (Any Two) **12**

a) Draw and explain the performance characteristics of wind mill.

b) Explain terrestrial and extra-terrestrial solar radiation with neat diagram.

c) Draw and explain any two types of concentrating solar collectors.

Section – II

Q.4 Attempt the following. (Any Four) **16**

a) Draw and describe the general layout of small hydro plant (SHP).

b) What is DEC? Explain the need for DEC.

c) Explain Aerobic and Anaerobic digestion.

d) Distinguish between fixed dome type & floating drum type biogas plant.

e) What is geothermal energy? State the selection criteria for geothermal power plant.

f) Describe the working of open cycle OTEC system.

Q.5 Attempt the following. (Any Two) **12**

a) Explain tidal energy conversion system with neat diagram. Also state the advantages and disadvantages of tidal power.

b) Draw & explain double chamber biogas plant.

c) Draw and describe dry steam geothermal power plant.

Seat No.	

Set **S**

T. Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Renewable Energy Sources (BTN07607)

Day & Date: Monday, 25-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the given options. 14

1) Small hydro plants (SHPs) have _____.
a) High head and small capacity
b) low head and small capacity
c) low head and large capacity
d) large head and large capacity

2) The minimum temperature difference between source and sink in an ocean required by a practical heat engine is _____.
a) 540°C b) 120°C
c) 10°C d) 20°C

3) Two-basin tidal schemes _____.
a) Are more economical than single basin schemes
b) Operate on ebb cycles in both basins
c) Produce less uniform power
d) Produce more uniform power

4) The standard value of solar constant is _____.
a) 1 KW/m^2 b) 1.367 KW/m^2
c) 1.5 KW/m^2 d) 5 KW/m^2

5) The radiation we receive on the earth's surface is _____.
a) terrestrial b) extra-terrestrial
c) diffuse d) beam

6) A solar thermal collector _____.
a) Collects the solar energy and reflects it back
b) Absorbs the solar radiation and dissipates it to the ambient
c) Collects and converts the solar energy in to electrical energy
d) Collects and converts the solar energy in to thermal energy and delivers it to the next stage of the system.

7) Which of the following is true for the renewable energy sources?
a) Highly polluting
b) High waste disposal cost
c) Unreliable supply
d) High running cost

8) Which statement is not true for FPC _____.
a) it utilizes beam
b) it diffuse radiation for heating
c) high water temperature is achieved
d) require less maintenance

9) The range of wind speed suitable for wind power generator is _____.
a) 0 to 5 m/s
b) 5 to 25 m/s
c) 25 to 50 m/s
d) 50 to 75 m/s

10) The amount of energy available in the wind at any instant is proportional to _____ of the wind speed.
a) Square root power of two
b) Square root power of three
c) Square power
d) Cube power

11) Compared to the fixed-dome model of a biogas plant, a floating drum-type plant is _____.
a) more efficient
b) less efficient
c) equally efficient
d) very cheap

12) _____ is called as the bio gas.
a) Bio ethanol
b) Bio methane
c) Bio diesel
d) Bio butanol

13) The geothermal energy is the _____ from the earth.
a) Heat
b) Light
c) Photons
d) Protons

14) In most hydrothermal fields, hot spots occur at a depth of about _____.
a) 10 km
b) 10 m
c) 2 to 3 km
d) 30 km

___

Seat No.	

Set **S**

T. Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Renewable Energy Sources (BTN07607)

Day & Date: Monday, 25-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All Questions are compulsory.
2) Figures to the right indicates full marks.
3) Assume suitable data if necessary.

Section – I

Q.2 Attempt the following. (Any Four) **16**

a) Explain the working principle of solar pond. Also state the applications of solar pond.

b) Brief the components of wind energy conversion system.

c) Explain physics of the sun with neat diagram.

d) Describe the working of pyrheliometer with neat diagram.

e) Explain the difference between concentrating collectors and flat plate type collectors.

f) State the types of advanced solar collectors. Explain any one.

Q.3 Attempt the following. (Any Two) **12**

a) Draw and explain the performance characteristics of wind mill.

b) Explain terrestrial and extra-terrestrial solar radiation with neat diagram.

c) Draw and explain any two types of concentrating solar collectors.

Section – II

Q.4 Attempt the following. (Any Four) **16**

a) Draw and describe the general layout of small hydro plant (SHP).

b) What is DEC? Explain the need for DEC.

c) Explain Aerobic and Anaerobic digestion.

d) Distinguish between fixed dome type & floating drum type biogas plant.

e) What is geothermal energy? State the selection criteria for geothermal power plant.

f) Describe the working of open cycle OTEC system.

Q.5 Attempt the following. (Any Two) **12**

a) Explain tidal energy conversion system with neat diagram. Also state the advantages and disadvantages of tidal power.

b) Draw & explain double chamber biogas plant.

c) Draw and describe dry steam geothermal power plant.

SLR-QH-605

Seat No.		Set	P

T. Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Fiber Optic Communication (BTN07608)

Day & Date: Monday, 25-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the given options. 14

1) Optical modulators are widely used with superior performance _____.
a) Only Laboratory
b) Including optical communications, signal processing, and optical measurements
c) Time Measurement
d) None of the above

2) Optical fiber is the technology associated with data transmission using _____.
a) Air
b) Light pulses
c) Waves
d) Both a) & c)

3) Optical fiber is used by telecommunications companies to transmit ____.
a) Telephone signals
b) Telephone signals, Internet communication and cable television signals
c) Internet communication and cable television signals
d) None of the above

4) How do you measure bending losses in optical fiber _____.
a) By taking the logarithmic ratio of input power (P_i) to the output power (P_o).
b) By taking the logarithmic of Output power (P_o)
c) By taking the logarithmic of input power (P_i)
d) Only Power

5) DWDM Means _____.
   a) Data wavelength-division multiplexing
   b) Dense wavelength-division multiplexing
   c) Dense wavelength-diverted multiplexing
   d) Dense wavelength-division manager

6) A light-emitting diode (LED) is a semiconductor device that emit light when _____.
   a) Output reaches saturation level
   b) Current flows through it
   c) Output will be a sine waveform
   d) Output will be a non-sinusoidal waveform

7) Fiber optic Ethernet transmits data signals over _____.
   a) Fiber cables rather than the copper cables of traditional Ethernet wiring
   b) Copper cables
   c) Wired Cable
   d) All of the mentioned

8) In an optical network, which topologies are used?
   a) Ring
   b) Star
   c) Bus
   d) All of the above

9) Dense wavelength division multiplexing (DWDM) is a _____.
   a) Wired communication technique
   b) Fiber-optic transmission technique
   c) Mixing techniques
   d) Protocol

10) A major consideration with all types of fiber, fiber connection is the _____.
   a) optical loss encountered at the interface
   b) air loss
   c) hest loss
   d) None of the above

11) Fiber splicing is the process of _____.
   a) Temporary joining of two fibers
   b) Permanently joining two fibers together
   c) Permanent and temporary joint
   d) None of the above

12) An optical amplifier is a device that amplifies _____.
   a) Electrical signal
   b) an optical signal
   c) Both a) and b)
   d) None of the above

13) Wavelength division multiplexing (WDM) is a _____.
   a) Technique of multiplexing multiple ray
   b) Technique of multiplexing multiple optical carrier signals
   c) Both a) & b)
   d) None of the above

14) A LASER means _____.
   a) Light amplification some emit radiation
   b) Light activated stimulated emission of radiation
   c) Both a) & b)
   d) Light amplification by stimulated emission of radiation

Seat No.		Set	P

T. Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Fiber Optic Communication (BTN07608)

Day & Date: Monday, 25-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicates full marks.

Section – I

Q.2 Answer the following. (Any Four) **16**

a) Write any 8 application of Optical Fiber communication.

b) Write down the types of optical fiber. Explain any one in details.

c) Write a short note on fiber alignment & joint losses.

d) What is fiber splices? Explain.

e) Explain shortly fiber coupler & fiber connector.

Q.3 Answer the Following. (Any Two) **12**

a) Write down the type of dispersion in optical fiber communication. Explain in details.

b) What are semiconductor injection laser and their structure?

c) Explain mode theory (Ray Theory) of Optical Fiber.

Section – II

Q.4 Answer the following. (Any Four) **16**

a) Explain wavelength division modulation (WDM).

b) Explain requirement of optical detector.

c) Explain phototransistor in optical detectors.

d) Explain SONET/SDH rings.

e) Draw LED characteristics. Explain.

Q.5 Answer the Following. (Any Two) **12**

a) Explain the performance parameter of detector in details.

b) Explain optical network in details.

c) Explain avalanche photodiodes in details.

Seat No.		Set	Q

T. Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Fiber Optic Communication (BTN07608)

Day & Date: Monday, 25-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the given options. 14

1) In an optical network, which topologies are used?
a) Ring b) Star
c) Bus d) All of the above

2) Dense wavelength division multiplexing (DWDM) is a _____.
a) Wired communication technique
b) Fiber-optic transmission technique
c) Mixing techniques
d) Protocol

3) A major consideration with all types of fiber, fiber connection is the _____.
a) optical loss encountered at the interface
b) air loss
c) hest loss
d) None of the above

4) Fiber splicing is the process of _____.
a) Temporary joining of two fibers
b) Permanently joining two fibers together
c) Permanent and temporary joint
d) None of the above

5) An optical amplifier is a device that amplifies _____.
a) Electrical signal b) an optical signal
c) Both a) and b) d) None of the above

6) Wavelength division multiplexing (WDM) is a _____.
   a) Technique of multiplexing multiple ray
   b) Technique of multiplexing multiple optical carrier signals
   c) Both a) & b)
   d) None of the above

7) A LASER means _____.
   a) Light amplification some emit radiation
   b) Light activated stimulated emission of radiation
   c) Both a) & b)
   d) Light amplification by stimulated emission of radiation

8) Optical modulators are widely used with superior performance _____.
   a) Only Laboratory
   b) Including optical communications, signal processing, and optical measurements
   c) Time Measurement
   d) None of the above

9) Optical fiber is the technology associated with data transmission using _____.
   a) Air
   b) Light pulses
   c) Waves
   d) Both a) & c)

10) Optical fiber is used by telecommunications companies to transmit ____.
   a) Telephone signals
   b) Telephone signals, Internet communication and cable television signals
   c) Internet communication and cable television signals
   d) None of the above

11) How do you measure bending losses in optical fiber _____.
   a) By taking the logarithmic ratio of input power (P_i) to the output power (P_o).
   b) By taking the logarithmic of Output power (P_o)
   c) By taking the logarithmic of input power (P_i)
   d) Only Power

12) DWDM Means _____.
   a) Data wavelength-division multiplexing
   b) Dense wavelength-division multiplexing
   c) Dense wavelength-diverted multiplexing
   d) Dense wavelength-division manager

13) A light-emitting diode (LED) is a semiconductor device that emit light when _____.

a) Output reaches saturation level
b) Current flows through it
c) Output will be a sine waveform
d) Output will be a non-sinusoidal waveform

14) Fiber optic Ethernet transmits data signals over _____.

a) Fiber cables rather than the copper cables of traditional Ethernet wiring
b) Copper cables
c) Wired Cable
d) All of the mentioned

SLR-QH-605

Seat No.	

Set Q

T. Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Fiber Optic Communication (BTN07608)

Day & Date: Monday, 25-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicates full marks.

Section – I

Q.2 Answer the following. (Any Four) **16**

a) Write any 8 application of Optical Fiber communication.

b) Write down the types of optical fiber. Explain any one in details.

c) Write a short note on fiber alignment & joint losses.

d) What is fiber splices? Explain.

e) Explain shortly fiber coupler & fiber connector.

Q.3 Answer the Following. (Any Two) **12**

a) Write down the type of dispersion in optical fiber communication. Explain in details.

b) What are semiconductor injection laser and their structure?

c) Explain mode theory (Ray Theory) of Optical Fiber.

Section – II

Q.4 Answer the following. (Any Four) **16**

a) Explain wavelength division modulation (WDM).

b) Explain requirement of optical detector.

c) Explain phototransistor in optical detectors.

d) Explain SONET/SDH rings.

e) Draw LED characteristics. Explain.

Q.5 Answer the Following. (Any Two) **12**

a) Explain the performance parameter of detector in details.

b) Explain optical network in details.

c) Explain avalanche photodiodes in details.

Seat No.		Set	R

T. Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Fiber Optic Communication (BTN07608)

Day & Date: Monday, 25-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the given options. 14

1) Fiber splicing is the process of _____.
a) Temporary joining of two fibers
b) Permanently joining two fibers together
c) Permanent and temporary joint
d) None of the above

2) An optical amplifier is a device that amplifies _____.
a) Electrical signal b) an optical signal
c) Both a) and b) d) None of the above

3) Wavelength division multiplexing (WDM) is a _____.
a) Technique of multiplexing multiple ray
b) Technique of multiplexing multiple optical carrier signals
c) Both a) & b)
d) None of the above

4) A LASER means _____.
a) Light amplification some emit radiation
b) Light activated stimulated emission of radiation
c) Both a) & b)
d) Light amplification by stimulated emission of radiation

5) Optical modulators are widely used with superior performance _____.
a) Only Laboratory
b) Including optical communications, signal processing, and optical measurements
c) Time Measurement
d) None of the above

6) Optical fiber is the technology associated with data transmission using _____.
   a) Air
   b) Light pulses
   c) Waves
   d) Both a) & c)

7) Optical fiber is used by telecommunications companies to transmit ____.
   a) Telephone signals
   b) Telephone signals, Internet communication and cable television signals
   c) Internet communication and cable television signals
   d) None of the above

8) How do you measure bending losses in optical fiber _____.
   a) By taking the logarithmic ratio of input power (P_i) to the output power (P_o).
   b) By taking the logarithmic of Output power (P_o)
   c) By taking the logarithmic of input power (P_i)
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9) DWDM Means _____.
   a) Data wavelength-division multiplexing
   b) Dense wavelength-division multiplexing
   c) Dense wavelength-diverted multiplexing
   d) Dense wavelength-division manager

10) A light-emitting diode (LED) is a semiconductor device that emit light when _____.
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   a) Fiber cables rather than the copper cables of traditional Ethernet wiring
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12) In an optical network, which topologies are used?
   a) Ring
   b) Star
   c) Bus
   d) All of the above

13) Dense wavelength division multiplexing (DWDM) is a _____.
   a) Wired communication technique
   b) Fiber-optic transmission technique
   c) Mixing techniques
   d) Protocol

14) A major consideration with all types of fiber, fiber connection is the _____.

a) optical loss encountered at the interface
b) air loss
c) hest loss
d) None of the above

SLR-QH-605

Seat No.	

Set R

T. Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Fiber Optic Communication (BTN07608)

Day & Date: Monday, 25-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicates full marks.

Section – I

Q.2 Answer the following. (Any Four) **16**

a) Write any 8 application of Optical Fiber communication.

b) Write down the types of optical fiber. Explain any one in details.

c) Write a short note on fiber alignment & joint losses.

d) What is fiber splices? Explain.

e) Explain shortly fiber coupler & fiber connector.

Q.3 Answer the Following. (Any Two) **12**

a) Write down the type of dispersion in optical fiber communication. Explain in details.

b) What are semiconductor injection laser and their structure?

c) Explain mode theory (Ray Theory) of Optical Fiber.

Section – II

Q.4 Answer the following. (Any Four) **16**

a) Explain wavelength division modulation (WDM).

b) Explain requirement of optical detector.

c) Explain phototransistor in optical detectors.

d) Explain SONET/SDH rings.

e) Draw LED characteristics. Explain.

Q.5 Answer the Following. (Any Two) **12**

a) Explain the performance parameter of detector in details.

b) Explain optical network in details.

c) Explain avalanche photodiodes in details.

SLR-QH-605

Seat No.		Set	S

T. Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Fiber Optic Communication (BTN07608)

Day & Date: Monday, 25-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the given options. 14

1) A light-emitting diode (LED) is a semiconductor device that emit light when _____.
a) Output reaches saturation level
b) Current flows through it
c) Output will be a sine waveform
d) Output will be a non-sinusoidal waveform

2) Fiber optic Ethernet transmits data signals over _____.
a) Fiber cables rather than the copper cables of traditional Ethernet wiring
b) Copper cables
c) Wired Cable
d) All of the mentioned

3) In an optical network, which topologies are used?
a) Ring b) Star
c) Bus d) All of the above

4) Dense wavelength division multiplexing (DWDM) is a _____.
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b) Fiber-optic transmission technique
c) Mixing techniques
d) Protocol

5) A major consideration with all types of fiber, fiber connection is the _____.
a) optical loss encountered at the interface
b) air loss
c) hest loss
d) None of the above

6) Fiber splicing is the process of _____.
   a) Temporary joining of two fibers
   b) Permanently joining two fibers together
   c) Permanent and temporary joint
   d) None of the above

7) An optical amplifier is a device that amplifies _____.
   a) Electrical signal
   b) an optical signal
   c) Both a) and b)
   d) None of the above

8) Wavelength division multiplexing (WDM) is a _____.
   a) Technique of multiplexing multiple ray
   b) Technique of multiplexing multiple optical carrier signals
   c) Both a) & b)
   d) None of the above

9) A LASER means _____.
   a) Light amplification some emit radiation
   b) Light activated stimulated emission of radiation
   c) Both a) & b)
   d) Light amplification by stimulated emission of radiation

10) Optical modulators are widely used with superior performance _____.
   a) Only Laboratory
   b) Including optical communications, signal processing, and optical measurements
   c) Time Measurement
   d) None of the above

11) Optical fiber is the technology associated with data transmission using _____.
   a) Air
   b) Light pulses
   c) Waves
   d) Both a) & c)

12) Optical fiber is used by telecommunications companies to transmit ____.
   a) Telephone signals
   b) Telephone signals, Internet communication and cable television signals
   c) Internet communication and cable television signals
   d) None of the above

13) How do you measure bending losses in optical fiber _____.
   a) By taking the logarithmic ratio of input power (P_i) to the output power (P_o).
   b) By taking the logarithmic of Output power (P_o)
   c) By taking the logarithmic of input power (P_i)
   d) Only Power

14) DWDM Means _____.

a) Data wavelength-division multiplexing
b) Dense wavelength-division multiplexing
c) Dense wavelength-diverted multiplexing
d) Dense wavelength-division manager

SLR-QH-605

Seat No.		Set	S

T. Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Fiber Optic Communication (BTN07608)

Day & Date: Monday, 25-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicates full marks.

Section – I

Q.2 Answer the following. (Any Four) **16**

a) Write any 8 application of Optical Fiber communication.

b) Write down the types of optical fiber. Explain any one in details.

c) Write a short note on fiber alignment & joint losses.

d) What is fiber splices? Explain.

e) Explain shortly fiber coupler & fiber connector.

Q.3 Answer the Following. (Any Two) **12**

a) Write down the type of dispersion in optical fiber communication. Explain in details.

b) What are semiconductor injection laser and their structure?

c) Explain mode theory (Ray Theory) of Optical Fiber.

Section – II

Q.4 Answer the following. (Any Four) **16**

a) Explain wavelength division modulation (WDM).

b) Explain requirement of optical detector.

c) Explain phototransistor in optical detectors.

d) Explain SONET/SDH rings.

e) Draw LED characteristics. Explain.

Q.5 Answer the Following. (Any Two) **12**

a) Explain the performance parameter of detector in details.

b) Explain optical network in details.

c) Explain avalanche photodiodes in details.

SLR-QH-606

Seat No.	

Set P

T. Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Sensors & Applications (BTN07609)

Day & Date: Monday, 25-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the given options. 14

1) Which of the following is NOT a characteristic of an ideal sensor?
a) Linearity b) High sensitivity
c) Infinite drift d) Fast response

2) The output of a piezoelectric sensor is proportional to _____.
a) Pressure b) Strain rate
c) Electric field d) Magnetic field

3) Hall Effect sensors are primarily used to measure _____.
a) Pressure b) Magnetic field
c) Temperature d) Humidity

4) The capacitance of a capacitive sensor changes mainly due to _____.
a) Variation in dielectric constant
b) Variation in resistance
c) Voltage change
d) Frequency variation

5) A thermistor is a type of _____ sensor.
a) Pressure b) Temperature
c) Position d) Magnetic

6) In signal conditioning, an instrumentation amplifier is mainly used for _____.
a) Frequency modulation
b) Voltage regulation
c) Differential signal amplification
d) Filtering

7) Bridge circuits are commonly used with _____ sensors.
a) Strain gauge b) Hall Effect
c) Capacitive d) Ultrasonic

8) Which of the following sensors is used for humidity measurement?
a) Capacitive b) Piezoelectric
c) Thermocouple d) Inductive

9) Nanotechnology is mainly used in sensors to _____.
a) Increase size
b) Reduce sensitivity
c) Improve performance and miniaturization
d) Increase power consumption

10) Which type of sensor detects motion based on infrared radiation?
a) PIR sensor b) Ultrasonic sensor
c) LVDT d) Thermistor

11) Which material property is essential for piezoelectric sensors?
a) Ferromagnetic
b) Semiconductor
c) Non-centrosymmetric crystal structure
d) Conductivity

12) The main function of an actuator is to _____.
a) Sense the environment
b) Convert electrical energy into mechanical motion
c) Amplify signals
d) Store data

13) An electromechanical actuator converts _____.
a) Electrical energy to mechanical energy
b) Thermal energy to electrical energy
c) Pressure to current
d) Light to voltage

14) Micro and nano actuators are primarily used in _____ applications.
a) Heavy machinery b) Micro-robotics and MEMS
c) Power generation d) HVAC systems

SLR-QH-606

Seat No.	

Set P

T. Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Sensors & Applications (BTN07609)

Day & Date: Monday, 25-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All Questions are compulsory.
2) Figures to the right indicates full marks.

Section – I

Q.2 Attempt the following. (Any Four) **16**

a) What is sensor? Explain difference between sensor & transducer.

b) What is charge field & potential? Explain.

c) How the sensor is classified? Explain.

d) State the different types of temperature sensor and explain any one of them.

e) Explain analog to digital converter with diagram.

Q.3 Attempt the following. (Any Two) **12**

a) Explain the types of batteries used for low power sensors.

b) Describe the dynamic models of sensor element.

c) Explain the hall effect with necessary diagram.

Section – II

Q.4 Attempt the following. (Any Four) **16**

a) What are occupancy detector & motion detector? Explain.

b) Explain the wet etching MEMS Technology.

c) Write the Selection criteria of Actuators.

d) Why & where LVDT sensor used?

e) State different types of excitation circuits and explain any one of them in details.

Q.5 Attempt the following. (Any Two) **12**

a) State and explain the principle of operation of micro and nano actuator with advantages and disadvantages.

b) State the different types of material used for fabrication of sensor and explain any one of them.

c) Explain rotary velocity sensor (Tachometer) in details.

Seat No.	

Set **Q**

T. Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Sensors & Applications (BTN07609)

Day & Date: Monday, 25-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the given options. 14

1) Which of the following sensors is used for humidity measurement?
a) Capacitive b) Piezoelectric
c) Thermocouple d) Inductive

2) Nanotechnology is mainly used in sensors to _____.
a) Increase size
b) Reduce sensitivity
c) Improve performance and miniaturization
d) Increase power consumption

3) Which type of sensor detects motion based on infrared radiation?
a) PIR sensor b) Ultrasonic sensor
c) LVDT d) Thermistor

4) Which material property is essential for piezoelectric sensors?
a) Ferromagnetic
b) Semiconductor
c) Non-centrosymmetric crystal structure
d) Conductivity

5) The main function of an actuator is to _____.
a) Sense the environment
b) Convert electrical energy into mechanical motion
c) Amplify signals
d) Store data

6) An electromechanical actuator converts _____.
a) Electrical energy to mechanical energy
b) Thermal energy to electrical energy
c) Pressure to current
d) Light to voltage

7) Micro and nano actuators are primarily used in _____ applications.
a) Heavy machinery
b) Micro-robotics and MEMS
c) Power generation
d) HVAC systems

8) Which of the following is NOT a characteristic of an ideal sensor?
a) Linearity
b) High sensitivity
c) Infinite drift
d) Fast response

9) The output of a piezoelectric sensor is proportional to _____.
a) Pressure
b) Strain rate
c) Electric field
d) Magnetic field

10) Hall Effect sensors are primarily used to measure _____.
a) Pressure
b) Magnetic field
c) Temperature
d) Humidity

11) The capacitance of a capacitive sensor changes mainly due to _____.
a) Variation in dielectric constant
b) Variation in resistance
c) Voltage change
d) Frequency variation

12) A thermistor is a type of _____ sensor.
a) Pressure
b) Temperature
c) Position
d) Magnetic

13) In signal conditioning, an instrumentation amplifier is mainly used for _____.
a) Frequency modulation
b) Voltage regulation
c) Differential signal amplification
d) Filtering

14) Bridge circuits are commonly used with _____ sensors.
a) Strain gauge
b) Hall Effect
c) Capacitive
d) Ultrasonic

SLR-QH-606

Seat No.	

Set Q

T. Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Sensors & Applications (BTN07609)

Day & Date: Monday, 25-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All Questions are compulsory.
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Section – I

Q.2 Attempt the following. (Any Four) **16**

a) What is sensor? Explain difference between sensor & transducer.

b) What is charge field & potential? Explain.

c) How the sensor is classified? Explain.

d) State the different types of temperature sensor and explain any one of them.

e) Explain analog to digital converter with diagram.

Q.3 Attempt the following. (Any Two) **12**

a) Explain the types of batteries used for low power sensors.

b) Describe the dynamic models of sensor element.

c) Explain the hall effect with necessary diagram.

Section – II

Q.4 Attempt the following. (Any Four) **16**

a) What are occupancy detector & motion detector? Explain.

b) Explain the wet etching MEMS Technology.

c) Write the Selection criteria of Actuators.

d) Why & where LVDT sensor used?

e) State different types of excitation circuits and explain any one of them in details.

Q.5 Attempt the following. (Any Two) **12**

a) State and explain the principle of operation of micro and nano actuator with advantages and disadvantages.

b) State the different types of material used for fabrication of sensor and explain any one of them.

c) Explain rotary velocity sensor (Tachometer) in details.

Seat No.	

Set | **R**

T. Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Sensors & Applications (BTN07609)

Day & Date: Monday, 25-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the given options. 14

1) Which material property is essential for piezoelectric sensors?
a) Ferromagnetic
b) Semiconductor
c) Non-centrosymmetric crystal structure
d) Conductivity

2) The main function of an actuator is to _____.
a) Sense the environment
b) Convert electrical energy into mechanical motion
c) Amplify signals
d) Store data

3) An electromechanical actuator converts _____.
a) Electrical energy to mechanical energy
b) Thermal energy to electrical energy
c) Pressure to current
d) Light to voltage

4) Micro and nano actuators are primarily used in _____ applications.
a) Heavy machinery b) Micro-robotics and MEMS
c) Power generation d) HVAC systems

5) Which of the following is NOT a characteristic of an ideal sensor?
a) Linearity b) High sensitivity
c) Infinite drift d) Fast response

6) The output of a piezoelectric sensor is proportional to _____.
a) Pressure b) Strain rate
c) Electric field d) Magnetic field

7) Hall Effect sensors are primarily used to measure _____.
a) Pressure b) Magnetic field
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8) The capacitance of a capacitive sensor changes mainly due to _____.
a) Variation in dielectric constant
b) Variation in resistance
c) Voltage change
d) Frequency variation

9) A thermistor is a type of _____ sensor.
a) Pressure b) Temperature
c) Position d) Magnetic

10) In signal conditioning, an instrumentation amplifier is mainly used for _____.
a) Frequency modulation
b) Voltage regulation
c) Differential signal amplification
d) Filtering

11) Bridge circuits are commonly used with _____ sensors.
a) Strain gauge b) Hall Effect
c) Capacitive d) Ultrasonic

12) Which of the following sensors is used for humidity measurement?
a) Capacitive b) Piezoelectric
c) Thermocouple d) Inductive

13) Nanotechnology is mainly used in sensors to _____.
a) Increase size
b) Reduce sensitivity
c) Improve performance and miniaturization
d) Increase power consumption

14) Which type of sensor detects motion based on infrared radiation?
a) PIR sensor b) Ultrasonic sensor
c) LVDT d) Thermistor

SLR-QH-606

Seat No.	

Set R

T. Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Sensors & Applications (BTN07609)

Day & Date: Monday, 25-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All Questions are compulsory.
2) Figures to the right indicates full marks.

Section – I

Q.2 Attempt the following. (Any Four) **16**

a) What is sensor? Explain difference between sensor & transducer.

b) What is charge field & potential? Explain.

c) How the sensor is classified? Explain.

d) State the different types of temperature sensor and explain any one of them.

e) Explain analog to digital converter with diagram.

Q.3 Attempt the following. (Any Two) **12**

a) Explain the types of batteries used for low power sensors.

b) Describe the dynamic models of sensor element.

c) Explain the hall effect with necessary diagram.

Section – II

Q.4 Attempt the following. (Any Four) **16**

a) What are occupancy detector & motion detector? Explain.

b) Explain the wet etching MEMS Technology.

c) Write the Selection criteria of Actuators.

d) Why & where LVDT sensor used?

e) State different types of excitation circuits and explain any one of them in details.

Q.5 Attempt the following. (Any Two) **12**

a) State and explain the principle of operation of micro and nano actuator with advantages and disadvantages.

b) State the different types of material used for fabrication of sensor and explain any one of them.

c) Explain rotary velocity sensor (Tachometer) in details.

Seat No.		Set	S

T. Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Sensors & Applications (BTN07609)

Day & Date: Monday, 25-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the given options. 14

1) In signal conditioning, an instrumentation amplifier is mainly used for _____.
a) Frequency modulation
b) Voltage regulation
c) Differential signal amplification
d) Filtering

2) Bridge circuits are commonly used with _____ sensors.
a) Strain gauge b) Hall Effect
c) Capacitive d) Ultrasonic

3) Which of the following sensors is used for humidity measurement?
a) Capacitive b) Piezoelectric
c) Thermocouple d) Inductive

4) Nanotechnology is mainly used in sensors to _____.
a) Increase size
b) Reduce sensitivity
c) Improve performance and miniaturization
d) Increase power consumption

5) Which type of sensor detects motion based on infrared radiation?
a) PIR sensor b) Ultrasonic sensor
c) LVDT d) Thermistor

6) Which material property is essential for piezoelectric sensors?
a) Ferromagnetic
b) Semiconductor
c) Non-centrosymmetric crystal structure
d) Conductivity

7) The main function of an actuator is to _____.
a) Sense the environment
b) Convert electrical energy into mechanical motion
c) Amplify signals
d) Store data

8) An electromechanical actuator converts _____.
a) Electrical energy to mechanical energy
b) Thermal energy to electrical energy
c) Pressure to current
d) Light to voltage

9) Micro and nano actuators are primarily used in _____ applications.
a) Heavy machinery
b) Micro-robotics and MEMS
c) Power generation
d) HVAC systems

10) Which of the following is NOT a characteristic of an ideal sensor?
a) Linearity
b) High sensitivity
c) Infinite drift
d) Fast response

11) The output of a piezoelectric sensor is proportional to _____.
a) Pressure
b) Strain rate
c) Electric field
d) Magnetic field

12) Hall Effect sensors are primarily used to measure _____.
a) Pressure
b) Magnetic field
c) Temperature
d) Humidity

13) The capacitance of a capacitive sensor changes mainly due to _____.
a) Variation in dielectric constant
b) Variation in resistance
c) Voltage change
d) Frequency variation

14) A thermistor is a type of _____ sensor.
a) Pressure
b) Temperature
c) Position
d) Magnetic

SLR-QH-606

Seat No.		Set	S

T. Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Sensors & Applications (BTN07609)

Day & Date: Monday, 25-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All Questions are compulsory.
2) Figures to the right indicates full marks.

Section – I

Q.2 Attempt the following. (Any Four) **16**

a) What is sensor? Explain difference between sensor & transducer.

b) What is charge field & potential? Explain.

c) How the sensor is classified? Explain.

d) State the different types of temperature sensor and explain any one of them.

e) Explain analog to digital converter with diagram.

Q.3 Attempt the following. (Any Two) **12**

a) Explain the types of batteries used for low power sensors.

b) Describe the dynamic models of sensor element.

c) Explain the hall effect with necessary diagram.

Section – II

Q.4 Attempt the following. (Any Four) **16**

a) What are occupancy detector & motion detector? Explain.

b) Explain the wet etching MEMS Technology.

c) Write the Selection criteria of Actuators.

d) Why & where LVDT sensor used?

e) State different types of excitation circuits and explain any one of them in details.

Q.5 Attempt the following. (Any Two) **12**

a) State and explain the principle of operation of micro and nano actuator with advantages and disadvantages.

b) State the different types of material used for fabrication of sensor and explain any one of them.

c) Explain rotary velocity sensor (Tachometer) in details.

SLR-QH-608

Seat No.	

Set P

T. Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April- 2026
Electrical Safety (BTN07611)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 50
Time: 10:00 AM To 12:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 20 Minutes Marks:10

Q.1 Give the correct option for the following questions. 10

1) Avoid working in _____ conditions.
a) Cold b) Dry
c) Sunny d) Wet

2) _____ all electrical equipment before use.
a) Clean b) Inspect
c) Label d) Organize

3) _____ gives a stray current somewhere to go and keeps workers from becoming part of the circuit.
a) De-energizing b) Energizing
c) Grounding d) Guarding

4) Class-A fire consists of fire due to _____.
a) Wood b) Oil
c) Transformer d) Chemical

5) Specially designed PPE for electrical work includes _____ insulating gloves, matting, blankets, and covers.
a) Plastic b) Rubber
c) Steel d) Wood

6) _____ use caution when working near electricity.
a) Always b) Never
c) Rarely d) Sometimes

7) The minimum distance provided between two conducting points by air/gas/oil is known as _____.

a) Clearances
b) Creepages
c) Clearances and Creepages
d) All of these

8) _____ workers have little or no training working on or near electricity.

a) Pipeline
b) Qualified
c) Rescue
d) Unqualified

9) Electrical hazards include shock, electrical arcs and blasts, and _____ or faulty equipment.

a) Broken
b) Double-insulated
c) Polished
d) Secure

10) _____ is a measurement of how much energy you are using each second.

a) Distance
b) Power
c) Volume
d) Weight

SLR-QH-608

Seat No.	

Set P

T. Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April- 2026
Electrical Safety (BTN07611)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 40
Time: 10:00 AM To 12:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw neat diagrams whenever necessary.
4) Make suitable assumptions if necessary and state them clearly.

Q.2 Answer Any Five questions. **40**

a) Write the safety precautions to be taken during the operation and maintenance of electrical equipment.

b) Explain in brief types of fire extinguisher.

c) State and explain method of artificial respiration.

d) What is electrical shock? Distinguish between primary shock and secondary shock.

e) Explain the procedure of permit to do the work on electrical equipment.

f) State safety procedure during erection phase, commissioning phase and maintenance phase.

SLR-QH-608

Seat No.	

Set Q

T. Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April- 2026
Electrical Safety (BTN07611)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 50
Time: 10:00 AM To 12:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 20 Minutes Marks:10

Q.1 Give the correct option for the following questions. 10

1) _____ use caution when working near electricity.
a) Always b) Never
c) Rarely d) Sometimes

2) The minimum distance provided between two conducting points by air/gas/oil is known as _____.
a) Clearances b) Creepages
c) Clearances and Creepages d) All of these

3) _____ workers have little or no training working on or near electricity.
a) Pipeline b) Qualified
c) Rescue d) Unqualified

4) Electrical hazards include shock, electrical arcs and blasts, and _____ or faulty equipment.
a) Broken b) Double-insulated
c) Polished d) Secure

5) _____ is a measurement of how much energy you are using each second.
a) Distance b) Power
c) Volume d) Weight

6) Avoid working in _____ conditions.
a) Cold b) Dry
c) Sunny d) Wet

7) _____ all electrical equipment before use.

a) Clean
b) Inspect
c) Label
d) Organize

8) _____ gives a stray current somewhere to go and keeps workers from becoming part of the circuit.

a) De-energizing
b) Energizing
c) Grounding
d) Guarding

9) Class-A fire consists of fire due to _____.

a) Wood
b) Oil
c) Transformer
d) Chemical

10) Specially designed PPE for electrical work includes _____ insulating gloves, matting, blankets, and covers.

a) Plastic
b) Rubber
c) Steel
d) Wood

SLR-QH-608

Seat No.	

Set Q

T. Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April- 2026
Electrical Safety (BTN07611)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 40
Time: 10:00 AM To 12:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw neat diagrams whenever necessary.
4) Make suitable assumptions if necessary and state them clearly.

Q.2 Answer Any Five questions. **40**

a) Write the safety precautions to be taken during the operation and maintenance of electrical equipment.

b) Explain in brief types of fire extinguisher.

c) State and explain method of artificial respiration.

d) What is electrical shock? Distinguish between primary shock and secondary shock.

e) Explain the procedure of permit to do the work on electrical equipment.

f) State safety procedure during erection phase, commissioning phase and maintenance phase.

SLR-QH-608

Seat No.	

Set R

T. Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April- 2026
Electrical Safety (BTN07611)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 50
Time: 10:00 AM To 12:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 20 Minutes Marks:10

Q.1 Give the correct option for the following questions. 10

1) Electrical hazards include shock, electrical arcs and blasts, and _____ or faulty equipment.
a) Broken b) Double-insulated
c) Polished d) Secure

2) _____ is a measurement of how much energy you are using each second.
a) Distance b) Power
c) Volume d) Weight

3) Avoid working in _____ conditions.
a) Cold b) Dry
c) Sunny d) Wet

4) _____ all electrical equipment before use.
a) Clean b) Inspect
c) Label d) Organize

5) _____ gives a stray current somewhere to go and keeps workers from becoming part of the circuit.
a) De-energizing b) Energizing
c) Grounding d) Guarding

6) Class-A fire consists of fire due to _____.
a) Wood b) Oil
c) Transformer d) Chemical

7) Specially designed PPE for electrical work includes _____ insulating gloves, matting, blankets, and covers.

a) Plastic b) Rubber
c) Steel d) Wood

8) _____ use caution when working near electricity.

a) Always b) Never
c) Rarely d) Sometimes

9) The minimum distance provided between two conducting points by air/gas/oil is known as _____.

a) Clearances b) Creepages
c) Clearances and Creepages d) All of these

10) _____ workers have little or no training working on or near electricity.

a) Pipeline b) Qualified
c) Rescue d) Unqualified

SLR-QH-608

Seat No.	

Set R

T. Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April- 2026
Electrical Safety (BTN07611)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 40
Time: 10:00 AM To 12:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw neat diagrams whenever necessary.
4) Make suitable assumptions if necessary and state them clearly.

Q.2 Answer Any Five questions. **40**

a) Write the safety precautions to be taken during the operation and maintenance of electrical equipment.

b) Explain in brief types of fire extinguisher.

c) State and explain method of artificial respiration.

d) What is electrical shock? Distinguish between primary shock and secondary shock.

e) Explain the procedure of permit to do the work on electrical equipment.

f) State safety procedure during erection phase, commissioning phase and maintenance phase.

Seat No.	

Set **S**

T. Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April- 2026
Electrical Safety (BTN07611)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 50
Time: 10:00 AM To 12:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 20 Minutes Marks:10

Q.1 Give the correct option for the following questions. 10

1) _____ gives a stray current somewhere to go and keeps workers from becoming part of the circuit.
a) De-energizing b) Energizing
c) Grounding d) Guarding

2) Class-A fire consists of fire due to _____.
a) Wood b) Oil
c) Transformer d) Chemical

3) Specially designed PPE for electrical work includes _____ insulating gloves, matting, blankets, and covers.
a) Plastic b) Rubber
c) Steel d) Wood

4) _____ use caution when working near electricity.
a) Always b) Never
c) Rarely d) Sometimes

5) The minimum distance provided between two conducting points by air/gas/oil is known as _____.
a) Clearances b) Creepages
c) Clearances and Creepages d) All of these

6) _____ workers have little or no training working on or near electricity.
a) Pipeline b) Qualified
c) Rescue d) Unqualified

7) Electrical hazards include shock, electrical arcs and blasts, and _____ or faulty equipment.

a) Broken
b) Double-insulated
c) Polished
d) Secure

8) _____ is a measurement of how much energy you are using each second.

a) Distance
b) Power
c) Volume
d) Weight

9) Avoid working in _____ conditions.

a) Cold
b) Dry
c) Sunny
d) Wet

10) _____ all electrical equipment before use.

a) Clean
b) Inspect
c) Label
d) Organize

SLR-QH-608

Seat No.	

Set | **S**

T. Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April- 2026
Electrical Safety (BTN07611)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 40
Time: 10:00 AM To 12:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw neat diagrams whenever necessary.
4) Make suitable assumptions if necessary and state them clearly.

Q.2 Answer Any Five questions. **40**

a) Write the safety precautions to be taken during the operation and maintenance of electrical equipment.

b) Explain in brief types of fire extinguisher.

c) State and explain method of artificial respiration.

d) What is electrical shock? Distinguish between primary shock and secondary shock.

e) Explain the procedure of permit to do the work on electrical equipment.

f) State safety procedure during erection phase, commissioning phase and maintenance phase.

SLR-QH-609

Seat No.	

Set P

T. Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Solar Photo Voltaic System Design & Installation (BTN07612)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 50
Time: 10:00 AM To 12:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 20 Minutes Marks:10

Q.1 Choose the correct answer. 10

1) What is the smallest unit of a solar photovoltaic system?
a) Solar Cell b) Solar Array
c) Solar module d) Solar Panel

2) In P-N Junction solar cell, P-type semiconductor is connected to _____.
a) Cathode b) Anode
c) Triode d) Diode

3) What is the function of an inverter?
a) Conversion of AC to DC b) Conversion of DC to AC
c) Amplifying the sound d) Step up the voltage

4) What is MPPT?
a) Maximum Photo Power Tracer
b) Maximum Power Point Tracer
c) Multi Point Power Tracer
d) None of the above

5) Turn around efficiency of battery energy storage system is around _____.
a) 75 percent b) 50 percent
c) 25 percent d) 10 percent

6) Certain metals become super-conducting when cooled below _____.
a) Melting point b) Transition temperature
c) 00 K d) 00 C

7) What is the maximum possible output of a solar array?

a) 300 W/m^2 b) 100 W/m^2

c) 250 W/m^2 d) 500 W/m^2

8) In solar thermal conversion systems, the solar heat is transferred to _____.

a) Water-steam b) Liquid metals

c) Molten salts d) Any of the above

9) The current density of a photo voltaic cell range from _____.

a) 10-20 mA/cm^2 b) 40 - 50 mA/cm^2

c) 20 - 40 mA/cm^2 d) 60 - 100 mA/cm

10) Which of the following areas is preferred for solar thermal electric plants?

a) Mountain tops b) Hot arid zones

c) Coastal areas d) High rainfall zones

Seat No.	

Set **P**

T. Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Solar Photo Voltaic System Design & Installation (BTN07612)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 40
Time: 10:00 AM To 12:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicates full marks.
3) Assume suitable data if necessary.
4) Draw neat diagrams whenever necessary.

Q.2 Attempt Any Four of the following. **20**

a) Define the term IV Curve, efficiency, and Solar Cell.

b) Write a short note on charging and discharging characteristics of the battery.

c) Explain the shading analysis of the battery.

d) Explain the different types of Inverters and their operation.

e) What are the factors involved in the preparation of installation of Solar Power plant?

Q.3 Attempt Any Two of the following. **20**

a) Explain the Interconnection of modules installation.

b) Explain the different Components of a grid-connected SPV system.

c) Explain the different types of batteries and their operation and structure.

SLR-QH-609

Seat No.	

Set Q

T. Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Solar Photo Voltaic System Design & Installation (BTN07612)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 50
Time: 10:00 AM To 12:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 20 Minutes Marks:10

Q.1 Choose the correct answer. 10

1) Certain metals become super-conducting when cooled below _____.
a) Melting point b) Transition temperature
c) 00 K d) 00 C

2) What is the maximum possible output of a solar array?
a) 300 W/m^2 b) 100 W/m^2
c) 250 W/m^2 d) 500 W/m^2

3) In solar thermal conversion systems, the solar heat is transferred to _____.
a) Water-steam b) Liquid metals
c) Molten salts d) Any of the above

4) The current density of a photo voltaic cell range from _____.
a) 10-20 mA/cm^2 b) 40 - 50 mA/cm^2
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7) In P-N Junction solar cell, P-type semiconductor is connected to _____.

a) Cathode
b) Anode
c) Triode
d) Diode

8) What is the function of an inverter?

a) Conversion of AC to DC
b) Conversion of DC to AC
c) Amplifying the sound
d) Step up the voltage

9) What is MPPT?

a) Maximum Photo Power Tracer
b) Maximum Power Point Tracer
c) Multi Point Power Tracer
d) None of the above

10) Turn around efficiency of battery energy storage system is around _____.

a) 75 percent
b) 50 percent
c) 25 percent
d) 10 percent

SLR-QH-609

Seat No.	

Set Q

T. Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Solar Photo Voltaic System Design & Installation (BTN07612)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 40
Time: 10:00 AM To 12:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicates full marks.
3) Assume suitable data if necessary.
4) Draw neat diagrams whenever necessary.

Q.2 Attempt Any Four of the following. **20**

a) Define the term IV Curve, efficiency, and Solar Cell.

b) Write a short note on charging and discharging characteristics of the battery.

c) Explain the shading analysis of the battery.

d) Explain the different types of Inverters and their operation.

e) What are the factors involved in the preparation of installation of Solar Power plant?

Q.3 Attempt Any Two of the following. **20**

a) Explain the Interconnection of modules installation.

b) Explain the different Components of a grid-connected SPV system.

c) Explain the different types of batteries and their operation and structure.

Seat No.	

Set **R**

T. Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Solar Photo Voltaic System Design & Installation (BTN07612)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 50
Time: 10:00 AM To 12:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 20 Minutes Marks:10

Q.1 Choose the correct answer. **10**

1) The current density of a photo voltaic cell range from _____.
a) 10-20 mA/cm^2 b) 40 - 50 mA/cm^2
c) 20 - 40 mA/cm^2 d) 60 - 100 mA/cm

2) Which of the following areas is preferred for solar thermal electric plants?
a) Mountain tops b) Hot arid zones
c) Coastal areas d) High rainfall zones

3) What is the smallest unit of a solar photovoltaic system?
a) Solar Cell b) Solar Array
c) Solar module d) Solar Panel

4) In P-N Junction solar cell, P-type semiconductor is connected to _____.
a) Cathode b) Anode
c) Triode d) Diode

5) What is the function of an inverter?
a) Conversion of AC to DC b) Conversion of DC to AC
c) Amplifying the sound d) Step up the voltage

6) What is MPPT?
a) Maximum Photo Power Tracer
b) Maximum Power Point Tracer
c) Multi Point Power Tracer
d) None of the above

7) Turn around efficiency of battery energy storage system is around _____.

a) 75 percent
b) 50 percent
c) 25 percent
d) 10 percent

8) Certain metals become super-conducting when cooled below _____.

a) Melting point
b) Transition temperature
c) 00 K
d) 00 C

9) What is the maximum possible output of a solar array?

a) 300 W/m^2
b) 100 W/m^2
c) 250 W/m^2
d) 500 W/m^2

10) In solar thermal conversion systems, the solar heat is transferred to _____.

a) Water-steam
b) Liquid metals
c) Molten salts
d) Any of the above

Seat No.	

Set **R**

T. Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Solar Photo Voltaic System Design & Installation (BTN07612)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 40
Time: 10:00 AM To 12:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicates full marks.
3) Assume suitable data if necessary.
4) Draw neat diagrams whenever necessary.

Q.2 Attempt Any Four of the following. **20**

a) Define the term IV Curve, efficiency, and Solar Cell.

b) Write a short note on charging and discharging characteristics of the battery.

c) Explain the shading analysis of the battery.

d) Explain the different types of Inverters and their operation.

e) What are the factors involved in the preparation of installation of Solar Power plant?

Q.3 Attempt Any Two of the following. **20**

a) Explain the Interconnection of modules installation.

b) Explain the different Components of a grid-connected SPV system.

c) Explain the different types of batteries and their operation and structure.

Seat No.	

Set **S**

T. Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Solar Photo Voltaic System Design & Installation (BTN07612)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 50
Time: 10:00 AM To 12:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 20 Minutes Marks:10

Q.1 Choose the correct answer. **10**

1) What is the function of an inverter?
a) Conversion of AC to DC b) Conversion of DC to AC
c) Amplifying the sound d) Step up the voltage

2) What is MPPT?
a) Maximum Photo Power Tracer
b) Maximum Power Point Tracer
c) Multi Point Power Tracer
d) None of the above

3) Turn around efficiency of battery energy storage system is around _____.
a) 75 percent b) 50 percent
c) 25 percent d) 10 percent

4) Certain metals become super-conducting when cooled below _____.
a) Melting point b) Transition temperature
c) 00 K d) 00 C

5) What is the maximum possible output of a solar array?
a) 300 W/m^2 b) 100 W/m^2
c) 250 W/m^2 d) 500 W/m^2

6) In solar thermal conversion systems, the solar heat is transferred to _____.
a) Water-steam b) Liquid metals
c) Molten salts d) Any of the above

7) The current density of a photo voltaic cell range from _____.

a) 10-20 mA/cm^2 b) 40 - 50 mA/cm^2

c) 20 - 40 mA/cm^2 d) 60 - 100 mA/cm

8) Which of the following areas is preferred for solar thermal electric plants?

a) Mountain tops b) Hot arid zones

c) Coastal areas d) High rainfall zones

9) What is the smallest unit of a solar photovoltaic system?

a) Solar Cell b) Solar Array

c) Solar module d) Solar Panel

10) In P-N Junction solar cell, P-type semiconductor is connected to _____.

a) Cathode b) Anode

c) Triode d) Diode

SLR-QH-609

Seat No.	

Set S

T. Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Solar Photo Voltaic System Design & Installation (BTN07612)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 40
Time: 10:00 AM To 12:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicates full marks.
3) Assume suitable data if necessary.
4) Draw neat diagrams whenever necessary.

Q.2 Attempt Any Four of the following. **20**

a) Define the term IV Curve, efficiency, and Solar Cell.

b) Write a short note on charging and discharging characteristics of the battery.

c) Explain the shading analysis of the battery.

d) Explain the different types of Inverters and their operation.

e) What are the factors involved in the preparation of installation of Solar Power plant?

Q.3 Attempt Any Two of the following. **20**

a) Explain the Interconnection of modules installation.

b) Explain the different Components of a grid-connected SPV system.

c) Explain the different types of batteries and their operation and structure.

SLR-QH-610

Seat No.	

Set P

T. Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Energy Management System for Electric Vehicle (BTN07614)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer: **14**

1) Sodium Chloride batteries have _____ electrolytes.
a) One b) Three
c) Two d) Four

2) How can a higher voltage be obtained from a cell _____.
a) By connecting multiple cells in series
b) By increasing its thickness
c) By connecting multiple cells in parallel
d) By decreasing its thickness

3) Advantages of lithium batteries _____.
a) Light weight b) Compact
c) Low maintenance d) All of the above

4) Which quantity among the following increases when cells are connected in parallel?
a) Voltage b) internal resistance
c) Amp Hours d) current

5) If the Capacity of battery is 400mAh, it can supply 4A current for _____.
a) 120min b) 240min
c) 60min d) 30min

6) Factors related to EV battery selection criteria.
a) Identify and select battery chemistry
b) Depth of discharge and Capacity
c) C-rating
d) All of the above

7) Which method is employed to connect the batteries?
a) parallel b) direct
c) series d) reverse

8) In EVs, what is the purpose of a traction battery pack?
a) To control the vehicle's steering
b) To provide power for propulsion
c) To manage climate control
d) To regulate tire pressure

9) What is the primary function of a Battery Management System (BMS)?
a) Entertainment control
b) Tire pressure monitoring
c) Regulating engine temperature
d) Monitoring and managing battery health and performance

10) What does battery cell equalization aim to achieve?
a) Balancing the state of charge among cells
b) Increasing the weight of the battery
c) Improving the battery's color consistency
d) Reducing the overall battery capacity

11) What is the primary role of the protection interface in EV batteries?
a) Enhance entertainment features
b) Ensure safety by preventing overcharging and over-discharging
c) Maximize fuel efficiency
d) Optimize tire wear

12) Which method for State of Charge (SOC) estimation is based on integrating current over time?
a) Coulomb counting b) Voltage-based methods
c) Temperature sensing d) Impedance spectroscopy

13) What factors can contribute to thermal runaway in batteries?
a) High discharge rates, short circuits, and charging
b) Low discharge rates and optimal charging
c) Lack of safety vents and low temperatures
d) Ignoring explosive potential

14) What is an important consideration in preventing battery leakage?
a) Maximizing leakage rates b) Ignoring leakage paths
c) Controlling gas generation d) Encouraging rupture events

Seat No.	

Set | P

T. Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Energy Management System for Electric Vehicle (BTN07614)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All Questions are compulsory.
2) Figures to the right indicates full marks.
3) Assume suitable data if necessary.

Section – I

Q.2 Solve Any Four. **16**

a) Explain in detail flywheel energy storage element.

b) Explain Parameterization of NiCd battery model.

c) Explain about Lithium Based Batteries in Energy Storage System.

d) Explain how chemical energy can converted into electrical energy.

e) Describe battery Specifications and characterize to battery operating conditions.

f) Differentiate between Cell and batteries.

Q.3 Solve Any Two. **12**

a) Describe the Battery Energy Storage based System in Hybrid Electric Vehicles.

b) Explain following regarding performance criteria for Electric Vehicles batteries:
i) Vehicle propulsion factors
ii) Power and energy requirements of batteries

c) Explain General approach to modeling of batteries.

Section – II

Q.4 Solve Any Four. **16**

a) Explain the fundamentals of battery pack design.

b) Describes any one State of Charge (SOC) estimation methods.

c) Explain with neat diagram the Battery Management System (BMS).

d) Describes any one EV Battery testing methods.

e) Describe the causes and consequences of gas generation in batteries.

f) Explain the role of safety vents in preventing and managing cell ruptures.

Q.5 Solve Any Two. **12**

a) Write a short note on Battery Thermal Management system.

b) Describes the Battery cell equalization methods.

c) Explain the recycling, disposal, and second use of EV batteries.

SLR-QH-610

Seat No.	

Set Q

T. Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Energy Management System for Electric Vehicle (BTN07614)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer: 14

1) In EVs, what is the purpose of a traction battery pack?
a) To control the vehicle's steering
b) To provide power for propulsion
c) To manage climate control
d) To regulate tire pressure

2) What is the primary function of a Battery Management System (BMS)?
a) Entertainment control
b) Tire pressure monitoring
c) Regulating engine temperature
d) Monitoring and managing battery health and performance

3) What does battery cell equalization aim to achieve?
a) Balancing the state of charge among cells
b) Increasing the weight of the battery
c) Improving the battery's color consistency
d) Reducing the overall battery capacity

4) What is the primary role of the protection interface in EV batteries?
a) Enhance entertainment features
b) Ensure safety by preventing overcharging and over-discharging
c) Maximize fuel efficiency
d) Optimize tire wear

5) Which method for State of Charge (SOC) estimation is based on integrating current over time?
a) Coulomb counting
b) Voltage-based methods
c) Temperature sensing
d) Impedance spectroscopy

6) What factors can contribute to thermal runaway in batteries?
a) High discharge rates, short circuits, and charging
b) Low discharge rates and optimal charging
c) Lack of safety vents and low temperatures
d) Ignoring explosive potential

7) What is an important consideration in preventing battery leakage?
a) Maximizing leakage rates
b) Ignoring leakage paths
c) Controlling gas generation
d) Encouraging rupture events

8) Sodium Chloride batteries have _____ electrolytes.
a) One
b) Three
c) Two
d) Four

9) How can a higher voltage be obtained from a cell _____.
a) By connecting multiple cells in series
b) By increasing its thickness
c) By connecting multiple cells in parallel
d) By decreasing its thickness

10) Advantages of lithium batteries _____.
a) Light weight
b) Compact
c) Low maintenance
d) All of the above

11) Which quantity among the following increases when cells are connected in parallel?
a) Voltage
b) internal resistance
c) Amp Hours
d) current

12) If the Capacity of battery is 400mAh, it can supply 4A current for _____.
a) 120min
b) 240min
c) 60min
d) 30min

13) Factors related to EV battery selection criteria.
a) Identify and select battery chemistry
b) Depth of discharge and Capacity
c) C-rating
d) All of the above

14) Which method is employed to connect the batteries?
a) parallel
b) direct
c) series
d) reverse

SLR-QH-610

Seat No.	

Set Q

T. Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Energy Management System for Electric Vehicle (BTN07614)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All Questions are compulsory.
2) Figures to the right indicates full marks.
3) Assume suitable data if necessary.

Section – I

Q.2 Solve Any Four. **16**

a) Explain in detail flywheel energy storage element.

b) Explain Parameterization of NiCd battery model.

c) Explain about Lithium Based Batteries in Energy Storage System.

d) Explain how chemical energy can converted into electrical energy.

e) Describe battery Specifications and characterize to battery operating conditions.

f) Differentiate between Cell and batteries.

Q.3 Solve Any Two. **12**

a) Describe the Battery Energy Storage based System in Hybrid Electric Vehicles.

b) Explain following regarding performance criteria for Electric Vehicles batteries:
i) Vehicle propulsion factors
ii) Power and energy requirements of batteries

c) Explain General approach to modeling of batteries.

Section – II

Q.4 Solve Any Four. **16**

a) Explain the fundamentals of battery pack design.

b) Describes any one State of Charge (SOC) estimation methods.

c) Explain with neat diagram the Battery Management System (BMS).

d) Describes any one EV Battery testing methods.

e) Describe the causes and consequences of gas generation in batteries.

f) Explain the role of safety vents in preventing and managing cell ruptures.

Q.5 Solve Any Two. **12**

a) Write a short note on Battery Thermal Management system.

b) Describes the Battery cell equalization methods.

c) Explain the recycling, disposal, and second use of EV batteries.

Seat No.	

Set R

T. Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Energy Management System for Electric Vehicle (BTN07614)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer: 14

1) What is the primary role of the protection interface in EV batteries?
a) Enhance entertainment features
b) Ensure safety by preventing overcharging and over-discharging
c) Maximize fuel efficiency
d) Optimize tire wear

2) Which method for State of Charge (SOC) estimation is based on integrating current over time?
a) Coulomb counting b) Voltage-based methods
c) Temperature sensing d) Impedance spectroscopy

3) What factors can contribute to thermal runaway in batteries?
a) High discharge rates, short circuits, and charging
b) Low discharge rates and optimal charging
c) Lack of safety vents and low temperatures
d) Ignoring explosive potential

4) What is an important consideration in preventing battery leakage?
a) Maximizing leakage rates b) Ignoring leakage paths
c) Controlling gas generation d) Encouraging rupture events

5) Sodium Chloride batteries have _____ electrolytes.
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6) How can a higher voltage be obtained from a cell _____.
- a) By connecting multiple cells in series
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- c) By connecting multiple cells in parallel
- d) By decreasing its thickness

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- a) Light weight
- b) Compact
- c) Low maintenance
- d) All of the above

8) Which quantity among the following increases when cells are connected in parallel?
- a) Voltage
- b) internal resistance
- c) Amp Hours
- d) current

9) If the Capacity of battery is 400mAh, it can supply 4A current for _____.
- a) 120min
- b) 240min
- c) 60min
- d) 30min

10) Factors related to EV battery selection criteria.
- a) Identify and select battery chemistry
- b) Depth of discharge and Capacity
- c) C-rating
- d) All of the above

11) Which method is employed to connect the batteries?
- a) parallel
- b) direct
- c) series
- d) reverse

12) In EVs, what is the purpose of a traction battery pack?
- a) To control the vehicle's steering
- b) To provide power for propulsion
- c) To manage climate control
- d) To regulate tire pressure

13) What is the primary function of a Battery Management System (BMS)?
- a) Entertainment control
- b) Tire pressure monitoring
- c) Regulating engine temperature
- d) Monitoring and managing battery health and performance

14) What does battery cell equalization aim to achieve?
- a) Balancing the state of charge among cells
- b) Increasing the weight of the battery
- c) Improving the battery's color consistency
- d) Reducing the overall battery capacity

Seat No.	

Set **R**

T. Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Energy Management System for Electric Vehicle (BTN07614)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All Questions are compulsory.
2) Figures to the right indicates full marks.
3) Assume suitable data if necessary.

Section – I

Q.2 Solve Any Four. **16**

a) Explain in detail flywheel energy storage element.

b) Explain Parameterization of NiCd battery model.

c) Explain about Lithium Based Batteries in Energy Storage System.

d) Explain how chemical energy can converted into electrical energy.

e) Describe battery Specifications and characterize to battery operating conditions.

f) Differentiate between Cell and batteries.

Q.3 Solve Any Two. **12**

a) Describe the Battery Energy Storage based System in Hybrid Electric Vehicles.

b) Explain following regarding performance criteria for Electric Vehicles batteries:
i) Vehicle propulsion factors
ii) Power and energy requirements of batteries

c) Explain General approach to modeling of batteries.

Section – II

Q.4 Solve Any Four. **16**

a) Explain the fundamentals of battery pack design.

b) Describes any one State of Charge (SOC) estimation methods.

c) Explain with neat diagram the Battery Management System (BMS).

d) Describes any one EV Battery testing methods.

e) Describe the causes and consequences of gas generation in batteries.

f) Explain the role of safety vents in preventing and managing cell ruptures.

Q.5 Solve Any Two. **12**

a) Write a short note on Battery Thermal Management system.

b) Describes the Battery cell equalization methods.

c) Explain the recycling, disposal, and second use of EV batteries.

Seat No.	

Set **S**

T. Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Energy Management System for Electric Vehicle (BTN07614)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer: **14**

1) Factors related to EV battery selection criteria.
a) Identify and select battery chemistry
b) Depth of discharge and Capacity
c) C-rating
d) All of the above

2) Which method is employed to connect the batteries?
a) parallel b) direct
c) series d) reverse

3) In EVs, what is the purpose of a traction battery pack?
a) To control the vehicle's steering
b) To provide power for propulsion
c) To manage climate control
d) To regulate tire pressure

4) What is the primary function of a Battery Management System (BMS)?
a) Entertainment control
b) Tire pressure monitoring
c) Regulating engine temperature
d) Monitoring and managing battery health and performance

5) What does battery cell equalization aim to achieve?
a) Balancing the state of charge among cells
b) Increasing the weight of the battery
c) Improving the battery's color consistency
d) Reducing the overall battery capacity

6) What is the primary role of the protection interface in EV batteries?
a) Enhance entertainment features
b) Ensure safety by preventing overcharging and over-discharging
c) Maximize fuel efficiency
d) Optimize tire wear

7) Which method for State of Charge (SOC) estimation is based on integrating current over time?
a) Coulomb counting
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c) Temperature sensing
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c) Lack of safety vents and low temperatures
d) Ignoring explosive potential

9) What is an important consideration in preventing battery leakage?
a) Maximizing leakage rates
b) Ignoring leakage paths
c) Controlling gas generation
d) Encouraging rupture events

10) Sodium Chloride batteries have _____ electrolytes.
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b) Three
c) Two
d) Four

11) How can a higher voltage be obtained from a cell _____.
a) By connecting multiple cells in series
b) By increasing its thickness
c) By connecting multiple cells in parallel
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12) Advantages of lithium batteries _____.
a) Light weight
b) Compact
c) Low maintenance
d) All of the above

13) Which quantity among the following increases when cells are connected in parallel?
a) Voltage
b) internal resistance
c) Amp Hours
d) current

14) If the Capacity of battery is 400mAh, it can supply 4A current for _____.
a) 120min
b) 240min
c) 60min
d) 30min

Seat No.	

Set **S**

T. Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New/Old) (CBCS) Examination: March/April – 2026
Energy Management System for Electric Vehicle (BTN07614)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All Questions are compulsory.
2) Figures to the right indicates full marks.
3) Assume suitable data if necessary.

Section – I

Q.2 Solve Any Four. **16**

a) Explain in detail flywheel energy storage element.

b) Explain Parameterization of NiCd battery model.

c) Explain about Lithium Based Batteries in Energy Storage System.

d) Explain how chemical energy can converted into electrical energy.

e) Describe battery Specifications and characterize to battery operating conditions.

f) Differentiate between Cell and batteries.

Q.3 Solve Any Two. **12**

a) Describe the Battery Energy Storage based System in Hybrid Electric Vehicles.

b) Explain following regarding performance criteria for Electric Vehicles batteries:
i) Vehicle propulsion factors
ii) Power and energy requirements of batteries

c) Explain General approach to modeling of batteries.

Section – II

Q.4 Solve Any Four. **16**

a) Explain the fundamentals of battery pack design.

b) Describes any one State of Charge (SOC) estimation methods.

c) Explain with neat diagram the Battery Management System (BMS).

d) Describes any one EV Battery testing methods.

e) Describe the causes and consequences of gas generation in batteries.

f) Explain the role of safety vents in preventing and managing cell ruptures.

Q.5 Solve Any Two. **12**

a) Write a short note on Battery Thermal Management system.

b) Describes the Battery cell equalization methods.

c) Explain the recycling, disposal, and second use of EV batteries.

SLR-QH-612

Seat No.		Set	P

Fourth. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Power Quality and FACTS (BTN07701)

Day & Date: Saturday, 02-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternative. **14**

1) Power Quality mainly deals with _____.
a) Power factor only
b) Quality of voltage and current
c) Transmission losses
d) Generation of power

2) Which device is used to control voltage sag and swell?
a) Resistor b) Relay
c) FACTS device d) Transformer

3) The CBEMA curve is used to study _____.
a) Power factor b) Load current
c) Voltage tolerance d) Temperature rise

4) Harmonics are mainly produced due to _____.
a) Resistive loads b) Balanced loads
c) Non-linear loads d) Linear loads

5) The fall form of THD is _____.
a) Total High Deviation b) True Harmonic Deviation
c) Total Harmonic Distortion d) Total Heat Distortion

6) Which one is a passive filter element?
a) SCR b) Diode
c) IGBT d) Inductor

7) Power quality problems can cause _____.
a) Higher efficiency
b) Energy saving
c) Equipment damage
d) Smooth operation of equipment

8) SVC is mainly used to control _____.
a) Load torque
b) Temperature
c) Reactive power
d) Frequency

9) STATCOM stands for _____.
a) Static Controlled Machine
b) Static Series Converter
c) Static Synchronous Compensator
d) Static Compensation Machine

10) FACTS devices help to improve _____.
a) Insulation
b) Lighting
c) Cooling
d) Transmission capability

11) TCSC is a type of _____ compensator.
a) None
b) Parallel
c) Series
d) Shunt

12) UPFC is a combination of _____.
a) SVC and TCR
b) TCSC and SSSC
c) STATCOM and SSSC
d) SVC and STATCOM

13) The main function of a series capacitor is to _____.
a) Produce harmonics
b) Increase voltage drop
c) Reduce line reactance
d) Increase resistance

14) IPFC stands for _____.
a) Interphase Flow Controller
b) Integrated Phase Flow Compensator
c) Internal Power Flow Converter
d) Interline Power Flow Controller

SLR-QH-612

Seat No.		Set	P

Fourth. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Power Quality and FACTS (BTN07701)

Day & Date: Saturday, 02-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Make suitable assumptions if necessary and state them clearly.

Section – I

Q.2 Answer any FOUR of the following. **16**

a) Define and explain various power quality indices.
b) Explain voltage sags and swells with causes and effects.
c) Discuss methods of locating harmonic sources in a distribution system.
d) Explain different types of transients affecting power quality.
e) Write short note on International Power Quality Standards. (IEEE/IEC).

Q.3 Answer any TWO of the following. **12**

a) Describe the principle and working of active and passive filters for harmonic mitigation.
b) Explain the process and instrumentation used for power quality monitoring.
c) With suitable diagrams, explain harmonic distortion evaluation procedure.

Section – II

Q.4 Answer any FOUR of the following. **16**

a) Explain the objectives and classification of FACTS controllers.
b) Compare V-I and V-Q characteristics of SVC and STATCOM.
c) Explain the concept and operation of TCR and TSC.
d) Write short note on midpoint voltage regulation using shunt compensation.
e) Explain the role of FACTS in enhancement of system stability.

Q.5 Answer any TWO of the following. **12**

a) Describe the operating principle and control structure of UPFC with neat block diagram.
b) Explain different types of series compensators such as TSSC, TCSC, and SSSC.
c) Discuss the operation and applications of IPFC in multi-line compensation.

Seat No.	

Set **Q**

Fourth. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Power Quality and FACTS (BTN07701)

Day & Date: Saturday, 02-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternative. **14**

1) SVC is mainly used to control _____.
a) Load torque b) Temperature
c) Reactive power d) Frequency

2) STATCOM stands for _____.
a) Static Controlled Machine
b) Static Series Converter
c) Static Synchronous Compensator
d) Static Compensation Machine

3) FACTS devices help to improve _____.
a) Insulation b) Lighting
c) Cooling d) Transmission capability

4) TCSC is a type of _____ compensator.
a) None b) Parallel
c) Series d) Shunt

5) UPFC is a combination of _____.
a) SVC and TCR b) TCSC and SSSC
c) STATCOM and SSSC d) SVC and STATCOM

6) The main function of a series capacitor is to _____.
a) Produce harmonics b) Increase voltage drop
c) Reduce line reactance d) Increase resistance

7) IPFC stands for _____.
a) Interphase Flow Controller
b) Integrated Phase Flow Compensator
c) Internal Power Flow Converter
d) Interline Power Flow Controller

8) Power Quality mainly deals with _____.
a) Power factor only
b) Quality of voltage and current
c) Transmission losses
d) Generation of power

9) Which device is used to control voltage sag and swell?
a) Resistor b) Relay
c) FACTS device d) Transformer

10) The CBEMA curve is used to study _____.
a) Power factor b) Load current
c) Voltage tolerance d) Temperature rise

11) Harmonics are mainly produced due to _____.
a) Resistive loads b) Balanced loads
c) Non-linear loads d) Linear loads

12) The fall form of THD is _____.
a) Total High Deviation b) True Harmonic Deviation
c) Total Harmonic Distortion d) Total Heat Distortion

13) Which one is a passive filter element?
a) SCR b) Diode
c) IGBT d) Inductor

14) Power quality problems can cause _____.
a) Higher efficiency
b) Energy saving
c) Equipment damage
d) Smooth operation of equipment

Seat No.	

Set **Q**

Fourth. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Power Quality and FACTS (BTN07701)

Day & Date: Saturday, 02-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Make suitable assumptions if necessary and state them clearly.

Section – I

Q.2 Answer any FOUR of the following. **16**

a) Define and explain various power quality indices.
b) Explain voltage sags and swells with causes and effects.
c) Discuss methods of locating harmonic sources in a distribution system.
d) Explain different types of transients affecting power quality.
e) Write short note on International Power Quality Standards. (IEEE/IEC).

Q.3 Answer any TWO of the following. **12**

a) Describe the principle and working of active and passive filters for harmonic mitigation.
b) Explain the process and instrumentation used for power quality monitoring.
c) With suitable diagrams, explain harmonic distortion evaluation procedure.

Section – II

Q.4 Answer any FOUR of the following. **16**

a) Explain the objectives and classification of FACTS controllers.
b) Compare V-I and V-Q characteristics of SVC and STATCOM.
c) Explain the concept and operation of TCR and TSC.
d) Write short note on midpoint voltage regulation using shunt compensation.
e) Explain the role of FACTS in enhancement of system stability.

Q.5 Answer any TWO of the following. **12**

a) Describe the operating principle and control structure of UPFC with neat block diagram.
b) Explain different types of series compensators such as TSSC, TCSC, and SSSC.
c) Discuss the operation and applications of IPFC in multi-line compensation.

Seat No.	

Set R

Fourth. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Power Quality and FACTS (BTN07701)

Day & Date: Saturday, 02-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternative. **14**

1) TCSC is a type of _____ compensator.
a) None b) Parallel
c) Series d) Shunt

2) UPFC is a combination of _____.
a) SVC and TCR b) TCSC and SSSC
c) STATCOM and SSSC d) SVC and STATCOM

3) The main function of a series capacitor is to _____.
a) Produce harmonics b) Increase voltage drop
c) Reduce line reactance d) Increase resistance

4) IPFC stands for _____.
a) Interphase Flow Controller
b) Integrated Phase Flow Compensator
c) Internal Power Flow Converter
d) Interline Power Flow Controller

5) Power Quality mainly deals with _____.
a) Power factor only
b) Quality of voltage and current
c) Transmission losses
d) Generation of power

6) Which device is used to control voltage sag and swell?
a) Resistor b) Relay
c) FACTS device d) Transformer

7) The CBEMA curve is used to study _____.
a) Power factor b) Load current
c) Voltage tolerance d) Temperature rise

8) Harmonics are mainly produced due to _____.
a) Resistive loads b) Balanced loads
c) Non-linear loads d) Linear loads

9) The fall form of THD is _____.
a) Total High Deviation b) True Harmonic Deviation
c) Total Harmonic Distortion d) Total Heat Distortion

10) Which one is a passive filter element?
a) SCR b) Diode
c) IGBT d) Inductor

11) Power quality problems can cause _____.
a) Higher efficiency
b) Energy saving
c) Equipment damage
d) Smooth operation of equipment

12) SVC is mainly used to control _____.
a) Load torque b) Temperature
c) Reactive power d) Frequency

13) STATCOM stands for _____.
a) Static Controlled Machine
b) Static Series Converter
c) Static Synchronous Compensator
d) Static Compensation Machine

14) FACTS devices help to improve _____.
a) Insulation b) Lighting
c) Cooling d) Transmission capability

Seat No.	

Set **R**

Fourth. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Power Quality and FACTS (BTN07701)

Day & Date: Saturday, 02-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
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3) Make suitable assumptions if necessary and state them clearly.

Section – I

Q.2 Answer any FOUR of the following. **16**

a) Define and explain various power quality indices.
b) Explain voltage sags and swells with causes and effects.
c) Discuss methods of locating harmonic sources in a distribution system.
d) Explain different types of transients affecting power quality.
e) Write short note on International Power Quality Standards. (IEEE/IEC).

Q.3 Answer any TWO of the following. **12**

a) Describe the principle and working of active and passive filters for harmonic mitigation.
b) Explain the process and instrumentation used for power quality monitoring.
c) With suitable diagrams, explain harmonic distortion evaluation procedure.

Section – II

Q.4 Answer any FOUR of the following. **16**

a) Explain the objectives and classification of FACTS controllers.
b) Compare V-I and V-Q characteristics of SVC and STATCOM.
c) Explain the concept and operation of TCR and TSC.
d) Write short note on midpoint voltage regulation using shunt compensation.
e) Explain the role of FACTS in enhancement of system stability.

Q.5 Answer any TWO of the following. **12**

a) Describe the operating principle and control structure of UPFC with neat block diagram.
b) Explain different types of series compensators such as TSSC, TCSC, and SSSC.
c) Discuss the operation and applications of IPFC in multi-line compensation.

Seat No.		Set	S

Fourth. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Power Quality and FACTS (BTN07701)

Day & Date: Saturday, 02-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

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MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternative. **14**

1) Which one is a passive filter element?
a) SCR b) Diode
c) IGBT d) Inductor

2) Power quality problems can cause _____.
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b) Energy saving
c) Equipment damage
d) Smooth operation of equipment

3) SVC is mainly used to control _____.
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4) STATCOM stands for _____.
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c) Static Synchronous Compensator
d) Static Compensation Machine

5) FACTS devices help to improve _____.
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7) UPFC is a combination of _____.
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c) STATCOM and SSSC
d) SVC and STATCOM

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c) Reduce line reactance
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c) Internal Power Flow Converter
d) Interline Power Flow Controller

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d) Generation of power

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b) Relay
c) FACTS device
d) Transformer

12) The CBEMA curve is used to study _____.
a) Power factor
b) Load current
c) Voltage tolerance
d) Temperature rise

13) Harmonics are mainly produced due to _____.
a) Resistive loads
b) Balanced loads
c) Non-linear loads
d) Linear loads

14) The fall form of THD is _____.
a) Total High Deviation
b) True Harmonic Deviation
c) Total Harmonic Distortion
d) Total Heat Distortion

SLR-QH-612

Seat No.		Set	S

Fourth. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Power Quality and FACTS (BTN07701)

Day & Date: Saturday, 02-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Make suitable assumptions if necessary and state them clearly.

Section – I

Q.2 Answer any FOUR of the following. **16**

a) Define and explain various power quality indices.
b) Explain voltage sags and swells with causes and effects.
c) Discuss methods of locating harmonic sources in a distribution system.
d) Explain different types of transients affecting power quality.
e) Write short note on International Power Quality Standards. (IEEE/IEC).

Q.3 Answer any TWO of the following. **12**

a) Describe the principle and working of active and passive filters for harmonic mitigation.
b) Explain the process and instrumentation used for power quality monitoring.
c) With suitable diagrams, explain harmonic distortion evaluation procedure.

Section – II

Q.4 Answer any FOUR of the following. **16**

a) Explain the objectives and classification of FACTS controllers.
b) Compare V-I and V-Q characteristics of SVC and STATCOM.
c) Explain the concept and operation of TCR and TSC.
d) Write short note on midpoint voltage regulation using shunt compensation.
e) Explain the role of FACTS in enhancement of system stability.

Q.5 Answer any TWO of the following. **12**

a) Describe the operating principle and control structure of UPFC with neat block diagram.
b) Explain different types of series compensators such as TSSC, TCSC, and SSSC.
c) Discuss the operation and applications of IPFC in multi-line compensation.

SLR-QH-613

Seat No.	

Set P

Fourth. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Signals and System (BTN07702)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark
2) Don't forget to Mention question paper set (P/Q/R/S) on top on page.
3) Figures to the right indicates full marks.
4) Consider data whenever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Multiple Choice Questions. **14**

1) Mathematically unit step is an integral of _____.
a) Unit step b) Unit ramp
c) Unit parabola d) Unit Impulse

2) Convolution of two unequal width rectangular signals will give resultant as _____.
a) Trapezoidal b) Square
c) Triangular d) None of the above

3) If $x[4 - n]$ is derived from the $x[n]$ by which transformation _____.
a) reversal and shift b) reversal only
c) scaling d) scaling and shifting

4) With $u[n]$ as unit step function, $u[n] - u[n-2]$ is, _____.
a) $\delta[n]$ b) $\delta[n] + \delta[n-1]$
c) $\delta[n] - \delta[n-2]$ d) $\delta[n] + \delta[n+1]$

5) For energy signal, the energy will be finite and the average power will be _____.
a) infinite b) finite
c) zero d) cannot be defined

6) Which of the following signal is causal signal?
a) $x(t) = A$ b) $x(t) = t$
c) $x(t) = u(t)$ d) $x(t) = e^{-at}$

7) An LTI system is stable, if the impulse response is _____.

a) $\sum_{n=-\infty}^{\infty} |h(n)| = 0$ b) $\sum_{n=-\infty}^{\infty} |h(n)| < \infty$

c) $\sum_{n=-\infty}^{\infty} |h(n)| \neq 0$ d) Either a or b

8) Fourier series of any periodic signal $x(t)$ can only be obtained if, _____.

a) finite number of discontinuities within finite time interval, T
b) finite number of positive and negative maxima in the period, T
c) well defined at infinite number of points
d) both (a) and (b)

9) Fourier transform of the signum function, $x(t) = sgn(t)$ is _____.

a) $\frac{2}{\omega}$ b) $\frac{2}{j\omega}$

c) $\frac{2}{(j\omega)^2}$ d) $-\frac{2}{j\omega}$

10) If all the poles of the system function H(z) have magnitude smaller than 1, then the system will be, _____.

a) stable b) unstable
c) BIBO stable d) a and c

11) If $x(n)$ and $X(k)$ are an N-point DFT pair, then the value of $X(k + N)$ ____

a) $X(-k)$ b) $-X(k)$
c) $X(k)$ d) None of the above

12) If Fourier transform of $x(t)$ is $X(\omega)$, then Fourier Transform of $e^{-j\omega_0 t}x(t)$ is _____.

a) $\frac{X(\omega)}{\omega_0}$ b) $X(\omega - \omega_0)$

c) $X(\omega + \omega_0)$ d) $\omega_0 X(\omega)$

13) Bit reversing is required for both DIT and DIF algorithms _____.

a) DIT b) DIF
c) Both DIT and DIF d) None of these

14) The Z-transform is a, _____.

a) finite series b) infinite power series
c) geometric series d) both a and c

Seat No.	

Set **P**

Fourth. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Signals and System (BTN07702)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Consider data whenever necessary.

SECTION – I

Q.2 Attempt Any Four. **16**

a) Explain basic properties of the LTI system.

b) Perform the convolution of the following signals
$x(t) = u(t)$ and $h(t) = e^{-5t}u(t)$

c) Draw following discrete time signal in graphical form
$x(-3) = -1, x(-2) = 2, x(-1) = 0, x(0) = 1, x(1) = 2, x(2) = 3, x(3) = 2$

d) Check the causality of the system defined as,
$y(t) = x^2(t) + x(t-2)$

e) Explain the terms Time-Invariant and Time-Variant System, with examples.

f) Find the even and odd signal of signal defined as,
$x(t) = \cos(t) + \sin(t) + \cos(t)\sin(t)$

Q.3 Attempt Any Two. **12**

a) Define the following related to systems- Continuous and discrete system. Lumped parameter and distributed parameter system, static and dynamic system, causal and non-causal system, linear and non-liner system, stable and unstable system.

b) State whether the system $y(t) = x^2(t - t_0) + 2$ is linear, causal, time variant and dynamic.

c) A continuous time signal is defined as, $x(t) = \begin{cases} t; & 0 \le t \le 3 \\ 0; & t > 3 \end{cases}$

Sketch the waveform of
i) $-x(t)$
ii) $x(-t)$
iii) $x(2-3t)$

SECTION – II

Q.4 Attempt Any Four. **16**

a) Explain following properties for Continuous Time Fourier Transform.
   i) Linearity
   ii) Time shifting
   iii) Time scaling

b) Represent the discrete time signal in terms of impulse.

c) Find 4 points DFT for a signal defined as, $x[n] = \{1,2,3,4\}$

d) Explain Linearity and Time shifting Property for Z transform.

e) Give the Property of Region of Conversion.

f) Find Z-Transform of the signal $x[n] = (a)^n\, u(n)$.

Q.5 Attempt Any Two. **12**

a) Explain magnitude and phase spectrum for Fourier Transform.

b) Find the inverse Z-Transform of the $X(z) = \frac{1+2z+3z^2}{2+3z+z^2}$ using partial fraction method.

c) Determine the Fourier Transform of Gaussian Pulse $x(t) = e^{-b^2t^2}$

Seat No.	

Set **Q**

Fourth. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Signals and System (BTN07702)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

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MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Multiple Choice Questions. **14**

1) Fourier series of any periodic signal $x(t)$ can only be obtained if, _____.
a) finite number of discontinuities within finite time interval, T
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2) Fourier transform of the signum function, $x(t) = sgn(t)$ is _____.
a) $\frac{2}{\omega}$ b) $\frac{2}{j\omega}$
c) $\frac{2}{(j\omega)^2}$ d) $-\frac{2}{j\omega}$

3) If all the poles of the system function H(z) have magnitude smaller than 1, then the system will be, _____.
a) stable b) unstable
c) BIBO stable d) a and c

4) If $x(n)$ and $X(k)$ are an N-point DFT pair, then the value of $X(k + N)$ ____
a) $X(-k)$ b) $-X(k)$
c) $X(k)$ d) None of the above

5) If Fourier transform of $x(t)$ is $X(\omega)$, then Fourier Transform of $e^{-j\omega_0 t}x(t)$ is _____.
a) $\frac{X(\omega)}{\omega_0}$ b) $X(\omega - \omega_0)$
c) $X(\omega + \omega_0)$ d) $\omega_0 X(\omega)$

6) Bit reversing is required for both DIT and DIF algorithms _____.
a) DIT
b) DIF
c) Both DIT and DIF
d) None of these

7) The Z-transform is a, _____.
a) finite series
b) infinite power series
c) geometric series
d) both a and c

8) Mathematically unit step is an integral of _____.
a) Unit step
b) Unit ramp
c) Unit parabola
d) Unit Impulse

9) Convolution of two unequal width rectangular signals will give resultant as _____.
a) Trapezoidal
b) Square
c) Triangular
d) None of the above

10) If $x[4 - n]$ is derived from the $x[n]$ by which transformation _____.
a) reversal and shift
b) reversal only
c) scaling
d) scaling and shifting

11) With $u[n]$ as unit step function, $u[n] - u[n-2]$ is, _____.
a) $\delta[n]$
b) $\delta[n] + \delta[n-1]$
c) $\delta[n] - \delta[n-2]$
d) $\delta[n] + \delta[n+1]$

12) For energy signal, the energy will be finite and the average power will be _____.
a) infinite
b) finite
c) zero
d) cannot be defined

13) Which of the following signal is causal signal?
a) $x(t) = A$
b) $x(t) = t$
c) $x(t) = u(t)$
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14) An LTI system is stable, if the impulse response is _____.
a) $\sum_{n=-\infty}^{\infty} |h(n)| = 0$
b) $\sum_{n=-\infty}^{\infty} |h(n)| < \infty$
c) $\sum_{n=-\infty}^{\infty} |h(n)| \neq 0$
d) Either a or b

Seat No.	

Set **Q**

Fourth. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Signals and System (BTN07702)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Consider data whenever necessary.

SECTION – I

Q.2 Attempt Any Four. **16**

a) Explain basic properties of the LTI system.

b) Perform the convolution of the following signals
$x(t) = u(t)$ and $h(t) = e^{-5t}u(t)$

c) Draw following discrete time signal in graphical form
$x(-3) = -1, x(-2) = 2, x(-1) = 0, x(0) = 1, x(1) = 2, x(2) = 3, x(3) = 2$

d) Check the causality of the system defined as,
$y(t) = x^2(t) + x(t-2)$

e) Explain the terms Time-Invariant and Time-Variant System, with examples.

f) Find the even and odd signal of signal defined as,
$x(t) = \cos(t) + \sin(t) + \cos(t)\sin(t)$

Q.3 Attempt Any Two. **12**

a) Define the following related to systems- Continuous and discrete system. Lumped parameter and distributed parameter system, static and dynamic system, causal and non-causal system, linear and non-liner system, stable and unstable system.

b) State whether the system $y(t) = x^2(t - t_0) + 2$ is linear, causal, time variant and dynamic.

c) A continuous time signal is defined as, $x(t) = \begin{cases} t; & 0 \le t \le 3 \\ 0; & t > 3 \end{cases}$

Sketch the waveform of
i) $-x(t)$
ii) $x(-t)$
iii) $x(2-3t)$

SECTION – II

Q.4 Attempt Any Four. **16**

a) Explain following properties for Continuous Time Fourier Transform.
   i) Linearity
   ii) Time shifting
   iii) Time scaling

b) Represent the discrete time signal in terms of impulse.

c) Find 4 points DFT for a signal defined as, $x[n] = \{1,2,3,4\}$

d) Explain Linearity and Time shifting Property for Z transform.

e) Give the Property of Region of Conversion.

f) Find Z-Transform of the signal $x[n] = (a)^n\, u(n)$.

Q.5 Attempt Any Two. **12**

a) Explain magnitude and phase spectrum for Fourier Transform.

b) Find the inverse Z-Transform of the $X(z) = \frac{1+2z+3z^2}{2+3z+z^2}$ using partial fraction method.

c) Determine the Fourier Transform of Gaussian Pulse $x(t) = e^{-b^2t^2}$

Seat No.	

Set **R**

Fourth. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Signals and System (BTN07702)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark
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4) Consider data whenever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Multiple Choice Questions. **14**

1) If $x(n)$ and $X(k)$ are an N-point DFT pair, then the value of $X(k + N)$ _____
a) $X(-k)$ b) $-X(k)$
c) $X(k)$ d) None of the above

2) If Fourier transform of $x(t)$ is $X(\omega)$, then Fourier Transform of $e^{-j\omega_0 t}x(t)$ is _____.
a) $\frac{X(\omega)}{\omega_0}$ b) $X(\omega - \omega_0)$
c) $X(\omega + \omega_0)$ d) $\omega_0 X(\omega)$

3) Bit reversing is required for both DIT and DIF algorithms _____.
a) DIT b) DIF
c) Both DIT and DIF d) None of these

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5) Mathematically unit step is an integral of _____.
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c) scaling
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8) With $u[n]$ as unit step function, $u[n] - u[n-2]$ is, _____.
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a) $x(t) = A$
b) $x(t) = t$
c) $x(t) = u(t)$
d) $x(t) = e^{-at}$

11) An LTI system is stable, if the impulse response is _____.
a) $\sum_{n=-\infty}^{\infty} |h(n)| = 0$
b) $\sum_{n=-\infty}^{\infty} |h(n)| < \infty$
c) $\sum_{n=-\infty}^{\infty} |h(n)| \neq 0$
d) Either a or b

12) Fourier series of any periodic signal $x(t)$ can only be obtained if, _____.
a) finite number of discontinuities within finite time interval, T
b) finite number of positive and negative maxima in the period, T
c) well defined at infinite number of points
d) both (a) and (b)

13) Fourier transform of the signum function, $x(t) = sgn(t)$ is _____.
a) $\frac{2}{\omega}$
b) $\frac{2}{j\omega}$
c) $\frac{2}{(j\omega)^2}$
d) $-\frac{2}{j\omega}$

14) If all the poles of the system function H(z) have magnitude smaller than 1, then the system will be, _____.
a) stable
b) unstable
c) BIBO stable
d) a and c

Seat No.	

Set **R**

Fourth. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Signals and System (BTN07702)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Consider data whenever necessary.

SECTION – I

Q.2 Attempt Any Four. **16**

a) Explain basic properties of the LTI system.

b) Perform the convolution of the following signals
$x(t) = u(t)$ and $h(t) = e^{-5t}u(t)$

c) Draw following discrete time signal in graphical form
$x(-3) = -1, x(-2) = 2, x(-1) = 0, x(0) = 1, x(1) = 2, x(2) = 3, x(3) = 2$

d) Check the causality of the system defined as,
$y(t) = x^2(t) + x(t-2)$

e) Explain the terms Time-Invariant and Time-Variant System, with examples.

f) Find the even and odd signal of signal defined as,
$x(t) = \cos(t) + \sin(t) + \cos(t)\sin(t)$

Q.3 Attempt Any Two. **12**

a) Define the following related to systems- Continuous and discrete system. Lumped parameter and distributed parameter system, static and dynamic system, causal and non-causal system, linear and non-liner system, stable and unstable system.

b) State whether the system $y(t) = x^2(t - t_0) + 2$ is linear, causal, time variant and dynamic.

c) A continuous time signal is defined as, $x(t) = \begin{cases} t; & 0 \le t \le 3 \\ 0; & t > 3 \end{cases}$

Sketch the waveform of
i) $-x(t)$
ii) $x(-t)$
iii) $x(2-3t)$

SECTION – II

Q.4 Attempt Any Four. **16**

a) Explain following properties for Continuous Time Fourier Transform.
   i) Linearity
   ii) Time shifting
   iii) Time scaling

b) Represent the discrete time signal in terms of impulse.

c) Find 4 points DFT for a signal defined as, $x[n] = \{1,2,3,4\}$

d) Explain Linearity and Time shifting Property for Z transform.

e) Give the Property of Region of Conversion.

f) Find Z-Transform of the signal $x[n] = (a)^n\, u(n)$.

Q.5 Attempt Any Two. **12**

a) Explain magnitude and phase spectrum for Fourier Transform.

b) Find the inverse Z-Transform of the $X(z) = \frac{1+2z+3z^2}{2+3z+z^2}$ using partial fraction method.

c) Determine the Fourier Transform of Gaussian Pulse $x(t) = e^{-b^2t^2}$

Seat No.	

Set **S**

Fourth. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Signals and System (BTN07702)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark
2) Don't forget to Mention question paper set (P/Q/R/S) on top on page.
3) Figures to the right indicates full marks.
4) Consider data whenever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Multiple Choice Questions. **14**

1) Which of the following signal is causal signal?
a) $x(t) = A$ b) $x(t) = t$
c) $x(t) = u(t)$ d) $x(t) = e^{-at}$

2) An LTI system is stable, if the impulse response is _____.
a) $\sum_{n=-\infty}^{\infty} |h(n)| = 0$ b) $\sum_{n=-\infty}^{\infty} |h(n)| < \infty$
c) $\sum_{n=-\infty}^{\infty} |h(n)| \neq 0$ d) Either a or b

3) Fourier series of any periodic signal $x(t)$ can only be obtained if, _____.
a) finite number of discontinuities within finite time interval, T
b) finite number of positive and negative maxima in the period, T
c) well defined at infinite number of points
d) both (a) and (b)

4) Fourier transform of the signum function, $x(t) = sgn(t)$ is _____.
a) $\frac{2}{\omega}$ b) $\frac{2}{j\omega}$
c) $\frac{2}{(j\omega)^2}$ d) $-\frac{2}{j\omega}$

5) If all the poles of the system function H(z) have magnitude smaller than 1, then the system will be, _____.
a) stable b) unstable
c) BIBO stable d) a and c

6) If $x(n)$ and $X(k)$ are an N-point DFT pair, then the value of $X(k + N)$ _____

a) $X(-k)$ b) $-X(k)$

c) $X(k)$ d) None of the above

7) If Fourier transform of $x(t)$ is $X(\omega)$, then Fourier Transform of $e^{-j\omega_0 t}x(t)$ is _____.

a) $\frac{X(\omega)}{\omega_0}$ b) $X(\omega - \omega_0)$

c) $X(\omega + \omega_0)$ d) $\omega_0 X(\omega)$

8) Bit reversing is required for both DIT and DIF algorithms _____.

a) DIT b) DIF

c) Both DIT and DIF d) None of these

9) The Z-transform is a, _____.

a) finite series b) infinite power series

c) geometric series d) both a and c

10) Mathematically unit step is an integral of _____.

a) Unit step b) Unit ramp

c) Unit parabola d) Unit Impulse

11) Convolution of two unequal width rectangular signals will give resultant as _____.

a) Trapezoidal b) Square

c) Triangular d) None of the above

12) If $x[4 - n]$ is derived from the $x[n]$ by which transformation _____.

a) reversal and shift b) reversal only

c) scaling d) scaling and shifting

13) With $u[n]$ as unit step function, $u[n] - u[n-2]$ is, _____.

a) $\delta[n]$ b) $\delta[n] + \delta[n-1]$

c) $\delta[n] - \delta[n-2]$ d) $\delta[n] + \delta[n+1]$

14) For energy signal, the energy will be finite and the average power will be _____.

a) infinite b) finite

c) zero d) cannot be defined

Seat No.	

Set **S**

Fourth. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Signals and System (BTN07702)

Day & Date: Tuesday, 05-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Consider data whenever necessary.

SECTION – I

Q.2 Attempt Any Four. **16**

a) Explain basic properties of the LTI system.

b) Perform the convolution of the following signals
$x(t) = u(t)$ and $h(t) = e^{-5t}u(t)$

c) Draw following discrete time signal in graphical form
$x(-3) = -1, x(-2) = 2, x(-1) = 0, x(0) = 1, x(1) = 2, x(2) = 3, x(3) = 2$

d) Check the causality of the system defined as,
$y(t) = x^2(t) + x(t-2)$

e) Explain the terms Time-Invariant and Time-Variant System, with examples.

f) Find the even and odd signal of signal defined as,
$x(t) = \cos(t) + \sin(t) + \cos(t)\sin(t)$

Q.3 Attempt Any Two. **12**

a) Define the following related to systems- Continuous and discrete system. Lumped parameter and distributed parameter system, static and dynamic system, causal and non-causal system, linear and non-liner system, stable and unstable system.

b) State whether the system $y(t) = x^2(t - t_0) + 2$ is linear, causal, time variant and dynamic.

c) A continuous time signal is defined as, $x(t) = \begin{cases} t; & 0 \le t \le 3 \\ 0; & t > 3 \end{cases}$

Sketch the waveform of
i) $-x(t)$
ii) $x(-t)$
iii) $x(2-3t)$

SECTION – II

Q.4 Attempt Any Four. **16**

a) Explain following properties for Continuous Time Fourier Transform.
   i) Linearity
   ii) Time shifting
   iii) Time scaling

b) Represent the discrete time signal in terms of impulse.

c) Find 4 points DFT for a signal defined as, $x[n] = \{1,2,3,4\}$

d) Explain Linearity and Time shifting Property for Z transform.

e) Give the Property of Region of Conversion.

f) Find Z-Transform of the signal $x[n] = (a)^n\, u(n)$.

Q.5 Attempt Any Two. **12**

a) Explain magnitude and phase spectrum for Fourier Transform.

b) Find the inverse Z-Transform of the $X(z) = \frac{1+2z+3z^2}{2+3z+z^2}$ using partial fraction method.

c) Determine the Fourier Transform of Gaussian Pulse $x(t) = e^{-b^2t^2}$

SLR-QH-614

Seat No.	

Set P

Fourth. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Switchgear and Protection (BTN07703)

Day & Date: Thursday, 07-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top on page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answers. **14**

1) Relay gets its operating energy from _____.
a) transformer b) alternator
c) overhead lines d) C.T. & P.T.

2) Back up protection is needed for _____.
a) over voltage b) short circuits
c) over current d) all of these

3) Protection by fuses is generally not used beyond _____.
a) 20 A b) 50 A
c) 100 A d) 200 A

4) H.R.C. fuses provide best protection against _____.
a) overload b) reverse current
c) open-circuits d) short-circuits

5) Directional relays are based on flow of _____.
a) power b) current
c) voltage wave d) all of the above

6) Admittance relay is _____.
a) Non-directional relay b) Directional relay
c) Differential relay d) All of the above

7) Relays are used for phase faults on long line _____.
a) Impedance b) Reactance
c) Either of the above d) None of the above

8) Over fluxing protection is recommended for _____.
a) Distribution transformer
b) Generator transformer of the power plant
c) Auto-transformer of the power plant
d) Station transformer of the power plant

9) To limit short-circuit current in a power system are used _____.
a) Earth wires
b) Isolators
c) H.R.C. fuses
d) Reactors

10) Recovery voltage is the value of rms voltage that reappears across the poles of a circuit breaker before _____.
a) Restriking voltage
b) Final arc extinction
c) Rise of voltage
d) All of the above

11) How is the restriking voltage measured?
a) RMS value
b) Peak value
c) Instantaneous value
d) Average value

12) What is the main purpose of oil in oil circuit breakers?
a) Provide insulation
b) Quenching arc
c) Provide cooling of contacts
d) None of the above

13) What is the most important property which makes the SF_6 very efficient medium for circuit breaking?
a) It is nontoxic and non-inflammable
b) Has a high dielectric constant
c) Has a high breakdown strength
d) It is highly electronegative gas

14) The over-voltage surges in power systems may be caused by _____.
a) Lightning
b) Switching
c) Resonance
d) Any of the above

SLR-QH-614

Seat No.	

Set P

Fourth. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Switchgear and Protection (BTN07703)

Day & Date: Thursday, 07-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicates full marks.
3) Assume suitable data if required.

SECTION – I

Q.2 Solve any Four. **16**

a) What do you mean by zones of protection? Explain primary and backup protection?

b) Explain microprocessor based relay with block diagram.

c) Discuss the overcurrent protective scheme for radial and ring main feeder.

d) What different types of fuse? Explain construction and operation of HRC fuse with neat diagram?

e) Explain now impedance relay is used for distance protection with its characteristics.

f) Describe microprocessor based reactance relay with block diagram and flow chart to realize its characteristics.

Q.3 Solve any Two. **12**

a) Derive torque equation for induction relay in detail.

b) Explain microprocessor based overcurrent relay with block diagram.

c) Describe microprocessor based impedance relay with block diagram with its flow chart in detail.

SECTION – II

Q.4 Solve any Four. **16**

a) Explain differential protection of bus bar with neat diagram.

b) Briefly describe MCB and MCCB with neat diagram.

c) Explain the phenomenon of capacitive current interruption with suitable waveforms.

d) What are the causes of over voltages in power system?

e) Explain different methods of testing of circuit breaker.

f) Explain protection of induction motor for different faults.

Q.5 Attempt any Two. **12**

a) With neat sketch explain construction & operation of air blast circuit breaker with their types.

b) Derive an expression of Restriking voltage & RRRV in terms of system voltage, inductance and capacitance.

c) Explain the protection of generator against
- i) Motoring action
- ii) Overheating
- iii) Excitation failure

Seat No.	

Set **Q**

Fourth. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Switchgear and Protection (BTN07703)

Day & Date: Thursday, 07-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top on page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answers. **14**

1) Over fluxing protection is recommended for _____.
a) Distribution transformer
b) Generator transformer of the power plant
c) Auto-transformer of the power plant
d) Station transformer of the power plant

2) To limit short-circuit current in a power system are used _____.
a) Earth wires b) Isolators
c) H.R.C. fuses d) Reactors

3) Recovery voltage is the value of rms voltage that reappears across the poles of a circuit breaker before _____.
a) Restriking voltage b) Final arc extinction
c) Rise of voltage d) All of the above

4) How is the restriking voltage measured?
a) RMS value b) Peak value
c) Instantaneous value d) Average value

5) What is the main purpose of oil in oil circuit breakers?
a) Provide insulation b) Quenching arc
c) Provide cooling of contacts d) None of the above

6) What is the most important property which makes the SF_6 very efficient medium for circuit breaking?
a) It is nontoxic and non-inflammable
b) Has a high dielectric constant
c) Has a high breakdown strength
d) It is highly electronegative gas

7) The over-voltage surges in power systems may be caused by _____.
a) Lightning b) Switching
c) Resonance d) Any of the above

8) Relay gets its operating energy from _____.
a) transformer b) alternator
c) overhead lines d) C.T. & P.T.

9) Back up protection is needed for _____.
a) over voltage b) short circuits
c) over current d) all of these

10) Protection by fuses is generally not used beyond _____.
a) 20 A b) 50 A
c) 100 A d) 200 A

11) H.R.C. fuses provide best protection against _____.
a) overload b) reverse current
c) open-circuits d) short-circuits

12) Directional relays are based on flow of _____.
a) power b) current
c) voltage wave d) all of the above

13) Admittance relay is _____.
a) Non-directional relay b) Directional relay
c) Differential relay d) All of the above

14) Relays are used for phase faults on long line _____.
a) Impedance b) Reactance
c) Either of the above d) None of the above

Seat No.	

Set **Q**

Fourth. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Switchgear and Protection (BTN07703)

Day & Date: Thursday, 07-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicates full marks.
3) Assume suitable data if required.

SECTION – I

Q.2 Solve any Four. **16**

a) What do you mean by zones of protection? Explain primary and backup protection?

b) Explain microprocessor based relay with block diagram.

c) Discuss the overcurrent protective scheme for radial and ring main feeder.

d) What different types of fuse? Explain construction and operation of HRC fuse with neat diagram?

e) Explain now impedance relay is used for distance protection with its characteristics.

f) Describe microprocessor based reactance relay with block diagram and flow chart to realize its characteristics.

Q.3 Solve any Two. **12**

a) Derive torque equation for induction relay in detail.

b) Explain microprocessor based overcurrent relay with block diagram.

c) Describe microprocessor based impedance relay with block diagram with its flow chart in detail.

SECTION – II

Q.4 Solve any Four. **16**

a) Explain differential protection of bus bar with neat diagram.

b) Briefly describe MCB and MCCB with neat diagram.

c) Explain the phenomenon of capacitive current interruption with suitable waveforms.

d) What are the causes of over voltages in power system?

e) Explain different methods of testing of circuit breaker.

f) Explain protection of induction motor for different faults.

Q.5 Attempt any Two. **12**

a) With neat sketch explain construction & operation of air blast circuit breaker with their types.

b) Derive an expression of Restriking voltage & RRRV in terms of system voltage, inductance and capacitance.

c) Explain the protection of generator against
- i) Motoring action
- ii) Overheating
- iii) Excitation failure

Seat No.	

Set **R**

Fourth. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Switchgear and Protection (BTN07703)

Day & Date: Thursday, 07-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top on page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answers. **14**

1) How is the restriking voltage measured?
a) RMS value b) Peak value
c) Instantaneous value d) Average value

2) What is the main purpose of oil in oil circuit breakers?
a) Provide insulation b) Quenching arc
c) Provide cooling of contacts d) None of the above

3) What is the most important property which makes the SF_6 very efficient medium for circuit breaking?
a) It is nontoxic and non-inflammable
b) Has a high dielectric constant
c) Has a high breakdown strength
d) It is highly electronegative gas

4) The over-voltage surges in power systems may be caused by _____.
a) Lightning b) Switching
c) Resonance d) Any of the above

5) Relay gets its operating energy from _____.
a) transformer b) alternator
c) overhead lines d) C.T. & P.T.

6) Back up protection is needed for _____.
a) over voltage b) short circuits
c) over current d) all of these

7) Protection by fuses is generally not used beyond _____.
a) 20 A b) 50 A
c) 100 A d) 200 A

8) H.R.C. fuses provide best protection against _____.
a) overload b) reverse current
c) open-circuits d) short-circuits

9) Directional relays are based on flow of _____.
a) power b) current
c) voltage wave d) all of the above

10) Admittance relay is _____.
a) Non-directional relay b) Directional relay
c) Differential relay d) All of the above

11) Relays are used for phase faults on long line _____.
a) Impedance b) Reactance
c) Either of the above d) None of the above

12) Over fluxing protection is recommended for _____.
a) Distribution transformer
b) Generator transformer of the power plant
c) Auto-transformer of the power plant
d) Station transformer of the power plant

13) To limit short-circuit current in a power system are used _____.
a) Earth wires b) Isolators
c) H.R.C. fuses d) Reactors

14) Recovery voltage is the value of rms voltage that reappears across the poles of a circuit breaker before _____.
a) Restriking voltage b) Final arc extinction
c) Rise of voltage d) All of the above

SLR-QH-614

Seat No.	

Set R

Fourth. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Switchgear and Protection (BTN07703)

Day & Date: Thursday, 07-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicates full marks.
3) Assume suitable data if required.

SECTION – I

Q.2 Solve any Four. **16**

a) What do you mean by zones of protection? Explain primary and backup protection?

b) Explain microprocessor based relay with block diagram.

c) Discuss the overcurrent protective scheme for radial and ring main feeder.

d) What different types of fuse? Explain construction and operation of HRC fuse with neat diagram?

e) Explain now impedance relay is used for distance protection with its characteristics.

f) Describe microprocessor based reactance relay with block diagram and flow chart to realize its characteristics.

Q.3 Solve any Two. **12**

a) Derive torque equation for induction relay in detail.

b) Explain microprocessor based overcurrent relay with block diagram.

c) Describe microprocessor based impedance relay with block diagram with its flow chart in detail.

SECTION – II

Q.4 Solve any Four. **16**

a) Explain differential protection of bus bar with neat diagram.

b) Briefly describe MCB and MCCB with neat diagram.

c) Explain the phenomenon of capacitive current interruption with suitable waveforms.

d) What are the causes of over voltages in power system?

e) Explain different methods of testing of circuit breaker.

f) Explain protection of induction motor for different faults.

Q.5 Attempt any Two. **12**

a) With neat sketch explain construction & operation of air blast circuit breaker with their types.

b) Derive an expression of Restriking voltage & RRRV in terms of system voltage, inductance and capacitance.

c) Explain the protection of generator against
- i) Motoring action
- ii) Overheating
- iii) Excitation failure

Seat No.	

Set **S**

Fourth. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Switchgear and Protection (BTN07703)

Day & Date: Thursday, 07-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top on page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answers. **14**

1) Admittance relay is _____.
a) Non-directional relay b) Directional relay
c) Differential relay d) All of the above

2) Relays are used for phase faults on long line _____.
a) Impedance b) Reactance
c) Either of the above d) None of the above

3) Over fluxing protection is recommended for _____.
a) Distribution transformer
b) Generator transformer of the power plant
c) Auto-transformer of the power plant
d) Station transformer of the power plant

4) To limit short-circuit current in a power system are used _____.
a) Earth wires b) Isolators
c) H.R.C. fuses d) Reactors

5) Recovery voltage is the value of rms voltage that reappears across the poles of a circuit breaker before _____.
a) Restriking voltage b) Final arc extinction
c) Rise of voltage d) All of the above

6) How is the restriking voltage measured?
a) RMS value b) Peak value
c) Instantaneous value d) Average value

7) What is the main purpose of oil in oil circuit breakers?
a) Provide insulation b) Quenching arc
c) Provide cooling of contacts d) None of the above

8) What is the most important property which makes the SF_6 very efficient medium for circuit breaking?
a) It is nontoxic and non-inflammable
b) Has a high dielectric constant
c) Has a high breakdown strength
d) It is highly electronegative gas

9) The over-voltage surges in power systems may be caused by _____.
a) Lightning b) Switching
c) Resonance d) Any of the above

10) Relay gets its operating energy from _____.
a) transformer b) alternator
c) overhead lines d) C.T. & P.T.

11) Back up protection is needed for _____.
a) over voltage b) short circuits
c) over current d) all of these

12) Protection by fuses is generally not used beyond _____.
a) 20 A b) 50 A
c) 100 A d) 200 A

13) H.R.C. fuses provide best protection against _____.
a) overload b) reverse current
c) open-circuits d) short-circuits

14) Directional relays are based on flow of _____.
a) power b) current
c) voltage wave d) all of the above

SLR-QH-614

Seat No.	

Set S

Fourth. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Switchgear and Protection (BTN07703)

Day & Date: Thursday, 07-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicates full marks.
3) Assume suitable data if required.

SECTION – I

Q.2 Solve any Four. **16**

a) What do you mean by zones of protection? Explain primary and backup protection?

b) Explain microprocessor based relay with block diagram.

c) Discuss the overcurrent protective scheme for radial and ring main feeder.

d) What different types of fuse? Explain construction and operation of HRC fuse with neat diagram?

e) Explain now impedance relay is used for distance protection with its characteristics.

f) Describe microprocessor based reactance relay with block diagram and flow chart to realize its characteristics.

Q.3 Solve any Two. **12**

a) Derive torque equation for induction relay in detail.

b) Explain microprocessor based overcurrent relay with block diagram.

c) Describe microprocessor based impedance relay with block diagram with its flow chart in detail.

SECTION – II

Q.4 Solve any Four. **16**

a) Explain differential protection of bus bar with neat diagram.

b) Briefly describe MCB and MCCB with neat diagram.

c) Explain the phenomenon of capacitive current interruption with suitable waveforms.

d) What are the causes of over voltages in power system?

e) Explain different methods of testing of circuit breaker.

f) Explain protection of induction motor for different faults.

Q.5 Attempt any Two. **12**

a) With neat sketch explain construction & operation of air blast circuit breaker with their types.

b) Derive an expression of Restriking voltage & RRRV in terms of system voltage, inductance and capacitance.

c) Explain the protection of generator against
- i) Motoring action
- ii) Overheating
- iii) Excitation failure

SLR-QH-616

Seat No.	

Set P

Fourth. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Power System and Operation Control (BTN07707)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

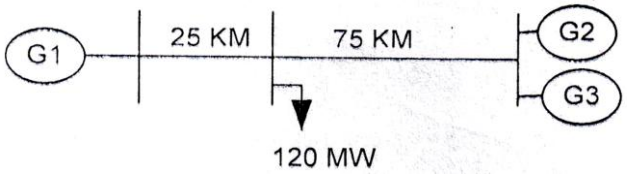
Instructions: 1) Q. No. 1 is compulsory. It should be solved in first 30 Minutes in Answer Book Each question carries one mark.
2) All questions are compulsory.
3) Figures to the right indicates full marks.
4) Assume suitable data whenever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the option: **14**

1) A load Centre of 120 MW derives power from two power stations connected by 220 KV transmission lines of 25 KM and 75 Km as shown in the figure below



The generators G1, G2 & G3 are of 100 MW capacity each and have identical fuel cost characteristics. The minimum loss generation schedule for supplying the 120 MW load is

a) P1 = 80 MW + Losses; P2 = 20 MW; P3 = 20 MW
b) P1 = 60 MW; P2 = 20 MW; P3 = 40 MW + Losses
c) P1 = 40 MW; P2 = 40 MW; P3 = 40 MW + Losses
d) P1 = 30 MW + Losses; P2 = 45 MW; P3 = 45 MW

2) Unit of λ (Lagrange Multiplier) and B (loss coefficient) are _____.

a) Rs/Kwhr, Unitless
b) Rs/Kwhr, KW^{-1}
c) Rs/Kg, KW^{-1}
d) Rs/hr, KW^{-1}

3) If Kinetic energy of generator reduces _____.

a) Power decreases
b) Speed falls
c) Frequency Reduces
d) All of the above

4) Balance of real power maintains steady _____.

a) Voltage
b) Cost
c) Frequency
d) Voltage and frequency

5) Spinning reserve is defined as _____.
   a) [Total generation output of all synchronized units at a particular time] + [load at that time + losses at that time]
   b) [Total generation output of all synchronized units at a particular time] − [load at that time − losses at that time]
   c) [Total generation output of all synchronized units at a particular time] − [load at that time + losses at that time]
   d) None of these

6) In the DP method, the cost function $F_N(X)$ Represents _____.
   a) Minimum cost in Rs/hr of Generation of N MW by X number of units.
   b) Minimum cost in Rs/hr of Generation of X MW by N number of units.
   c) Minimum cost in Rs/hr of Generation of N MW by X^{th} unit.
   d) Minimum cost in Rs/hr of Generation of X MW by N^{th} unit.

7) In synchronous condensers, leading VARS are produced by _____.
   a) Increasing Field Current
   b) Decreasing Field Current
   c) Increasing speed of the machine
   d) Decreasing speed of the machine

8) KVAR is equal to _____.
   a) $\mathrm{KW}\sin\theta$
   b) $\mathrm{KW}\cos\theta$
   c) $\mathrm{KVA}\cos\theta$
   d) $\mathrm{KW}\tan\theta$

9) A Unit when scheduled for connection to the system is said to be _____.
   a) Loaded
   b) Disconnected
   c) Hot reserve
   d) Committed

10) Rating of Compensator is given in _____.
   a) MW
   b) KVAr
   c) pf
   d) None of these

11) In Contingency Ranking, the severest fault will be ranked _____.
   a) 1
   b) Last
   c) Will depend on type of fault
   d) Will depend on duration of fault

12) In a network with 4 generators and 25 lines, the number of generations shift factors are _____.
   a) 4
   b) 25
   c) 100
   d) 96

13) Voltage stability in power systems refers to _____.
   a) The ability of the system to maintain steady voltages at all buses
   b) The ability of the system to generate power continuously
   c) The efficiency of transmission lines
   d) The reduction of system losses

14) Which factor can significantly affect voltage stability?

a) Load demand
b) Generator output
c) Transmission line reactance
d) All of the above

Seat No.	

Set | P

Fourth. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Power System and Operation Control (BTN07707)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All Questions are compulsory.
2) Figures to the right indicates full marks.
3) Assume the suitable data whenever necessary.

SECTION – I

Q.2 Attempt any Four. **16**

a) Explain with mathematical formulation the economic load dispatch including transmission losses.

b) Write short note incremental production cost on thermal power plant.

c) Explain the priority list method for unit commitment with suitable example.

d) Discuss the importance of short-term hydro thermal co-ordination.

e) List the advantages of interconnected operation of power system.

f) Explain Speed regulation parameter with neat sketches.

Q.3 Solve Any Two. **12**

a) In a system with two plants the incremental fuel cost are given by $dF_1/dP_1 = 0.01\ P_1 + 20$ Rs./MW-hour & $dC_2/dP_2 = 0.015P_2 + 22.5$ Rs./MW-hour. The system is running under an optimal schedule with $P_1 = P_2 = 100$ MW. If $dP_L/P_2 = 0.22$. Find Penalty Factor and dP_L/dP_1.

b) Explain with illustrative transfer function of the load frequency control of two area system.

c) Define the unit commitment & explain the following concepts with reference to unit commitment.
i) Minimum up time and Minimum down time
ii) Fuel constraint
iii) Must Run
iv) Hydro constraint

SECTION – II

Q.4 Attempt Any Four. **16**

a) What is line compensation? Why is it necessary?

b) Explain power system voltage stability.

c) Write a short note on sensitivity factor.

d) Explain Series Compensator and draw phasor diagram.

e) Give the explanation of system state classification.

f) Explain Security Analysis.

Q.5 Attempt Any Two. **12**

a) Name the sources of reactive power. Discuss the sources of reactive power. Discuss any two of these sources in detail.

b) Write a short note on with reference to voltage stability
   i) State of art
   ii) Future trends and challenges

c) What are the classification system state security? Explain in brief Contingency Analysis.

SLR-QH-616

Seat No.	

Set Q

Fourth. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Power System and Operation Control (BTN07707)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in first 30 Minutes in Answer Book Each question carries one mark.
2) All questions are compulsory.
3) Figures to the right indicates full marks.
4) Assume suitable data whenever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the option: 14

1) KVAR is equal to _____.
a) $\mathrm{KW}\sin\theta$ b) $\mathrm{KW}\cos\theta$
c) $\mathrm{KVA}\cos\theta$ d) $\mathrm{KW}\tan\theta$

2) A Unit when scheduled for connection to the system is said to be _____.
a) Loaded b) Disconnected
c) Hot reserve d) Committed

3) Rating of Compensator is given in _____.
a) MW b) KVAr
c) pf d) None of these

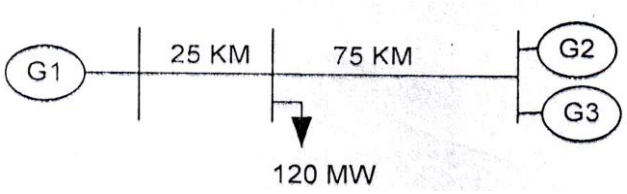
4) In Contingency Ranking, the severest fault will be ranked _____.
a) 1 b) Last
c) Will depend on type of fault d) Will depend on duration of fault

5) In a network with 4 generators and 25 lines, the number of generations shift factors are _____.
a) 4 b) 25
c) 100 d) 96

6) Voltage stability in power systems refers to _____.
a) The ability of the system to maintain steady voltages at all buses
b) The ability of the system to generate power continuously
c) The efficiency of transmission lines
d) The reduction of system losses

7) Which factor can significantly affect voltage stability?
a) Load demand b) Generator output
c) Transmission line reactance d) All of the above

8) A load Centre of 120 MW derives power from two power stations connected by 220 KV transmission lines of 25 KM and 75 Km as shown in the figure below



The generators G1, G2 & G3 are of 100 MW capacity each and have identical fuel cost characteristics. The minimum loss generation schedule for supplying the 120 MW load is

a) P1 = 80 MW + Losses; P2 = 20 MW; P3 = 20 MW
b) P1 = 60 MW; P2 = 20 MW; P3 = 40 MW + Losses
c) P1 = 40 MW; P2 = 40 MW; P3 = 40 MW + Losses
d) P1 = 30 MW + Losses; P2 = 45 MW; P3 = 45 MW

9) Unit of λ (Lagrange Multiplier) and B (loss coefficient) are _____.

a) Rs/Kwhr, Unitless
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a) Voltage
b) Cost
c) Frequency
d) Voltage and frequency

12) Spinning reserve is defined as _____.

a) [Total generation output of all synchronized units at a particular time] + [load at that time + losses at that time]
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d) None of these

13) In the DP method, the cost function $F_N(X)$ Represents _____.

a) Minimum cost in Rs/hr of Generation of N MW by X number of units.
b) Minimum cost in Rs/hr of Generation of X MW by N number of units.
c) Minimum cost in Rs/hr of Generation of N MW by X^{th} unit.
d) Minimum cost in Rs/hr of Generation of X MW by N^{th} unit.

14) In synchronous condensers, leading VARS are produced by _____.

a) Increasing Field Current
b) Decreasing Field Current
c) Increasing speed of the machine
d) Decreasing speed of the machine

Seat No.	

Set **Q**

Fourth. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Power System and Operation Control (BTN07707)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All Questions are compulsory.
2) Figures to the right indicates full marks.
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SECTION – I

Q.2 Attempt any Four. **16**

a) Explain with mathematical formulation the economic load dispatch including transmission losses.

b) Write short note incremental production cost on thermal power plant.

c) Explain the priority list method for unit commitment with suitable example.

d) Discuss the importance of short-term hydro thermal co-ordination.

e) List the advantages of interconnected operation of power system.

f) Explain Speed regulation parameter with neat sketches.

Q.3 Solve Any Two. **12**

a) In a system with two plants the incremental fuel cost are given by $dF_1/dP_1 = 0.01\ P_1 + 20$ Rs./MW-hour & $dC_2/dP_2 = 0.015P_2 + 22.5$ Rs./MW-hour. The system is running under an optimal schedule with $P_1 = P_2 = 100$ MW. If $dP_L/P_2 = 0.22$. Find Penalty Factor and dP_L/dP_1.

b) Explain with illustrative transfer function of the load frequency control of two area system.

c) Define the unit commitment & explain the following concepts with reference to unit commitment.
i) Minimum up time and Minimum down time
ii) Fuel constraint
iii) Must Run
iv) Hydro constraint

SECTION – II

Q.4 Attempt Any Four. **16**

a) What is line compensation? Why is it necessary?

b) Explain power system voltage stability.

c) Write a short note on sensitivity factor.

d) Explain Series Compensator and draw phasor diagram.

e) Give the explanation of system state classification.

f) Explain Security Analysis.

Q.5 Attempt Any Two. **12**

a) Name the sources of reactive power. Discuss the sources of reactive power. Discuss any two of these sources in detail.

b) Write a short note on with reference to voltage stability
   i) State of art
   ii) Future trends and challenges

c) What are the classification system state security? Explain in brief Contingency Analysis.

SLR-QH-616

Seat No.		Set	R

Fourth. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Power System and Operation Control (BTN07707)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in first 30 Minutes in Answer Book Each question carries one mark.
2) All questions are compulsory.
3) Figures to the right indicates full marks.
4) Assume suitable data whenever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the option: 14

1) In Contingency Ranking, the severest fault will be ranked _____.
a) 1 b) Last
c) Will depend on type of fault d) Will depend on duration of fault

2) In a network with 4 generators and 25 lines, the number of generations shift factors are _____.
a) 4 b) 25
c) 100 d) 96

3) Voltage stability in power systems refers to _____.
a) The ability of the system to maintain steady voltages at all buses
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4) Which factor can significantly affect voltage stability?
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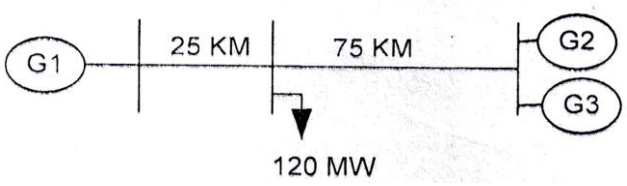

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7) If Kinetic energy of generator reduces _____.
a) Power decreases
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8) Balance of real power maintains steady _____.
a) Voltage
b) Cost
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9) Spinning reserve is defined as _____.
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b) $\mathrm{KW}\cos\theta$
c) $\mathrm{KVA}\cos\theta$
d) $\mathrm{KW}\tan\theta$

13) A Unit when scheduled for connection to the system is said to be _____.
a) Loaded
b) Disconnected
c) Hot reserve
d) Committed

14) Rating of Compensator is given in _____.

a) MW
b) KVAr
c) pf
d) None of these

Seat No.	

Set **R**

Fourth. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Power System and Operation Control (BTN07707)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All Questions are compulsory.
2) Figures to the right indicates full marks.
3) Assume the suitable data whenever necessary.

SECTION – I

Q.2 Attempt any Four. **16**

a) Explain with mathematical formulation the economic load dispatch including transmission losses.

b) Write short note incremental production cost on thermal power plant.

c) Explain the priority list method for unit commitment with suitable example.

d) Discuss the importance of short-term hydro thermal co-ordination.

e) List the advantages of interconnected operation of power system.

f) Explain Speed regulation parameter with neat sketches.

Q.3 Solve Any Two. **12**

a) In a system with two plants the incremental fuel cost are given by $dF_1/dP_1 = 0.01\ P_1 + 20$ Rs./MW-hour & $dC_2/dP_2 = 0.015P_2 + 22.5$ Rs./MW-hour. The system is running under an optimal schedule with $P_1 = P_2 = 100$ MW. If $dP_L/P_2 = 0.22$. Find Penalty Factor and dP_L/dP_1.

b) Explain with illustrative transfer function of the load frequency control of two area system.

c) Define the unit commitment & explain the following concepts with reference to unit commitment.
i) Minimum up time and Minimum down time
ii) Fuel constraint
iii) Must Run
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SECTION – II

Q.4 Attempt Any Four. **16**

a) What is line compensation? Why is it necessary?

b) Explain power system voltage stability.

c) Write a short note on sensitivity factor.

d) Explain Series Compensator and draw phasor diagram.

e) Give the explanation of system state classification.

f) Explain Security Analysis.

Q.5 Attempt Any Two. **12**

a) Name the sources of reactive power. Discuss the sources of reactive power. Discuss any two of these sources in detail.

b) Write a short note on with reference to voltage stability
   i) State of art
   ii) Future trends and challenges

c) What are the classification system state security? Explain in brief Contingency Analysis.

SLR-QH-616

Seat No.		Set	S

Fourth. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Power System and Operation Control (BTN07707)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in first 30 Minutes in Answer Book Each question carries one mark.
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MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the option: 14

1) In the DP method, the cost function $F_N(X)$ Represents _____.
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c) $\mathrm{KVA}\cos\theta$ d) $\mathrm{KW}\tan\theta$

4) A Unit when scheduled for connection to the system is said to be _____.
a) Loaded b) Disconnected
c) Hot reserve d) Committed

5) Rating of Compensator is given in _____.
a) MW b) KVAr
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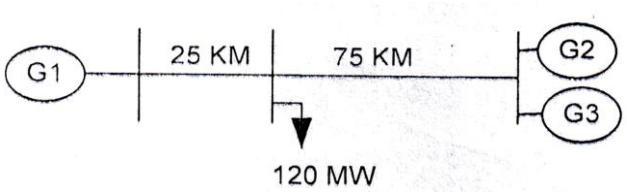

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b) [Total generation output of all synchronized units at a particular time] − [load at that time − losses at that time]
c) [Total generation output of all synchronized units at a particular time] − [load at that time + losses at that time]
d) None of these

SLR-QH-616

Seat No.		Set	S

Fourth. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Power System and Operation Control (BTN07707)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All Questions are compulsory.
2) Figures to the right indicates full marks.
3) Assume the suitable data whenever necessary.

SECTION – I

Q.2 Attempt any Four. **16**

a) Explain with mathematical formulation the economic load dispatch including transmission losses.

b) Write short note incremental production cost on thermal power plant.

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Q.3 Solve Any Two. **12**

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i) Minimum up time and Minimum down time
ii) Fuel constraint
iii) Must Run
iv) Hydro constraint

SECTION – II

Q.4 Attempt Any Four. **16**

a) What is line compensation? Why is it necessary?

b) Explain power system voltage stability.

c) Write a short note on sensitivity factor.

d) Explain Series Compensator and draw phasor diagram.

e) Give the explanation of system state classification.

f) Explain Security Analysis.

Q.5 Attempt Any Two. **12**

a) Name the sources of reactive power. Discuss the sources of reactive power. Discuss any two of these sources in detail.

b) Write a short note on with reference to voltage stability
   i) State of art
   ii) Future trends and challenges

c) What are the classification system state security? Explain in brief Contingency Analysis.

SLR-QH-620

Seat No.	

Set P

Fourth. Y. (B.Tech.) (Electrical Engineering) (Sem - I) (New) (CBCS)
Examination: March/April – 2026
Smart Grid Technology (BTN07721)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Alternatives. **14**

1) WAMS is _____.
a) Wide area Automation and Management System
b) Wide Area Measurement System
c) Wide Area Management System
d) West Automatic Management System

2) The main responsibility of Application layer in TCP/IP protocol architecture is _____.
a) Routing packets from source to destination across multiple layers
b) Allow users to access network resources
c) Transmits raw bits as signals between nodes
d) Provides reliable and application independent process to process delivery of Messages

3) Power quality is the ability of a system _____.
a) To operate causing disturbance or damage to loads and components
b) To operate without causing disturbance or damage to loads and components
c) To lose synchronism of the synchronous machines
d) None of the above

4) Which statement from the following is not true for OMS, _____?
   a) Prediction of location of transformer, fused, recloses or breaker that opened upon failure.
   b) Prioritizing restoration efforts and managing resources based upon criteria such as locations of emergency facilities, size of outages, and duration of outages.
   c) Providing information on extent of outages and number of customers impacted to management, media and regulators.
   d) It is a networking system using mesh topology to interact with consumers and utilities.

5) _____ supply the required data for the smart grid which helps the grid in providing an automated response.
   a) Smart meters
   b) Sensors
   c) Actuators
   d) PLC

6) Power quality is a major concern because of the _____.
   a) Sensitivity of digital and modern control equipment to distortion/PQ deterioration
   b) It does not cause disturbance or damage to loads and components
   c) Synchronous machines operate in synchronism
   d) Bus voltages are maintained

7) Which of the following is not a property associated with power quality of smart grids _____.
   a) Self-healing
   b) Frequency monitoring and control
   c) Load forecasting
   d) Asset management

8) Fiber optic is an example for _____.
   a) Home Area Networks
   b) Industry Area Networks (IAN)
   c) Wide Area Networks (WAN)
   d) Neighborhood Area Networks

9) In smart grid PLM means _____.
   a) Peak Load Management
   b) Plant Load Management
   c) Power Leakage Management
   d) Plant Leakage Management

10) The boundaries of the customer domain typically consider which type of meters _____.
   a) Energy services load
   b) Energy services interface
   c) Energy services demand
   d) Wattmeter

11) The conversion efficiency of a photo crystalline silicon solar cell is _____.

a) 12.5 to 15%
b) 11 to 14%
c) 10 to 13%
d) 9 to 12%

12) The following Type of inverter may not be suitable for grid connected mode?

a) Grid feeding converters
b) Grid Forming converters
c) Grid supporting Converters
d) None of the above

13) The unit where the meter signals are collected prior to onward transmission to the Central Monitoring Station (CMS) is called _____.

a) Data Control Unit
b) Data Monitoring Unit
c) Data Concentrator Unit
d) Data Processing Unit

14) The concept of national grid is based on maintaining _____.

a) Demand-supply relationship
b) Generation-supply relationship
c) Demand-generation relationship
d) None of the above

SLR-QH-620

Seat No.	

Set P

Fourth. Y. (B.Tech.) (Electrical Engineering) (Sem - I) (New) (CBCS)
Examination: March/April – 2026
Smart Grid Technology (BTN07721)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Solve Any Four. **16**

a) What is the need of Smart Grid? What will be the components of Smart Grid?

b) What are smart energy meters? Explain its function in smart grid.

c) Explain role of AMI in Smart Grid.

d) What is Geographic Information System (GIS)? Explain the components of GIS.

e) Explain functions of smart grid components.

Q.3 Solve Any Two. **12**

a) What is the Smart Grid? Overview of how Indian power market is organized.

b) Explain EMC and its importance in smart grid.

c) Explain how automatic meter reading can make the system Smarter.

SECTION – II

Q.4 Solve Any Four. **16**

a) Explain the concept of Power Quality and EMC in Smart Grid.

b) Describe web Based Power Quality Monitoring.

c) What is difference between STATCOM and DSTATCOM?

d) Describe the power quality issues of grid connected renewable energy resources.

e) What are the Visualization Techniques used in Smart Grid system.

Q.5 Solve Any Two. **12**

a) Explain Voltage source converters and Current source converters.

b) What is distribution system state the function of the distribution system? What are the methods of energy management?

c) Where are power electronic converters used? Why power electronics technology is important in the grid connected system?

Seat No.	

Set **Q**

Fourth. Y. (B.Tech.) (Electrical Engineering) (Sem - I) (New) (CBCS)
Examination: March/April – 2026
Smart Grid Technology (BTN07721)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Alternatives. **14**

1) Fiber optic is an example for _____.
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c) Wide Area Networks (WAN)
d) Neighborhood Area Networks

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7) The concept of national grid is based on maintaining _____.

a) Demand-supply relationship
b) Generation-supply relationship
c) Demand-generation relationship
d) None of the above

8) WAMS is _____.

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b) Wide Area Measurement System
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d) West Automatic Management System

9) The main responsibility of Application layer in TCP/IP protocol architecture is _____.

a) Routing packets from source to destination across multiple layers
b) Allow users to access network resources
c) Transmits raw bits as signals between nodes
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10) Power quality is the ability of a system _____.

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c) Providing information on extent of outages and number of customers impacted to management, media and regulators.
d) It is a networking system using mesh topology to interact with consumers and utilities.

12) _____ supply the required data for the smart grid which helps the grid in providing an automated response.

a) Smart meters
b) Sensors
c) Actuators
d) PLC

13) Power quality is a major concern because of the _____.

a) Sensitivity of digital and modern control equipment to distortion/PQ deterioration
b) It does not cause disturbance or damage to loads and components
c) Synchronous machines operate in synchronism
d) Bus voltages are maintained

14) Which of the following is not a property associated with power quality of smart grids _____.

a) Self-healing
b) Frequency monitoring and control
c) Load forecasting
d) Asset management

SLR-QH-620

Seat No.	

Set Q

Fourth. Y. (B.Tech.) (Electrical Engineering) (Sem - I) (New) (CBCS)
Examination: March/April – 2026
Smart Grid Technology (BTN07721)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Solve Any Four. **16**

a) What is the need of Smart Grid? What will be the components of Smart Grid?

b) What are smart energy meters? Explain its function in smart grid.

c) Explain role of AMI in Smart Grid.

d) What is Geographic Information System (GIS)? Explain the components of GIS.

e) Explain functions of smart grid components.

Q.3 Solve Any Two. **12**

a) What is the Smart Grid? Overview of how Indian power market is organized.

b) Explain EMC and its importance in smart grid.

c) Explain how automatic meter reading can make the system Smarter.

SECTION – II

Q.4 Solve Any Four. **16**

a) Explain the concept of Power Quality and EMC in Smart Grid.

b) Describe web Based Power Quality Monitoring.

c) What is difference between STATCOM and DSTATCOM?

d) Describe the power quality issues of grid connected renewable energy resources.

e) What are the Visualization Techniques used in Smart Grid system.

Q.5 Solve Any Two. **12**

a) Explain Voltage source converters and Current source converters.

b) What is distribution system state the function of the distribution system? What are the methods of energy management?

c) Where are power electronic converters used? Why power electronics technology is important in the grid connected system?

SLR-QH-620

Seat No.	

Set R

Fourth. Y. (B.Tech.) (Electrical Engineering) (Sem - I) (New) (CBCS)
Examination: March/April – 2026
Smart Grid Technology (BTN07721)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Alternatives. **14**

1) The conversion efficiency of a photo crystalline silicon solar cell is _____.
a) 12.5 to 15% b) 11 to 14%
c) 10 to 13% d) 9 to 12%

2) The following Type of inverter may not be suitable for grid connected mode?
a) Grid feeding converters
b) Grid Forming converters
c) Grid supporting Converters
d) None of the above

3) The unit where the meter signals are collected prior to onward transmission to the Central Monitoring Station (CMS) is called _____.
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c) Data Concentrator Unit d) Data Processing Unit

4) The concept of national grid is based on maintaining _____.
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b) Generation-supply relationship
c) Demand-generation relationship
d) None of the above

5) WAMS is _____.
a) Wide area Automation and Management System
b) Wide Area Measurement System
c) Wide Area Management System
d) West Automatic Management System

6) The main responsibility of Application layer in TCP/IP protocol architecture is _____.
   a) Routing packets from source to destination across multiple layers
   b) Allow users to access network resources
   c) Transmits raw bits as signals between nodes
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   a) To operate causing disturbance or damage to loads and components
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8) Which statement from the following is not true for OMS, _____?
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   b) Prioritizing restoration efforts and managing resources based upon criteria such as locations of emergency facilities, size of outages, and duration of outages.
   c) Providing information on extent of outages and number of customers impacted to management, media and regulators.
   d) It is a networking system using mesh topology to interact with consumers and utilities.

9) _____ supply the required data for the smart grid which helps the grid in providing an automated response.
   a) Smart meters
   b) Sensors
   c) Actuators
   d) PLC

10) Power quality is a major concern because of the _____.
   a) Sensitivity of digital and modern control equipment to distortion/PQ deterioration
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   c) Synchronous machines operate in synchronism
   d) Bus voltages are maintained

11) Which of the following is not a property associated with power quality of smart grids _____.
   a) Self-healing
   b) Frequency monitoring and control
   c) Load forecasting
   d) Asset management

12) Fiber optic is an example for _____.
   a) Home Area Networks
   b) Industry Area Networks (IAN)
   c) Wide Area Networks (WAN)
   d) Neighborhood Area Networks

13) In smart grid PLM means _____.
   a) Peak Load Management
   b) Plant Load Management
   c) Power Leakage Management
   d) Plant Leakage Management

14) The boundaries of the customer domain typically consider which type of meters _____.
   a) Energy services load
   b) Energy services interface
   c) Energy services demand
   d) Wattmeter

SLR-QH-620

Seat No.	

Set R

Fourth. Y. (B.Tech.) (Electrical Engineering) (Sem - I) (New) (CBCS)
Examination: March/April – 2026
Smart Grid Technology (BTN07721)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Solve Any Four. **16**

a) What is the need of Smart Grid? What will be the components of Smart Grid?

b) What are smart energy meters? Explain its function in smart grid.

c) Explain role of AMI in Smart Grid.

d) What is Geographic Information System (GIS)? Explain the components of GIS.

e) Explain functions of smart grid components.

Q.3 Solve Any Two. **12**

a) What is the Smart Grid? Overview of how Indian power market is organized.

b) Explain EMC and its importance in smart grid.

c) Explain how automatic meter reading can make the system Smarter.

SECTION – II

Q.4 Solve Any Four. **16**

a) Explain the concept of Power Quality and EMC in Smart Grid.

b) Describe web Based Power Quality Monitoring.

c) What is difference between STATCOM and DSTATCOM?

d) Describe the power quality issues of grid connected renewable energy resources.

e) What are the Visualization Techniques used in Smart Grid system.

Q.5 Solve Any Two. **12**

a) Explain Voltage source converters and Current source converters.

b) What is distribution system state the function of the distribution system? What are the methods of energy management?

c) Where are power electronic converters used? Why power electronics technology is important in the grid connected system?

SLR-QH-620

Seat No.	

Set S

Fourth. Y. (B.Tech.) (Electrical Engineering) (Sem - I) (New) (CBCS)
Examination: March/April – 2026
Smart Grid Technology (BTN07721)

Day & Date: Saturday, 09-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Alternatives. **14**

1) Power quality is a major concern because of the _____.
a) Sensitivity of digital and modern control equipment to distortion/PQ deterioration
b) It does not cause disturbance or damage to loads and components
c) Synchronous machines operate in synchronism
d) Bus voltages are maintained

2) Which of the following is not a property associated with power quality of smart grids _____.
a) Self-healing
b) Frequency monitoring and control
c) Load forecasting
d) Asset management

3) Fiber optic is an example for _____.
a) Home Area Networks
b) Industry Area Networks (IAN)
c) Wide Area Networks (WAN)
d) Neighborhood Area Networks

4) In smart grid PLM means _____.
a) Peak Load Management
b) Plant Load Management
c) Power Leakage Management
d) Plant Leakage Management

5) The boundaries of the customer domain typically consider which type of meters _____.

a) Energy services load
b) Energy services interface
c) Energy services demand
d) Wattmeter

6) The conversion efficiency of a photo crystalline silicon solar cell is _____.

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b) 11 to 14%
c) 10 to 13%
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c) Grid supporting Converters
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8) The unit where the meter signals are collected prior to onward transmission to the Central Monitoring Station (CMS) is called _____.

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9) The concept of national grid is based on maintaining _____.

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c) Providing information on extent of outages and number of customers impacted to management, media and regulators.
d) It is a networking system using mesh topology to interact with consumers and utilities.

14) _____ supply the required data for the smart grid which helps the grid in providing an automated response.

a) Smart meters
b) Sensors
c) Actuators
d) PLC

SLR-QH-620

Seat No.	

Set S

Fourth. Y. (B.Tech.) (Electrical Engineering) (Sem - I) (New) (CBCS)
Examination: March/April – 2026
Smart Grid Technology (BTN07721)

Day & Date: Saturday, 09-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Solve Any Four. **16**

a) What is the need of Smart Grid? What will be the components of Smart Grid?

b) What are smart energy meters? Explain its function in smart grid.

c) Explain role of AMI in Smart Grid.

d) What is Geographic Information System (GIS)? Explain the components of GIS.

e) Explain functions of smart grid components.

Q.3 Solve Any Two. **12**

a) What is the Smart Grid? Overview of how Indian power market is organized.

b) Explain EMC and its importance in smart grid.

c) Explain how automatic meter reading can make the system Smarter.

SECTION – II

Q.4 Solve Any Four. **16**

a) Explain the concept of Power Quality and EMC in Smart Grid.

b) Describe web Based Power Quality Monitoring.

c) What is difference between STATCOM and DSTATCOM?

d) Describe the power quality issues of grid connected renewable energy resources.

e) What are the Visualization Techniques used in Smart Grid system.

Q.5 Solve Any Two. **12**

a) Explain Voltage source converters and Current source converters.

b) What is distribution system state the function of the distribution system? What are the methods of energy management?

c) Where are power electronic converters used? Why power electronics technology is important in the grid connected system?

SLR-QH-621

Seat No.		Set	P

Fourth. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Power System Planning (BTN07711)

Day & Date: Monday, 11-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the given options. 14

1) What is the modern trend in electric power generation?
a) To have a large number of small size thermal plants located at different places
b) To have large size thermal plants near load centre
c) To have large size thermal plants located near coal fields
d) None of the above

2) Planning for power systems is essentially a projection of _____.
a) how the system should grow over a specific period of time
b) judgment about the future loads and the size of investment in generating capacity additions
c) transmission facilities expansion and reinforcements
d) All above

3) Transmission efficiency of line increases with the _____.
a) Decrease in power factor and voltage
b) Increase in power factor and voltage
c) Increase in power factor but Decrease in voltage
d) Increase in Voltage but Decrease in power factor

4) The main problem in implanting Distribution Automation in metros is _____.
a) RTUs b) Communication
c) D.A.S. d) control computers

5) The correlation technique relates system load to _____.
a) Various demographic factors b) Economic factors
c) Both a) and b) d) None of the above

6) Load forecasting method are _____.
a) Extrapolation b) Correlation
c) Combination of a) and b) d) All of the above

7) The load forecasting is method to predict _____.
a) Past loads b) Present loads
c) Future loads d) None of these

8) Transmission efficiency of line increases with the _____.
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9) Energy conservation means _____.
a) Using Energy more efficiently
b) Reducing wastage of Energy
c) New investment in more efficient equipment
d) All above

10) Load flow study is carried out for _____.
a) Fault calculations b) Stability studies
c) System planning d) Frequency control

11) The objective of energy management includes _____.
a) Minimising energy costs
b) Minimising waste
c) Minimising environmental degradation
d) All the above

12) The reduction of utility load primarily during peak demand is known as _____.
a) Peak clipping b) Load shifting
c) Valley filling d) MTP analysis

13) The demand side management can be achieved by the technique of _____.
a) Time of day pricing and metering
b) Multi - utility power exchange model
c) Load management
d) All of these

14) Power factor of a load can be improved by using _____.
a) Static capacitors b) Synchronous condenser
c) Phase advancer d) All of the above

SLR-QH-621

Seat No.	

Set P

Fourth. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Power System Planning (BTN07711)

Day & Date: Monday, 11-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Solve Any Four. **16**

a) Define the term load forecasting. Categorize loads in power system.

b) Describe different methodologies used for load forecasting.

c) Elaborate weather load model and explain how to get peak demand forecasting.

d) Write a short note on generation sources.

e) What do you mean by Distribution Automation? Explain tools of distribution automation.

Q.3 Solve Any Two. **12**

a) Explain generation system model and Cost analysis.

b) Explain what do you mean by system planning. State the objectives of system planning.

c) Explain Long term Planning.

SECTION – II

Q.4 Solve Any Four. **16**

a) Explain the Data required for Composite System Reliability and quality.

b) Write short note on listing of energy conservation opportunities (ECOs).

c) What do you mean by Demand Side Management?

d) Explain the objectives of Transmission Planning.

e) Discuss the steps involved in DSM planning and implementation.

Q.5 Solve Any Two. **12**

a) Describe the following terms of load control:

i) Peak clipping
ii) Valley filling
iii) Load shedding
iv) Strategic energy conservation

b) Explain New algorithms and methods relating to Demand Side Management.

c) Discuss the possibilities of energy conservation in various sectors.

SLR-QH-621

Seat No.		Set	Q

Fourth. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Power System Planning (BTN07711)

Day & Date: Monday, 11-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the given options. **14**

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   c) Combination of a) and b)
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14) The load forecasting is method to predict _____.
   a) Past loads
   b) Present loads
   c) Future loads
   d) None of these

SLR-QH-621

Seat No.	

Set Q

Fourth. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Power System Planning (BTN07711)

Day & Date: Monday, 11-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Solve Any Four. **16**

a) Define the term load forecasting. Categorize loads in power system.

b) Describe different methodologies used for load forecasting.

c) Elaborate weather load model and explain how to get peak demand forecasting.

d) Write a short note on generation sources.

e) What do you mean by Distribution Automation? Explain tools of distribution automation.

Q.3 Solve Any Two. **12**

a) Explain generation system model and Cost analysis.

b) Explain what do you mean by system planning. State the objectives of system planning.

c) Explain Long term Planning.

SECTION – II

Q.4 Solve Any Four. **16**

a) Explain the Data required for Composite System Reliability and quality.

b) Write short note on listing of energy conservation opportunities (ECOs).

c) What do you mean by Demand Side Management?

d) Explain the objectives of Transmission Planning.

e) Discuss the steps involved in DSM planning and implementation.

Q.5 Solve Any Two. **12**

a) Describe the following terms of load control:

i) Peak clipping
ii) Valley filling
iii) Load shedding
iv) Strategic energy conservation

b) Explain New algorithms and methods relating to Demand Side Management.

c) Discuss the possibilities of energy conservation in various sectors.

Seat No.	

Set **R**

Fourth. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Power System Planning (BTN07711)

Day & Date: Monday, 11-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the given options. **14**

1) The objective of energy management includes _____.
a) Minimising energy costs
b) Minimising waste
c) Minimising environmental degradation
d) All the above

2) The reduction of utility load primarily during peak demand is known as _____.
a) Peak clipping b) Load shifting
c) Valley filling d) MTP analysis

3) The demand side management can be achieved by the technique of _____.
a) Time of day pricing and metering
b) Multi - utility power exchange model
c) Load management
d) All of these

4) Power factor of a load can be improved by using _____.
a) Static capacitors b) Synchronous condenser
c) Phase advancer d) All of the above

5) What is the modern trend in electric power generation?
a) To have a large number of small size thermal plants located at different places
b) To have large size thermal plants near load centre
c) To have large size thermal plants located near coal fields
d) None of the above

6) Planning for power systems is essentially a projection of _____.
   a) how the system should grow over a specific period of time
   b) judgment about the future loads and the size of investment in generating capacity additions
   c) transmission facilities expansion and reinforcements
   d) All above

7) Transmission efficiency of line increases with the _____.
   a) Decrease in power factor and voltage
   b) Increase in power factor and voltage
   c) Increase in power factor but Decrease in voltage
   d) Increase in Voltage but Decrease in power factor

8) The main problem in implanting Distribution Automation in metros is _____.
   a) RTUs
   b) Communication
   c) D.A.S.
   d) control computers

9) The correlation technique relates system load to _____.
   a) Various demographic factors
   b) Economic factors
   c) Both a) and b)
   d) None of the above

10) Load forecasting method are _____.
   a) Extrapolation
   b) Correlation
   c) Combination of a) and b)
   d) All of the above

11) The load forecasting is method to predict _____.
   a) Past loads
   b) Present loads
   c) Future loads
   d) None of these

12) Transmission efficiency of line increases with the _____.
   a) Decrease in power factor and voltage
   b) Increase in power factor and voltage
   c) Increase in power factor but decrease in voltage
   d) Increase in Voltage but decrease in power factor

13) Energy conservation means _____.
   a) Using Energy more efficiently
   b) Reducing wastage of Energy
   c) New investment in more efficient equipment
   d) All above

14) Load flow study is carried out for _____.
   a) Fault calculations
   b) Stability studies
   c) System planning
   d) Frequency control

SLR-QH-621

Seat No.	

Set R

Fourth. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Power System Planning (BTN07711)

Day & Date: Monday, 11-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Solve Any Four. **16**

a) Define the term load forecasting. Categorize loads in power system.

b) Describe different methodologies used for load forecasting.

c) Elaborate weather load model and explain how to get peak demand forecasting.

d) Write a short note on generation sources.

e) What do you mean by Distribution Automation? Explain tools of distribution automation.

Q.3 Solve Any Two. **12**

a) Explain generation system model and Cost analysis.

b) Explain what do you mean by system planning. State the objectives of system planning.

c) Explain Long term Planning.

SECTION – II

Q.4 Solve Any Four. **16**

a) Explain the Data required for Composite System Reliability and quality.

b) Write short note on listing of energy conservation opportunities (ECOs).

c) What do you mean by Demand Side Management?

d) Explain the objectives of Transmission Planning.

e) Discuss the steps involved in DSM planning and implementation.

Q.5 Solve Any Two. **12**

a) Describe the following terms of load control:

i) Peak clipping
ii) Valley filling
iii) Load shedding
iv) Strategic energy conservation

b) Explain New algorithms and methods relating to Demand Side Management.

c) Discuss the possibilities of energy conservation in various sectors.

SLR-QH-621

Seat No.		Set	S

Fourth. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Power System Planning (BTN07711)

Day & Date: Monday, 11-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the given options. 14

1) Load forecasting method are _____.
a) Extrapolation b) Correlation
c) Combination of a) and b) d) All of the above

2) The load forecasting is method to predict _____.
a) Past loads b) Present loads
c) Future loads d) None of these

3) Transmission efficiency of line increases with the _____.
a) Decrease in power factor and voltage
b) Increase in power factor and voltage
c) Increase in power factor but decrease in voltage
d) Increase in Voltage but decrease in power factor

4) Energy conservation means _____.
a) Using Energy more efficiently
b) Reducing wastage of Energy
c) New investment in more efficient equipment
d) All above

5) Load flow study is carried out for _____.
a) Fault calculations b) Stability studies
c) System planning d) Frequency control

6) The objective of energy management includes _____.
a) Minimising energy costs
b) Minimising waste
c) Minimising environmental degradation
d) All the above

7) The reduction of utility load primarily during peak demand is known as _____.
   a) Peak clipping
   b) Load shifting
   c) Valley filling
   d) MTP analysis

8) The demand side management can be achieved by the technique of _____.
   a) Time of day pricing and metering
   b) Multi - utility power exchange model
   c) Load management
   d) All of these

9) Power factor of a load can be improved by using _____.
   a) Static capacitors
   b) Synchronous condenser
   c) Phase advancer
   d) All of the above

10) What is the modern trend in electric power generation?
   a) To have a large number of small size thermal plants located at different places
   b) To have large size thermal plants near load centre
   c) To have large size thermal plants located near coal fields
   d) None of the above

11) Planning for power systems is essentially a projection of _____.
   a) how the system should grow over a specific period of time
   b) judgment about the future loads and the size of investment in generating capacity additions
   c) transmission facilities expansion and reinforcements
   d) All above

12) Transmission efficiency of line increases with the _____.
   a) Decrease in power factor and voltage
   b) Increase in power factor and voltage
   c) Increase in power factor but Decrease in voltage
   d) Increase in Voltage but Decrease in power factor

13) The main problem in implanting Distribution Automation in metros is _____.
   a) RTUs
   b) Communication
   c) D.A.S.
   d) control computers

14) The correlation technique relates system load to _____.
   a) Various demographic factors
   b) Economic factors
   c) Both a) and b)
   d) None of the above

SLR-QH-621

Seat No.	

Set S

Fourth. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Power System Planning (BTN07711)

Day & Date: Monday, 11-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Solve Any Four. **16**

a) Define the term load forecasting. Categorize loads in power system.

b) Describe different methodologies used for load forecasting.

c) Elaborate weather load model and explain how to get peak demand forecasting.

d) Write a short note on generation sources.

e) What do you mean by Distribution Automation? Explain tools of distribution automation.

Q.3 Solve Any Two. **12**

a) Explain generation system model and Cost analysis.

b) Explain what do you mean by system planning. State the objectives of system planning.

c) Explain Long term Planning.

SECTION – II

Q.4 Solve Any Four. **16**

a) Explain the Data required for Composite System Reliability and quality.

b) Write short note on listing of energy conservation opportunities (ECOs).

c) What do you mean by Demand Side Management?

d) Explain the objectives of Transmission Planning.

e) Discuss the steps involved in DSM planning and implementation.

Q.5 Solve Any Two. **12**

a) Describe the following terms of load control:

i) Peak clipping
ii) Valley filling
iii) Load shedding
iv) Strategic energy conservation

b) Explain New algorithms and methods relating to Demand Side Management.

c) Discuss the possibilities of energy conservation in various sectors.

SLR-QH-622

Seat No.		Set	P

Fourth. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Extra High Voltage AC Transmission (BTN07712)

Day & Date: Monday, 11-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) The function of steel wire in an ACSR conductor is to _____.
a) Compensate for skin effect
b) Take care of surges
c) Provide additional mechanical strength
d) Reduce inductance

2) First mode of propagation is called as _____.
a) Line to ground b) Line to line
c) Homopolar d) Both a) & c)

3) The measurement of electrostatic field of an e.h.v. line is done by _____.
a) Dipole b) Spherical Dipole
c) Parallel plate d) All of the above

4) In lossless transmission line theoretically have _____.
a) $r = 1 = 0$ b) $1 = g = 0$
c) $g = c = 0$ d) $r = g = 0$

5) The most accurate and versatile method of achieving reactive power compensation is by using _____.
a) Switched capacitors
b) Fixed capacitor with controlled reactor
c) Saturable reactor with capacitor bank
d) Switched capacitor with controlled reactor

6) Which of the following method may be used to inject reactive power in the transmission line?
a) Series capacitor b) Synchronous capacitors
c) Both a) and b) d) None of these

7) The conductors of an EHV line is selected on the basis of _____.
a) Current carrying capacity
b) Corona and RI performance
c) Line voltage
d) None of these

8) Operating 750 KV line gives AN at a level of _____.
a) 50 dB
b) 55.4 dB
c) 52 dB
d) 58.5 dB

9) For Aeolian vibration the frequency of vibration is usually limited to _____ Hz and the amplitudes less than ____ cm.
a) 20 Hz, 2.5 cm
b) 25 Hz, 2.5 cm
c) 50 Hz, 2.5 cm
d) 50 Hz, 3.5 cm

10) Voltage gradient on a transmission line conductor is highest _____.
a) at the surface of the conductor
b) at the centre of the conductor
c) at the distance of one radius from the surface
d) None of these

11) Refraction coefficient of voltage (K_T) for open ended line _____.
a) +2
b) 1
c) -1
d) 0

12) The over-voltage surges in power systems may be caused by _____.
a) lightning
b) Switching
c) resonance
d) any of the above

13) The dimensions of constants B and C are respectively _____and _____.
a) Ohm, Siemens
b) Mho, Siemens
c) Both are dimensionless
d) Siemens, Ohm

14) Insulation of the modern EHV lines is designed based on _____.
a) Lighting voltage
b) Switching voltage
c) Corona
d) RI

Seat No.	

Set **P**

Fourth. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Extra High Voltage AC Transmission (BTN07712)

Day & Date: Monday, 11-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Solve Any Four. **16**

a) Explain the need of extra high voltage for transmission system.

b) Explain limits for radio interference.

c) Explain reflection and refraction of travelling waves.

d) Explain the concept attenuation of travelling waves on transmission line.

e) How the audible noise is generated and what are its characteristics?

f) Derive differential equations and solutions for general case in travelling waves.

Q.3 Solve Any Two. **12**

a) Explain the different mechanical considerations in EHV line performance?

b) Derive the expression $P_c = \frac{1}{2} KC(V_m^2 - V_0^2)$ for the energy loss from charge-voltage diagram.

c) Derive the expression for open ended line double exponential response.

SECTION – II

Q.4 Solve Any Four. **16**

a) Explain in detail ferro-resonance over voltages.

b) Explain conductor-tower, conductor-ground and conductor-conductor clearances.

c) Describe static reactive compensating system.

d) State and explain the causes of over voltages.

e) Explain the term power circle diagram and its use.

f) What are the factors considered under steady state in design of EHV lines?

Q.5 Solve Any Two. **12**

a) Explain line insulation design based upon transient over voltages in detail.

b) Explain in detail sinusoidal excitation lumped parameter circuit.

c) A 100 MVA 230kV 50 Hz transformer has x_t = 12% and is connected to a line 200 km long which has an inductance of 1 mH/km. The filter, connected to the LV 33 kV side of the transformer, is required to suppress the 5^{th} harmonic generated by the TCR to 1% of I_n. Calculate the value of filter capacitor if the filter inductance used is 2mH.

Seat No.	

Set **Q**

Fourth. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Extra High Voltage AC Transmission (BTN07712)

Day & Date: Monday, 11-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Operating 750 KV line gives AN at a level of _____.
a) 50 dB b) 55.4 dB
c) 52 dB d) 58.5 dB

2) For Aeolian vibration the frequency of vibration is usually limited to _____ Hz and the amplitudes less than ____ cm.
a) 20 Hz, 2.5 cm b) 25 Hz, 2.5 cm
c) 50 Hz, 2.5 cm d) 50 Hz, 3.5 cm

3) Voltage gradient on a transmission line conductor is highest _____.
a) at the surface of the conductor
b) at the centre of the conductor
c) at the distance of one radius from the surface
d) None of these

4) Refraction coefficient of voltage (K_T) for open ended line _____.
a) +2 b) 1
c) -1 d) 0

5) The over-voltage surges in power systems may be caused by _____.
a) lightning b) Switching
c) resonance d) any of the above

6) The dimensions of constants B and C are respectively _____and _____.
a) Ohm, Siemens b) Mho, Siemens
c) Both are dimensionless d) Siemens, Ohm

7) Insulation of the modern EHV lines is designed based on _____.
a) Lighting voltage b) Switching voltage
c) Corona d) RI

8) The function of steel wire in an ACSR conductor is to _____.
   a) Compensate for skin effect
   b) Take care of surges
   c) Provide additional mechanical strength
   d) Reduce inductance

9) First mode of propagation is called as _____.
   a) Line to ground
   b) Line to line
   c) Homopolar
   d) Both a) & c)

10) The measurement of electrostatic field of an e.h.v. line is done by _____.
   a) Dipole
   b) Spherical Dipole
   c) Parallel plate
   d) All of the above

11) In lossless transmission line theoretically have _____.
   a) $r = 1 = 0$
   b) $1 = g = 0$
   c) $g = c = 0$
   d) $r = g = 0$

12) The most accurate and versatile method of achieving reactive power compensation is by using _____.
   a) Switched capacitors
   b) Fixed capacitor with controlled reactor
   c) Saturable reactor with capacitor bank
   d) Switched capacitor with controlled reactor

13) Which of the following method may be used to inject reactive power in the transmission line?
   a) Series capacitor
   b) Synchronous capacitors
   c) Both a) and b)
   d) None of these

14) The conductors of an EHV line is selected on the basis of _____.
   a) Current carrying capacity
   b) Corona and RI performance
   c) Line voltage
   d) None of these

Seat No.	

Set **Q**

Fourth. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Extra High Voltage AC Transmission (BTN07712)

Day & Date: Monday, 11-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Solve Any Four. **16**

a) Explain the need of extra high voltage for transmission system.

b) Explain limits for radio interference.

c) Explain reflection and refraction of travelling waves.

d) Explain the concept attenuation of travelling waves on transmission line.

e) How the audible noise is generated and what are its characteristics?

f) Derive differential equations and solutions for general case in travelling waves.

Q.3 Solve Any Two. **12**

a) Explain the different mechanical considerations in EHV line performance?

b) Derive the expression $P_c = \frac{1}{2} KC(V_m^2 - V_0^2)$ for the energy loss from charge-voltage diagram.

c) Derive the expression for open ended line double exponential response.

SECTION – II

Q.4 Solve Any Four. **16**

a) Explain in detail ferro-resonance over voltages.

b) Explain conductor-tower, conductor-ground and conductor-conductor clearances.

c) Describe static reactive compensating system.

d) State and explain the causes of over voltages.

e) Explain the term power circle diagram and its use.

f) What are the factors considered under steady state in design of EHV lines?

Q.5 Solve Any Two. **12**

a) Explain line insulation design based upon transient over voltages in detail.

b) Explain in detail sinusoidal excitation lumped parameter circuit.

c) A 100 MVA 230kV 50 Hz transformer has x_t = 12% and is connected to a line 200 km long which has an inductance of 1 mH/km. The filter, connected to the LV 33 kV side of the transformer, is required to suppress the 5^{th} harmonic generated by the TCR to 1% of I_n. Calculate the value of filter capacitor if the filter inductance used is 2mH.

SLR-QH-622

Seat No.	

Set R

Fourth. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Extra High Voltage AC Transmission (BTN07712)

Day & Date: Monday, 11-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Refraction coefficient of voltage (K_T) for open ended line _____.
a) +2 b) 1
c) -1 d) 0

2) The over-voltage surges in power systems may be caused by _____.
a) lightning b) Switching
c) resonance d) any of the above

3) The dimensions of constants B and C are respectively _____and _____.
a) Ohm, Siemens b) Mho, Siemens
c) Both are dimensionless d) Siemens, Ohm

4) Insulation of the modern EHV lines is designed based on _____.
a) Lighting voltage b) Switching voltage
c) Corona d) RI

5) The function of steel wire in an ACSR conductor is to _____.
a) Compensate for skin effect
b) Take care of surges
c) Provide additional mechanical strength
d) Reduce inductance

6) First mode of propagation is called as _____.
a) Line to ground b) Line to line
c) Homopolar d) Both a) & c)

7) The measurement of electrostatic field of an e.h.v. line is done by _____.
a) Dipole b) Spherical Dipole
c) Parallel plate d) All of the above

8) In lossless transmission line theoretically have _____.
a) $r = 1 = 0$ b) $1 = g = 0$
c) $g = c = 0$ d) $r = g = 0$

9) The most accurate and versatile method of achieving reactive power compensation is by using _____.
a) Switched capacitors
b) Fixed capacitor with controlled reactor
c) Saturable reactor with capacitor bank
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10) Which of the following method may be used to inject reactive power in the transmission line?
a) Series capacitor b) Synchronous capacitors
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11) The conductors of an EHV line is selected on the basis of _____.
a) Current carrying capacity b) Corona and RI performance
c) Line voltage d) None of these

12) Operating 750 KV line gives AN at a level of _____.
a) 50 dB b) 55.4 dB
c) 52 dB d) 58.5 dB

13) For Aeolian vibration the frequency of vibration is usually limited to _____ Hz and the amplitudes less than ____ cm.
a) 20 Hz, 2.5 cm b) 25 Hz, 2.5 cm
c) 50 Hz, 2.5 cm d) 50 Hz, 3.5 cm

14) Voltage gradient on a transmission line conductor is highest _____.
a) at the surface of the conductor
b) at the centre of the conductor
c) at the distance of one radius from the surface
d) None of these

Seat No.	

Set **R**

Fourth. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Extra High Voltage AC Transmission (BTN07712)

Day & Date: Monday, 11-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Solve Any Four. **16**

a) Explain the need of extra high voltage for transmission system.

b) Explain limits for radio interference.

c) Explain reflection and refraction of travelling waves.

d) Explain the concept attenuation of travelling waves on transmission line.

e) How the audible noise is generated and what are its characteristics?

f) Derive differential equations and solutions for general case in travelling waves.

Q.3 Solve Any Two. **12**

a) Explain the different mechanical considerations in EHV line performance?

b) Derive the expression $P_c = \frac{1}{2} KC(V_m^2 - V_0^2)$ for the energy loss from charge-voltage diagram.

c) Derive the expression for open ended line double exponential response.

SECTION – II

Q.4 Solve Any Four. **16**

a) Explain in detail ferro-resonance over voltages.

b) Explain conductor-tower, conductor-ground and conductor-conductor clearances.

c) Describe static reactive compensating system.

d) State and explain the causes of over voltages.

e) Explain the term power circle diagram and its use.

f) What are the factors considered under steady state in design of EHV lines?

Q.5 Solve Any Two. **12**

a) Explain line insulation design based upon transient over voltages in detail.

b) Explain in detail sinusoidal excitation lumped parameter circuit.

c) A 100 MVA 230kV 50 Hz transformer has x_t = 12% and is connected to a line 200 km long which has an inductance of 1 mH/km. The filter, connected to the LV 33 kV side of the transformer, is required to suppress the 5^{th} harmonic generated by the TCR to 1% of I_n. Calculate the value of filter capacitor if the filter inductance used is 2mH.

Seat No.	

Set **S**

Fourth. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Extra High Voltage AC Transmission (BTN07712)

Day & Date: Monday, 11-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which of the following method may be used to inject reactive power in the transmission line?
a) Series capacitor b) Synchronous capacitors
c) Both a) and b) d) None of these

2) The conductors of an EHV line is selected on the basis of _____.
a) Current carrying capacity b) Corona and RI performance
c) Line voltage d) None of these

3) Operating 750 KV line gives AN at a level of _____.
a) 50 dB b) 55.4 dB
c) 52 dB d) 58.5 dB

4) For Aeolian vibration the frequency of vibration is usually limited to _____ Hz and the amplitudes less than ____ cm.
a) 20 Hz, 2.5 cm b) 25 Hz, 2.5 cm
c) 50 Hz, 2.5 cm d) 50 Hz, 3.5 cm

5) Voltage gradient on a transmission line conductor is highest _____.
a) at the surface of the conductor
b) at the centre of the conductor
c) at the distance of one radius from the surface
d) None of these

6) Refraction coefficient of voltage (K_T) for open ended line _____.
a) +2 b) 1
c) -1 d) 0

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a) lightning
b) Switching
c) resonance
d) any of the above

8) The dimensions of constants B and C are respectively _____and _____.
a) Ohm, Siemens
b) Mho, Siemens
c) Both are dimensionless
d) Siemens, Ohm

9) Insulation of the modern EHV lines is designed based on _____.
a) Lighting voltage
b) Switching voltage
c) Corona
d) RI

10) The function of steel wire in an ACSR conductor is to _____.
a) Compensate for skin effect
b) Take care of surges
c) Provide additional mechanical strength
d) Reduce inductance

11) First mode of propagation is called as _____.
a) Line to ground
b) Line to line
c) Homopolar
d) Both a) & c)

12) The measurement of electrostatic field of an e.h.v. line is done by _____.
a) Dipole
b) Spherical Dipole
c) Parallel plate
d) All of the above

13) In lossless transmission line theoretically have _____.
a) $r = 1 = 0$
b) $1 = g = 0$
c) $g = c = 0$
d) $r = g = 0$

14) The most accurate and versatile method of achieving reactive power compensation is by using _____.
a) Switched capacitors
b) Fixed capacitor with controlled reactor
c) Saturable reactor with capacitor bank
d) Switched capacitor with controlled reactor

Seat No.	

Set **S**

Fourth. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Extra High Voltage AC Transmission (BTN07712)

Day & Date: Monday, 11-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Solve Any Four. **16**

a) Explain the need of extra high voltage for transmission system.

b) Explain limits for radio interference.

c) Explain reflection and refraction of travelling waves.

d) Explain the concept attenuation of travelling waves on transmission line.

e) How the audible noise is generated and what are its characteristics?

f) Derive differential equations and solutions for general case in travelling waves.

Q.3 Solve Any Two. **12**

a) Explain the different mechanical considerations in EHV line performance?

b) Derive the expression $P_c = \frac{1}{2} KC(V_m^2 - V_0^2)$ for the energy loss from charge-voltage diagram.

c) Derive the expression for open ended line double exponential response.

SECTION – II

Q.4 Solve Any Four. **16**

a) Explain in detail ferro-resonance over voltages.

b) Explain conductor-tower, conductor-ground and conductor-conductor clearances.

c) Describe static reactive compensating system.

d) State and explain the causes of over voltages.

e) Explain the term power circle diagram and its use.

f) What are the factors considered under steady state in design of EHV lines?

Q.5 Solve Any Two. **12**

a) Explain line insulation design based upon transient over voltages in detail.

b) Explain in detail sinusoidal excitation lumped parameter circuit.

c) A 100 MVA 230kV 50 Hz transformer has x_t = 12% and is connected to a line 200 km long which has an inductance of 1 mH/km. The filter, connected to the LV 33 kV side of the transformer, is required to suppress the 5^{th} harmonic generated by the TCR to 1% of I_n. Calculate the value of filter capacitor if the filter inductance used is 2mH.

SLR-QH-624

Seat No.		Set	P

Fourth. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Advanced Electrical Drives (BTN07714)

Day & Date: Monday, 11-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) The operating speed of a synchronous motor can be changed to new fixed value by _____.
a) Changing the load
b) Changing the supply voltage
c) Changing frequency
d) Using brakes

2) A four quadrant operation requires _____.
a) Two full converters in series
b) Two full converters connected in parallel
c) Two full converter connected in back to back
d) Two semi converters connected in back to back

3) For high frequency choppers the device that is preferred is _____.
a) Thyristor b) TRIAC
c) Transistor d) GTO

4) During the starting of a slip ring induction motor using rotor resistance starter, the insertion of resistance in the rotor circuit causes _____.
a) Stator current to increase and torque to decrease
b) Stator current to decrease and torque to increase
c) Stators current to increase and power factor to decrease
d) Power factor to decrease and torque to increase

5) Which duty cycle is preferred if the load requires a constant power for short period of time and rest for sufficient longer duration?
a) Short Time duty
b) Intermittent duty
c) Intermittent duty with starting
d) Intermittent duty with starting and braking

6) The slip of an induction motor normally does not depend on _____.
a) rotor speed
b) synchronous speed
c) shaft torque
d) core loss component

7) Efficiency by using rotor resistance control in IM is _____.
a) High
b) Low
c) Very high
d) Very low

8) Speed control by variation of field flux results in _____.
a) Constant power drive
b) Constant torque drive
c) Variable power drive
d) None of the above

9) Full-converter can be used in DC motor for regenerative braking in _____.
a) Constant Operation
b) Variable Operation
c) Inversion Operation
d) Opposite Operation

10) Reluctance motor is a _____.
a) Variable torque motor
b) Low torque variable speed motor
c) Self starting type synchronous motor
d) Low noise, slow speed motor

11) Cycloconverter drive has applications in _____.
a) Low power and low speed operations
b) High power and high speed operations
c) Low power and high speed operations
d) High power and low speed operations

12) Applications of dc motor is restricted to a few load speed applications because of _____.
a) cost of motor is high
b) mechanical commutation problems
c) maintenance problem
d) all of above

13) Stepper motor is popular for _____.
a) Speed control
b) Position control
c) Torque control
d) Both a) and b)

14) Which of the following method is employed when regenerative braking is necessary?
a) DC Chopper
b) Variable Resistor
c) Inverter Rectifier
d) Motor-generator

SLR-QH-624

Seat No.	

Set P

Fourth. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Advanced Electrical Drives (BTN07714)

Day & Date: Monday, 11-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Solve Any Four **16**

a) Describe in details dynamics of Electric Drives?

b) Describe in details Characteristics of DC motors.

c) Explain the working of phase controlled converter fed DC drives.

d) Explain stator voltage control of an induction motor with speed torque characteristics.

e) Explain the chopper fed DC separately excited motor in motoring mode.

Q.3 Solve Any Two. **12**

a) Derive fundamental torque equations and components of load torque.

b) Explain the static Kramer method and static Schrebius method of speed control of three phase induction motor.

c) Describe in details dual-converter control of DC drive.

SECTION – II

Q.4 Solve Any Four. **16**

a) Explain Losses in electrical drive system.

b) Draw and explain variable frequency control for synchronous motors.

c) Explain with circuit diagram converter circuit for switched reluctance motor.

d) Describe in details Energy efficient operation of drives.

e) Explain drive circuit for stepper motor with neat sketch.

Q.5 Solve Any Two. **12**

a) Describe in details improvement of power factor and quality of supply.

b) With neat sketch explain VSI feed induction motor drive also draw block diagram for closed loop control.

c) Draw a neat diagram & explain the Cycloconverter control for synchronous motors.

Seat No.		Set	Q

Fourth. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Advanced Electrical Drives (BTN07714)

Day & Date: Monday, 11-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Speed control by variation of field flux results in _____.
a) Constant power drive b) Constant torque drive
c) Variable power drive d) None of the above

2) Full-converter can be used in DC motor for regenerative braking in _____.
a) Constant Operation b) Variable Operation
c) Inversion Operation d) Opposite Operation

3) Reluctance motor is a _____.
a) Variable torque motor
b) Low torque variable speed motor
c) Self starting type synchronous motor
d) Low noise, slow speed motor

4) Cycloconverter drive has applications in _____.
a) Low power and low speed operations
b) High power and high speed operations
c) Low power and high speed operations
d) High power and low speed operations

5) Applications of dc motor is restricted to a few load speed applications because of _____.
a) cost of motor is high
b) mechanical commutation problems
c) maintenance problem
d) all of above

6) Stepper motor is popular for _____.
a) Speed control
b) Position control
c) Torque control
d) Both a) and b)

7) Which of the following method is employed when regenerative braking is necessary?
a) DC Chopper
b) Variable Resistor
c) Inverter Rectifier
d) Motor-generator

8) The operating speed of a synchronous motor can be changed to new fixed value by _____.
a) Changing the load
b) Changing the supply voltage
c) Changing frequency
d) Using brakes

9) A four quadrant operation requires _____.
a) Two full converters in series
b) Two full converters connected in parallel
c) Two full converter connected in back to back
d) Two semi converters connected in back to back

10) For high frequency choppers the device that is preferred is _____.
a) Thyristor
b) TRIAC
c) Transistor
d) GTO

11) During the starting of a slip ring induction motor using rotor resistance starter, the insertion of resistance in the rotor circuit causes _____.
a) Stator current to increase and torque to decrease
b) Stator current to decrease and torque to increase
c) Stators current to increase and power factor to decrease
d) Power factor to decrease and torque to increase

12) Which duty cycle is preferred if the load requires a constant power for short period of time and rest for sufficient longer duration?
a) Short Time duty
b) Intermittent duty
c) Intermittent duty with starting
d) Intermittent duty with starting and braking

13) The slip of an induction motor normally does not depend on _____.
a) rotor speed
b) synchronous speed
c) shaft torque
d) core loss component

14) Efficiency by using rotor resistance control in IM is _____.
a) High
b) Low
c) Very high
d) Very low

Seat No.	

Set **Q**

Fourth. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Advanced Electrical Drives (BTN07714)

Day & Date: Monday, 11-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Solve Any Four **16**

a) Describe in details dynamics of Electric Drives?

b) Describe in details Characteristics of DC motors.

c) Explain the working of phase controlled converter fed DC drives.

d) Explain stator voltage control of an induction motor with speed torque characteristics.

e) Explain the chopper fed DC separately excited motor in motoring mode.

Q.3 Solve Any Two. **12**

a) Derive fundamental torque equations and components of load torque.

b) Explain the static Kramer method and static Schrebius method of speed control of three phase induction motor.

c) Describe in details dual-converter control of DC drive.

SECTION – II

Q.4 Solve Any Four. **16**

a) Explain Losses in electrical drive system.

b) Draw and explain variable frequency control for synchronous motors.

c) Explain with circuit diagram converter circuit for switched reluctance motor.

d) Describe in details Energy efficient operation of drives.

e) Explain drive circuit for stepper motor with neat sketch.

Q.5 Solve Any Two. **12**

a) Describe in details improvement of power factor and quality of supply.

b) With neat sketch explain VSI feed induction motor drive also draw block diagram for closed loop control.

c) Draw a neat diagram & explain the Cycloconverter control for synchronous motors.

Seat No.	

Set R

Fourth. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Advanced Electrical Drives (BTN07714)

Day & Date: Monday, 11-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Cycloconverter drive has applications in _____.
a) Low power and low speed operations
b) High power and high speed operations
c) Low power and high speed operations
d) High power and low speed operations

2) Applications of dc motor is restricted to a few load speed applications because of _____.
a) cost of motor is high
b) mechanical commutation problems
c) maintenance problem
d) all of above

3) Stepper motor is popular for _____.
a) Speed control b) Position control
c) Torque control d) Both a) and b)

4) Which of the following method is employed when regenerative braking is necessary?
a) DC Chopper b) Variable Resistor
c) Inverter Rectifier d) Motor-generator

5) The operating speed of a synchronous motor can be changed to new fixed value by _____.
a) Changing the load
b) Changing the supply voltage
c) Changing frequency
d) Using brakes

6) A four quadrant operation requires _____.
   a) Two full converters in series
   b) Two full converters connected in parallel
   c) Two full converter connected in back to back
   d) Two semi converters connected in back to back

7) For high frequency choppers the device that is preferred is _____.
   a) Thyristor
   b) TRIAC
   c) Transistor
   d) GTO

8) During the starting of a slip ring induction motor using rotor resistance starter, the insertion of resistance in the rotor circuit causes _____.
   a) Stator current to increase and torque to decrease
   b) Stator current to decrease and torque to increase
   c) Stators current to increase and power factor to decrease
   d) Power factor to decrease and torque to increase

9) Which duty cycle is preferred if the load requires a constant power for short period of time and rest for sufficient longer duration?
   a) Short Time duty
   b) Intermittent duty
   c) Intermittent duty with starting
   d) Intermittent duty with starting and braking

10) The slip of an induction motor normally does not depend on _____.
   a) rotor speed
   b) synchronous speed
   c) shaft torque
   d) core loss component

11) Efficiency by using rotor resistance control in IM is _____.
   a) High
   b) Low
   c) Very high
   d) Very low

12) Speed control by variation of field flux results in _____.
   a) Constant power drive
   b) Constant torque drive
   c) Variable power drive
   d) None of the above

13) Full-converter can be used in DC motor for regenerative braking in _____.
   a) Constant Operation
   b) Variable Operation
   c) Inversion Operation
   d) Opposite Operation

14) Reluctance motor is a _____.
   a) Variable torque motor
   b) Low torque variable speed motor
   c) Self starting type synchronous motor
   d) Low noise, slow speed motor

SLR-QH-624

Seat No.	

Set R

Fourth. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Advanced Electrical Drives (BTN07714)

Day & Date: Monday, 11-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Solve Any Four **16**

a) Describe in details dynamics of Electric Drives?

b) Describe in details Characteristics of DC motors.

c) Explain the working of phase controlled converter fed DC drives.

d) Explain stator voltage control of an induction motor with speed torque characteristics.

e) Explain the chopper fed DC separately excited motor in motoring mode.

Q.3 Solve Any Two. **12**

a) Derive fundamental torque equations and components of load torque.

b) Explain the static Kramer method and static Schrebius method of speed control of three phase induction motor.

c) Describe in details dual-converter control of DC drive.

SECTION – II

Q.4 Solve Any Four. **16**

a) Explain Losses in electrical drive system.

b) Draw and explain variable frequency control for synchronous motors.

c) Explain with circuit diagram converter circuit for switched reluctance motor.

d) Describe in details Energy efficient operation of drives.

e) Explain drive circuit for stepper motor with neat sketch.

Q.5 Solve Any Two. **12**

a) Describe in details improvement of power factor and quality of supply.

b) With neat sketch explain VSI feed induction motor drive also draw block diagram for closed loop control.

c) Draw a neat diagram & explain the Cycloconverter control for synchronous motors.

Seat No.		Set	S

Fourth. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Advanced Electrical Drives (BTN07714)

Day & Date: Monday, 11-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) The slip of an induction motor normally does not depend on _____.
a) rotor speed b) synchronous speed
c) shaft torque d) core loss component

2) Efficiency by using rotor resistance control in IM is _____.
a) High b) Low
c) Very high d) Very low

3) Speed control by variation of field flux results in _____.
a) Constant power drive b) Constant torque drive
c) Variable power drive d) None of the above

4) Full-converter can be used in DC motor for regenerative braking in _____.
a) Constant Operation b) Variable Operation
c) Inversion Operation d) Opposite Operation

5) Reluctance motor is a _____.
a) Variable torque motor
b) Low torque variable speed motor
c) Self starting type synchronous motor
d) Low noise, slow speed motor

6) Cycloconverter drive has applications in _____.
a) Low power and low speed operations
b) High power and high speed operations
c) Low power and high speed operations
d) High power and low speed operations

7) Applications of dc motor is restricted to a few load speed applications because of _____.
   a) cost of motor is high
   b) mechanical commutation problems
   c) maintenance problem
   d) all of above

8) Stepper motor is popular for _____.
   a) Speed control
   b) Position control
   c) Torque control
   d) Both a) and b)

9) Which of the following method is employed when regenerative braking is necessary?
   a) DC Chopper
   b) Variable Resistor
   c) Inverter Rectifier
   d) Motor-generator

10) The operating speed of a synchronous motor can be changed to new fixed value by _____.
   a) Changing the load
   b) Changing the supply voltage
   c) Changing frequency
   d) Using brakes

11) A four quadrant operation requires _____.
   a) Two full converters in series
   b) Two full converters connected in parallel
   c) Two full converter connected in back to back
   d) Two semi converters connected in back to back

12) For high frequency choppers the device that is preferred is _____.
   a) Thyristor
   b) TRIAC
   c) Transistor
   d) GTO

13) During the starting of a slip ring induction motor using rotor resistance starter, the insertion of resistance in the rotor circuit causes _____.
   a) Stator current to increase and torque to decrease
   b) Stator current to decrease and torque to increase
   c) Stators current to increase and power factor to decrease
   d) Power factor to decrease and torque to increase

14) Which duty cycle is preferred if the load requires a constant power for short period of time and rest for sufficient longer duration?
   a) Short Time duty
   b) Intermittent duty
   c) Intermittent duty with starting
   d) Intermittent duty with starting and braking

SLR-QH-624

Seat No.	

Set S

Fourth. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Advanced Electrical Drives (BTN07714)

Day & Date: Monday, 11-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Solve Any Four **16**

a) Describe in details dynamics of Electric Drives?

b) Describe in details Characteristics of DC motors.

c) Explain the working of phase controlled converter fed DC drives.

d) Explain stator voltage control of an induction motor with speed torque characteristics.

e) Explain the chopper fed DC separately excited motor in motoring mode.

Q.3 Solve Any Two. **12**

a) Derive fundamental torque equations and components of load torque.

b) Explain the static Kramer method and static Schrebius method of speed control of three phase induction motor.

c) Describe in details dual-converter control of DC drive.

SECTION – II

Q.4 Solve Any Four. **16**

a) Explain Losses in electrical drive system.

b) Draw and explain variable frequency control for synchronous motors.

c) Explain with circuit diagram converter circuit for switched reluctance motor.

d) Describe in details Energy efficient operation of drives.

e) Explain drive circuit for stepper motor with neat sketch.

Q.5 Solve Any Two. **12**

a) Describe in details improvement of power factor and quality of supply.

b) With neat sketch explain VSI feed induction motor drive also draw block diagram for closed loop control.

c) Draw a neat diagram & explain the Cycloconverter control for synchronous motors.

SLR-QH-625

Seat No.		Set	P

Fourth. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Advanced Applications in Solar Energy Technology (BTN07715)

Day & Date: Monday, 11-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Multiple choice questions: 14

1) In a forced or active solar water heating system, how is water circulated through the collector and storage tank?
a) By natural convection b) Using a pump or circulator
c) Through a heat exchanger d) Through a photovoltaic panel

2) In a passive solar heating system, what is the role of south-facing windows?
a) To minimize solar heat gain b) To maximize solar heat gain
c) To provide ventilation d) To generate electricity

3) In a box-type dryer, what role does the fan play in the drying process?
a) Temperature control b) Humidity regulation
c) Air circulation d) Product color enhancement

4) What is Net Metering in the context of solar PV systems?
a) Meter reading at night
b) Exchanging old meters for new ones
c) Billing method that credits excess energy back to the grid
d) Meter calibration process

5) To prevent freezing in a solar water heating system, what type of fluid is often used in the collector loop?
a) Water b) Antifreeze solution
c) Oil d) Air

6) In a Solar Vapour Compression Refrigeration system, what is the role of the compressor?
a) To absorb heat from the surroundings
b) To generate solar energy
c) To pressurize the refrigerant, making it hot
d) To circulate cold air

7) Which factor is crucial for determining the efficiency of a solar PV rooftop system?
a) Roof color
b) Panel orientation
c) Building height
d) Local population density

8) What is Triethylene Glycol primarily used for?
a) As a refrigerant to cool the air
b) As a fuel to generate heat
c) As an absorbent to capture heat from the solar collectors
d) As a coolant for the solar panels

9) What is the role of the desiccant material?
a) To heat the incoming air
b) To absorb and remove moisture from the incoming air
c) To cool the indoor air
d) To filter the air

10) How does a wick-type solar still function?
a) By using mirrors to concentrate sunlight
b) By absorbing sunlight with photovoltaic cells
c) By using a wick to transport water for evaporation
d) By converting sunlight into heat directly

11) In food processing, hot air is often used for _____.
a) Freezing
b) Sterilization
c) Fermentation
d) Dehydration

12) In industrial processes, hot air is commonly used for _____.
a) Electricity generation
b) Water purification
c) Space heating
d) Metal casting

13) Which factor is crucial for determining the efficiency of a solar PV rooftop system?
a) Roof color
b) Panel orientation
c) Building height
d) Local population density

14) In a passive solar building, what is the primary purpose of shading devices?
a) To block all sunlight from entering the building
b) To reduce glare
c) To control heat gain and prevent overheating
d) To create a dark interior environment

Seat No.	

Set **P**

Fourth. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Advanced Applications in Solar Energy Technology (BTN07715)

Day & Date: Monday, 11-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt Any Three. **12**

a) Explain
i) Freezing
ii) Scaling

b) Describe the “Direct Gain” in passive solar design.

c) Explain the concept of “Solar Vapour Compression Refrigeration.”

d) Discuss with neat diagram working of Thermal storage wall.

Q.3 Attempt Any Two. **16**

a) Explain
i) Natural circulation water heating
ii) Forced circulation water heating

b) Explain any two methods of passive cooling of building.

c) What is Intermittent absorption refrigeration system?

SECTION – II

Q.4 Attempt Any Three. **12**

a) Explain simple solar still.

b) Describe Box type solar dryer.

c) What is net metering in rooftop system?

d) Discuss material problems in solar still.

Q.5 Attempt Any Two. **16**

a) Explain concept of wick type solar still & active solar still.

b) Explain Bin type grain dryer & solar timber drying.

c) Describe the concept of solar water pumping system with its advantages.

Seat No.	

Set **Q**

Fourth. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Advanced Applications in Solar Energy Technology (BTN07715)

Day & Date: Monday, 11-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Multiple choice questions: **14**

1) What is Triethylene Glycol primarily used for?
a) As a refrigerant to cool the air
b) As a fuel to generate heat
c) As an absorbent to capture heat from the solar collectors
d) As a coolant for the solar panels

2) What is the role of the desiccant material?
a) To heat the incoming air
b) To absorb and remove moisture from the incoming air
c) To cool the indoor air
d) To filter the air

3) How does a wick-type solar still function?
a) By using mirrors to concentrate sunlight
b) By absorbing sunlight with photovoltaic cells
c) By using a wick to transport water for evaporation
d) By converting sunlight into heat directly

4) In food processing, hot air is often used for _____.
a) Freezing b) Sterilization
c) Fermentation d) Dehydration

5) In industrial processes, hot air is commonly used for _____.
a) Electricity generation b) Water purification
c) Space heating d) Metal casting

6) Which factor is crucial for determining the efficiency of a solar PV rooftop system?
a) Roof color b) Panel orientation
c) Building height d) Local population density

7) In a passive solar building, what is the primary purpose of shading devices?
a) To block all sunlight from entering the building
b) To reduce glare
c) To control heat gain and prevent overheating
d) To create a dark interior environment

8) In a forced or active solar water heating system, how is water circulated through the collector and storage tank?
a) By natural convection
b) Using a pump or circulator
c) Through a heat exchanger
d) Through a photovoltaic panel

9) In a passive solar heating system, what is the role of south-facing windows?
a) To minimize solar heat gain
b) To maximize solar heat gain
c) To provide ventilation
d) To generate electricity

10) In a box-type dryer, what role does the fan play in the drying process?
a) Temperature control
b) Humidity regulation
c) Air circulation
d) Product color enhancement

11) What is Net Metering in the context of solar PV systems?
a) Meter reading at night
b) Exchanging old meters for new ones
c) Billing method that credits excess energy back to the grid
d) Meter calibration process

12) To prevent freezing in a solar water heating system, what type of fluid is often used in the collector loop?
a) Water
b) Antifreeze solution
c) Oil
d) Air

13) In a Solar Vapour Compression Refrigeration system, what is the role of the compressor?
a) To absorb heat from the surroundings
b) To generate solar energy
c) To pressurize the refrigerant, making it hot
d) To circulate cold air

14) Which factor is crucial for determining the efficiency of a solar PV rooftop system?
a) Roof color
b) Panel orientation
c) Building height
d) Local population density

Seat No.	

Set **Q**

Fourth. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Advanced Applications in Solar Energy Technology (BTN07715)

Day & Date: Monday, 11-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt Any Three. **12**

a) Explain
i) Freezing
ii) Scaling

b) Describe the “Direct Gain” in passive solar design.

c) Explain the concept of “Solar Vapour Compression Refrigeration.”

d) Discuss with neat diagram working of Thermal storage wall.

Q.3 Attempt Any Two. **16**

a) Explain
i) Natural circulation water heating
ii) Forced circulation water heating

b) Explain any two methods of passive cooling of building.

c) What is Intermittent absorption refrigeration system?

SECTION – II

Q.4 Attempt Any Three. **12**

a) Explain simple solar still.

b) Describe Box type solar dryer.

c) What is net metering in rooftop system?

d) Discuss material problems in solar still.

Q.5 Attempt Any Two. **16**

a) Explain concept of wick type solar still & active solar still.

b) Explain Bin type grain dryer & solar timber drying.

c) Describe the concept of solar water pumping system with its advantages.

Seat No.	

Set **R**

Fourth. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Advanced Applications in Solar Energy Technology (BTN07715)

Day & Date: Monday, 11-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Multiple choice questions: **14**

1) In food processing, hot air is often used for _____.
a) Freezing b) Sterilization
c) Fermentation d) Dehydration

2) In industrial processes, hot air is commonly used for _____.
a) Electricity generation b) Water purification
c) Space heating d) Metal casting

3) Which factor is crucial for determining the efficiency of a solar PV rooftop system?
a) Roof color b) Panel orientation
c) Building height d) Local population density

4) In a passive solar building, what is the primary purpose of shading devices?
a) To block all sunlight from entering the building
b) To reduce glare
c) To control heat gain and prevent overheating
d) To create a dark interior environment

5) In a forced or active solar water heating system, how is water circulated through the collector and storage tank?
a) By natural convection b) Using a pump or circulator
c) Through a heat exchanger d) Through a photovoltaic panel

6) In a passive solar heating system, what is the role of south-facing windows?
a) To minimize solar heat gain b) To maximize solar heat gain
c) To provide ventilation d) To generate electricity

7) In a box-type dryer, what role does the fan play in the drying process?
a) Temperature control
b) Humidity regulation
c) Air circulation
d) Product color enhancement

8) What is Net Metering in the context of solar PV systems?
a) Meter reading at night
b) Exchanging old meters for new ones
c) Billing method that credits excess energy back to the grid
d) Meter calibration process

9) To prevent freezing in a solar water heating system, what type of fluid is often used in the collector loop?
a) Water
b) Antifreeze solution
c) Oil
d) Air

10) In a Solar Vapour Compression Refrigeration system, what is the role of the compressor?
a) To absorb heat from the surroundings
b) To generate solar energy
c) To pressurize the refrigerant, making it hot
d) To circulate cold air

11) Which factor is crucial for determining the efficiency of a solar PV rooftop system?
a) Roof color
b) Panel orientation
c) Building height
d) Local population density

12) What is Triethylene Glycol primarily used for?
a) As a refrigerant to cool the air
b) As a fuel to generate heat
c) As an absorbent to capture heat from the solar collectors
d) As a coolant for the solar panels

13) What is the role of the desiccant material?
a) To heat the incoming air
b) To absorb and remove moisture from the incoming air
c) To cool the indoor air
d) To filter the air

14) How does a wick-type solar still function?
a) By using mirrors to concentrate sunlight
b) By absorbing sunlight with photovoltaic cells
c) By using a wick to transport water for evaporation
d) By converting sunlight into heat directly

Seat No.	

Set **R**

Fourth. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Advanced Applications in Solar Energy Technology (BTN07715)

Day & Date: Monday, 11-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt Any Three. **12**

a) Explain
i) Freezing
ii) Scaling

b) Describe the “Direct Gain” in passive solar design.

c) Explain the concept of “Solar Vapour Compression Refrigeration.”

d) Discuss with neat diagram working of Thermal storage wall.

Q.3 Attempt Any Two. **16**

a) Explain
i) Natural circulation water heating
ii) Forced circulation water heating

b) Explain any two methods of passive cooling of building.

c) What is Intermittent absorption refrigeration system?

SECTION – II

Q.4 Attempt Any Three. **12**

a) Explain simple solar still.

b) Describe Box type solar dryer.

c) What is net metering in rooftop system?

d) Discuss material problems in solar still.

Q.5 Attempt Any Two. **16**

a) Explain concept of wick type solar still & active solar still.

b) Explain Bin type grain dryer & solar timber drying.

c) Describe the concept of solar water pumping system with its advantages.

Seat No.	

Set **S**

Fourth. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Advanced Applications in Solar Energy Technology (BTN07715)

Day & Date: Monday, 11-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Multiple choice questions: 14

1) In a Solar Vapour Compression Refrigeration system, what is the role of the compressor?
a) To absorb heat from the surroundings
b) To generate solar energy
c) To pressurize the refrigerant, making it hot
d) To circulate cold air

2) Which factor is crucial for determining the efficiency of a solar PV rooftop system?
a) Roof color
b) Panel orientation
c) Building height
d) Local population density

3) What is Triethylene Glycol primarily used for?
a) As a refrigerant to cool the air
b) As a fuel to generate heat
c) As an absorbent to capture heat from the solar collectors
d) As a coolant for the solar panels

4) What is the role of the desiccant material?
a) To heat the incoming air
b) To absorb and remove moisture from the incoming air
c) To cool the indoor air
d) To filter the air

5) How does a wick-type solar still function?
a) By using mirrors to concentrate sunlight
b) By absorbing sunlight with photovoltaic cells
c) By using a wick to transport water for evaporation
d) By converting sunlight into heat directly

6) In food processing, hot air is often used for _____.
a) Freezing b) Sterilization
c) Fermentation d) Dehydration

7) In industrial processes, hot air is commonly used for _____.
a) Electricity generation b) Water purification
c) Space heating d) Metal casting

8) Which factor is crucial for determining the efficiency of a solar PV rooftop system?
a) Roof color b) Panel orientation
c) Building height d) Local population density

9) In a passive solar building, what is the primary purpose of shading devices?
a) To block all sunlight from entering the building
b) To reduce glare
c) To control heat gain and prevent overheating
d) To create a dark interior environment

10) In a forced or active solar water heating system, how is water circulated through the collector and storage tank?
a) By natural convection b) Using a pump or circulator
c) Through a heat exchanger d) Through a photovoltaic panel

11) In a passive solar heating system, what is the role of south-facing windows?
a) To minimize solar heat gain b) To maximize solar heat gain
c) To provide ventilation d) To generate electricity

12) In a box-type dryer, what role does the fan play in the drying process?
a) Temperature control b) Humidity regulation
c) Air circulation d) Product color enhancement

13) What is Net Metering in the context of solar PV systems?
a) Meter reading at night
b) Exchanging old meters for new ones
c) Billing method that credits excess energy back to the grid
d) Meter calibration process

14) To prevent freezing in a solar water heating system, what type of fluid is often used in the collector loop?
a) Water b) Antifreeze solution
c) Oil d) Air

SLR-QH-625

Seat No.	

Set S

Fourth. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Advanced Applications in Solar Energy Technology (BTN07715)

Day & Date: Monday, 11-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt Any Three. **12**

a) Explain
i) Freezing
ii) Scaling

b) Describe the “Direct Gain” in passive solar design.

c) Explain the concept of “Solar Vapour Compression Refrigeration.”

d) Discuss with neat diagram working of Thermal storage wall.

Q.3 Attempt Any Two. **16**

a) Explain
i) Natural circulation water heating
ii) Forced circulation water heating

b) Explain any two methods of passive cooling of building.

c) What is Intermittent absorption refrigeration system?

SECTION – II

Q.4 Attempt Any Three. **12**

a) Explain simple solar still.

b) Describe Box type solar dryer.

c) What is net metering in rooftop system?

d) Discuss material problems in solar still.

Q.5 Attempt Any Two. **16**

a) Explain concept of wick type solar still & active solar still.

b) Explain Bin type grain dryer & solar timber drying.

c) Describe the concept of solar water pumping system with its advantages.

SLR-QH-627

Seat No.		Set	P

Fourth. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Testing & Certification of Electric & Hybrid vehicles (BTN07719)

Day & Date: Wednesday, 13-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) What is an Automobile?
a) self-propelled vehicle
b) used for carrying passengers and goods on the ground
c) contains the power source for its propulsion
d) All of the mentioned

2) Gradient resistance for a vehicle depends on which of the following factors?
a) Weight of the vehicle b) Size of the vehicle
c) Width of tyres d) Speed of the vehicle

3) What does the 'ply rating' refer to?
a) Aspect ratio
b) Rated strength
c) Recommended inflation pressure
d) The actual number of plies

4) What is the function of the Electronic control unit in Anti-lock braking system?
a) Monitoring the speed of the wheel
b) Decreases the stopping distance
c) Provides electronic stability control
d) Maintaining the tractive force

5) A vehicle driving performance is usually evaluated by _____.
a) Acceleration time b) Maximum speed
c) Gradeability d) All of the above

6) An under-inflated tyre will wear the tread most _____.
- a) Near the centre
- b) Near the edges
- c) In the lateral direction
- d) In the cross direction

7) The capacity of a battery is usually expressed in terms of _____.
- a) Volts
- b) Amperes
- c) Weight
- d) Ampere hours

8) When the front wheels of a vehicle are locked during braking, then _____.
- a) Stopping distance becomes extremely long
- b) Front tyres skid across the road surface, and the vehicle spins around
- c) Rear tyres skid across the road surface, and the vehicle spins around
- d) Driver loses control over the steering, and the vehicle continues moving in its current direction

9) What is the primary purpose of a demist test in a vehicle?
- a) To evaluate the vehicle's audio system
- b) To assess the effectiveness of the demisting system in clearing condensation and fog from the windshield
- c) To measure the vehicle's fuel efficiency
- d) To check the tire pressure

10) What is the typical outcome of a successful type approval process?
- a) The product is eligible for warranty coverage
- b) The product can be sold in the market legally
- c) The product's price is regulated by the government
- d) The product must be recalled from the market

11) In noise testing, which instrument is used to measure sound levels and frequencies?
- a) Voltmeter
- b) Tachometer
- c) Sound level meter
- d) Spectrometer

12) What is the advantage of using HiL testing for EVs/HEVs?
- a) It is more cost-effective than physical testing
- b) It eliminates the need for vehicle prototypes
- c) It can simulate a wide range of operating conditions and scenarios
- d) It speeds up the charging process

13) What is the primary purpose of tell-tales (warning lights) in a vehicle's dashboard?
- a) To enhance the vehicle's aesthetics
- b) To provide ambient lighting in the cabin
- c) To communicate important vehicle information and warnings
- d) To control the vehicle's entertainment system

14) What is the full form of CMVR in the context of Indian road transport?

a) Central Motor Vehicle Rules
b) Central Ministry for Vehicle Regulation
c) Comprehensive Motor Vehicle Report
d) Central Motor Vehicle Registry

SLR-QH-627

Seat No.		Set	P

Fourth. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Testing & Certification of Electric & Hybrid vehicles (BTN07719)

Day & Date: Wednesday, 13-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Solve Any Four. **16**

a) Describe M, N & O categories of vehicle.

b) Describe various performance parameters of vehicle.

c) Explain the arrangement of foot controls for M1 type vehicle.

d) Explain Energy consumption calculation of electric vehicle.

e) What is dynamic testing of vehicle? Explain the factors affecting dynamic testing.

f) Explain the procedure of constant speed fuel consumption test of vehicle.

Q.3 Solve Any Two. **12**

a) State the required instruments for testing of vehicles. Also explain any four types of test tracks.

b) Explain the requirement of temporary cabin for Drive-Away-Chassis.

c) Explain grade ability test of vehicle.

SECTION – II

Q.4 Solve Any Four. **16**

a) Describe hinges and latches test of vehicle.

b) Explain drivers field of vision.

c) Explain the tests for safety requirements of traction batteries.

d) Explain fuel tank test of vehicle.

e) Describe the requirements of Electric Vehicle Conductive DC Charging System.

f) State and explain hybrid electric vehicles tests (M and N category).

Q.5 Solve Any Two. **12**

a) Describe windscreen laminated and toughened safety glass test of vehicle.

b) Tests for Hybrid Electric System Intended for Retro-fitment on Vehicles of M and N Category (GVW < 3500 kg).

c) Describe the requirements of Electric Vehicle Conductive AC Charging System.

Seat No.	

Set **Q**

Fourth. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Testing & Certification of Electric & Hybrid vehicles (BTN07719)

Day & Date: Wednesday, 13-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) When the front wheels of a vehicle are locked during braking, then _____.
a) Stopping distance becomes extremely long
b) Front tyres skid across the road surface, and the vehicle spins around
c) Rear tyres skid across the road surface, and the vehicle spins around
d) Driver loses control over the steering, and the vehicle continues moving in its current direction

2) What is the primary purpose of a demist test in a vehicle?
a) To evaluate the vehicle's audio system
b) To assess the effectiveness of the demisting system in clearing condensation and fog from the windshield
c) To measure the vehicle's fuel efficiency
d) To check the tire pressure

3) What is the typical outcome of a successful type approval process?
a) The product is eligible for warranty coverage
b) The product can be sold in the market legally
c) The product's price is regulated by the government
d) The product must be recalled from the market

4) In noise testing, which instrument is used to measure sound levels and frequencies?
a) Voltmeter b) Tachometer
c) Sound level meter d) Spectrometer

5) What is the advantage of using HiL testing for EVs/HEVs?
   a) It is more cost-effective than physical testing
   b) It eliminates the need for vehicle prototypes
   c) It can simulate a wide range of operating conditions and scenarios
   d) It speeds up the charging process

6) What is the primary purpose of tell-tales (warning lights) in a vehicle's dashboard?
   a) To enhance the vehicle's aesthetics
   b) To provide ambient lighting in the cabin
   c) To communicate important vehicle information and warnings
   d) To control the vehicle's entertainment system

7) What is the full form of CMVR in the context of Indian road transport?
   a) Central Motor Vehicle Rules
   b) Central Ministry for Vehicle Regulation
   c) Comprehensive Motor Vehicle Report
   d) Central Motor Vehicle Registry

8) What is an Automobile?
   a) self-propelled vehicle
   b) used for carrying passengers and goods on the ground
   c) contains the power source for its propulsion
   d) All of the mentioned

9) Gradient resistance for a vehicle depends on which of the following factors?
   a) Weight of the vehicle
   b) Size of the vehicle
   c) Width of tyres
   d) Speed of the vehicle

10) What does the ‘ply rating’ refer to?
   a) Aspect ratio
   b) Rated strength
   c) Recommended inflation pressure
   d) The actual number of plies

11) What is the function of the Electronic control unit in Anti-lock braking system?
   a) Monitoring the speed of the wheel
   b) Decreases the stopping distance
   c) Provides electronic stability control
   d) Maintaining the tractive force

12) A vehicle driving performance is usually evaluated by _____.
   a) Acceleration time
   b) Maximum speed
   c) Gradeability
   d) All of the above

13) An under-inflated tyre will wear the tread most _____.

a) Near the centre
b) Near the edges
c) In the lateral direction
d) In the cross direction

14) The capacity of a battery is usually expressed in terms of _____.

a) Volts
b) Amperes
c) Weight
d) Ampere hours

SLR-QH-627

Seat No.		Set	Q

Fourth. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Testing & Certification of Electric & Hybrid vehicles (BTN07719)

Day & Date: Wednesday, 13-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Solve Any Four. **16**

a) Describe M, N & O categories of vehicle.

b) Describe various performance parameters of vehicle.

c) Explain the arrangement of foot controls for M1 type vehicle.

d) Explain Energy consumption calculation of electric vehicle.

e) What is dynamic testing of vehicle? Explain the factors affecting dynamic testing.

f) Explain the procedure of constant speed fuel consumption test of vehicle.

Q.3 Solve Any Two. **12**

a) State the required instruments for testing of vehicles. Also explain any four types of test tracks.

b) Explain the requirement of temporary cabin for Drive-Away-Chassis.

c) Explain grade ability test of vehicle.

SECTION – II

Q.4 Solve Any Four. **16**

a) Describe hinges and latches test of vehicle.

b) Explain drivers field of vision.

c) Explain the tests for safety requirements of traction batteries.

d) Explain fuel tank test of vehicle.

e) Describe the requirements of Electric Vehicle Conductive DC Charging System.

f) State and explain hybrid electric vehicles tests (M and N category).

Q.5 Solve Any Two. **12**

a) Describe windscreen laminated and toughened safety glass test of vehicle.

b) Tests for Hybrid Electric System Intended for Retro-fitment on Vehicles of M and N Category (GVW < 3500 kg).

c) Describe the requirements of Electric Vehicle Conductive AC Charging System.

Seat No.	

Set R

Fourth. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Testing & Certification of Electric & Hybrid vehicles (BTN07719)

Day & Date: Wednesday, 13-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) In noise testing, which instrument is used to measure sound levels and frequencies?
a) Voltmeter b) Tachometer
c) Sound level meter d) Spectrometer

2) What is the advantage of using HiL testing for EVs/HEVs?
a) It is more cost-effective than physical testing
b) It eliminates the need for vehicle prototypes
c) It can simulate a wide range of operating conditions and scenarios
d) It speeds up the charging process

3) What is the primary purpose of tell-tales (warning lights) in a vehicle's dashboard?
a) To enhance the vehicle's aesthetics
b) To provide ambient lighting in the cabin
c) To communicate important vehicle information and warnings
d) To control the vehicle's entertainment system

4) What is the full form of CMVR in the context of Indian road transport?
a) Central Motor Vehicle Rules
b) Central Ministry for Vehicle Regulation
c) Comprehensive Motor Vehicle Report
d) Central Motor Vehicle Registry

5) What is an Automobile?
   a) self-propelled vehicle
   b) used for carrying passengers and goods on the ground
   c) contains the power source for its propulsion
   d) All of the mentioned

6) Gradient resistance for a vehicle depends on which of the following factors?
   a) Weight of the vehicle
   b) Size of the vehicle
   c) Width of tyres
   d) Speed of the vehicle

7) What does the 'ply rating' refer to?
   a) Aspect ratio
   b) Rated strength
   c) Recommended inflation pressure
   d) The actual number of plies

8) What is the function of the Electronic control unit in Anti-lock braking system?
   a) Monitoring the speed of the wheel
   b) Decreases the stopping distance
   c) Provides electronic stability control
   d) Maintaining the tractive force

9) A vehicle driving performance is usually evaluated by _____.
   a) Acceleration time
   b) Maximum speed
   c) Gradeability
   d) All of the above

10) An under-inflated tyre will wear the tread most _____.
   a) Near the centre
   b) Near the edges
   c) In the lateral direction
   d) In the cross direction

11) The capacity of a battery is usually expressed in terms of _____.
   a) Volts
   b) Amperes
   c) Weight
   d) Ampere hours

12) When the front wheels of a vehicle are locked during braking, then _____.
   a) Stopping distance becomes extremely long
   b) Front tyres skid across the road surface, and the vehicle spins around
   c) Rear tyres skid across the road surface, and the vehicle spins around
   d) Driver loses control over the steering, and the vehicle continues moving in its current direction

13) What is the primary purpose of a demist test in a vehicle?
   a) To evaluate the vehicle's audio system
   b) To assess the effectiveness of the demisting system in clearing condensation and fog from the windshield
   c) To measure the vehicle's fuel efficiency
   d) To check the tire pressure

14) What is the typical outcome of a successful type approval process?
   a) The product is eligible for warranty coverage
   b) The product can be sold in the market legally
   c) The product's price is regulated by the government
   d) The product must be recalled from the market

SLR-QH-627

Seat No.		Set	R

Fourth. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Testing & Certification of Electric & Hybrid vehicles (BTN07719)

Day & Date: Wednesday, 13-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Solve Any Four. **16**

a) Describe M, N & O categories of vehicle.

b) Describe various performance parameters of vehicle.

c) Explain the arrangement of foot controls for M1 type vehicle.

d) Explain Energy consumption calculation of electric vehicle.

e) What is dynamic testing of vehicle? Explain the factors affecting dynamic testing.

f) Explain the procedure of constant speed fuel consumption test of vehicle.

Q.3 Solve Any Two. **12**

a) State the required instruments for testing of vehicles. Also explain any four types of test tracks.

b) Explain the requirement of temporary cabin for Drive-Away-Chassis.

c) Explain grade ability test of vehicle.

SECTION – II

Q.4 Solve Any Four. **16**

a) Describe hinges and latches test of vehicle.

b) Explain drivers field of vision.

c) Explain the tests for safety requirements of traction batteries.

d) Explain fuel tank test of vehicle.

e) Describe the requirements of Electric Vehicle Conductive DC Charging System.

f) State and explain hybrid electric vehicles tests (M and N category).

Q.5 Solve Any Two. **12**

a) Describe windscreen laminated and toughened safety glass test of vehicle.

b) Tests for Hybrid Electric System Intended for Retro-fitment on Vehicles of M and N Category (GVW < 3500 kg).

c) Describe the requirements of Electric Vehicle Conductive AC Charging System.

Seat No.	

Set **S**

Fourth. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Testing & Certification of Electric & Hybrid vehicles (BTN07719)

Day & Date: Wednesday, 13-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) An under-inflated tyre will wear the tread most _____.
a) Near the centre b) Near the edges
c) In the lateral direction d) In the cross direction

2) The capacity of a battery is usually expressed in terms of _____.
a) Volts b) Amperes
c) Weight d) Ampere hours

3) When the front wheels of a vehicle are locked during braking, then _____.
a) Stopping distance becomes extremely long
b) Front tyres skid across the road surface, and the vehicle spins around
c) Rear tyres skid across the road surface, and the vehicle spins around
d) Driver loses control over the steering, and the vehicle continues moving in its current direction

4) What is the primary purpose of a demist test in a vehicle?
a) To evaluate the vehicle's audio system
b) To assess the effectiveness of the demisting system in clearing condensation and fog from the windshield
c) To measure the vehicle's fuel efficiency
d) To check the tire pressure

5) What is the typical outcome of a successful type approval process?
a) The product is eligible for warranty coverage
b) The product can be sold in the market legally
c) The product's price is regulated by the government
d) The product must be recalled from the market

6) In noise testing, which instrument is used to measure sound levels and frequencies?
   a) Voltmeter
   b) Tachometer
   c) Sound level meter
   d) Spectrometer

7) What is the advantage of using HiL testing for EVs/HEVs?
   a) It is more cost-effective than physical testing
   b) It eliminates the need for vehicle prototypes
   c) It can simulate a wide range of operating conditions and scenarios
   d) It speeds up the charging process

8) What is the primary purpose of tell-tales (warning lights) in a vehicle's dashboard?
   a) To enhance the vehicle's aesthetics
   b) To provide ambient lighting in the cabin
   c) To communicate important vehicle information and warnings
   d) To control the vehicle's entertainment system

9) What is the full form of CMVR in the context of Indian road transport?
   a) Central Motor Vehicle Rules
   b) Central Ministry for Vehicle Regulation
   c) Comprehensive Motor Vehicle Report
   d) Central Motor Vehicle Registry

10) What is an Automobile?
   a) self-propelled vehicle
   b) used for carrying passengers and goods on the ground
   c) contains the power source for its propulsion
   d) All of the mentioned

11) Gradient resistance for a vehicle depends on which of the following factors?
   a) Weight of the vehicle
   b) Size of the vehicle
   c) Width of tyres
   d) Speed of the vehicle

12) What does the ‘ply rating’ refer to?
   a) Aspect ratio
   b) Rated strength
   c) Recommended inflation pressure
   d) The actual number of plies

13) What is the function of the Electronic control unit in Anti-lock braking system?
   a) Monitoring the speed of the wheel
   b) Decreases the stopping distance
   c) Provides electronic stability control
   d) Maintaining the tractive force

14) A vehicle driving performance is usually evaluated by _____.

a) Acceleration time
b) Maximum speed
c) Gradeability
d) All of the above

SLR-QH-627

Seat No.		Set	S

Fourth. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Testing & Certification of Electric & Hybrid vehicles (BTN07719)

Day & Date: Wednesday, 13-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Solve Any Four. **16**

a) Describe M, N & O categories of vehicle.

b) Describe various performance parameters of vehicle.

c) Explain the arrangement of foot controls for M1 type vehicle.

d) Explain Energy consumption calculation of electric vehicle.

e) What is dynamic testing of vehicle? Explain the factors affecting dynamic testing.

f) Explain the procedure of constant speed fuel consumption test of vehicle.

Q.3 Solve Any Two. **12**

a) State the required instruments for testing of vehicles. Also explain any four types of test tracks.

b) Explain the requirement of temporary cabin for Drive-Away-Chassis.

c) Explain grade ability test of vehicle.

SECTION – II

Q.4 Solve Any Four. **16**

a) Describe hinges and latches test of vehicle.

b) Explain drivers field of vision.

c) Explain the tests for safety requirements of traction batteries.

d) Explain fuel tank test of vehicle.

e) Describe the requirements of Electric Vehicle Conductive DC Charging System.

f) State and explain hybrid electric vehicles tests (M and N category).

Q.5 Solve Any Two. **12**

a) Describe windscreen laminated and toughened safety glass test of vehicle.

b) Tests for Hybrid Electric System Intended for Retro-fitment on Vehicles of M and N Category (GVW < 3500 kg).

c) Describe the requirements of Electric Vehicle Conductive AC Charging System.

SLR-QH-629

Seat No.		Set	P

Fourth Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Electrical Estimation, Installation, and Testing (BTN07802)

Day & Date: Thursday, 14-05-2026 Max. Marks: 50
Time: 03:00 PM To 05:00 PM

Instructions:1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions (if necessary and state them clearly).

MCQ/Objective Type Questions

Duration: 20 Minutes Marks:10

Q.1 Choose the correct Answer. 10

1) In fire extinguisher we use _____.
a) CO_2 b) SO_2
c) O_2 d) H_2O

2) Do's and Don'ts are observed carefully in safety precautions as per _____.
a) IS 5216-1962 b) IS 5216-1964
c) IS 5216-1966 d) IS 5216-1969

3) What should be the insulation resistance in case of PVC wires?
a) 12.5 MΩ / number of outlet b) 82.5 MΩ/ number of outlet
c) 2.5 MΩ / number of outlet d) 10.5 MΩ/ number of outlet

4) Polarization index is greater than _____ for class A insulation.
a) 1 b) 1.5
c) 2 d) 2.5

5) Brake test is _____ method of testing machine.
a) Regenerative b) Direct
c) Indirect d) All of these

6) The torque of induction motor is _____.
a) Directly proportional to V b) Directly proportional to V^2
c) Inversely proportional to V d) Inversely proportional to V^2

7) When motor arranged in the same line as that of driven machine this coupling is also called as _____.
a) Direct coupling b) Indirect coupling
c) Both a) and b) d) None of these

8) Depth of foundation is dependent on _____.

a) Cost of equipment
b) Frequency
c) H.P. rating
d) None of these

9) Which of the following factors affects on life of insulating material ____.

a) Temperature
b) Deposition of dust
c) Impurities
d) All of these

10) In insulation resistance test of 132 kv transformer, minimum insulation resistance is _____.

a) 250MΩ
b) 500MΩ
c) 750MΩ
d) 1000MΩ

Seat No.	

Set **P**

Fourth Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Electrical Estimation, Installation, and Testing (BTN07802)

Day & Date: Thursday, 14-05-2026 Max. Marks: 40
Time: 03:00 PM To 05:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.2 Attempt (Any Five). **40**

a) State different factors on which severity of electric shock depends. Briefly explain every factor.

b) The main circuit wire in a house is required to carry a current of 45 amperes when connected to single phase a.c. supply. Determine the size of the wire if the length of the circuit is 40 metres.

c) Explain in details the effects of misalignment in case of directly coupled drives and indirectly coupled drives.

d) Explain with neat sketch and resistance equation measurement of DC resistance of three phase induction motor.

e) Explain with neat sketch procedure for levelling and alignment of two shafts of directly and indirectly coupled drives.

f) Explain with neat sketch open delta method in case of transformer.

g) State and explain properties of good transformer oil. Also State factors on which life of insulation depends.

Seat No.	

Set **Q**

Fourth Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Electrical Estimation, Installation, and Testing (BTN07802)

Day & Date: Thursday, 14-05-2026 Max. Marks: 50
Time: 03:00 PM To 05:00 PM

Instructions:1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions (if necessary and state them clearly).

MCQ/Objective Type Questions

Duration: 20 Minutes Marks:10

Q.1 Choose the correct Answer. **10**

1) The torque of induction motor is _____.
a) Directly proportional to V b) Directly proportional to V^2
c) Inversely proportional to V d) Inversely proportional to V^2

2) When motor arranged in the same line as that of driven machine this coupling is also called as _____.
a) Direct coupling b) Indirect coupling
c) Both a) and b) d) None of these

3) Depth of foundation is dependent on _____.
a) Cost of equipment b) Frequency
c) H.P. rating d) None of these

4) Which of the following factors affects on life of insulating material ____.
a) Temperature b) Deposition of dust
c) Impurities d) All of these

5) In insulation resistance test of 132 kv transformer, minimum insulation resistance is _____.
a) 250MΩ b) 500MΩ
c) 750MΩ d) 1000MΩ

6) In fire extinguisher we use _____.
a) CO_2 b) SO_2
c) O_2 d) H_2O

7) Do's and Don'ts are observed carefully in safety precautions as per _____.

a) IS 5216-1962 b) IS 5216-1964
c) IS 5216-1966 d) IS 5216-1969

8) What should be the insulation resistance in case of PVC wires?

a) 12.5 MΩ / number of outlet b) 82.5 MΩ/ number of outlet
c) 2.5 MΩ / number of outlet d) 10.5 MΩ/ number of outlet

9) Polarization index is greater than _____ for class A insulation.

a) 1 b) 1.5
c) 2 d) 2.5

10) Brake test is _____ method of testing machine.

a) Regenerative b) Direct
c) Indirect d) All of these

Seat No.	

Set **Q**

Fourth Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Electrical Estimation, Installation, and Testing (BTN07802)

Day & Date: Thursday, 14-05-2026 Max. Marks: 40
Time: 03:00 PM To 05:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.2 Attempt (Any Five). **40**

a) State different factors on which severity of electric shock depends. Briefly explain every factor.

b) The main circuit wire in a house is required to carry a current of 45 amperes when connected to single phase a.c. supply. Determine the size of the wire if the length of the circuit is 40 metres.

c) Explain in details the effects of misalignment in case of directly coupled drives and indirectly coupled drives.

d) Explain with neat sketch and resistance equation measurement of DC resistance of three phase induction motor.

e) Explain with neat sketch procedure for levelling and alignment of two shafts of directly and indirectly coupled drives.

f) Explain with neat sketch open delta method in case of transformer.

g) State and explain properties of good transformer oil. Also State factors on which life of insulation depends.

Seat No.	

Set **R**

Fourth Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Electrical Estimation, Installation, and Testing (BTN07802)

Day & Date: Thursday, 14-05-2026 Max. Marks: 50
Time: 03:00 PM To 05:00 PM

Instructions:1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions (if necessary and state them clearly).

MCQ/Objective Type Questions

Duration: 20 Minutes Marks:10

Q.1 Choose the correct Answer. 10

1) Which of the following factors affects on life of insulating material ____.
a) Temperature b) Deposition of dust
c) Impurities d) All of these

2) In insulation resistance test of 132 kv transformer, minimum insulation resistance is _____.
a) 250MΩ b) 500MΩ
c) 750MΩ d) 1000MΩ

3) In fire extinguisher we use _____.
a) CO_2 b) SO_2
c) O_2 d) H_2O

4) Do's and Don'ts are observed carefully in safety precautions as per _____.
a) IS 5216-1962 b) IS 5216-1964
c) IS 5216-1966 d) IS 5216-1969

5) What should be the insulation resistance in case of PVC wires?
a) 12.5 MΩ / number of outlet b) 82.5 MΩ/ number of outlet
c) 2.5 MΩ / number of outlet d) 10.5 MΩ/ number of outlet

6) Polarization index is greater than _____ for class A insulation.
a) 1 b) 1.5
c) 2 d) 2.5

7) Brake test is _____ method of testing machine.
a) Regenerative b) Direct
c) Indirect d) All of these

8) The torque of induction motor is _____.

a) Directly proportional to V
b) Directly proportional to V^2
c) Inversely proportional to V
d) Inversely proportional to V^2

9) When motor arranged in the same line as that of driven machine this coupling is also called as _____.

a) Direct coupling
b) Indirect coupling
c) Both a) and b)
d) None of these

10) Depth of foundation is dependent on _____.

a) Cost of equipment
b) Frequency
c) H.P. rating
d) None of these

Seat No.	

Set **R**

Fourth Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Electrical Estimation, Installation, and Testing (BTN07802)

Day & Date: Thursday, 14-05-2026 Max. Marks: 40
Time: 03:00 PM To 05:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.2 Attempt (Any Five). **40**

a) State different factors on which severity of electric shock depends. Briefly explain every factor.

b) The main circuit wire in a house is required to carry a current of 45 amperes when connected to single phase a.c. supply. Determine the size of the wire if the length of the circuit is 40 metres.

c) Explain in details the effects of misalignment in case of directly coupled drives and indirectly coupled drives.

d) Explain with neat sketch and resistance equation measurement of DC resistance of three phase induction motor.

e) Explain with neat sketch procedure for levelling and alignment of two shafts of directly and indirectly coupled drives.

f) Explain with neat sketch open delta method in case of transformer.

g) State and explain properties of good transformer oil. Also State factors on which life of insulation depends.

Seat No.	

Set **S**

Fourth Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Electrical Estimation, Installation, and Testing (BTN07802)

Day & Date: Thursday, 14-05-2026 Max. Marks: 50
Time: 03:00 PM To 05:00 PM

Instructions:1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions (if necessary and state them clearly).

MCQ/Objective Type Questions

Duration: 20 Minutes Marks:10

Q.1 Choose the correct Answer. **10**

1) What should be the insulation resistance in case of PVC wires?
a) 12.5 MΩ / number of outlet b) 82.5 MΩ/ number of outlet
c) 2.5 MΩ / number of outlet d) 10.5 MΩ/ number of outlet

2) Polarization index is greater than _____ for class A insulation.
a) 1 b) 1.5
c) 2 d) 2.5

3) Brake test is _____ method of testing machine.
a) Regenerative b) Direct
c) Indirect d) All of these

4) The torque of induction motor is _____.
a) Directly proportional to V b) Directly proportional to V^2
c) Inversely proportional to V d) Inversely proportional to V^2

5) When motor arranged in the same line as that of driven machine this coupling is also called as _____.
a) Direct coupling b) Indirect coupling
c) Both a) and b) d) None of these

6) Depth of foundation is dependent on _____.
a) Cost of equipment b) Frequency
c) H.P. rating d) None of these

7) Which of the following factors affects on life of insulating material ____.
a) Temperature b) Deposition of dust
c) Impurities d) All of these

8) In insulation resistance test of 132 kv transformer, minimum insulation resistance is _____.

a) 250MΩ b) 500MΩ
c) 750MΩ d) 1000MΩ

9) In fire extinguisher we use _____.

a) CO_2 b) SO_2
c) O_2 d) H_2O

10) Do's and Don'ts are observed carefully in safety precautions as per _____.

a) IS 5216-1962 b) IS 5216-1964
c) IS 5216-1966 d) IS 5216-1969

SLR-QH-629

Seat No.	

Set S

Fourth Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Electrical Estimation, Installation, and Testing (BTN07802)

Day & Date: Thursday, 14-05-2026 Max. Marks: 40
Time: 03:00 PM To 05:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.2 Attempt (Any Five). 40

a) State different factors on which severity of electric shock depends. Briefly explain every factor.

b) The main circuit wire in a house is required to carry a current of 45 amperes when connected to single phase a.c. supply. Determine the size of the wire if the length of the circuit is 40 metres.

c) Explain in details the effects of misalignment in case of directly coupled drives and indirectly coupled drives.

d) Explain with neat sketch and resistance equation measurement of DC resistance of three phase induction motor.

e) Explain with neat sketch procedure for levelling and alignment of two shafts of directly and indirectly coupled drives.

f) Explain with neat sketch open delta method in case of transformer.

g) State and explain properties of good transformer oil. Also State factors on which life of insulation depends.

SLR-QH-630

Seat No.	

Set P

Fourth Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Mechatronics (BTN07803)

Day & Date: Thursday, 14-05-2026 Max. Marks: 50
Time: 03:00 PM To 05:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 20 Minutes Marks:10

Q.1 Choose the correct alternatives from the options. 10

1) Mechatronics is the integration of which of the following engineering fields?
a) Mechanical, Electrical, and Civil Engineering
b) Mechanical, Electrical, and Computer Engineering
c) Civil, Chemical, and Electrical Engineering
d) Electrical, Civil, and Marine Engineering

2) In the Mechatronic design process, the first step is _____.
a) System integration b) Conceptual design
c) Problem identification d) Detailed design

3) Which of the following is a correct pair of design type and example?
a) Original design - Modifying an existing machine
b) Adaptive design - Creating a new invention
c) Redesign - Improving an existing system for better performance
d) Original design - Copying an existing system

4) What is the main purpose of modeling in Mechatronic systems?
a) To build the hardware directly
b) To represent and analyze the behavior of a real system
c) To increase production speed
d) To design mechanical parts only

5) Which of the following tools is commonly used for model simulation in Mechatronics?
a) AutoCAD b) MATLAB/Simulink
c) MS Word d) Photoshop

6) Simulator coupling is used to _____.
   a) Increase motor speed
   b) Reduce mechanical vibrations
   c) Connect different simulation software for co-simulation
   d) Convert analog signals to digital signals

7) The main function of a DAQ (Data Acquisition) card is to _____.
   a) Provide mechanical movement to actuators
   b) Convert electrical signals from sensors into digital data
   c) Control power supply to motors
   d) None of the above

8) In Mechatronics, an Ethernet switch is mainly used for _____.
   a) Connecting mechanical components
   b) Providing high-speed data networking between devices
   c) Converting analog signals to digital
   d) Reducing electrical noise

9) The purpose of a Man-Machine Interface (MMI) is to _____.
   a) Enable interaction between human operators and machines
   b) Control electrical circuits directly
   c) Increase motor efficiency
   d) Convert digital signals into analog form

10) The autofocus mechanism in modern cameras mainly works on the principle of _____.
   a) Measuring distance using sound waves
   b) Detecting image sharpness and adjusting lens position
   c) Increasing image brightness
   d) Controlling shutter speed manually

SLR-QH-630

Seat No.	

Set P

Fourth Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Mechatronics (BTN07803)

Day & Date: Thursday, 14-05-2026 Max. Marks: 40
Time: 03:00 PM To 05:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt Any Five questions. **20**

a) Explain the key elements of a Mechatronic system.

b) Differentiate between Traditional design and Mechatronic design.

c) Write the steps involved in the Mechatronic design process.

d) Explain different types of design in Mechatronics.

e) Define modeling and explain its importance in Mechatronic systems.

f) Explain the process of model development.

SECTION– II

Q.3 Attempt Any Five questions. **20**

a) Explain the functions and importance of a DAQ (Data Acquisition) card.

b) What is an Ethernet switch? Why is it used in Mechatronic systems?

c) Explain the function and components of an Engine Management System (EMS).

d) Describe temperature control using a PID controller.

e) Describe the components and operation of a pH control system.

f) Write short notes on micro-robots and their applications.

SLR-QH-630

Seat No.		Set	Q

Fourth Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Mechatronics (BTN07803)

Day & Date: Thursday, 14-05-2026 Max. Marks: 50
Time: 03:00 PM To 05:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 20 Minutes Marks:10

Q.1 Choose the correct alternatives from the options. 10

1) Simulator coupling is used to _____.
a) Increase motor speed
b) Reduce mechanical vibrations
c) Connect different simulation software for co-simulation
d) Convert analog signals to digital signals

2) The main function of a DAQ (Data Acquisition) card is to _____.
a) Provide mechanical movement to actuators
b) Convert electrical signals from sensors into digital data
c) Control power supply to motors
d) None of the above

3) In Mechatronics, an Ethernet switch is mainly used for _____.
a) Connecting mechanical components
b) Providing high-speed data networking between devices
c) Converting analog signals to digital
d) Reducing electrical noise

4) The purpose of a Man-Machine Interface (MMI) is to _____.
a) Enable interaction between human operators and machines
b) Control electrical circuits directly
c) Increase motor efficiency
d) Convert digital signals into analog form

5) The autofocus mechanism in modern cameras mainly works on the principle of _____.
a) Measuring distance using sound waves
b) Detecting image sharpness and adjusting lens position
c) Increasing image brightness
d) Controlling shutter speed manually

6) Mechatronics is the integration of which of the following engineering fields?
   a) Mechanical, Electrical, and Civil Engineering
   b) Mechanical, Electrical, and Computer Engineering
   c) Civil, Chemical, and Electrical Engineering
   d) Electrical, Civil, and Marine Engineering

7) In the Mechatronic design process, the first step is _____.
   a) System integration
   b) Conceptual design
   c) Problem identification
   d) Detailed design

8) Which of the following is a correct pair of design type and example?
   a) Original design - Modifying an existing machine
   b) Adaptive design - Creating a new invention
   c) Redesign - Improving an existing system for better performance
   d) Original design - Copying an existing system

9) What is the main purpose of modeling in Mechatronic systems?
   a) To build the hardware directly
   b) To represent and analyze the behavior of a real system
   c) To increase production speed
   d) To design mechanical parts only

10) Which of the following tools is commonly used for model simulation in Mechatronics?
   a) AutoCAD
   b) MATLAB/Simulink
   c) MS Word
   d) Photoshop

SLR-QH-630

Seat No.	

Set Q

Fourth Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Mechatronics (BTN07803)

Day & Date: Thursday, 14-05-2026 Max. Marks: 40
Time: 03:00 PM To 05:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt Any Five questions. **20**

a) Explain the key elements of a Mechatronic system.

b) Differentiate between Traditional design and Mechatronic design.

c) Write the steps involved in the Mechatronic design process.

d) Explain different types of design in Mechatronics.

e) Define modeling and explain its importance in Mechatronic systems.

f) Explain the process of model development.

SECTION– II

Q.3 Attempt Any Five questions. **20**

a) Explain the functions and importance of a DAQ (Data Acquisition) card.

b) What is an Ethernet switch? Why is it used in Mechatronic systems?

c) Explain the function and components of an Engine Management System (EMS).

d) Describe temperature control using a PID controller.

e) Describe the components and operation of a pH control system.

f) Write short notes on micro-robots and their applications.

SLR-QH-630

Seat No.	

Set R

Fourth Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Mechatronics (BTN07803)

Day & Date: Thursday, 14-05-2026 Max. Marks: 50
Time: 03:00 PM To 05:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 20 Minutes Marks:10

Q.1 Choose the correct alternatives from the options. 10

1) The purpose of a Man-Machine Interface (MMI) is to _____.
a) Enable interaction between human operators and machines
b) Control electrical circuits directly
c) Increase motor efficiency
d) Convert digital signals into analog form

2) The autofocus mechanism in modern cameras mainly works on the principle of _____.
a) Measuring distance using sound waves
b) Detecting image sharpness and adjusting lens position
c) Increasing image brightness
d) Controlling shutter speed manually

3) Mechatronics is the integration of which of the following engineering fields?
a) Mechanical, Electrical, and Civil Engineering
b) Mechanical, Electrical, and Computer Engineering
c) Civil, Chemical, and Electrical Engineering
d) Electrical, Civil, and Marine Engineering

4) In the Mechatronic design process, the first step is _____.
a) System integration b) Conceptual design
c) Problem identification d) Detailed design

5) Which of the following is a correct pair of design type and example?
a) Original design - Modifying an existing machine
b) Adaptive design - Creating a new invention
c) Redesign - Improving an existing system for better performance
d) Original design - Copying an existing system

6) What is the main purpose of modeling in Mechatronic systems?
a) To build the hardware directly
b) To represent and analyze the behavior of a real system
c) To increase production speed
d) To design mechanical parts only

7) Which of the following tools is commonly used for model simulation in Mechatronics?
a) AutoCAD
b) MATLAB/Simulink
c) MS Word
d) Photoshop

8) Simulator coupling is used to _____.
a) Increase motor speed
b) Reduce mechanical vibrations
c) Connect different simulation software for co-simulation
d) Convert analog signals to digital signals

9) The main function of a DAQ (Data Acquisition) card is to _____.
a) Provide mechanical movement to actuators
b) Convert electrical signals from sensors into digital data
c) Control power supply to motors
d) None of the above

10) In Mechatronics, an Ethernet switch is mainly used for _____.
a) Connecting mechanical components
b) Providing high-speed data networking between devices
c) Converting analog signals to digital
d) Reducing electrical noise

SLR-QH-630

Seat No.	

Set R

Fourth Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Mechatronics (BTN07803)

Day & Date: Thursday, 14-05-2026 Max. Marks: 40
Time: 03:00 PM To 05:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt Any Five questions. **20**

a) Explain the key elements of a Mechatronic system.

b) Differentiate between Traditional design and Mechatronic design.

c) Write the steps involved in the Mechatronic design process.

d) Explain different types of design in Mechatronics.

e) Define modeling and explain its importance in Mechatronic systems.

f) Explain the process of model development.

SECTION– II

Q.3 Attempt Any Five questions. **20**

a) Explain the functions and importance of a DAQ (Data Acquisition) card.

b) What is an Ethernet switch? Why is it used in Mechatronic systems?

c) Explain the function and components of an Engine Management System (EMS).

d) Describe temperature control using a PID controller.

e) Describe the components and operation of a pH control system.

f) Write short notes on micro-robots and their applications.

SLR-QH-630

Seat No.		Set	S

Fourth Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Mechatronics (BTN07803)

Day & Date: Thursday, 14-05-2026 Max. Marks: 50
Time: 03:00 PM To 05:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 20 Minutes Marks:10

Q.1 Choose the correct alternatives from the options. 10

1) Which of the following is a correct pair of design type and example?
a) Original design - Modifying an existing machine
b) Adaptive design - Creating a new invention
c) Redesign - Improving an existing system for better performance
d) Original design - Copying an existing system

2) What is the main purpose of modeling in Mechatronic systems?
a) To build the hardware directly
b) To represent and analyze the behavior of a real system
c) To increase production speed
d) To design mechanical parts only

3) Which of the following tools is commonly used for model simulation in Mechatronics?
a) AutoCAD b) MATLAB/Simulink
c) MS Word d) Photoshop

4) Simulator coupling is used to _____.
a) Increase motor speed
b) Reduce mechanical vibrations
c) Connect different simulation software for co-simulation
d) Convert analog signals to digital signals

5) The main function of a DAQ (Data Acquisition) card is to _____.
a) Provide mechanical movement to actuators
b) Convert electrical signals from sensors into digital data
c) Control power supply to motors
d) None of the above

6) In Mechatronics, an Ethernet switch is mainly used for _____.
   a) Connecting mechanical components
   b) Providing high-speed data networking between devices
   c) Converting analog signals to digital
   d) Reducing electrical noise

7) The purpose of a Man-Machine Interface (MMI) is to _____.
   a) Enable interaction between human operators and machines
   b) Control electrical circuits directly
   c) Increase motor efficiency
   d) Convert digital signals into analog form

8) The autofocus mechanism in modern cameras mainly works on the principle of _____.
   a) Measuring distance using sound waves
   b) Detecting image sharpness and adjusting lens position
   c) Increasing image brightness
   d) Controlling shutter speed manually

9) Mechatronics is the integration of which of the following engineering fields?
   a) Mechanical, Electrical, and Civil Engineering
   b) Mechanical, Electrical, and Computer Engineering
   c) Civil, Chemical, and Electrical Engineering
   d) Electrical, Civil, and Marine Engineering

10) In the Mechatronic design process, the first step is _____.
   a) System integration
   b) Conceptual design
   c) Problem identification
   d) Detailed design

SLR-QH-630

Seat No.	

Set S

Fourth Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Mechatronics (BTN07803)

Day & Date: Thursday, 14-05-2026 Max. Marks: 40
Time: 03:00 PM To 05:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt Any Five questions. **20**

a) Explain the key elements of a Mechatronic system.

b) Differentiate between Traditional design and Mechatronic design.

c) Write the steps involved in the Mechatronic design process.

d) Explain different types of design in Mechatronics.

e) Define modeling and explain its importance in Mechatronic systems.

f) Explain the process of model development.

SECTION– II

Q.3 Attempt Any Five questions. **20**

a) Explain the functions and importance of a DAQ (Data Acquisition) card.

b) What is an Ethernet switch? Why is it used in Mechatronic systems?

c) Explain the function and components of an Engine Management System (EMS).

d) Describe temperature control using a PID controller.

e) Describe the components and operation of a pH control system.

f) Write short notes on micro-robots and their applications.

SLR-QH-631

Seat No.	

Set P

Fourth Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Alternate Energy Systems (BTN07804)

Day & Date: Thursday, 14-05-2026 Max. Marks: 50
Time: 03:00 PM To 05:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 20 Minutes Marks:10

Q.1 Choose the Correct Alternatives from the Options. 10

1) What is the average power per unit area of solar radiation received outside the Earth's atmosphere?
a) Solar constant b) Solar radiation geometry
c) Spectral distribution d) Extraterrestrial radiation

2) What empirical equations are commonly used to predict the availability of solar radiation?
a) Newton's laws b) Maxwell's equations
c) Beer-Lambert law d) Solar radiation model

3) What is the term used to describe the process of adjusting the operating point of a photovoltaic (PV) system to maximize power output?
a) Solar tracking
b) Peak power point operation
c) MPPT control
d) PV efficiency optimization

4) In which type of PV system application would you expect to find the highest demand for energy storage solutions?
a) Residential b) Commercial
c) Industrial d) Off-grid

5) What statistical data are used to assess wind speed characteristics at a specific location?
a) Wind speed statistics b) Turbine selection criteria
c) Site evaluation reports d) Wind farm simulations

6) Which factor is essential for the design of a wind turbine rotor?
a) Blade color b) Blade length
c) Blade material d) Blade weight

7) Which biomass conversion technology involves the breakdown of organic matter in the absence of oxygen to produce biogas?

a) Anaerobic digestion
b) Ethanol fermentation
c) Biomass gasification
d) Biodiesel production

8) Which type of waste can be used for power generation from municipal solid waste (MSW)?

a) Organic waste
b) Glass waste
c) Plastic waste
d) Metal waste

9) What are grid codes?

a) Regulations that govern the operation of electrical grids
b) Standards for the design of renewable energy systems
c) Guidelines for optimizing grid reliability
d) Protocols for grid maintenance

10) What does life cycle costing involve in the context of renewable energy systems?

a) Calculating the total cost of ownership of a renewable energy system over its entire lifespan
b) Estimating the potential lifespan of a renewable energy system
c) Analyzing the environmental impact of renewable energy technologies
d) Comparing the costs of renewable energy systems with those of fossil fuel-based systems

SLR-QH-631

Seat No.	

Set P

Fourth Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026
Alternate Energy Systems (BTN07804)

Day & Date: Thursday, 14-05-2026 Max. Marks: 40
Time: 03:00 PM To 05:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt (Any Two) **08**

a) Write Short note on concentrating solar power (CSP) plants.

b) What are the advantages and limitations of using parabolic dish technology in CSP systems?

c) Describe the role of maximum power point tracking (MPPT) in optimizing the performance of solar energy systems.

Q.3 Attempt (Any Two) **12**

a) Discuss the key concepts related to solar radiation at the Earth's surface.

b) Discuss the key differences in the design considerations for photovoltaic (PV) systems in residential, commercial, and industrial applications.

c) Explain the concept of power contained in wind and how it is converted into usable energy in wind turbine systems.

SECTION – II

Q.4 Attempt (Any Two) **08**

a) Discuss the power-speed characteristics and torque-speed characteristics of wind turbines.

b) Discuss the factors affecting biogas production in biogas technologies.

c) What is co-generation? How co-generation leads to energy conservation.

Q.5 Attempt (Any Two) **12**

a) Discuss the classification of biomass and the different types of biomass resources available for energy production. What are the factors influencing their energy potential?

b) Describe the different types of biomass gasifiers, what are their advantages, disadvantages, and applications?

c) Discuss the challenges and benefits of integrating renewable energy sources (RES) with the existing electrical grid.

SLR-QH-631

Seat No.	

Set Q

Fourth Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Alternate Energy Systems (BTN07804)

Day & Date: Thursday, 14-05-2026 Max. Marks: 50
Time: 03:00 PM To 05:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 20 Minutes Marks:10

Q.1 Choose the Correct Alternatives from the Options. 10

1) Which factor is essential for the design of a wind turbine rotor?
a) Blade color b) Blade length
c) Blade material d) Blade weight

2) Which biomass conversion technology involves the breakdown of organic matter in the absence of oxygen to produce biogas?
a) Anaerobic digestion b) Ethanol fermentation
c) Biomass gasification d) Biodiesel production

3) Which type of waste can be used for power generation from municipal solid waste (MSW)?
a) Organic waste b) Glass waste
c) Plastic waste d) Metal waste

4) What are grid codes?
a) Regulations that govern the operation of electrical grids
b) Standards for the design of renewable energy systems
c) Guidelines for optimizing grid reliability
d) Protocols for grid maintenance

5) What does life cycle costing involve in the context of renewable energy systems?
a) Calculating the total cost of ownership of a renewable energy system over its entire lifespan
b) Estimating the potential lifespan of a renewable energy system
c) Analyzing the environmental impact of renewable energy technologies
d) Comparing the costs of renewable energy systems with those of fossil fuel-based systems

6) What is the average power per unit area of solar radiation received outside the Earth's atmosphere?

a) Solar constant
b) Solar radiation geometry
c) Spectral distribution
d) Extraterrestrial radiation

7) What empirical equations are commonly used to predict the availability of solar radiation?

a) Newton's laws
b) Maxwell's equations
c) Beer-Lambert law
d) Solar radiation model

8) What is the term used to describe the process of adjusting the operating point of a photovoltaic (PV) system to maximize power output?

a) Solar tracking
b) Peak power point operation
c) MPPT control
d) PV efficiency optimization

9) In which type of PV system application would you expect to find the highest demand for energy storage solutions?

a) Residential
b) Commercial
c) Industrial
d) Off-grid

10) What statistical data are used to assess wind speed characteristics at a specific location?

a) Wind speed statistics
b) Turbine selection criteria
c) Site evaluation reports
d) Wind farm simulations

SLR-QH-631

Seat No.	

Set Q

Fourth Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026
Alternate Energy Systems (BTN07804)

Day & Date: Thursday, 14-05-2026 Max. Marks: 40
Time: 03:00 PM To 05:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt (Any Two) **08**

a) Write Short note on concentrating solar power (CSP) plants.

b) What are the advantages and limitations of using parabolic dish technology in CSP systems?

c) Describe the role of maximum power point tracking (MPPT) in optimizing the performance of solar energy systems.

Q.3 Attempt (Any Two) **12**

a) Discuss the key concepts related to solar radiation at the Earth's surface.

b) Discuss the key differences in the design considerations for photovoltaic (PV) systems in residential, commercial, and industrial applications.

c) Explain the concept of power contained in wind and how it is converted into usable energy in wind turbine systems.

SECTION – II

Q.4 Attempt (Any Two) **08**

a) Discuss the power-speed characteristics and torque-speed characteristics of wind turbines.

b) Discuss the factors affecting biogas production in biogas technologies.

c) What is co-generation? How co-generation leads to energy conservation.

Q.5 Attempt (Any Two) **12**

a) Discuss the classification of biomass and the different types of biomass resources available for energy production. What are the factors influencing their energy potential?

b) Describe the different types of biomass gasifiers, what are their advantages, disadvantages, and applications?

c) Discuss the challenges and benefits of integrating renewable energy sources (RES) with the existing electrical grid.

Seat No.	

Set **R**

Fourth Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Alternate Energy Systems (BTN07804)

Day & Date: Thursday, 14-05-2026 Max. Marks: 50
Time: 03:00 PM To 05:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 20 Minutes Marks:10

Q.1 Choose the Correct Alternatives from the Options. 10

1) What are grid codes?
a) Regulations that govern the operation of electrical grids
b) Standards for the design of renewable energy systems
c) Guidelines for optimizing grid reliability
d) Protocols for grid maintenance

2) What does life cycle costing involve in the context of renewable energy systems?
a) Calculating the total cost of ownership of a renewable energy system over its entire lifespan
b) Estimating the potential lifespan of a renewable energy system
c) Analyzing the environmental impact of renewable energy technologies
d) Comparing the costs of renewable energy systems with those of fossil fuel-based systems

3) What is the average power per unit area of solar radiation received outside the Earth's atmosphere?
a) Solar constant b) Solar radiation geometry
c) Spectral distribution d) Extraterrestrial radiation

4) What empirical equations are commonly used to predict the availability of solar radiation?
a) Newton's laws b) Maxwell's equations
c) Beer-Lambert law d) Solar radiation model

5) What is the term used to describe the process of adjusting the operating point of a photovoltaic (PV) system to maximize power output?

a) Solar tracking
b) Peak power point operation
c) MPPT control
d) PV efficiency optimization

6) In which type of PV system application would you expect to find the highest demand for energy storage solutions?

a) Residential
b) Commercial
c) Industrial
d) Off-grid

7) What statistical data are used to assess wind speed characteristics at a specific location?

a) Wind speed statistics
b) Turbine selection criteria
c) Site evaluation reports
d) Wind farm simulations

8) Which factor is essential for the design of a wind turbine rotor?

a) Blade color
b) Blade length
c) Blade material
d) Blade weight

9) Which biomass conversion technology involves the breakdown of organic matter in the absence of oxygen to produce biogas?

a) Anaerobic digestion
b) Ethanol fermentation
c) Biomass gasification
d) Biodiesel production

10) Which type of waste can be used for power generation from municipal solid waste (MSW)?

a) Organic waste
b) Glass waste
c) Plastic waste
d) Metal waste

SLR-QH-631

Seat No.	

Set R

Fourth Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026
Alternate Energy Systems (BTN07804)

Day & Date: Thursday, 14-05-2026 Max. Marks: 40
Time: 03:00 PM To 05:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt (Any Two) **08**

a) Write Short note on concentrating solar power (CSP) plants.

b) What are the advantages and limitations of using parabolic dish technology in CSP systems?

c) Describe the role of maximum power point tracking (MPPT) in optimizing the performance of solar energy systems.

Q.3 Attempt (Any Two) **12**

a) Discuss the key concepts related to solar radiation at the Earth's surface.

b) Discuss the key differences in the design considerations for photovoltaic (PV) systems in residential, commercial, and industrial applications.

c) Explain the concept of power contained in wind and how it is converted into usable energy in wind turbine systems.

SECTION – II

Q.4 Attempt (Any Two) **08**

a) Discuss the power-speed characteristics and torque-speed characteristics of wind turbines.

b) Discuss the factors affecting biogas production in biogas technologies.

c) What is co-generation? How co-generation leads to energy conservation.

Q.5 Attempt (Any Two) **12**

a) Discuss the classification of biomass and the different types of biomass resources available for energy production. What are the factors influencing their energy potential?

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c) Discuss the challenges and benefits of integrating renewable energy sources (RES) with the existing electrical grid.

Seat No.		Set	S

Fourth Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Alternate Energy Systems (BTN07804)

Day & Date: Thursday, 14-05-2026 Max. Marks: 50
Time: 03:00 PM To 05:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 20 Minutes Marks:10

Q.1 Choose the Correct Alternatives from the Options. 10

1) What is the term used to describe the process of adjusting the operating point of a photovoltaic (PV) system to maximize power output?
a) Solar tracking
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d) PV efficiency optimization

2) In which type of PV system application would you expect to find the highest demand for energy storage solutions?
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6) Which type of waste can be used for power generation from municipal solid waste (MSW)?

a) Organic waste
b) Glass waste
c) Plastic waste
d) Metal waste

7) What are grid codes?

a) Regulations that govern the operation of electrical grids
b) Standards for the design of renewable energy systems
c) Guidelines for optimizing grid reliability
d) Protocols for grid maintenance

8) What does life cycle costing involve in the context of renewable energy systems?

a) Calculating the total cost of ownership of a renewable energy system over its entire lifespan
b) Estimating the potential lifespan of a renewable energy system
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9) What is the average power per unit area of solar radiation received outside the Earth's atmosphere?

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d) Extraterrestrial radiation

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a) Newton's laws
b) Maxwell's equations
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d) Solar radiation model

SLR-QH-631

Seat No.	

Set S

Fourth Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026
Alternate Energy Systems (BTN07804)

Day & Date: Thursday, 14-05-2026 Max. Marks: 40
Time: 03:00 PM To 05:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt (Any Two) **08**

a) Write Short note on concentrating solar power (CSP) plants.

b) What are the advantages and limitations of using parabolic dish technology in CSP systems?

c) Describe the role of maximum power point tracking (MPPT) in optimizing the performance of solar energy systems.

Q.3 Attempt (Any Two) **12**

a) Discuss the key concepts related to solar radiation at the Earth's surface.

b) Discuss the key differences in the design considerations for photovoltaic (PV) systems in residential, commercial, and industrial applications.

c) Explain the concept of power contained in wind and how it is converted into usable energy in wind turbine systems.

SECTION – II

Q.4 Attempt (Any Two) **08**

a) Discuss the power-speed characteristics and torque-speed characteristics of wind turbines.

b) Discuss the factors affecting biogas production in biogas technologies.

c) What is co-generation? How co-generation leads to energy conservation.

Q.5 Attempt (Any Two) **12**

a) Discuss the classification of biomass and the different types of biomass resources available for energy production. What are the factors influencing their energy potential?

b) Describe the different types of biomass gasifiers, what are their advantages, disadvantages, and applications?

c) Discuss the challenges and benefits of integrating renewable energy sources (RES) with the existing electrical grid.

SLR-QH-632

Seat No.	

Set P

Fourth Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Electrical Energy Audit and Management (BTN07805)

Day & Date: Monday, 18-05-2026 Max. Marks: 50
Time: 03:00 PM To 05:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 20 Minutes Marks: 10

Q.1 Choose the correct alternatives from the options. 10

1) In the given options, the non-commercial source of energy is _____.
a) Coal b) Lignite
c) Firewood d) Refined petroleum products

2) One unit of electricity is equivalent to _____ kcal heat units.
a) 800 b) 860
c) 400 d) 680

3) In Cogeneration, the system efficiencies can go up to _____.
a) 70 b) 80
c) 90 d) 60

4) Non-contact speed measurements can be carried out by _____.
a) Tachometer b) Stroboscope
c) Oscilloscope d) Speedometer

5) Sankey diagram shows in graphics _____.
a) Energy input b) Energy output
c) Energy balance d) All of the above

6) The support for energy management is expressed in a formal written declaration of commitment. This is called _____.
a) Company policy b) Management policy
c) Energy policy d) Energy efficiency

7) The force field analysis in energy action planning deals with barrier having _____.
a) Positive force only
b) Negative force only
c) Both negative and positive force
d) No force

8) Energy manger should be well versed with _____.
   a) Manufacturing and processing skills
   b) Managerial and technical skills
   c) Technical and marketing skills
   d) Managerial and Commercial Skills

9) The judicious and effective use of energy to maximize profits and enhance competitive positions". This can be the definition of _____.
   a) Energy conservation
   b) Energy management
   c) Energy policy
   d) Energy Audit

10) Demand Side Management is required to _____.
   a) Reduce overall cost of installed capacity
   b) Reduce needs of peaking station
   c) Ensure quality and equity of supply
   d) All of the above

SLR-QH-632

Seat No.	

Set P

Fourth Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Electrical Energy Audit and Management (BTN07805)

Day & Date: Monday, 18-05-2026 Max. Marks: 40
Time: 03:00 PM To 05:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt Any Two. **08**

a) What are the necessary skills of Energy Manager?

b) What is the energy conservation and it's important?

c) Define the following terms in Details:
i) Primary and Secondary Energy
ii) Commercial and Non-Commercial

Q.3 Attempt Any Two. **12**

a) Write a short note on solar thermal technology as energy source.

b) What are the duties and responsibilities of Energy Manager?

c) Explain the Indian Electricity Act, 2003.

Section – II

Q.4 Attempt Any Two. **08**

a) Write a note on Simple Payback Period.

b) Explain the need of Energy Audit.

c) What is co-generation? How co-generation leads to energy conservation?

Q.5 Attempt Any Two. **12**

a) Explain various instruments with function of each used to carryout Energy Audit.

b) Explain the various types of Energy Audit.

c) Explain the opportunities for energy conservation in illumination.

Seat No.	

Set Q

Fourth Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Electrical Energy Audit and Management (BTN07805)

Day & Date: Monday, 18-05-2026 Max. Marks: 50
Time: 03:00 PM To 05:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 20 Minutes Marks: 10

Q.1 Choose the correct alternatives from the options. 10

1) The support for energy management is expressed in a formal written declaration of commitment. This is called _____.
a) Company policy b) Management policy
c) Energy policy d) Energy efficiency

2) The force field analysis in energy action planning deals with barrier having _____.
a) Positive force only
b) Negative force only
c) Both negative and positive force
d) No force

3) Energy manger should be well versed with _____.
a) Manufacturing and processing skills
b) Managerial and technical skills
c) Technical and marketing skills
d) Managerial and Commercial Skills

4) The judicious and effective use of energy to maximize profits and enhance competitive positions". This can be the definition of _____.
a) Energy conservation b) Energy management
c) Energy policy d) Energy Audit

5) Demand Side Management is required to _____.
a) Reduce overall cost of installed capacity
b) Reduce needs of peaking station
c) Ensure quality and equity of supply
d) All of the above

6) In the given options, the non-commercial source of energy is _____.
a) Coal b) Lignite
c) Firewood d) Refined petroleum products

7) One unit of electricity is equivalent to _____ kcal heat units.
a) 800 b) 860
c) 400 d) 680

8) In Cogeneration, the system efficiencies can go up to _____.
a) 70 b) 80
c) 90 d) 60

9) Non-contact speed measurements can be carried out by _____.
a) Tachometer b) Stroboscope
c) Oscilloscope d) Speedometer

10) Sankey diagram shows in graphics _____.
a) Energy input b) Energy output
c) Energy balance d) All of the above

SLR-QH-632

Seat No.	

Set Q

Fourth Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Electrical Energy Audit and Management (BTN07805)

Day & Date: Monday, 18-05-2026 Max. Marks: 40
Time: 03:00 PM To 05:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt Any Two. **08**

a) What are the necessary skills of Energy Manager?

b) What is the energy conservation and it's important?

c) Define the following terms in Details:
i) Primary and Secondary Energy
ii) Commercial and Non-Commercial

Q.3 Attempt Any Two. **12**

a) Write a short note on solar thermal technology as energy source.

b) What are the duties and responsibilities of Energy Manager?

c) Explain the Indian Electricity Act, 2003.

Section – II

Q.4 Attempt Any Two. **08**

a) Write a note on Simple Payback Period.

b) Explain the need of Energy Audit.

c) What is co-generation? How co-generation leads to energy conservation?

Q.5 Attempt Any Two. **12**

a) Explain various instruments with function of each used to carryout Energy Audit.

b) Explain the various types of Energy Audit.

c) Explain the opportunities for energy conservation in illumination.

Seat No.	

Set **R**

Fourth Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Electrical Energy Audit and Management (BTN07805)

Day & Date: Monday, 18-05-2026 Max. Marks: 50
Time: 03:00 PM To 05:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 20 Minutes Marks: 10

Q.1 Choose the correct alternatives from the options. 10

1) The judicious and effective use of energy to maximize profits and enhance competitive positions". This can be the definition of _____.
a) Energy conservation b) Energy management
c) Energy policy d) Energy Audit

2) Demand Side Management is required to _____.
a) Reduce overall cost of installed capacity
b) Reduce needs of peaking station
c) Ensure quality and equity of supply
d) All of the above

3) In the given options, the non-commercial source of energy is _____.
a) Coal b) Lignite
c) Firewood d) Refined petroleum products

4) One unit of electricity is equivalent to _____ kcal heat units.
a) 800 b) 860
c) 400 d) 680

5) In Cogeneration, the system efficiencies can go up to _____.
a) 70 b) 80
c) 90 d) 60

6) Non-contact speed measurements can be carried out by _____.
a) Tachometer b) Stroboscope
c) Oscilloscope d) Speedometer

7) Sankey diagram shows in graphics _____.
a) Energy input b) Energy output
c) Energy balance d) All of the above

8) The support for energy management is expressed in a formal written declaration of commitment. This is called _____.

a) Company policy
b) Management policy
c) Energy policy
d) Energy efficiency

9) The force field analysis in energy action planning deals with barrier having _____.

a) Positive force only
b) Negative force only
c) Both negative and positive force
d) No force

10) Energy manger should be well versed with _____.

a) Manufacturing and processing skills
b) Managerial and technical skills
c) Technical and marketing skills
d) Managerial and Commercial Skills

SLR-QH-632

Seat No.	

Set R

Fourth Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Electrical Energy Audit and Management (BTN07805)

Day & Date: Monday, 18-05-2026 Max. Marks: 40
Time: 03:00 PM To 05:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt Any Two. **08**

a) What are the necessary skills of Energy Manager?

b) What is the energy conservation and it's important?

c) Define the following terms in Details:
i) Primary and Secondary Energy
ii) Commercial and Non-Commercial

Q.3 Attempt Any Two. **12**

a) Write a short note on solar thermal technology as energy source.

b) What are the duties and responsibilities of Energy Manager?

c) Explain the Indian Electricity Act, 2003.

Section – II

Q.4 Attempt Any Two. **08**

a) Write a note on Simple Payback Period.

b) Explain the need of Energy Audit.

c) What is co-generation? How co-generation leads to energy conservation?

Q.5 Attempt Any Two. **12**

a) Explain various instruments with function of each used to carryout Energy Audit.

b) Explain the various types of Energy Audit.

c) Explain the opportunities for energy conservation in illumination.

Seat No.	

Set **S**

Fourth Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Electrical Energy Audit and Management (BTN07805)

Day & Date: Monday, 18-05-2026 Max. Marks: 50
Time: 03:00 PM To 05:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 20 Minutes Marks: 10

Q.1 Choose the correct alternatives from the options. 10

1) In Cogeneration, the system efficiencies can go up to _____.
a) 70 b) 80
c) 90 d) 60

2) Non-contact speed measurements can be carried out by _____.
a) Tachometer b) Stroboscope
c) Oscilloscope d) Speedometer

3) Sankey diagram shows in graphics _____.
a) Energy input b) Energy output
c) Energy balance d) All of the above

4) The support for energy management is expressed in a formal written declaration of commitment. This is called _____.
a) Company policy b) Management policy
c) Energy policy d) Energy efficiency

5) The force field analysis in energy action planning deals with barrier having _____.
a) Positive force only
b) Negative force only
c) Both negative and positive force
d) No force

6) Energy manger should be well versed with _____.
a) Manufacturing and processing skills
b) Managerial and technical skills
c) Technical and marketing skills
d) Managerial and Commercial Skills

7) The judicious and effective use of energy to maximize profits and enhance competitive positions". This can be the definition of _____.

a) Energy conservation
b) Energy management
c) Energy policy
d) Energy Audit

8) Demand Side Management is required to _____.

a) Reduce overall cost of installed capacity
b) Reduce needs of peaking station
c) Ensure quality and equity of supply
d) All of the above

9) In the given options, the non-commercial source of energy is _____.

a) Coal
b) Lignite
c) Firewood
d) Refined petroleum products

10) One unit of electricity is equivalent to _____ kcal heat units.

a) 800
b) 860
c) 400
d) 680

SLR-QH-632

Seat No.	

Set S

Fourth Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Electrical Energy Audit and Management (BTN07805)

Day & Date: Monday, 18-05-2026 Max. Marks: 40
Time: 03:00 PM To 05:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt Any Two. **08**

a) What are the necessary skills of Energy Manager?

b) What is the energy conservation and it's important?

c) Define the following terms in Details:
i) Primary and Secondary Energy
ii) Commercial and Non-Commercial

Q.3 Attempt Any Two. **12**

a) Write a short note on solar thermal technology as energy source.

b) What are the duties and responsibilities of Energy Manager?

c) Explain the Indian Electricity Act, 2003.

Section – II

Q.4 Attempt Any Two. **08**

a) Write a note on Simple Payback Period.

b) Explain the need of Energy Audit.

c) What is co-generation? How co-generation leads to energy conservation?

Q.5 Attempt Any Two. **12**

a) Explain various instruments with function of each used to carryout Energy Audit.

b) Explain the various types of Energy Audit.

c) Explain the opportunities for energy conservation in illumination.

SLR-QH-633

Seat No.		Set	P

Fourth Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026
High Voltage DC Transmission (BTN07806)

Day & Date: Monday, 18-05-2026 Max. Marks: 50
Time: 03:00 PM To 05:00 PM

Instructions:1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume the suitable data wherever necessary.

MCQ/Objective Type Questions

Duration: 20 Minutes Marks:10

Q.1 Choose the correct alternatives from the options. 10

1) The rating of monopolar HVDC system is _____ to that of bipolar HVDC system.
a) $1/2$ b) $\sqrt{2}$
c) 2 d) $\sqrt{3}$

2) The two conductor in the Homo polar HVDC system is _____.
a) Positive polarity b) Negative polarity
c) Same polarity d) Any of the above

3) The main advantage of HVDC-VSC schemes is _____.
a) both active and reactive powers can be controlled
b) does not require DC filters
c) can be used for very high power more than 1500 MW
d) All of the above

4) A thyristor valve conducts when _____.
a) anode is positive
b) anode is negative
c) anode is positive with positive gate pulse
d) anode is positive with negative gate pulse

5) In HVDC link with CC control _____.
a) power loss is more
b) short circuit current is limited
c) both (a) and (b)
d) None of the above

6) In which type of HVDC system, only one pole is used?
a) Monopolar b) Bipolar
c) Homopolar d) Both (a) and (b)

7) Modern HVDC systems are all _____.
a) 3-pulse converters b) 6-pulse converters
c) 24-pulse converters d) 12-pulse converters

8) A thyristor valve is fabricated using _____.
a) SCRs connected in series (all)
b) SCRs connected in parallel (all)
c) SCRs connected in series and parallel as modules
d) All of the above

9) In 12-pulse connections, transformers are connected _____.
a) Delta/Delta (both)
b) Star/Star (both)
c) Star/Delta (both)
d) One Star/Star and other Star/Delta

10) IGBT converters operate on the principle of _____.
a) voltage source converter b) current source converter
c) power source converter d) either (a) or (b)

SLR-QH-633

Seat No.	

Set P

Fourth Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026
High Voltage DC Transmission (BTN07806)

Day & Date: Monday, 18-05-2026 Max. Marks: 40
Time: 03:00 PM To 05:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data whenever necessary.

Section – I

Q.2 Solve Any Four of the following. **20**

a) Explain the HVDC application in wind power generation.

b) Explain the characteristics of harmonics.

c) Explain series, parallel and series parallel system of HVDC system.

d) What is the purpose of filters in HVDC system?

e) Write short note on surge arrestors.

Section – II

Q.3 Solve Any Two of the following. **20**

a) Explain the response of HVDC system for inverter side AC system faults.

b) Explain the interaction between HVAC and DC systems.

c) Classify the solution methodology for AC - DC load flow and explain.

SLR-QH-633

Seat No.	

Set Q

Fourth Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026
High Voltage DC Transmission (BTN07806)

Day & Date: Monday, 18-05-2026 Max. Marks: 50
Time: 03:00 PM To 05:00 PM

Instructions:1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume the suitable data wherever necessary.

MCQ/Objective Type Questions

Duration: 20 Minutes Marks:10

Q.1 Choose the correct alternatives from the options. 10

1) In which type of HVDC system, only one pole is used?
a) Monopolar b) Bipolar
c) Homopolar d) Both (a) and (b)

2) Modern HVDC systems are all _____.
a) 3-pulse converters b) 6-pulse converters
c) 24-pulse converters d) 12-pulse converters

3) A thyristor valve is fabricated using _____.
a) SCRs connected in series (all)
b) SCRs connected in parallel (all)
c) SCRs connected in series and parallel as modules
d) All of the above

4) In 12-pulse connections, transformers are connected _____.
a) Delta/Delta (both)
b) Star/Star (both)
c) Star/Delta (both)
d) One Star/Star and other Star/Delta

5) IGBT converters operate on the principle of _____.
a) voltage source converter b) current source converter
c) power source converter d) either (a) or (b)

6) The rating of monopolar HVDC system is _____ to that of bipolar HVDC system.
a) $1/2$ b) $\sqrt{2}$
c) 2 d) $\sqrt{3}$

7) The two conductor in the Homo polar HVDC system is _____.
a) Positive polarity b) Negative polarity
c) Same polarity d) Any of the above

8) The main advantage of HVDC-VSC schemes is _____.
a) both active and reactive powers can be controlled
b) does not require DC filters
c) can be used for very high power more than 1500 MW
d) All of the above

9) A thyristor valve conducts when _____.
a) anode is positive
b) anode is negative
c) anode is positive with positive gate pulse
d) anode is positive with negative gate pulse

10) In HVDC link with CC control _____.
a) power loss is more
b) short circuit current is limited
c) both (a) and (b)
d) None of the above

SLR-QH-633

Seat No.	

Set Q

Fourth Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026
High Voltage DC Transmission (BTN07806)

Day & Date: Monday, 18-05-2026 Max. Marks: 40
Time: 03:00 PM To 05:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data whenever necessary.

Section – I

Q.2 Solve Any Four of the following. **20**

a) Explain the HVDC application in wind power generation.

b) Explain the characteristics of harmonics.

c) Explain series, parallel and series parallel system of HVDC system.

d) What is the purpose of filters in HVDC system?

e) Write short note on surge arrestors.

Section – II

Q.3 Solve Any Two of the following. **20**

a) Explain the response of HVDC system for inverter side AC system faults.

b) Explain the interaction between HVAC and DC systems.

c) Classify the solution methodology for AC - DC load flow and explain.

SLR-QH-633

Seat No.		Set	R

Fourth Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026
High Voltage DC Transmission (BTN07806)

Day & Date: Monday, 18-05-2026 Max. Marks: 50
Time: 03:00 PM To 05:00 PM

Instructions:1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume the suitable data wherever necessary.

MCQ/Objective Type Questions

Duration: 20 Minutes Marks:10

Q.1 Choose the correct alternatives from the options. 10

1) In 12-pulse connections, transformers are connected _____.
a) Delta/Delta (both)
b) Star/Star (both)
c) Star/Delta (both)
d) One Star/Star and other Star/Delta

2) IGBT converters operate on the principle of _____.
a) voltage source converter b) current source converter
c) power source converter d) either (a) or (b)

3) The rating of monopolar HVDC system is _____ to that of bipolar HVDC system.
a) $1/2$ b) $\sqrt{2}$
c) 2 d) $\sqrt{3}$

4) The two conductor in the Homo polar HVDC system is _____.
a) Positive polarity b) Negative polarity
c) Same polarity d) Any of the above

5) The main advantage of HVDC-VSC schemes is _____.
a) both active and reactive powers can be controlled
b) does not require DC filters
c) can be used for very high power more than 1500 MW
d) All of the above

6) A thyristor valve conducts when _____.
   a) anode is positive
   b) anode is negative
   c) anode is positive with positive gate pulse
   d) anode is positive with negative gate pulse

7) In HVDC link with CC control _____.
   a) power loss is more
   b) short circuit current is limited
   c) both (a) and (b)
   d) None of the above

8) In which type of HVDC system, only one pole is used?
   a) Monopolar b) Bipolar
   c) Homopolar d) Both (a) and (b)

9) Modern HVDC systems are all _____.
   a) 3-pulse converters b) 6-pulse converters
   c) 24-pulse converters d) 12-pulse converters

10) A thyristor valve is fabricated using _____.
   a) SCRs connected in series (all)
   b) SCRs connected in parallel (all)
   c) SCRs connected in series and parallel as modules
   d) All of the above

SLR-QH-633

Seat No.	

Set R

Fourth Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026
High Voltage DC Transmission (BTN07806)

Day & Date: Monday, 18-05-2026 Max. Marks: 40
Time: 03:00 PM To 05:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data whenever necessary.

Section – I

Q.2 Solve Any Four of the following. **20**

a) Explain the HVDC application in wind power generation.

b) Explain the characteristics of harmonics.

c) Explain series, parallel and series parallel system of HVDC system.

d) What is the purpose of filters in HVDC system?

e) Write short note on surge arrestors.

Section – II

Q.3 Solve Any Two of the following. **20**

a) Explain the response of HVDC system for inverter side AC system faults.

b) Explain the interaction between HVAC and DC systems.

c) Classify the solution methodology for AC - DC load flow and explain.

SLR-QH-633

Seat No.		Set	S

Fourth Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026
High Voltage DC Transmission (BTN07806)

Day & Date: Monday, 18-05-2026 Max. Marks: 50
Time: 03:00 PM To 05:00 PM

Instructions:1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in answer book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume the suitable data wherever necessary.

MCQ/Objective Type Questions

Duration: 20 Minutes Marks:10

Q.1 Choose the correct alternatives from the options. 10

1) The main advantage of HVDC-VSC schemes is _____.
a) both active and reactive powers can be controlled
b) does not require DC filters
c) can be used for very high power more than 1500 MW
d) All of the above

2) A thyristor valve conducts when _____.
a) anode is positive
b) anode is negative
c) anode is positive with positive gate pulse
d) anode is positive with negative gate pulse

3) In HVDC link with CC control _____.
a) power loss is more
b) short circuit current is limited
c) both (a) and (b)
d) None of the above

4) In which type of HVDC system, only one pole is used?
a) Monopolar b) Bipolar
c) Homopolar d) Both (a) and (b)

5) Modern HVDC systems are all _____.
a) 3-pulse converters b) 6-pulse converters
c) 24-pulse converters d) 12-pulse converters

6) A thyristor valve is fabricated using _____.
   a) SCRs connected in series (all)
   b) SCRs connected in parallel (all)
   c) SCRs connected in series and parallel as modules
   d) All of the above

7) In 12-pulse connections, transformers are connected _____.
   a) Delta/Delta (both)
   b) Star/Star (both)
   c) Star/Delta (both)
   d) One Star/Star and other Star/Delta

8) IGBT converters operate on the principle of _____.
   a) voltage source converter b) current source converter
   c) power source converter d) either (a) or (b)

9) The rating of monopolar HVDC system is _____ to that of bipolar HVDC system.
   a) $1/2$ b) $\sqrt{2}$
   c) 2 d) $\sqrt{3}$

10) The two conductor in the Homo polar HVDC system is _____.
   a) Positive polarity b) Negative polarity
   c) Same polarity d) Any of the above

SLR-QH-633

Seat No.	

Set S

Fourth Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026
High Voltage DC Transmission (BTN07806)

Day & Date: Monday, 18-05-2026 Max. Marks: 40
Time: 03:00 PM To 05:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data whenever necessary.

Section – I

Q.2 Solve Any Four of the following. **20**

a) Explain the HVDC application in wind power generation.

b) Explain the characteristics of harmonics.

c) Explain series, parallel and series parallel system of HVDC system.

d) What is the purpose of filters in HVDC system?

e) Write short note on surge arrestors.

Section – II

Q.3 Solve Any Two of the following. **20**

a) Explain the response of HVDC system for inverter side AC system faults.

b) Explain the interaction between HVAC and DC systems.

c) Classify the solution methodology for AC - DC load flow and explain.

SLR-QH-635

Seat No.		Set	P

T. Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Design Optimization (CIVMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Use of non-programmable calculators is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Multiple Choice questions: **14**

1) Which of the following is the correct definition of an optimization problem?
a) Maximizing or minimizing an objective function subject to constraints
b) Solving differential equations
c) Performing statistical analysis
d) Evaluating integrals

2) In optimization, the objective function represents _____.
a) Constraints on the system
b) The variable to be optimized
c) The method of solving the problem
d) The search algorithm

3) Which of the following is a bracketing method in single-variable optimization?
a) Newton-Raphson method b) Golden section search
c) Variable metric method d) Powell's method

4) The bound phase method is used to _____.
a) Determine the initial feasible interval containing the minimum
b) Compute gradients of a function
c) Solve discrete variable problems
d) Reduce global optima to local optima

5) Multi-objective optimization involves _____.
   a) Optimizing a single objective only
   b) Simultaneously optimizing two or more conflicting objectives
   c) Solving only linear problems
   d) Ignoring constraints

6) Evolutionary optimization is suitable for _____.
   a) Smooth, convex problems only
   b) Problems with discontinuities and multimodal functions
   c) Single-variable functions only
   d) Linear programming only

7) Integer programming is used when _____.
   a) All decision variables are continuous
   b) Some or all decision variables must be integers
   c) Derivatives are unavailable
   d) Only one variable exists

8) Integer programming problems can be solved using _____.
   a) Simplex method with branch and bound
   b) Golden section search
   c) Newton-Raphson method
   d) Fibonacci search

9) Which is a primary difference between GAs and traditional optimization methods?
   a) GAs require gradient information
   b) GAs are population-based and stochastic
   c) Traditional methods are always faster
   d) GAs cannot handle constraints

10) Selection in GA is used to _____.
   a) Choose better solutions for reproduction
   b) Mutate the population
   c) Evaluate the objective function
   d) Reduce dimensionality

11) Which is a similarity between GAs and traditional methods?
   a) Both search for optimal solutions
   b) Both require derivatives
   c) Both are population-based
   d) Both are stochastic

12) Reducing the size of an optimization problem involves _____.
   a) Eliminating dependent or negligible variables
   b) Increasing the number of constraints
   c) Ignoring the objective function
   d) Using random search

13) Fast reanalysis techniques are used for _____.

a) Quickly evaluating changes in the objective function after modifications
b) Solving only linear problems
c) Gradient computation
d) Generating random solutions

14) Multilevel optimization is used when _____.

a) A system has hierarchical design variables and objectives
b) Single-variable optimization is sufficient
c) Gradient methods fail
d) Problem is unconstrained

SLR-QH-635

Seat No.		Set	P

T. Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Design Optimization (CIVMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculators is allowed.

SECTION – I

Q.2 Answer the following questions. **10**

a) Define optimization and explain the general procedure for solving an optimization problem.

b) Use the Exhaustive Search Method to find the minimum of $f(x) = x^2 - 6x + 10$ over $[0, 6]$ with 4 equal intervals.

Q.3 Answer Any Three of the following questions. **18**

a) Using the Newton-Raphson Method, find the root of $f(x) = x^2 - 5x + 6$ starting with $X_0 = 2.5$ Perform two iterations.

b) Using the Bisection Method, find the root of $f(x) = x^3 - 4x + 1$ in the interval $[0, 2]$ up to three iterations.

c) Apply the Fibonacci Search Method to minimize $f(x) = (x - 2)^2 + 1$ in $[0, 5]$ for $n = 5$ function evaluations.

d) Explain with an example the importance of optimization in engineering design.

e) $f(x_1, x_2) = x_1 - x_2 + 2x_1^2 + 2x_1x_2 + x_2^2$ Using Newton Method Minimize by taking the starting point as $x(0) = (0,0)$.

SECTION – II

Q.4 Answer the following questions. **10**

a) Write a note on Operators of genetic algorithm.

b) Describe fast reanalysis techniques and their significance in structural optimization.

Q.5 Answer Any Three of the following questions. **18**

a) Explain the concept of reduction of size of an optimization problem and mention its importance in engineering design.

b) Solve the Integer Programming Problem:
Maximize $Z = 5x_1 + 4x_2$
subject to $x_1 + x_2 \leq 5, 3x_1 + 2x_2 \leq 12,\ x_1, x_2 \geq 0$ and integers.

c) What is meant by sensitivity of optimum solution to problem parameters? Why is it important?

d) Discuss the practical approaches to reduce computational effort in optimization problems.

e) Difference between Genetic Algorithm and Traditional Techniques.

SLR-QH-635

Seat No.	

Set Q

T. Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Design Optimization (CIVMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Use of non-programmable calculators is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Multiple Choice questions: **14**

1) Integer programming problems can be solved using _____.
a) Simplex method with branch and bound
b) Golden section search
c) Newton-Raphson method
d) Fibonacci search

2) Which is a primary difference between GAs and traditional optimization methods?
a) GAs require gradient information
b) GAs are population-based and stochastic
c) Traditional methods are always faster
d) GAs cannot handle constraints

3) Selection in GA is used to _____.
a) Choose better solutions for reproduction
b) Mutate the population
c) Evaluate the objective function
d) Reduce dimensionality

4) Which is a similarity between GAs and traditional methods?
a) Both search for optimal solutions
b) Both require derivatives
c) Both are population-based
d) Both are stochastic

5) Reducing the size of an optimization problem involves _____.
   a) Eliminating dependent or negligible variables
   b) Increasing the number of constraints
   c) Ignoring the objective function
   d) Using random search

6) Fast reanalysis techniques are used for _____.
   a) Quickly evaluating changes in the objective function after modifications
   b) Solving only linear problems
   c) Gradient computation
   d) Generating random solutions

7) Multilevel optimization is used when _____.
   a) A system has hierarchical design variables and objectives
   b) Single-variable optimization is sufficient
   c) Gradient methods fail
   d) Problem is unconstrained

8) Which of the following is the correct definition of an optimization problem?
   a) Maximizing or minimizing an objective function subject to constraints
   b) Solving differential equations
   c) Performing statistical analysis
   d) Evaluating integrals

9) In optimization, the objective function represents _____.
   a) Constraints on the system
   b) The variable to be optimized
   c) The method of solving the problem
   d) The search algorithm

10) Which of the following is a bracketing method in single-variable optimization?
   a) Newton-Raphson method
   b) Golden section search
   c) Variable metric method
   d) Powell's method

11) The bound phase method is used to _____.
   a) Determine the initial feasible interval containing the minimum
   b) Compute gradients of a function
   c) Solve discrete variable problems
   d) Reduce global optima to local optima

12) Multi-objective optimization involves _____.
   a) Optimizing a single objective only
   b) Simultaneously optimizing two or more conflicting objectives
   c) Solving only linear problems
   d) Ignoring constraints

13) Evolutionary optimization is suitable for _____.
   a) Smooth, convex problems only
   b) Problems with discontinuities and multimodal functions
   c) Single-variable functions only
   d) Linear programming only

14) Integer programming is used when _____.
   a) All decision variables are continuous
   b) Some or all decision variables must be integers
   c) Derivatives are unavailable
   d) Only one variable exists

SLR-QH-635

Seat No.		Set	Q

T. Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Design Optimization (CIVMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculators is allowed.

SECTION – I

Q.2 Answer the following questions. **10**

a) Define optimization and explain the general procedure for solving an optimization problem.

b) Use the Exhaustive Search Method to find the minimum of $f(x) = x^2 - 6x + 10$ over $[0, 6]$ with 4 equal intervals.

Q.3 Answer Any Three of the following questions. **18**

a) Using the Newton-Raphson Method, find the root of $f(x) = x^2 - 5x + 6$ starting with $X_0 = 2.5$ Perform two iterations.

b) Using the Bisection Method, find the root of $f(x) = x^3 - 4x + 1$ in the interval $[0, 2]$ up to three iterations.

c) Apply the Fibonacci Search Method to minimize $f(x) = (x - 2)^2 + 1$ in $[0, 5]$ for $n = 5$ function evaluations.

d) Explain with an example the importance of optimization in engineering design.

e) $f(x_1, x_2) = x_1 - x_2 + 2x_1^2 + 2x_1x_2 + x_2^2$ Using Newton Method Minimize by taking the starting point as $x(0) = (0,0)$.

SECTION – II

Q.4 Answer the following questions. **10**

a) Write a note on Operators of genetic algorithm.

b) Describe fast reanalysis techniques and their significance in structural optimization.

Q.5 Answer Any Three of the following questions. **18**

a) Explain the concept of reduction of size of an optimization problem and mention its importance in engineering design.

b) Solve the Integer Programming Problem:
Maximize $Z = 5x_1 + 4x_2$
subject to $x_1 + x_2 \leq 5, 3x_1 + 2x_2 \leq 12,\ x_1, x_2 \geq 0$ and integers.

c) What is meant by sensitivity of optimum solution to problem parameters? Why is it important?

d) Discuss the practical approaches to reduce computational effort in optimization problems.

e) Difference between Genetic Algorithm and Traditional Techniques.

SLR-QH-635

Seat No.		Set	R

T. Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Design Optimization (CIVMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Use of non-programmable calculators is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Multiple Choice questions: **14**

1) Which is a similarity between GAs and traditional methods?
a) Both search for optimal solutions
b) Both require derivatives
c) Both are population-based
d) Both are stochastic

2) Reducing the size of an optimization problem involves _____.
a) Eliminating dependent or negligible variables
b) Increasing the number of constraints
c) Ignoring the objective function
d) Using random search

3) Fast reanalysis techniques are used for _____.
a) Quickly evaluating changes in the objective function after modifications
b) Solving only linear problems
c) Gradient computation
d) Generating random solutions

4) Multilevel optimization is used when _____.
a) A system has hierarchical design variables and objectives
b) Single-variable optimization is sufficient
c) Gradient methods fail
d) Problem is unconstrained

5) Which of the following is the correct definition of an optimization problem?
   a) Maximizing or minimizing an objective function subject to constraints
   b) Solving differential equations
   c) Performing statistical analysis
   d) Evaluating integrals

6) In optimization, the objective function represents _____.
   a) Constraints on the system
   b) The variable to be optimized
   c) The method of solving the problem
   d) The search algorithm

7) Which of the following is a bracketing method in single-variable optimization?
   a) Newton-Raphson method
   b) Golden section search
   c) Variable metric method
   d) Powell's method

8) The bound phase method is used to _____.
   a) Determine the initial feasible interval containing the minimum
   b) Compute gradients of a function
   c) Solve discrete variable problems
   d) Reduce global optima to local optima

9) Multi-objective optimization involves _____.
   a) Optimizing a single objective only
   b) Simultaneously optimizing two or more conflicting objectives
   c) Solving only linear problems
   d) Ignoring constraints

10) Evolutionary optimization is suitable for _____.
   a) Smooth, convex problems only
   b) Problems with discontinuities and multimodal functions
   c) Single-variable functions only
   d) Linear programming only

11) Integer programming is used when _____.
   a) All decision variables are continuous
   b) Some or all decision variables must be integers
   c) Derivatives are unavailable
   d) Only one variable exists

12) Integer programming problems can be solved using _____.
   a) Simplex method with branch and bound
   b) Golden section search
   c) Newton-Raphson method
   d) Fibonacci search

13) Which is a primary difference between GAs and traditional optimization methods?

a) GAs require gradient information
b) GAs are population-based and stochastic
c) Traditional methods are always faster
d) GAs cannot handle constraints

14) Selection in GA is used to _____.

a) Choose better solutions for reproduction
b) Mutate the population
c) Evaluate the objective function
d) Reduce dimensionality

SLR-QH-635

Seat No.		Set	R

T. Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Design Optimization (CIVMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculators is allowed.

SECTION – I

Q.2 Answer the following questions. **10**

a) Define optimization and explain the general procedure for solving an optimization problem.

b) Use the Exhaustive Search Method to find the minimum of $f(x) = x^2 - 6x + 10$ over $[0, 6]$ with 4 equal intervals.

Q.3 Answer Any Three of the following questions. **18**

a) Using the Newton-Raphson Method, find the root of $f(x) = x^2 - 5x + 6$ starting with $X_0 = 2.5$ Perform two iterations.

b) Using the Bisection Method, find the root of $f(x) = x^3 - 4x + 1$ in the interval $[0, 2]$ up to three iterations.

c) Apply the Fibonacci Search Method to minimize $f(x) = (x - 2)^2 + 1$ in $[0, 5]$ for $n = 5$ function evaluations.

d) Explain with an example the importance of optimization in engineering design.

e) $f(x_1, x_2) = x_1 - x_2 + 2x_1^2 + 2x_1x_2 + x_2^2$ Using Newton Method Minimize by taking the starting point as $x(0) = (0,0)$.

SECTION – II

Q.4 Answer the following questions. **10**

a) Write a note on Operators of genetic algorithm.

b) Describe fast reanalysis techniques and their significance in structural optimization.

Q.5 Answer Any Three of the following questions. **18**

a) Explain the concept of reduction of size of an optimization problem and mention its importance in engineering design.

b) Solve the Integer Programming Problem:
Maximize $Z = 5x_1 + 4x_2$
subject to $x_1 + x_2 \leq 5, 3x_1 + 2x_2 \leq 12,\ x_1, x_2 \geq 0$ and integers.

c) What is meant by sensitivity of optimum solution to problem parameters? Why is it important?

d) Discuss the practical approaches to reduce computational effort in optimization problems.

e) Difference between Genetic Algorithm and Traditional Techniques.

SLR-QH-635

Seat No.		Set	S

T. Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Design Optimization (CIVMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Use of non-programmable calculators is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Multiple Choice questions: **14**

1) Evolutionary optimization is suitable for _____.
a) Smooth, convex problems only
b) Problems with discontinuities and multimodal functions
c) Single-variable functions only
d) Linear programming only

2) Integer programming is used when _____.
a) All decision variables are continuous
b) Some or all decision variables must be integers
c) Derivatives are unavailable
d) Only one variable exists

3) Integer programming problems can be solved using _____.
a) Simplex method with branch and bound
b) Golden section search
c) Newton-Raphson method
d) Fibonacci search

4) Which is a primary difference between GAs and traditional optimization methods?
a) GAs require gradient information
b) GAs are population-based and stochastic
c) Traditional methods are always faster
d) GAs cannot handle constraints

5) Selection in GA is used to _____.
   a) Choose better solutions for reproduction
   b) Mutate the population
   c) Evaluate the objective function
   d) Reduce dimensionality

6) Which is a similarity between GAs and traditional methods?
   a) Both search for optimal solutions
   b) Both require derivatives
   c) Both are population-based
   d) Both are stochastic

7) Reducing the size of an optimization problem involves _____.
   a) Eliminating dependent or negligible variables
   b) Increasing the number of constraints
   c) Ignoring the objective function
   d) Using random search

8) Fast reanalysis techniques are used for _____.
   a) Quickly evaluating changes in the objective function after modifications
   b) Solving only linear problems
   c) Gradient computation
   d) Generating random solutions

9) Multilevel optimization is used when _____.
   a) A system has hierarchical design variables and objectives
   b) Single-variable optimization is sufficient
   c) Gradient methods fail
   d) Problem is unconstrained

10) Which of the following is the correct definition of an optimization problem?
   a) Maximizing or minimizing an objective function subject to constraints
   b) Solving differential equations
   c) Performing statistical analysis
   d) Evaluating integrals

11) In optimization, the objective function represents _____.
   a) Constraints on the system
   b) The variable to be optimized
   c) The method of solving the problem
   d) The search algorithm

12) Which of the following is a bracketing method in single-variable optimization?
   a) Newton-Raphson method
   b) Golden section search
   c) Variable metric method
   d) Powell's method

13) The bound phase method is used to _____.
   a) Determine the initial feasible interval containing the minimum
   b) Compute gradients of a function
   c) Solve discrete variable problems
   d) Reduce global optima to local optima

14) Multi-objective optimization involves _____.
   a) Optimizing a single objective only
   b) Simultaneously optimizing two or more conflicting objectives
   c) Solving only linear problems
   d) Ignoring constraints

SLR-QH-635

Seat No.		Set	S

T. Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Design Optimization (CIVMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculators is allowed.

SECTION – I

Q.2 Answer the following questions. **10**

a) Define optimization and explain the general procedure for solving an optimization problem.

b) Use the Exhaustive Search Method to find the minimum of $f(x) = x^2 - 6x + 10$ over $[0, 6]$ with 4 equal intervals.

Q.3 Answer Any Three of the following questions. **18**

a) Using the Newton-Raphson Method, find the root of $f(x) = x^2 - 5x + 6$ starting with $X_0 = 2.5$ Perform two iterations.

b) Using the Bisection Method, find the root of $f(x) = x^3 - 4x + 1$ in the interval $[0, 2]$ up to three iterations.

c) Apply the Fibonacci Search Method to minimize $f(x) = (x - 2)^2 + 1$ in $[0, 5]$ for $n = 5$ function evaluations.

d) Explain with an example the importance of optimization in engineering design.

e) $f(x_1, x_2) = x_1 - x_2 + 2x_1^2 + 2x_1x_2 + x_2^2$ Using Newton Method Minimize by taking the starting point as $x(0) = (0,0)$.

SECTION – II

Q.4 Answer the following questions. **10**

a) Write a note on Operators of genetic algorithm.

b) Describe fast reanalysis techniques and their significance in structural optimization.

Q.5 Answer Any Three of the following questions. **18**

a) Explain the concept of reduction of size of an optimization problem and mention its importance in engineering design.

b) Solve the Integer Programming Problem:
Maximize $Z = 5x_1 + 4x_2$
subject to $x_1 + x_2 \leq 5, 3x_1 + 2x_2 \leq 12,\ x_1, x_2 \geq 0$ and integers.

c) What is meant by sensitivity of optimum solution to problem parameters? Why is it important?

d) Discuss the practical approaches to reduce computational effort in optimization problems.

e) Difference between Genetic Algorithm and Traditional Techniques.

SLR-QH-635

Seat No.	

Set P

T. Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Design Optimization (CIVMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Use of non-programmable calculators is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Multiple Choice questions: **14**

1) Which of the following is the correct definition of an optimization problem?
a) Maximizing or minimizing an objective function subject to constraints
b) Solving differential equations
c) Performing statistical analysis
d) Evaluating integrals

2) In optimization, the objective function represents _____.
a) Constraints on the system
b) The variable to be optimized
c) The method of solving the problem
d) The search algorithm

3) Which of the following is a bracketing method in single-variable optimization?
a) Newton-Raphson method b) Golden section search
c) Variable metric method d) Powell's method

4) The bound phase method is used to _____.
a) Determine the initial feasible interval containing the minimum
b) Compute gradients of a function
c) Solve discrete variable problems
d) Reduce global optima to local optima

5) Multi-objective optimization involves _____.
   a) Optimizing a single objective only
   b) Simultaneously optimizing two or more conflicting objectives
   c) Solving only linear problems
   d) Ignoring constraints

6) Evolutionary optimization is suitable for _____.
   a) Smooth, convex problems only
   b) Problems with discontinuities and multimodal functions
   c) Single-variable functions only
   d) Linear programming only

7) Integer programming is used when _____.
   a) All decision variables are continuous
   b) Some or all decision variables must be integers
   c) Derivatives are unavailable
   d) Only one variable exists

8) Integer programming problems can be solved using _____.
   a) Simplex method with branch and bound
   b) Golden section search
   c) Newton-Raphson method
   d) Fibonacci search

9) Which is a primary difference between GAs and traditional optimization methods?
   a) GAs require gradient information
   b) GAs are population-based and stochastic
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10) Selection in GA is used to _____.
   a) Choose better solutions for reproduction
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   c) Evaluate the objective function
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11) Which is a similarity between GAs and traditional methods?
   a) Both search for optimal solutions
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12) Reducing the size of an optimization problem involves _____.
   a) Eliminating dependent or negligible variables
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   c) Ignoring the objective function
   d) Using random search

13) Fast reanalysis techniques are used for _____.

a) Quickly evaluating changes in the objective function after modifications
b) Solving only linear problems
c) Gradient computation
d) Generating random solutions

14) Multilevel optimization is used when _____.

a) A system has hierarchical design variables and objectives
b) Single-variable optimization is sufficient
c) Gradient methods fail
d) Problem is unconstrained

Seat No.	

Set **P**

T. Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Design Optimization (CIVMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculators is allowed.

SECTION – I

Q.2 Answer the following questions. **10**

a) Define optimization and explain the general procedure for solving an optimization problem.

b) Use the Exhaustive Search Method to find the minimum of $f(x) = x^2 - 6x + 10$ over $[0, 6]$ with 4 equal intervals.

Q.3 Answer Any Three of the following questions. **18**

a) Using the Newton-Raphson Method, find the root of $f(x) = x^2 - 5x + 6$ starting with $X_0 = 2.5$ Perform two iterations.

b) Using the Bisection Method, find the root of $f(x) = x^3 - 4x + 1$ in the interval $[0, 2]$ up to three iterations.

c) Apply the Fibonacci Search Method to minimize $f(x) = (x - 2)^2 + 1$ in $[0, 5]$ for $n = 5$ function evaluations.

d) Explain with an example the importance of optimization in engineering design.

e) $f(x_1, x_2) = x_1 - x_2 + 2x_1^2 + 2x_1x_2 + x_2^2$ Using Newton Method Minimize by taking the starting point as $x(0) = (0,0)$.

SECTION – II

Q.4 Answer the following questions. **10**

a) Write a note on Operators of genetic algorithm.

b) Describe fast reanalysis techniques and their significance in structural optimization.

Q.5 Answer Any Three of the following questions. **18**

a) Explain the concept of reduction of size of an optimization problem and mention its importance in engineering design.

b) Solve the Integer Programming Problem:
Maximize $Z = 5x_1 + 4x_2$
subject to $x_1 + x_2 \leq 5, 3x_1 + 2x_2 \leq 12,\ x_1, x_2 \geq 0$ and integers.

c) What is meant by sensitivity of optimum solution to problem parameters? Why is it important?

d) Discuss the practical approaches to reduce computational effort in optimization problems.

e) Difference between Genetic Algorithm and Traditional Techniques.

SLR-QH-635

Seat No.	

Set Q

T. Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Design Optimization (CIVMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Use of non-programmable calculators is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Multiple Choice questions: **14**

1) Integer programming problems can be solved using _____.
a) Simplex method with branch and bound
b) Golden section search
c) Newton-Raphson method
d) Fibonacci search

2) Which is a primary difference between GAs and traditional optimization methods?
a) GAs require gradient information
b) GAs are population-based and stochastic
c) Traditional methods are always faster
d) GAs cannot handle constraints

3) Selection in GA is used to _____.
a) Choose better solutions for reproduction
b) Mutate the population
c) Evaluate the objective function
d) Reduce dimensionality

4) Which is a similarity between GAs and traditional methods?
a) Both search for optimal solutions
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   b) Increasing the number of constraints
   c) Ignoring the objective function
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6) Fast reanalysis techniques are used for _____.
   a) Quickly evaluating changes in the objective function after modifications
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   c) Gradient computation
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7) Multilevel optimization is used when _____.
   a) A system has hierarchical design variables and objectives
   b) Single-variable optimization is sufficient
   c) Gradient methods fail
   d) Problem is unconstrained

8) Which of the following is the correct definition of an optimization problem?
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10) Which of the following is a bracketing method in single-variable optimization?
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   b) Golden section search
   c) Variable metric method
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11) The bound phase method is used to _____.
   a) Determine the initial feasible interval containing the minimum
   b) Compute gradients of a function
   c) Solve discrete variable problems
   d) Reduce global optima to local optima

12) Multi-objective optimization involves _____.
   a) Optimizing a single objective only
   b) Simultaneously optimizing two or more conflicting objectives
   c) Solving only linear problems
   d) Ignoring constraints

13) Evolutionary optimization is suitable for _____.
   a) Smooth, convex problems only
   b) Problems with discontinuities and multimodal functions
   c) Single-variable functions only
   d) Linear programming only

14) Integer programming is used when _____.
   a) All decision variables are continuous
   b) Some or all decision variables must be integers
   c) Derivatives are unavailable
   d) Only one variable exists

Seat No.	

Set **Q**

T. Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Design Optimization (CIVMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculators is allowed.

SECTION – I

Q.2 Answer the following questions. **10**

a) Define optimization and explain the general procedure for solving an optimization problem.

b) Use the Exhaustive Search Method to find the minimum of $f(x) = x^2 - 6x + 10$ over $[0, 6]$ with 4 equal intervals.

Q.3 Answer Any Three of the following questions. **18**

a) Using the Newton-Raphson Method, find the root of $f(x) = x^2 - 5x + 6$ starting with $X_0 = 2.5$ Perform two iterations.

b) Using the Bisection Method, find the root of $f(x) = x^3 - 4x + 1$ in the interval $[0, 2]$ up to three iterations.

c) Apply the Fibonacci Search Method to minimize $f(x) = (x - 2)^2 + 1$ in $[0, 5]$ for $n = 5$ function evaluations.

d) Explain with an example the importance of optimization in engineering design.

e) $f(x_1, x_2) = x_1 - x_2 + 2x_1^2 + 2x_1x_2 + x_2^2$ Using Newton Method Minimize by taking the starting point as $x(0) = (0,0)$.

SECTION – II

Q.4 Answer the following questions. **10**

a) Write a note on Operators of genetic algorithm.

b) Describe fast reanalysis techniques and their significance in structural optimization.

Q.5 Answer Any Three of the following questions. **18**

a) Explain the concept of reduction of size of an optimization problem and mention its importance in engineering design.

b) Solve the Integer Programming Problem:
Maximize $Z = 5x_1 + 4x_2$
subject to $x_1 + x_2 \leq 5, 3x_1 + 2x_2 \leq 12,\ x_1, x_2 \geq 0$ and integers.

c) What is meant by sensitivity of optimum solution to problem parameters? Why is it important?

d) Discuss the practical approaches to reduce computational effort in optimization problems.

e) Difference between Genetic Algorithm and Traditional Techniques.

Seat No.	

Set **R**

T. Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
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Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Multiple Choice questions: **14**

1) Which is a similarity between GAs and traditional methods?
a) Both search for optimal solutions
b) Both require derivatives
c) Both are population-based
d) Both are stochastic

2) Reducing the size of an optimization problem involves _____.
a) Eliminating dependent or negligible variables
b) Increasing the number of constraints
c) Ignoring the objective function
d) Using random search

3) Fast reanalysis techniques are used for _____.
a) Quickly evaluating changes in the objective function after modifications
b) Solving only linear problems
c) Gradient computation
d) Generating random solutions

4) Multilevel optimization is used when _____.
a) A system has hierarchical design variables and objectives
b) Single-variable optimization is sufficient
c) Gradient methods fail
d) Problem is unconstrained

5) Which of the following is the correct definition of an optimization problem?
   a) Maximizing or minimizing an objective function subject to constraints
   b) Solving differential equations
   c) Performing statistical analysis
   d) Evaluating integrals

6) In optimization, the objective function represents _____.
   a) Constraints on the system
   b) The variable to be optimized
   c) The method of solving the problem
   d) The search algorithm

7) Which of the following is a bracketing method in single-variable optimization?
   a) Newton-Raphson method
   b) Golden section search
   c) Variable metric method
   d) Powell's method

8) The bound phase method is used to _____.
   a) Determine the initial feasible interval containing the minimum
   b) Compute gradients of a function
   c) Solve discrete variable problems
   d) Reduce global optima to local optima

9) Multi-objective optimization involves _____.
   a) Optimizing a single objective only
   b) Simultaneously optimizing two or more conflicting objectives
   c) Solving only linear problems
   d) Ignoring constraints

10) Evolutionary optimization is suitable for _____.
   a) Smooth, convex problems only
   b) Problems with discontinuities and multimodal functions
   c) Single-variable functions only
   d) Linear programming only

11) Integer programming is used when _____.
   a) All decision variables are continuous
   b) Some or all decision variables must be integers
   c) Derivatives are unavailable
   d) Only one variable exists

12) Integer programming problems can be solved using _____.
   a) Simplex method with branch and bound
   b) Golden section search
   c) Newton-Raphson method
   d) Fibonacci search

13) Which is a primary difference between GAs and traditional optimization methods?

a) GAs require gradient information
b) GAs are population-based and stochastic
c) Traditional methods are always faster
d) GAs cannot handle constraints

14) Selection in GA is used to _____.

a) Choose better solutions for reproduction
b) Mutate the population
c) Evaluate the objective function
d) Reduce dimensionality

Seat No.	

Set **R**

T. Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Design Optimization (CIVMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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SECTION – I

Q.2 Answer the following questions. **10**

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SECTION – II

Q.4 Answer the following questions. **10**

a) Write a note on Operators of genetic algorithm.

b) Describe fast reanalysis techniques and their significance in structural optimization.

Q.5 Answer Any Three of the following questions. **18**

a) Explain the concept of reduction of size of an optimization problem and mention its importance in engineering design.

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SLR-QH-635

Seat No.		Set	S

T. Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Design Optimization (CIVMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Multiple Choice questions: **14**

1) Evolutionary optimization is suitable for _____.
a) Smooth, convex problems only
b) Problems with discontinuities and multimodal functions
c) Single-variable functions only
d) Linear programming only

2) Integer programming is used when _____.
a) All decision variables are continuous
b) Some or all decision variables must be integers
c) Derivatives are unavailable
d) Only one variable exists

3) Integer programming problems can be solved using _____.
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b) Golden section search
c) Newton-Raphson method
d) Fibonacci search

4) Which is a primary difference between GAs and traditional optimization methods?
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5) Selection in GA is used to _____.
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Seat No.		Set	S

T. Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Design Optimization (CIVMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
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SECTION – I

Q.2 Answer the following questions. **10**

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SECTION – II

Q.4 Answer the following questions. **10**

a) Write a note on Operators of genetic algorithm.

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a) Explain the concept of reduction of size of an optimization problem and mention its importance in engineering design.

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Maximize $Z = 5x_1 + 4x_2$
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e) Difference between Genetic Algorithm and Traditional Techniques.

SLR-QH-635

Seat No.		Set	P

T. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Design Optimization (CIVMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Multiple Choice questions: **14**

1) Which of the following is the correct definition of an optimization problem?
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2) In optimization, the objective function represents _____.
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Seat No.		Set	P

T. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Design Optimization (CIVMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
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SECTION – I

Q.2 Answer the following questions. **10**

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SECTION – II

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Seat No.	

Set **Q**

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MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Multiple Choice questions: **14**

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3) Selection in GA is used to _____.
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d) Reduce dimensionality

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Seat No.	

Set **Q**

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Day & Date: Saturday, 30-05-2026 Max. Marks: 56
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SLR-QH-635

Seat No.		Set	R

T. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
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MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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Seat No.		Set	R

T. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Design Optimization (CIVMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculators is allowed.

SECTION – I

Q.2 Answer the following questions. **10**

a) Define optimization and explain the general procedure for solving an optimization problem.

b) Use the Exhaustive Search Method to find the minimum of $f(x) = x^2 - 6x + 10$ over $[0, 6]$ with 4 equal intervals.

Q.3 Answer Any Three of the following questions. **18**

a) Using the Newton-Raphson Method, find the root of $f(x) = x^2 - 5x + 6$ starting with $X_0 = 2.5$ Perform two iterations.

b) Using the Bisection Method, find the root of $f(x) = x^3 - 4x + 1$ in the interval $[0, 2]$ up to three iterations.

c) Apply the Fibonacci Search Method to minimize $f(x) = (x - 2)^2 + 1$ in $[0, 5]$ for $n = 5$ function evaluations.

d) Explain with an example the importance of optimization in engineering design.

e) $f(x_1, x_2) = x_1 - x_2 + 2x_1^2 + 2x_1x_2 + x_2^2$ Using Newton Method Minimize by taking the starting point as $x(0) = (0,0)$.

SECTION – II

Q.4 Answer the following questions. **10**

a) Write a note on Operators of genetic algorithm.

b) Describe fast reanalysis techniques and their significance in structural optimization.

Q.5 Answer Any Three of the following questions. **18**

a) Explain the concept of reduction of size of an optimization problem and mention its importance in engineering design.

b) Solve the Integer Programming Problem:
Maximize $Z = 5x_1 + 4x_2$
subject to $x_1 + x_2 \leq 5, 3x_1 + 2x_2 \leq 12,\ x_1, x_2 \geq 0$ and integers.

c) What is meant by sensitivity of optimum solution to problem parameters? Why is it important?

d) Discuss the practical approaches to reduce computational effort in optimization problems.

e) Difference between Genetic Algorithm and Traditional Techniques.

Seat No.		Set	S

T. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Design Optimization (CIVMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Use of non-programmable calculators is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Multiple Choice questions: **14**

1) Evolutionary optimization is suitable for _____.
a) Smooth, convex problems only
b) Problems with discontinuities and multimodal functions
c) Single-variable functions only
d) Linear programming only

2) Integer programming is used when _____.
a) All decision variables are continuous
b) Some or all decision variables must be integers
c) Derivatives are unavailable
d) Only one variable exists

3) Integer programming problems can be solved using _____.
a) Simplex method with branch and bound
b) Golden section search
c) Newton-Raphson method
d) Fibonacci search

4) Which is a primary difference between GAs and traditional optimization methods?
a) GAs require gradient information
b) GAs are population-based and stochastic
c) Traditional methods are always faster
d) GAs cannot handle constraints

5) Selection in GA is used to _____.
   a) Choose better solutions for reproduction
   b) Mutate the population
   c) Evaluate the objective function
   d) Reduce dimensionality

6) Which is a similarity between GAs and traditional methods?
   a) Both search for optimal solutions
   b) Both require derivatives
   c) Both are population-based
   d) Both are stochastic

7) Reducing the size of an optimization problem involves _____.
   a) Eliminating dependent or negligible variables
   b) Increasing the number of constraints
   c) Ignoring the objective function
   d) Using random search

8) Fast reanalysis techniques are used for _____.
   a) Quickly evaluating changes in the objective function after modifications
   b) Solving only linear problems
   c) Gradient computation
   d) Generating random solutions

9) Multilevel optimization is used when _____.
   a) A system has hierarchical design variables and objectives
   b) Single-variable optimization is sufficient
   c) Gradient methods fail
   d) Problem is unconstrained

10) Which of the following is the correct definition of an optimization problem?
   a) Maximizing or minimizing an objective function subject to constraints
   b) Solving differential equations
   c) Performing statistical analysis
   d) Evaluating integrals

11) In optimization, the objective function represents _____.
   a) Constraints on the system
   b) The variable to be optimized
   c) The method of solving the problem
   d) The search algorithm

12) Which of the following is a bracketing method in single-variable optimization?
   a) Newton-Raphson method
   b) Golden section search
   c) Variable metric method
   d) Powell's method

13) The bound phase method is used to _____.
   a) Determine the initial feasible interval containing the minimum
   b) Compute gradients of a function
   c) Solve discrete variable problems
   d) Reduce global optima to local optima

14) Multi-objective optimization involves _____.
   a) Optimizing a single objective only
   b) Simultaneously optimizing two or more conflicting objectives
   c) Solving only linear problems
   d) Ignoring constraints

Seat No.		Set	S

T. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Design Optimization (CIVMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculators is allowed.

SECTION – I

Q.2 Answer the following questions. **10**

a) Define optimization and explain the general procedure for solving an optimization problem.

b) Use the Exhaustive Search Method to find the minimum of $f(x) = x^2 - 6x + 10$ over $[0, 6]$ with 4 equal intervals.

Q.3 Answer Any Three of the following questions. **18**

a) Using the Newton-Raphson Method, find the root of $f(x) = x^2 - 5x + 6$ starting with $X_0 = 2.5$ Perform two iterations.

b) Using the Bisection Method, find the root of $f(x) = x^3 - 4x + 1$ in the interval $[0, 2]$ up to three iterations.

c) Apply the Fibonacci Search Method to minimize $f(x) = (x - 2)^2 + 1$ in $[0, 5]$ for $n = 5$ function evaluations.

d) Explain with an example the importance of optimization in engineering design.

e) $f(x_1, x_2) = x_1 - x_2 + 2x_1^2 + 2x_1x_2 + x_2^2$ Using Newton Method Minimize by taking the starting point as $x(0) = (0,0)$.

SECTION – II

Q.4 Answer the following questions. **10**

a) Write a note on Operators of genetic algorithm.

b) Describe fast reanalysis techniques and their significance in structural optimization.

Q.5 Answer Any Three of the following questions. **18**

a) Explain the concept of reduction of size of an optimization problem and mention its importance in engineering design.

b) Solve the Integer Programming Problem:
Maximize $Z = 5x_1 + 4x_2$
subject to $x_1 + x_2 \leq 5, 3x_1 + 2x_2 \leq 12,\ x_1, x_2 \geq 0$ and integers.

c) What is meant by sensitivity of optimum solution to problem parameters? Why is it important?

d) Discuss the practical approaches to reduce computational effort in optimization problems.

e) Difference between Genetic Algorithm and Traditional Techniques.

SLR-QH-635

Seat No.	

Set P

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Design Optimization (CIVMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Use of non-programmable calculators is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Multiple Choice questions: **14**

1) Which of the following is the correct definition of an optimization problem?
a) Maximizing or minimizing an objective function subject to constraints
b) Solving differential equations
c) Performing statistical analysis
d) Evaluating integrals

2) In optimization, the objective function represents _____.
a) Constraints on the system
b) The variable to be optimized
c) The method of solving the problem
d) The search algorithm

3) Which of the following is a bracketing method in single-variable optimization?
a) Newton-Raphson method b) Golden section search
c) Variable metric method d) Powell's method

4) The bound phase method is used to _____.
a) Determine the initial feasible interval containing the minimum
b) Compute gradients of a function
c) Solve discrete variable problems
d) Reduce global optima to local optima

5) Multi-objective optimization involves _____.
   a) Optimizing a single objective only
   b) Simultaneously optimizing two or more conflicting objectives
   c) Solving only linear problems
   d) Ignoring constraints

6) Evolutionary optimization is suitable for _____.
   a) Smooth, convex problems only
   b) Problems with discontinuities and multimodal functions
   c) Single-variable functions only
   d) Linear programming only

7) Integer programming is used when _____.
   a) All decision variables are continuous
   b) Some or all decision variables must be integers
   c) Derivatives are unavailable
   d) Only one variable exists

8) Integer programming problems can be solved using _____.
   a) Simplex method with branch and bound
   b) Golden section search
   c) Newton-Raphson method
   d) Fibonacci search

9) Which is a primary difference between GAs and traditional optimization methods?
   a) GAs require gradient information
   b) GAs are population-based and stochastic
   c) Traditional methods are always faster
   d) GAs cannot handle constraints

10) Selection in GA is used to _____.
   a) Choose better solutions for reproduction
   b) Mutate the population
   c) Evaluate the objective function
   d) Reduce dimensionality

11) Which is a similarity between GAs and traditional methods?
   a) Both search for optimal solutions
   b) Both require derivatives
   c) Both are population-based
   d) Both are stochastic

12) Reducing the size of an optimization problem involves _____.
   a) Eliminating dependent or negligible variables
   b) Increasing the number of constraints
   c) Ignoring the objective function
   d) Using random search

13) Fast reanalysis techniques are used for _____.

a) Quickly evaluating changes in the objective function after modifications
b) Solving only linear problems
c) Gradient computation
d) Generating random solutions

14) Multilevel optimization is used when _____.

a) A system has hierarchical design variables and objectives
b) Single-variable optimization is sufficient
c) Gradient methods fail
d) Problem is unconstrained

Seat No.	

Set **P**

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Design Optimization (CIVMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculators is allowed.

SECTION – I

Q.2 Answer the following questions. **10**

a) Define optimization and explain the general procedure for solving an optimization problem.

b) Use the Exhaustive Search Method to find the minimum of $f(x) = x^2 - 6x + 10$ over $[0, 6]$ with 4 equal intervals.

Q.3 Answer Any Three of the following questions. **18**

a) Using the Newton-Raphson Method, find the root of $f(x) = x^2 - 5x + 6$ starting with $X_0 = 2.5$ Perform two iterations.

b) Using the Bisection Method, find the root of $f(x) = x^3 - 4x + 1$ in the interval $[0, 2]$ up to three iterations.

c) Apply the Fibonacci Search Method to minimize $f(x) = (x - 2)^2 + 1$ in $[0, 5]$ for $n = 5$ function evaluations.

d) Explain with an example the importance of optimization in engineering design.

e) $f(x_1, x_2) = x_1 - x_2 + 2x_1^2 + 2x_1x_2 + x_2^2$ Using Newton Method Minimize by taking the starting point as $x(0) = (0,0)$.

SECTION – II

Q.4 Answer the following questions. **10**

a) Write a note on Operators of genetic algorithm.

b) Describe fast reanalysis techniques and their significance in structural optimization.

Q.5 Answer Any Three of the following questions. **18**

a) Explain the concept of reduction of size of an optimization problem and mention its importance in engineering design.

b) Solve the Integer Programming Problem:
Maximize $Z = 5x_1 + 4x_2$
subject to $x_1 + x_2 \leq 5, 3x_1 + 2x_2 \leq 12,\ x_1, x_2 \geq 0$ and integers.

c) What is meant by sensitivity of optimum solution to problem parameters? Why is it important?

d) Discuss the practical approaches to reduce computational effort in optimization problems.

e) Difference between Genetic Algorithm and Traditional Techniques.

SLR-QH-635

Seat No.	

Set Q

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Design Optimization (CIVMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Use of non-programmable calculators is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Multiple Choice questions: **14**

1) Integer programming problems can be solved using _____.
a) Simplex method with branch and bound
b) Golden section search
c) Newton-Raphson method
d) Fibonacci search

2) Which is a primary difference between GAs and traditional optimization methods?
a) GAs require gradient information
b) GAs are population-based and stochastic
c) Traditional methods are always faster
d) GAs cannot handle constraints

3) Selection in GA is used to _____.
a) Choose better solutions for reproduction
b) Mutate the population
c) Evaluate the objective function
d) Reduce dimensionality

4) Which is a similarity between GAs and traditional methods?
a) Both search for optimal solutions
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c) Both are population-based
d) Both are stochastic

5) Reducing the size of an optimization problem involves _____.
   a) Eliminating dependent or negligible variables
   b) Increasing the number of constraints
   c) Ignoring the objective function
   d) Using random search

6) Fast reanalysis techniques are used for _____.
   a) Quickly evaluating changes in the objective function after modifications
   b) Solving only linear problems
   c) Gradient computation
   d) Generating random solutions

7) Multilevel optimization is used when _____.
   a) A system has hierarchical design variables and objectives
   b) Single-variable optimization is sufficient
   c) Gradient methods fail
   d) Problem is unconstrained

8) Which of the following is the correct definition of an optimization problem?
   a) Maximizing or minimizing an objective function subject to constraints
   b) Solving differential equations
   c) Performing statistical analysis
   d) Evaluating integrals

9) In optimization, the objective function represents _____.
   a) Constraints on the system
   b) The variable to be optimized
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10) Which of the following is a bracketing method in single-variable optimization?
   a) Newton-Raphson method
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   c) Variable metric method
   d) Powell's method

11) The bound phase method is used to _____.
   a) Determine the initial feasible interval containing the minimum
   b) Compute gradients of a function
   c) Solve discrete variable problems
   d) Reduce global optima to local optima

12) Multi-objective optimization involves _____.
   a) Optimizing a single objective only
   b) Simultaneously optimizing two or more conflicting objectives
   c) Solving only linear problems
   d) Ignoring constraints

13) Evolutionary optimization is suitable for _____.
   a) Smooth, convex problems only
   b) Problems with discontinuities and multimodal functions
   c) Single-variable functions only
   d) Linear programming only

14) Integer programming is used when _____.
   a) All decision variables are continuous
   b) Some or all decision variables must be integers
   c) Derivatives are unavailable
   d) Only one variable exists

SLR-QH-635

Seat No.	

Set Q

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Design Optimization (CIVMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculators is allowed.

SECTION – I

Q.2 Answer the following questions. **10**

a) Define optimization and explain the general procedure for solving an optimization problem.

b) Use the Exhaustive Search Method to find the minimum of $f(x) = x^2 - 6x + 10$ over $[0, 6]$ with 4 equal intervals.

Q.3 Answer Any Three of the following questions. **18**

a) Using the Newton-Raphson Method, find the root of $f(x) = x^2 - 5x + 6$ starting with $X_0 = 2.5$ Perform two iterations.

b) Using the Bisection Method, find the root of $f(x) = x^3 - 4x + 1$ in the interval $[0, 2]$ up to three iterations.

c) Apply the Fibonacci Search Method to minimize $f(x) = (x - 2)^2 + 1$ in $[0, 5]$ for $n = 5$ function evaluations.

d) Explain with an example the importance of optimization in engineering design.

e) $f(x_1, x_2) = x_1 - x_2 + 2x_1^2 + 2x_1x_2 + x_2^2$ Using Newton Method Minimize by taking the starting point as $x(0) = (0,0)$.

SECTION – II

Q.4 Answer the following questions. **10**

a) Write a note on Operators of genetic algorithm.

b) Describe fast reanalysis techniques and their significance in structural optimization.

Q.5 Answer Any Three of the following questions. **18**

a) Explain the concept of reduction of size of an optimization problem and mention its importance in engineering design.

b) Solve the Integer Programming Problem:
Maximize $Z = 5x_1 + 4x_2$
subject to $x_1 + x_2 \leq 5, 3x_1 + 2x_2 \leq 12,\ x_1, x_2 \geq 0$ and integers.

c) What is meant by sensitivity of optimum solution to problem parameters? Why is it important?

d) Discuss the practical approaches to reduce computational effort in optimization problems.

e) Difference between Genetic Algorithm and Traditional Techniques.

Seat No.	

Set **R**

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Design Optimization (CIVMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Use of non-programmable calculators is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Multiple Choice questions: **14**

1) Which is a similarity between GAs and traditional methods?
a) Both search for optimal solutions
b) Both require derivatives
c) Both are population-based
d) Both are stochastic

2) Reducing the size of an optimization problem involves _____.
a) Eliminating dependent or negligible variables
b) Increasing the number of constraints
c) Ignoring the objective function
d) Using random search

3) Fast reanalysis techniques are used for _____.
a) Quickly evaluating changes in the objective function after modifications
b) Solving only linear problems
c) Gradient computation
d) Generating random solutions

4) Multilevel optimization is used when _____.
a) A system has hierarchical design variables and objectives
b) Single-variable optimization is sufficient
c) Gradient methods fail
d) Problem is unconstrained

5) Which of the following is the correct definition of an optimization problem?
   a) Maximizing or minimizing an objective function subject to constraints
   b) Solving differential equations
   c) Performing statistical analysis
   d) Evaluating integrals

6) In optimization, the objective function represents _____.
   a) Constraints on the system
   b) The variable to be optimized
   c) The method of solving the problem
   d) The search algorithm

7) Which of the following is a bracketing method in single-variable optimization?
   a) Newton-Raphson method
   b) Golden section search
   c) Variable metric method
   d) Powell's method

8) The bound phase method is used to _____.
   a) Determine the initial feasible interval containing the minimum
   b) Compute gradients of a function
   c) Solve discrete variable problems
   d) Reduce global optima to local optima

9) Multi-objective optimization involves _____.
   a) Optimizing a single objective only
   b) Simultaneously optimizing two or more conflicting objectives
   c) Solving only linear problems
   d) Ignoring constraints

10) Evolutionary optimization is suitable for _____.
   a) Smooth, convex problems only
   b) Problems with discontinuities and multimodal functions
   c) Single-variable functions only
   d) Linear programming only

11) Integer programming is used when _____.
   a) All decision variables are continuous
   b) Some or all decision variables must be integers
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12) Integer programming problems can be solved using _____.
   a) Simplex method with branch and bound
   b) Golden section search
   c) Newton-Raphson method
   d) Fibonacci search

13) Which is a primary difference between GAs and traditional optimization methods?

a) GAs require gradient information
b) GAs are population-based and stochastic
c) Traditional methods are always faster
d) GAs cannot handle constraints

14) Selection in GA is used to _____.

a) Choose better solutions for reproduction
b) Mutate the population
c) Evaluate the objective function
d) Reduce dimensionality

SLR-QH-635

Seat No.	

Set | **R**

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Design Optimization (CIVMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculators is allowed.

SECTION – I

Q.2 Answer the following questions. **10**

a) Define optimization and explain the general procedure for solving an optimization problem.

b) Use the Exhaustive Search Method to find the minimum of $f(x) = x^2 - 6x + 10$ over $[0, 6]$ with 4 equal intervals.

Q.3 Answer Any Three of the following questions. **18**

a) Using the Newton-Raphson Method, find the root of $f(x) = x^2 - 5x + 6$ starting with $X_0 = 2.5$ Perform two iterations.

b) Using the Bisection Method, find the root of $f(x) = x^3 - 4x + 1$ in the interval $[0, 2]$ up to three iterations.

c) Apply the Fibonacci Search Method to minimize $f(x) = (x - 2)^2 + 1$ in $[0, 5]$ for $n = 5$ function evaluations.

d) Explain with an example the importance of optimization in engineering design.

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SECTION – II

Q.4 Answer the following questions. **10**

a) Write a note on Operators of genetic algorithm.

b) Describe fast reanalysis techniques and their significance in structural optimization.

Q.5 Answer Any Three of the following questions. **18**

a) Explain the concept of reduction of size of an optimization problem and mention its importance in engineering design.

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c) What is meant by sensitivity of optimum solution to problem parameters? Why is it important?

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e) Difference between Genetic Algorithm and Traditional Techniques.

SLR-QH-635

Seat No.	

Set S

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Design Optimization (CIVMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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3) Figures to the right indicates full marks.
4) Use of non-programmable calculators is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Multiple Choice questions: **14**

1) Evolutionary optimization is suitable for _____.
a) Smooth, convex problems only
b) Problems with discontinuities and multimodal functions
c) Single-variable functions only
d) Linear programming only

2) Integer programming is used when _____.
a) All decision variables are continuous
b) Some or all decision variables must be integers
c) Derivatives are unavailable
d) Only one variable exists

3) Integer programming problems can be solved using _____.
a) Simplex method with branch and bound
b) Golden section search
c) Newton-Raphson method
d) Fibonacci search

4) Which is a primary difference between GAs and traditional optimization methods?
a) GAs require gradient information
b) GAs are population-based and stochastic
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5) Selection in GA is used to _____.
   a) Choose better solutions for reproduction
   b) Mutate the population
   c) Evaluate the objective function
   d) Reduce dimensionality

6) Which is a similarity between GAs and traditional methods?
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   d) Using random search

8) Fast reanalysis techniques are used for _____.
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   c) Gradient computation
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9) Multilevel optimization is used when _____.
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   b) Single-variable optimization is sufficient
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   b) Golden section search
   c) Variable metric method
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13) The bound phase method is used to _____.
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   a) Optimizing a single objective only
   b) Simultaneously optimizing two or more conflicting objectives
   c) Solving only linear problems
   d) Ignoring constraints

SLR-QH-635

Seat No.		Set	S

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Design Optimization (CIVMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculators is allowed.

SECTION – I

Q.2 Answer the following questions. **10**

a) Define optimization and explain the general procedure for solving an optimization problem.

b) Use the Exhaustive Search Method to find the minimum of $f(x) = x^2 - 6x + 10$ over $[0, 6]$ with 4 equal intervals.

Q.3 Answer Any Three of the following questions. **18**

a) Using the Newton-Raphson Method, find the root of $f(x) = x^2 - 5x + 6$ starting with $X_0 = 2.5$ Perform two iterations.

b) Using the Bisection Method, find the root of $f(x) = x^3 - 4x + 1$ in the interval $[0, 2]$ up to three iterations.

c) Apply the Fibonacci Search Method to minimize $f(x) = (x - 2)^2 + 1$ in $[0, 5]$ for $n = 5$ function evaluations.

d) Explain with an example the importance of optimization in engineering design.

e) $f(x_1, x_2) = x_1 - x_2 + 2x_1^2 + 2x_1x_2 + x_2^2$ Using Newton Method Minimize by taking the starting point as $x(0) = (0,0)$.

SECTION – II

Q.4 Answer the following questions. **10**

a) Write a note on Operators of genetic algorithm.

b) Describe fast reanalysis techniques and their significance in structural optimization.

Q.5 Answer Any Three of the following questions. **18**

a) Explain the concept of reduction of size of an optimization problem and mention its importance in engineering design.

b) Solve the Integer Programming Problem:
Maximize $Z = 5x_1 + 4x_2$
subject to $x_1 + x_2 \leq 5, 3x_1 + 2x_2 \leq 12,\ x_1, x_2 \geq 0$ and integers.

c) What is meant by sensitivity of optimum solution to problem parameters? Why is it important?

d) Discuss the practical approaches to reduce computational effort in optimization problems.

e) Difference between Genetic Algorithm and Traditional Techniques.

SLR-QH-635

Seat No.		Set	P

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Design Optimization (CIVMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Use of non-programmable calculators is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Multiple Choice questions: **14**

1) Which of the following is the correct definition of an optimization problem?
a) Maximizing or minimizing an objective function subject to constraints
b) Solving differential equations
c) Performing statistical analysis
d) Evaluating integrals

2) In optimization, the objective function represents _____.
a) Constraints on the system
b) The variable to be optimized
c) The method of solving the problem
d) The search algorithm

3) Which of the following is a bracketing method in single-variable optimization?
a) Newton-Raphson method b) Golden section search
c) Variable metric method d) Powell's method

4) The bound phase method is used to _____.
a) Determine the initial feasible interval containing the minimum
b) Compute gradients of a function
c) Solve discrete variable problems
d) Reduce global optima to local optima

5) Multi-objective optimization involves _____.
   a) Optimizing a single objective only
   b) Simultaneously optimizing two or more conflicting objectives
   c) Solving only linear problems
   d) Ignoring constraints

6) Evolutionary optimization is suitable for _____.
   a) Smooth, convex problems only
   b) Problems with discontinuities and multimodal functions
   c) Single-variable functions only
   d) Linear programming only

7) Integer programming is used when _____.
   a) All decision variables are continuous
   b) Some or all decision variables must be integers
   c) Derivatives are unavailable
   d) Only one variable exists

8) Integer programming problems can be solved using _____.
   a) Simplex method with branch and bound
   b) Golden section search
   c) Newton-Raphson method
   d) Fibonacci search

9) Which is a primary difference between GAs and traditional optimization methods?
   a) GAs require gradient information
   b) GAs are population-based and stochastic
   c) Traditional methods are always faster
   d) GAs cannot handle constraints

10) Selection in GA is used to _____.
   a) Choose better solutions for reproduction
   b) Mutate the population
   c) Evaluate the objective function
   d) Reduce dimensionality

11) Which is a similarity between GAs and traditional methods?
   a) Both search for optimal solutions
   b) Both require derivatives
   c) Both are population-based
   d) Both are stochastic

12) Reducing the size of an optimization problem involves _____.
   a) Eliminating dependent or negligible variables
   b) Increasing the number of constraints
   c) Ignoring the objective function
   d) Using random search

13) Fast reanalysis techniques are used for _____.

a) Quickly evaluating changes in the objective function after modifications
b) Solving only linear problems
c) Gradient computation
d) Generating random solutions

14) Multilevel optimization is used when _____.

a) A system has hierarchical design variables and objectives
b) Single-variable optimization is sufficient
c) Gradient methods fail
d) Problem is unconstrained

Seat No.	

Set **P**

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Design Optimization (CIVMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculators is allowed.

SECTION – I

Q.2 Answer the following questions. **10**

a) Define optimization and explain the general procedure for solving an optimization problem.

b) Use the Exhaustive Search Method to find the minimum of $f(x) = x^2 - 6x + 10$ over $[0, 6]$ with 4 equal intervals.

Q.3 Answer Any Three of the following questions. **18**

a) Using the Newton-Raphson Method, find the root of $f(x) = x^2 - 5x + 6$ starting with $X_0 = 2.5$ Perform two iterations.

b) Using the Bisection Method, find the root of $f(x) = x^3 - 4x + 1$ in the interval $[0, 2]$ up to three iterations.

c) Apply the Fibonacci Search Method to minimize $f(x) = (x - 2)^2 + 1$ in $[0, 5]$ for $n = 5$ function evaluations.

d) Explain with an example the importance of optimization in engineering design.

e) $f(x_1, x_2) = x_1 - x_2 + 2x_1^2 + 2x_1x_2 + x_2^2$ Using Newton Method Minimize by taking the starting point as $x(0) = (0,0)$.

SECTION – II

Q.4 Answer the following questions. **10**

a) Write a note on Operators of genetic algorithm.

b) Describe fast reanalysis techniques and their significance in structural optimization.

Q.5 Answer Any Three of the following questions. **18**

a) Explain the concept of reduction of size of an optimization problem and mention its importance in engineering design.

b) Solve the Integer Programming Problem:
Maximize $Z = 5x_1 + 4x_2$
subject to $x_1 + x_2 \leq 5, 3x_1 + 2x_2 \leq 12,\ x_1, x_2 \geq 0$ and integers.

c) What is meant by sensitivity of optimum solution to problem parameters? Why is it important?

d) Discuss the practical approaches to reduce computational effort in optimization problems.

e) Difference between Genetic Algorithm and Traditional Techniques.

SLR-QH-635

Seat No.	

Set Q

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Design Optimization (CIVMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Use of non-programmable calculators is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Multiple Choice questions: **14**

1) Integer programming problems can be solved using _____.
a) Simplex method with branch and bound
b) Golden section search
c) Newton-Raphson method
d) Fibonacci search

2) Which is a primary difference between GAs and traditional optimization methods?
a) GAs require gradient information
b) GAs are population-based and stochastic
c) Traditional methods are always faster
d) GAs cannot handle constraints

3) Selection in GA is used to _____.
a) Choose better solutions for reproduction
b) Mutate the population
c) Evaluate the objective function
d) Reduce dimensionality

4) Which is a similarity between GAs and traditional methods?
a) Both search for optimal solutions
b) Both require derivatives
c) Both are population-based
d) Both are stochastic

5) Reducing the size of an optimization problem involves _____.
   a) Eliminating dependent or negligible variables
   b) Increasing the number of constraints
   c) Ignoring the objective function
   d) Using random search

6) Fast reanalysis techniques are used for _____.
   a) Quickly evaluating changes in the objective function after modifications
   b) Solving only linear problems
   c) Gradient computation
   d) Generating random solutions

7) Multilevel optimization is used when _____.
   a) A system has hierarchical design variables and objectives
   b) Single-variable optimization is sufficient
   c) Gradient methods fail
   d) Problem is unconstrained

8) Which of the following is the correct definition of an optimization problem?
   a) Maximizing or minimizing an objective function subject to constraints
   b) Solving differential equations
   c) Performing statistical analysis
   d) Evaluating integrals

9) In optimization, the objective function represents _____.
   a) Constraints on the system
   b) The variable to be optimized
   c) The method of solving the problem
   d) The search algorithm

10) Which of the following is a bracketing method in single-variable optimization?
   a) Newton-Raphson method
   b) Golden section search
   c) Variable metric method
   d) Powell's method

11) The bound phase method is used to _____.
   a) Determine the initial feasible interval containing the minimum
   b) Compute gradients of a function
   c) Solve discrete variable problems
   d) Reduce global optima to local optima

12) Multi-objective optimization involves _____.
   a) Optimizing a single objective only
   b) Simultaneously optimizing two or more conflicting objectives
   c) Solving only linear problems
   d) Ignoring constraints

13) Evolutionary optimization is suitable for _____.
   a) Smooth, convex problems only
   b) Problems with discontinuities and multimodal functions
   c) Single-variable functions only
   d) Linear programming only

14) Integer programming is used when _____.
   a) All decision variables are continuous
   b) Some or all decision variables must be integers
   c) Derivatives are unavailable
   d) Only one variable exists

Seat No.	

Set **Q**

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Design Optimization (CIVMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculators is allowed.

SECTION – I

Q.2 Answer the following questions. **10**

a) Define optimization and explain the general procedure for solving an optimization problem.

b) Use the Exhaustive Search Method to find the minimum of $f(x) = x^2 - 6x + 10$ over $[0, 6]$ with 4 equal intervals.

Q.3 Answer Any Three of the following questions. **18**

a) Using the Newton-Raphson Method, find the root of $f(x) = x^2 - 5x + 6$ starting with $X_0 = 2.5$ Perform two iterations.

b) Using the Bisection Method, find the root of $f(x) = x^3 - 4x + 1$ in the interval $[0, 2]$ up to three iterations.

c) Apply the Fibonacci Search Method to minimize $f(x) = (x - 2)^2 + 1$ in $[0, 5]$ for $n = 5$ function evaluations.

d) Explain with an example the importance of optimization in engineering design.

e) $f(x_1, x_2) = x_1 - x_2 + 2x_1^2 + 2x_1x_2 + x_2^2$ Using Newton Method Minimize by taking the starting point as $x(0) = (0,0)$.

SECTION – II

Q.4 Answer the following questions. **10**

a) Write a note on Operators of genetic algorithm.

b) Describe fast reanalysis techniques and their significance in structural optimization.

Q.5 Answer Any Three of the following questions. **18**

a) Explain the concept of reduction of size of an optimization problem and mention its importance in engineering design.

b) Solve the Integer Programming Problem:
Maximize $Z = 5x_1 + 4x_2$
subject to $x_1 + x_2 \leq 5, 3x_1 + 2x_2 \leq 12,\ x_1, x_2 \geq 0$ and integers.

c) What is meant by sensitivity of optimum solution to problem parameters? Why is it important?

d) Discuss the practical approaches to reduce computational effort in optimization problems.

e) Difference between Genetic Algorithm and Traditional Techniques.

SLR-QH-635

Seat No.		Set	R

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Design Optimization (CIVMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Use of non-programmable calculators is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Multiple Choice questions: **14**

1) Which is a similarity between GAs and traditional methods?
a) Both search for optimal solutions
b) Both require derivatives
c) Both are population-based
d) Both are stochastic

2) Reducing the size of an optimization problem involves _____.
a) Eliminating dependent or negligible variables
b) Increasing the number of constraints
c) Ignoring the objective function
d) Using random search

3) Fast reanalysis techniques are used for _____.
a) Quickly evaluating changes in the objective function after modifications
b) Solving only linear problems
c) Gradient computation
d) Generating random solutions

4) Multilevel optimization is used when _____.
a) A system has hierarchical design variables and objectives
b) Single-variable optimization is sufficient
c) Gradient methods fail
d) Problem is unconstrained

5) Which of the following is the correct definition of an optimization problem?
   a) Maximizing or minimizing an objective function subject to constraints
   b) Solving differential equations
   c) Performing statistical analysis
   d) Evaluating integrals

6) In optimization, the objective function represents _____.
   a) Constraints on the system
   b) The variable to be optimized
   c) The method of solving the problem
   d) The search algorithm

7) Which of the following is a bracketing method in single-variable optimization?
   a) Newton-Raphson method
   b) Golden section search
   c) Variable metric method
   d) Powell's method

8) The bound phase method is used to _____.
   a) Determine the initial feasible interval containing the minimum
   b) Compute gradients of a function
   c) Solve discrete variable problems
   d) Reduce global optima to local optima

9) Multi-objective optimization involves _____.
   a) Optimizing a single objective only
   b) Simultaneously optimizing two or more conflicting objectives
   c) Solving only linear problems
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10) Evolutionary optimization is suitable for _____.
   a) Smooth, convex problems only
   b) Problems with discontinuities and multimodal functions
   c) Single-variable functions only
   d) Linear programming only

11) Integer programming is used when _____.
   a) All decision variables are continuous
   b) Some or all decision variables must be integers
   c) Derivatives are unavailable
   d) Only one variable exists

12) Integer programming problems can be solved using _____.
   a) Simplex method with branch and bound
   b) Golden section search
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13) Which is a primary difference between GAs and traditional optimization methods?

a) GAs require gradient information
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d) GAs cannot handle constraints

14) Selection in GA is used to _____.

a) Choose better solutions for reproduction
b) Mutate the population
c) Evaluate the objective function
d) Reduce dimensionality

SLR-QH-635

Seat No.		Set	R

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Design Optimization (CIVMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculators is allowed.

SECTION – I

Q.2 Answer the following questions. **10**

a) Define optimization and explain the general procedure for solving an optimization problem.

b) Use the Exhaustive Search Method to find the minimum of $f(x) = x^2 - 6x + 10$ over $[0, 6]$ with 4 equal intervals.

Q.3 Answer Any Three of the following questions. **18**

a) Using the Newton-Raphson Method, find the root of $f(x) = x^2 - 5x + 6$ starting with $X_0 = 2.5$ Perform two iterations.

b) Using the Bisection Method, find the root of $f(x) = x^3 - 4x + 1$ in the interval $[0, 2]$ up to three iterations.

c) Apply the Fibonacci Search Method to minimize $f(x) = (x - 2)^2 + 1$ in $[0, 5]$ for $n = 5$ function evaluations.

d) Explain with an example the importance of optimization in engineering design.

e) $f(x_1, x_2) = x_1 - x_2 + 2x_1^2 + 2x_1x_2 + x_2^2$ Using Newton Method Minimize by taking the starting point as $x(0) = (0,0)$.

SECTION – II

Q.4 Answer the following questions. **10**

a) Write a note on Operators of genetic algorithm.

b) Describe fast reanalysis techniques and their significance in structural optimization.

Q.5 Answer Any Three of the following questions. **18**

a) Explain the concept of reduction of size of an optimization problem and mention its importance in engineering design.

b) Solve the Integer Programming Problem:
Maximize $Z = 5x_1 + 4x_2$
subject to $x_1 + x_2 \leq 5, 3x_1 + 2x_2 \leq 12,\ x_1, x_2 \geq 0$ and integers.

c) What is meant by sensitivity of optimum solution to problem parameters? Why is it important?

d) Discuss the practical approaches to reduce computational effort in optimization problems.

e) Difference between Genetic Algorithm and Traditional Techniques.

SLR-QH-635

Seat No.		Set	S

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Design Optimization (CIVMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Use of non-programmable calculators is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Multiple Choice questions: **14**

1) Evolutionary optimization is suitable for _____.
a) Smooth, convex problems only
b) Problems with discontinuities and multimodal functions
c) Single-variable functions only
d) Linear programming only

2) Integer programming is used when _____.
a) All decision variables are continuous
b) Some or all decision variables must be integers
c) Derivatives are unavailable
d) Only one variable exists

3) Integer programming problems can be solved using _____.
a) Simplex method with branch and bound
b) Golden section search
c) Newton-Raphson method
d) Fibonacci search

4) Which is a primary difference between GAs and traditional optimization methods?
a) GAs require gradient information
b) GAs are population-based and stochastic
c) Traditional methods are always faster
d) GAs cannot handle constraints

5) Selection in GA is used to _____.
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   b) Mutate the population
   c) Evaluate the objective function
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6) Which is a similarity between GAs and traditional methods?
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   b) Both require derivatives
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7) Reducing the size of an optimization problem involves _____.
   a) Eliminating dependent or negligible variables
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8) Fast reanalysis techniques are used for _____.
   a) Quickly evaluating changes in the objective function after modifications
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   c) Gradient computation
   d) Generating random solutions

9) Multilevel optimization is used when _____.
   a) A system has hierarchical design variables and objectives
   b) Single-variable optimization is sufficient
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13) The bound phase method is used to _____.
   a) Determine the initial feasible interval containing the minimum
   b) Compute gradients of a function
   c) Solve discrete variable problems
   d) Reduce global optima to local optima

14) Multi-objective optimization involves _____.
   a) Optimizing a single objective only
   b) Simultaneously optimizing two or more conflicting objectives
   c) Solving only linear problems
   d) Ignoring constraints

SLR-QH-635

Seat No.		Set	S

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Design Optimization (CIVMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculators is allowed.

SECTION – I

Q.2 Answer the following questions. **10**

a) Define optimization and explain the general procedure for solving an optimization problem.

b) Use the Exhaustive Search Method to find the minimum of $f(x) = x^2 - 6x + 10$ over $[0, 6]$ with 4 equal intervals.

Q.3 Answer Any Three of the following questions. **18**

a) Using the Newton-Raphson Method, find the root of $f(x) = x^2 - 5x + 6$ starting with $X_0 = 2.5$ Perform two iterations.

b) Using the Bisection Method, find the root of $f(x) = x^3 - 4x + 1$ in the interval $[0, 2]$ up to three iterations.

c) Apply the Fibonacci Search Method to minimize $f(x) = (x - 2)^2 + 1$ in $[0, 5]$ for $n = 5$ function evaluations.

d) Explain with an example the importance of optimization in engineering design.

e) $f(x_1, x_2) = x_1 - x_2 + 2x_1^2 + 2x_1x_2 + x_2^2$ Using Newton Method Minimize by taking the starting point as $x(0) = (0,0)$.

SECTION – II

Q.4 Answer the following questions. **10**

a) Write a note on Operators of genetic algorithm.

b) Describe fast reanalysis techniques and their significance in structural optimization.

Q.5 Answer Any Three of the following questions. **18**

a) Explain the concept of reduction of size of an optimization problem and mention its importance in engineering design.

b) Solve the Integer Programming Problem:
Maximize $Z = 5x_1 + 4x_2$
subject to $x_1 + x_2 \leq 5, 3x_1 + 2x_2 \leq 12,\ x_1, x_2 \geq 0$ and integers.

c) What is meant by sensitivity of optimum solution to problem parameters? Why is it important?

d) Discuss the practical approaches to reduce computational effort in optimization problems.

e) Difference between Genetic Algorithm and Traditional Techniques.

SLR-QH-636

Seat No.	

Set P

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Operation Research and Management (CIVMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary and mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternative from the options. 14

1) MBO is developed by _____.
a) Peter Drucker b) Gilbert
c) F. W. Taylor d) Henry Fayol

2) Graphical Method is most suitable if number of decision variables are _____.
a) Two b) Three
c) Four d) Zero

3) Dual of the Dual is _____.
a) Dual b) Zero
c) Primal d) Infinity

4) What is the condition of Balance Assignment Problem?
a) ∑ Demand = ∑ Supply
b) No. of rows > No. of column
c) No. of rows < No. of column
d) No. of rows = No. of columns

5) Major elements of queuing system are _____.
a) Customer b) Queue
c) Service Channel d) All the above

6) Games without a saddle point require player to play _____.
a) Mixed strategies b) Pure strategies
c) Dominated strategies d) None of these

7) Optimization means _____.
   a) Maximization
   b) Minimization or Maximization
   c) Minimization
   d) Avg. Minimization & Maximization

8) EOQ model helps to find _____.
   a) Optimum size of order
   b) Time interval between order
   c) Both a) and b)
   d) None of these

9) If F = Fixed Cost, V = Variable Cost, S = Selling Price then, BEP (Quantity) = _____.
   a) $\mathrm{V}/(\mathrm{S}-\mathrm{F})$
   b) $\mathrm{F}/(\mathrm{S}-\mathrm{V})$
   c) $\mathrm{V}+\mathrm{S}+\mathrm{F}$
   d) $(\mathrm{S}-\mathrm{V})2$

10) Functional organization is invented by _____.
   a) F.W. Taylor
   b) Gilbert
   c) Peter Drucker
   d) Henry Fayol

11) Maximisation problem in LPP will involve _____.
   a) Slack variable
   b) Surplus variable
   c) Both a and b
   d) None of these

12) Allocation of units is not dependent on transport cost in _____.
   a) VAM method
   b) NW corner method
   c) Both of these
   d) None of these

13) The size of the payoff matrix of a game can be reduced by using the principle of _____.
   a) game inversion
   b) rotation reduction
   c) dominance
   d) game transpose

14) In ABC analysis least monitoring and control is required for _____.
   a) A class item
   b) B class items
   c) C class items
   d) All of these

Seat No.	

Set **P**

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Operation Research and Management (CIVMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume additional suitable data, if necessary and mention it clearly

SECTION – I

Q.2 Attempt Any Two.

a) Discuss 14 principles of modern management. **14**

b) What are qualities of 'Leader'? Elaborate Leadership in with practical orientation.

c) Graphical Using Graphical method, solve

Maximize $Z = 2X_1 + 3X_2$

Subject to, $X_1 + X_2 \leq 30;$

$X_1 - X_2 \geq 0;$

$X_2 \geq 3;$

$0 \leq X_1 \leq 20;$

$0 \leq X_2 \leq 12;$

Q.3 Attempt Any Two. **14**

a) Determine IBFS of the following transportation problem using LCM. And calculate Transportation Cost.

		Destination					
		A1	B1	C1	D1	E1	Supply
Origin	A	2	11	10	3	7	4
	B	1	4	7	2	1	8
	C	3	9	4	8	12	9
Demand		3	3	4	5	6	

b) Four different jobs can be done on 4 different machines. The set-up takedown time cost are assumed to be prohibitively high for changeovers. The matrix below gives the cost in rupees for producing job i on machine j.

		Machines			
		M1	M2	M3	M4
Jobs	J1	51	77	49	55
	J2	32	34	59	68
	J3	37	44	70	54
	J4	55	55	58	55

c) Explain the Waiting Line Theory with all its characteristics to single channel waiting line. Also Discuss with the graph showing Waiting Time Cost, Idle time Cost & Total Expected Cost.

SECTION – II

Q.4 Attempt Any Two. **14**

a) What is a Genetic Algorithm? Explain the basic biological concept behind GA and list its key operators (Selection, Crossover, and Mutation).

b) What are advantages of Simulation? Give its applications & limitations. Elaborate stepwise procedure of 'Monte Carlo Simulation.

c) A company is bringing out a new product in market with three strategies of production line like full, patrial, and minimal. The state of nature may be good demand, fair demand, and poor demand, with following payoff of profit as shown in table below:

State of Nature (Demand)	Production Line: Full	Production Line: Partial	Production Line: Minimal
Good	80	70	50
Fair	50	45	40
Poor	−25	−10	0

Take optimal decision under each of the following decision rules

i) Maximax
ii) Maximin
iii) Laplace

Q.5 Attempt Any Two. **14**

a) A construction company consumes 4000 bags of cement per month. Price per bag of cement is Rs. 320/-. Inventory carrying cost per bag per year is Rs. 30/- and procurement cost per order is Rs. 500/-. Find economic order quantity and number of orders to be placed per month.

b) Write a note various types inventory cost. Explain graphically how the Economic Order Quantity (EOQ) balances the trade-off between Inventory Carrying Cost and Ordering Cost.

c) Write a detailed note on ABC analysis. Explain with a graphical representation.

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Operation Research and Management (CIVMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary and mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternative from the options. 14

1) EOQ model helps to find _____.
a) Optimum size of order
b) Time interval between order
c) Both a) and b)
d) None of these

2) If F = Fixed Cost, V = Variable Cost, S = Selling Price then, BEP (Quantity) = _____.
a) $V/(S-F)$ b) $F/(S-V)$
c) $V+S+F$ d) $(S-V)2$

3) Functional organization is invented by _____.
a) F.W. Taylor b) Gilbert
c) Peter Drucker d) Henry Fayol

4) Maximisation problem in LPP will involve _____.
a) Slack variable b) Surplus variable
c) Both a and b d) None of these

5) Allocation of units is not dependent on transport cost in _____.
a) VAM method b) NW corner method
c) Both of these d) None of these

6) The size of the payoff matrix of a game can be reduced by using the principle of _____.
a) game inversion b) rotation reduction
c) dominance d) game transpose

7) In ABC analysis least monitoring and control is required for _____.
a) A class item
b) B class items
c) C class items
d) All of these

8) MBO is developed by _____.
a) Peter Drucker
b) Gilbert
c) F. W. Taylor
d) Henry Fayol

9) Graphical Method is most suitable if number of decision variables are _____.
a) Two
b) Three
c) Four
d) Zero

10) Dual of the Dual is _____.
a) Dual
b) Zero
c) Primal
d) Infinity

11) What is the condition of Balance Assignment Problem?
a) ∑ Demand = ∑ Supply
b) No. of rows > No. of column
c) No. of rows < No. of column
d) No. of rows = No. of columns

12) Major elements of queuing system are _____.
a) Customer
b) Queue
c) Service Channel
d) All the above

13) Games without a saddle point require player to play _____.
a) Mixed strategies
b) Pure strategies
c) Dominated strategies
d) None of these

14) Optimization means _____.
a) Maximization
b) Minimization or Maximization
c) Minimization
d) Avg. Minimization & Maximization

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Operation Research and Management (CIVMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
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SECTION – I

Q.2 Attempt Any Two.

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b) What are qualities of 'Leader'? Elaborate Leadership in with practical orientation.

c) Graphical Using Graphical method, solve

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Subject to, $X_1 + X_2 \leq 30;$

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Q.3 Attempt Any Two. **14**

a) Determine IBFS of the following transportation problem using LCM. And calculate Transportation Cost.

		Destination					
		A1	B1	C1	D1	E1	Supply
Origin	A	2	11	10	3	7	4
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Demand		3	3	4	5	6	

b) Four different jobs can be done on 4 different machines. The set-up takedown time cost are assumed to be prohibitively high for changeovers. The matrix below gives the cost in rupees for producing job i on machine j.

		Machines			
		M1	M2	M3	M4
Jobs	J1	51	77	49	55
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	J3	37	44	70	54
	J4	55	55	58	55

c) Explain the Waiting Line Theory with all its characteristics to single channel waiting line. Also Discuss with the graph showing Waiting Time Cost, Idle time Cost & Total Expected Cost.

SECTION – II

Q.4 Attempt Any Two. **14**

a) What is a Genetic Algorithm? Explain the basic biological concept behind GA and list its key operators (Selection, Crossover, and Mutation).

b) What are advantages of Simulation? Give its applications & limitations. Elaborate stepwise procedure of 'Monte Carlo Simulation.

c) A company is bringing out a new product in market with three strategies of production line like full, patrial, and minimal. The state of nature may be good demand, fair demand, and poor demand, with following payoff of profit as shown in table below:

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Fair	50	45	40
Poor	−25	−10	0

Take optimal decision under each of the following decision rules

i) Maximax
ii) Maximin
iii) Laplace

Q.5 Attempt Any Two. **14**

a) A construction company consumes 4000 bags of cement per month. Price per bag of cement is Rs. 320/-. Inventory carrying cost per bag per year is Rs. 30/- and procurement cost per order is Rs. 500/-. Find economic order quantity and number of orders to be placed per month.

b) Write a note various types inventory cost. Explain graphically how the Economic Order Quantity (EOQ) balances the trade-off between Inventory Carrying Cost and Ordering Cost.

c) Write a detailed note on ABC analysis. Explain with a graphical representation.

Seat No.	

Set R

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Operation Research and Management (CIVMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary and mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternative from the options. 14

1) Maximisation problem in LPP will involve _____.
a) Slack variable b) Surplus variable
c) Both a and b d) None of these

2) Allocation of units is not dependent on transport cost in _____.
a) VAM method b) NW corner method
c) Both of these d) None of these

3) The size of the payoff matrix of a game can be reduced by using the principle of _____.
a) game inversion b) rotation reduction
c) dominance d) game transpose

4) In ABC analysis least monitoring and control is required for _____.
a) A class item b) B class items
c) C class items d) All of these

5) MBO is developed by _____.
a) Peter Drucker b) Gilbert
c) F. W. Taylor d) Henry Fayol

6) Graphical Method is most suitable if number of decision variables are _____.
a) Two b) Three
c) Four d) Zero

7) Dual of the Dual is _____.
a) Dual b) Zero
c) Primal d) Infinity

8) What is the condition of Balance Assignment Problem?
a) $\sum$ Demand = $\sum$ Supply
b) No. of rows > No. of column
c) No. of rows < No. of column
d) No. of rows = No. of columns

9) Major elements of queuing system are _____.
a) Customer
b) Queue
c) Service Channel
d) All the above

10) Games without a saddle point require player to play _____.
a) Mixed strategies
b) Pure strategies
c) Dominated strategies
d) None of these

11) Optimization means _____.
a) Maximization
b) Minimization or Maximization
c) Minimization
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12) EOQ model helps to find _____.
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c) Both a) and b)
d) None of these

13) If F = Fixed Cost, V = Variable Cost, S = Selling Price then, BEP (Quantity) = _____.
a) $\mathrm{V}/(\mathrm{S}-\mathrm{F})$
b) $\mathrm{F}/(\mathrm{S}-\mathrm{V})$
c) $\mathrm{V}+\mathrm{S}+\mathrm{F}$
d) $(\mathrm{S}-\mathrm{V})2$

14) Functional organization is invented by _____.
a) F.W. Taylor
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c) Peter Drucker
d) Henry Fayol

Seat No.	

Set **R**

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Operation Research and Management (CIVMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume additional suitable data, if necessary and mention it clearly

SECTION – I

Q.2 Attempt Any Two.

a) Discuss 14 principles of modern management. **14**

b) What are qualities of 'Leader'? Elaborate Leadership in with practical orientation.

c) Graphical Using Graphical method, solve

Maximize $Z = 2X_1 + 3X_2$

Subject to, $X_1 + X_2 \leq 30;$

$X_1 - X_2 \geq 0;$

$X_2 \geq 3;$

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$0 \leq X_2 \leq 12;$

Q.3 Attempt Any Two. **14**

a) Determine IBFS of the following transportation problem using LCM. And calculate Transportation Cost.

		Destination					
		A1	B1	C1	D1	E1	Supply
Origin	A	2	11	10	3	7	4
	B	1	4	7	2	1	8
	C	3	9	4	8	12	9
Demand		3	3	4	5	6	

b) Four different jobs can be done on 4 different machines. The set-up takedown time cost are assumed to be prohibitively high for changeovers. The matrix below gives the cost in rupees for producing job i on machine j.

		Machines			
		M1	M2	M3	M4
Jobs	J1	51	77	49	55
	J2	32	34	59	68
	J3	37	44	70	54
	J4	55	55	58	55

c) Explain the Waiting Line Theory with all its characteristics to single channel waiting line. Also Discuss with the graph showing Waiting Time Cost, Idle time Cost & Total Expected Cost.

SECTION – II

Q.4 Attempt Any Two. **14**

a) What is a Genetic Algorithm? Explain the basic biological concept behind GA and list its key operators (Selection, Crossover, and Mutation).

b) What are advantages of Simulation? Give its applications & limitations. Elaborate stepwise procedure of 'Monte Carlo Simulation.

c) A company is bringing out a new product in market with three strategies of production line like full, patrial, and minimal. The state of nature may be good demand, fair demand, and poor demand, with following payoff of profit as shown in table below:

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Take optimal decision under each of the following decision rules

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Q.5 Attempt Any Two. **14**

a) A construction company consumes 4000 bags of cement per month. Price per bag of cement is Rs. 320/-. Inventory carrying cost per bag per year is Rs. 30/- and procurement cost per order is Rs. 500/-. Find economic order quantity and number of orders to be placed per month.

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Seat No.	

Set **S**

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Operation Research and Management (CIVMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
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4) Assume suitable data if necessary and mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternative from the options. 14

1) Games without a saddle point require player to play _____.
a) Mixed strategies b) Pure strategies
c) Dominated strategies d) None of these

2) Optimization means _____.
a) Maximization
b) Minimization or Maximization
c) Minimization
d) Avg. Minimization & Maximization

3) EOQ model helps to find _____.
a) Optimum size of order
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4) If F = Fixed Cost, V = Variable Cost, S = Selling Price then, BEP (Quantity) = _____.
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13) What is the condition of Balance Assignment Problem?
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14) Major elements of queuing system are _____.
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Seat No.	

Set **S**

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Operation Research and Management (CIVMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
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SECTION – I

Q.2 Attempt Any Two.

a) Discuss 14 principles of modern management. **14**

b) What are qualities of 'Leader'? Elaborate Leadership in with practical orientation.

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Subject to, $X_1 + X_2 \leq 30;$

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Q.3 Attempt Any Two. **14**

a) Determine IBFS of the following transportation problem using LCM. And calculate Transportation Cost.

		Destination					
		A1	B1	C1	D1	E1	Supply
Origin	A	2	11	10	3	7	4
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Demand		3	3	4	5	6	

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c) Explain the Waiting Line Theory with all its characteristics to single channel waiting line. Also Discuss with the graph showing Waiting Time Cost, Idle time Cost & Total Expected Cost.

SECTION – II

Q.4 Attempt Any Two. **14**

a) What is a Genetic Algorithm? Explain the basic biological concept behind GA and list its key operators (Selection, Crossover, and Mutation).

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SLR-QH-636

Seat No.	

Set P

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Operation Research and Management (CIVMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
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MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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1) MBO is developed by _____.
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Seat No.	

Set **P**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Operation Research and Management (CIVMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
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SECTION – II

Q.4 Attempt Any Two. **14**

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a) A construction company consumes 4000 bags of cement per month. Price per bag of cement is Rs. 320/-. Inventory carrying cost per bag per year is Rs. 30/- and procurement cost per order is Rs. 500/-. Find economic order quantity and number of orders to be placed per month.

b) Write a note various types inventory cost. Explain graphically how the Economic Order Quantity (EOQ) balances the trade-off between Inventory Carrying Cost and Ordering Cost.

c) Write a detailed note on ABC analysis. Explain with a graphical representation.

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Operation Research and Management (CIVMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary and mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternative from the options. 14

1) EOQ model helps to find _____.
a) Optimum size of order
b) Time interval between order
c) Both a) and b)
d) None of these

2) If F = Fixed Cost, V = Variable Cost, S = Selling Price then, BEP (Quantity) = _____.
a) $\mathrm{V}/(\mathrm{S}-\mathrm{F})$ b) $\mathrm{F}/(\mathrm{S}-\mathrm{V})$
c) $\mathrm{V}+\mathrm{S}+\mathrm{F}$ d) $(\mathrm{S}-\mathrm{V})2$

3) Functional organization is invented by _____.
a) F.W. Taylor b) Gilbert
c) Peter Drucker d) Henry Fayol

4) Maximisation problem in LPP will involve _____.
a) Slack variable b) Surplus variable
c) Both a and b d) None of these

5) Allocation of units is not dependent on transport cost in _____.
a) VAM method b) NW corner method
c) Both of these d) None of these

6) The size of the payoff matrix of a game can be reduced by using the principle of _____.
a) game inversion b) rotation reduction
c) dominance d) game transpose

7) In ABC analysis least monitoring and control is required for _____.
a) A class item
b) B class items
c) C class items
d) All of these

8) MBO is developed by _____.
a) Peter Drucker
b) Gilbert
c) F. W. Taylor
d) Henry Fayol

9) Graphical Method is most suitable if number of decision variables are _____.
a) Two
b) Three
c) Four
d) Zero

10) Dual of the Dual is _____.
a) Dual
b) Zero
c) Primal
d) Infinity

11) What is the condition of Balance Assignment Problem?
a) ∑ Demand = ∑ Supply
b) No. of rows > No. of column
c) No. of rows < No. of column
d) No. of rows = No. of columns

12) Major elements of queuing system are _____.
a) Customer
b) Queue
c) Service Channel
d) All the above

13) Games without a saddle point require player to play _____.
a) Mixed strategies
b) Pure strategies
c) Dominated strategies
d) None of these

14) Optimization means _____.
a) Maximization
b) Minimization or Maximization
c) Minimization
d) Avg. Minimization & Maximization

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Operation Research and Management (CIVMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume additional suitable data, if necessary and mention it clearly

SECTION – I

Q.2 Attempt Any Two.

a) Discuss 14 principles of modern management. **14**

b) What are qualities of 'Leader'? Elaborate Leadership in with practical orientation.

c) Graphical Using Graphical method, solve

Maximize $Z = 2X_1 + 3X_2$

Subject to, $X_1 + X_2 \leq 30;$

$X_1 - X_2 \geq 0;$

$X_2 \geq 3;$

$0 \leq X_1 \leq 20;$

$0 \leq X_2 \leq 12;$

Q.3 Attempt Any Two. **14**

a) Determine IBFS of the following transportation problem using LCM. And calculate Transportation Cost.

		Destination					
		A1	B1	C1	D1	E1	Supply
Origin	A	2	11	10	3	7	4
	B	1	4	7	2	1	8
	C	3	9	4	8	12	9
Demand		3	3	4	5	6	

b) Four different jobs can be done on 4 different machines. The set-up takedown time cost are assumed to be prohibitively high for changeovers. The matrix below gives the cost in rupees for producing job i on machine j.

		Machines			
		M1	M2	M3	M4
Jobs	J1	51	77	49	55
	J2	32	34	59	68
	J3	37	44	70	54
	J4	55	55	58	55

c) Explain the Waiting Line Theory with all its characteristics to single channel waiting line. Also Discuss with the graph showing Waiting Time Cost, Idle time Cost & Total Expected Cost.

SECTION – II

Q.4 Attempt Any Two. **14**

a) What is a Genetic Algorithm? Explain the basic biological concept behind GA and list its key operators (Selection, Crossover, and Mutation).

b) What are advantages of Simulation? Give its applications & limitations. Elaborate stepwise procedure of 'Monte Carlo Simulation.

c) A company is bringing out a new product in market with three strategies of production line like full, patrial, and minimal. The state of nature may be good demand, fair demand, and poor demand, with following payoff of profit as shown in table below:

State of Nature (Demand)	Production Line: Full	Production Line: Partial	Production Line: Minimal
Good	80	70	50
Fair	50	45	40
Poor	−25	−10	0

Take optimal decision under each of the following decision rules

i) Maximax
ii) Maximin
iii) Laplace

Q.5 Attempt Any Two. **14**

a) A construction company consumes 4000 bags of cement per month. Price per bag of cement is Rs. 320/-. Inventory carrying cost per bag per year is Rs. 30/- and procurement cost per order is Rs. 500/-. Find economic order quantity and number of orders to be placed per month.

b) Write a note various types inventory cost. Explain graphically how the Economic Order Quantity (EOQ) balances the trade-off between Inventory Carrying Cost and Ordering Cost.

c) Write a detailed note on ABC analysis. Explain with a graphical representation.

Seat No.	

Set **R**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Operation Research and Management (CIVMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary and mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternative from the options. 14

1) Maximisation problem in LPP will involve _____.
a) Slack variable b) Surplus variable
c) Both a and b d) None of these

2) Allocation of units is not dependent on transport cost in _____.
a) VAM method b) NW corner method
c) Both of these d) None of these

3) The size of the payoff matrix of a game can be reduced by using the principle of _____.
a) game inversion b) rotation reduction
c) dominance d) game transpose

4) In ABC analysis least monitoring and control is required for _____.
a) A class item b) B class items
c) C class items d) All of these

5) MBO is developed by _____.
a) Peter Drucker b) Gilbert
c) F. W. Taylor d) Henry Fayol

6) Graphical Method is most suitable if number of decision variables are _____.
a) Two b) Three
c) Four d) Zero

7) Dual of the Dual is _____.
a) Dual b) Zero
c) Primal d) Infinity

8) What is the condition of Balance Assignment Problem?
a) $\sum$ Demand = $\sum$ Supply
b) No. of rows > No. of column
c) No. of rows < No. of column
d) No. of rows = No. of columns

9) Major elements of queuing system are _____.
a) Customer
b) Queue
c) Service Channel
d) All the above

10) Games without a saddle point require player to play _____.
a) Mixed strategies
b) Pure strategies
c) Dominated strategies
d) None of these

11) Optimization means _____.
a) Maximization
b) Minimization or Maximization
c) Minimization
d) Avg. Minimization & Maximization

12) EOQ model helps to find _____.
a) Optimum size of order
b) Time interval between order
c) Both a) and b)
d) None of these

13) If F = Fixed Cost, V = Variable Cost, S = Selling Price then, BEP (Quantity) = _____.
a) $\mathrm{V}/(\mathrm{S}-\mathrm{F})$
b) $\mathrm{F}/(\mathrm{S}-\mathrm{V})$
c) $\mathrm{V}+\mathrm{S}+\mathrm{F}$
d) $(\mathrm{S}-\mathrm{V})2$

14) Functional organization is invented by _____.
a) F.W. Taylor
b) Gilbert
c) Peter Drucker
d) Henry Fayol

Seat No.	

Set **R**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Operation Research and Management (CIVMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume additional suitable data, if necessary and mention it clearly

SECTION – I

Q.2 Attempt Any Two.

a) Discuss 14 principles of modern management. **14**

b) What are qualities of 'Leader'? Elaborate Leadership in with practical orientation.

c) Graphical Using Graphical method, solve

Maximize $Z = 2X_1 + 3X_2$

Subject to, $X_1 + X_2 \leq 30;$

$X_1 - X_2 \geq 0;$

$X_2 \geq 3;$

$0 \leq X_1 \leq 20;$

$0 \leq X_2 \leq 12;$

Q.3 Attempt Any Two. **14**

a) Determine IBFS of the following transportation problem using LCM. And calculate Transportation Cost.

		Destination					
		A1	B1	C1	D1	E1	Supply
Origin	A	2	11	10	3	7	4
	B	1	4	7	2	1	8
	C	3	9	4	8	12	9
Demand		3	3	4	5	6	

b) Four different jobs can be done on 4 different machines. The set-up takedown time cost are assumed to be prohibitively high for changeovers. The matrix below gives the cost in rupees for producing job i on machine j.

		Machines			
		M1	M2	M3	M4
Jobs	J1	51	77	49	55
	J2	32	34	59	68
	J3	37	44	70	54
	J4	55	55	58	55

c) Explain the Waiting Line Theory with all its characteristics to single channel waiting line. Also Discuss with the graph showing Waiting Time Cost, Idle time Cost & Total Expected Cost.

SECTION – II

Q.4 Attempt Any Two. **14**

a) What is a Genetic Algorithm? Explain the basic biological concept behind GA and list its key operators (Selection, Crossover, and Mutation).

b) What are advantages of Simulation? Give its applications & limitations. Elaborate stepwise procedure of 'Monte Carlo Simulation.

c) A company is bringing out a new product in market with three strategies of production line like full, patrial, and minimal. The state of nature may be good demand, fair demand, and poor demand, with following payoff of profit as shown in table below:

State of Nature (Demand)	Production Line: Full	Production Line: Partial	Production Line: Minimal
Good	80	70	50
Fair	50	45	40
Poor	−25	−10	0

Take optimal decision under each of the following decision rules

i) Maximax
ii) Maximin
iii) Laplace

Q.5 Attempt Any Two. **14**

a) A construction company consumes 4000 bags of cement per month. Price per bag of cement is Rs. 320/-. Inventory carrying cost per bag per year is Rs. 30/- and procurement cost per order is Rs. 500/-. Find economic order quantity and number of orders to be placed per month.

b) Write a note various types inventory cost. Explain graphically how the Economic Order Quantity (EOQ) balances the trade-off between Inventory Carrying Cost and Ordering Cost.

c) Write a detailed note on ABC analysis. Explain with a graphical representation.

Seat No.	

Set **S**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Operation Research and Management (CIVMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary and mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternative from the options. 14

1) Games without a saddle point require player to play _____.
a) Mixed strategies b) Pure strategies
c) Dominated strategies d) None of these

2) Optimization means _____.
a) Maximization
b) Minimization or Maximization
c) Minimization
d) Avg. Minimization & Maximization

3) EOQ model helps to find _____.
a) Optimum size of order
b) Time interval between order
c) Both a) and b)
d) None of these

4) If F = Fixed Cost, V = Variable Cost, S = Selling Price then, BEP (Quantity) = _____.
a) $V/(S-F)$ b) $F/(S-V)$
c) $V+S+F$ d) $(S-V)2$

5) Functional organization is invented by _____.
a) F.W. Taylor b) Gilbert
c) Peter Drucker d) Henry Fayol

6) Maximisation problem in LPP will involve _____.
a) Slack variable b) Surplus variable
c) Both a and b d) None of these

7) Allocation of units is not dependent on transport cost in _____.
a) VAM method
b) NW corner method
c) Both of these
d) None of these

8) The size of the payoff matrix of a game can be reduced by using the principle of _____.
a) game inversion
b) rotation reduction
c) dominance
d) game transpose

9) In ABC analysis least monitoring and control is required for _____.
a) A class item
b) B class items
c) C class items
d) All of these

10) MBO is developed by _____.
a) Peter Drucker
b) Gilbert
c) F. W. Taylor
d) Henry Fayol

11) Graphical Method is most suitable if number of decision variables are _____.
a) Two
b) Three
c) Four
d) Zero

12) Dual of the Dual is _____.
a) Dual
b) Zero
c) Primal
d) Infinity

13) What is the condition of Balance Assignment Problem?
a) $\sum$ Demand = $\sum$ Supply
b) No. of rows > No. of column
c) No. of rows < No. of column
d) No. of rows = No. of columns

14) Major elements of queuing system are _____.
a) Customer
b) Queue
c) Service Channel
d) All the above

Seat No.	

Set **S**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Operation Research and Management (CIVMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume additional suitable data, if necessary and mention it clearly

SECTION – I

Q.2 Attempt Any Two.

a) Discuss 14 principles of modern management. **14**

b) What are qualities of 'Leader'? Elaborate Leadership in with practical orientation.

c) Graphical Using Graphical method, solve

Maximize $Z = 2X_1 + 3X_2$

Subject to, $X_1 + X_2 \leq 30;$

$X_1 - X_2 \geq 0;$

$X_2 \geq 3;$

$0 \leq X_1 \leq 20;$

$0 \leq X_2 \leq 12;$

Q.3 Attempt Any Two. **14**

a) Determine IBFS of the following transportation problem using LCM. And calculate Transportation Cost.

		Destination					
		A1	B1	C1	D1	E1	Supply
Origin	A	2	11	10	3	7	4
	B	1	4	7	2	1	8
	C	3	9	4	8	12	9
Demand		3	3	4	5	6	

b) Four different jobs can be done on 4 different machines. The set-up takedown time cost are assumed to be prohibitively high for changeovers. The matrix below gives the cost in rupees for producing job i on machine j.

		Machines			
		M1	M2	M3	M4
Jobs	J1	51	77	49	55
	J2	32	34	59	68
	J3	37	44	70	54
	J4	55	55	58	55

c) Explain the Waiting Line Theory with all its characteristics to single channel waiting line. Also Discuss with the graph showing Waiting Time Cost, Idle time Cost & Total Expected Cost.

SECTION – II

Q.4 Attempt Any Two. **14**

a) What is a Genetic Algorithm? Explain the basic biological concept behind GA and list its key operators (Selection, Crossover, and Mutation).

b) What are advantages of Simulation? Give its applications & limitations. Elaborate stepwise procedure of 'Monte Carlo Simulation.

c) A company is bringing out a new product in market with three strategies of production line like full, patrial, and minimal. The state of nature may be good demand, fair demand, and poor demand, with following payoff of profit as shown in table below:

State of Nature (Demand)	Production Line: Full	Production Line: Partial	Production Line: Minimal
Good	80	70	50
Fair	50	45	40
Poor	−25	−10	0

Take optimal decision under each of the following decision rules

i) Maximax
ii) Maximin
iii) Laplace

Q.5 Attempt Any Two. **14**

a) A construction company consumes 4000 bags of cement per month. Price per bag of cement is Rs. 320/-. Inventory carrying cost per bag per year is Rs. 30/- and procurement cost per order is Rs. 500/-. Find economic order quantity and number of orders to be placed per month.

b) Write a note various types inventory cost. Explain graphically how the Economic Order Quantity (EOQ) balances the trade-off between Inventory Carrying Cost and Ordering Cost.

c) Write a detailed note on ABC analysis. Explain with a graphical representation.

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Seat No.	

Set P

T.Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Operation Research and Management (CIVMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary and mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternative from the options. 14

1) MBO is developed by _____.
a) Peter Drucker b) Gilbert
c) F. W. Taylor d) Henry Fayol

2) Graphical Method is most suitable if number of decision variables are _____.
a) Two b) Three
c) Four d) Zero

3) Dual of the Dual is _____.
a) Dual b) Zero
c) Primal d) Infinity

4) What is the condition of Balance Assignment Problem?
a) $\sum$ Demand = $\sum$ Supply
b) No. of rows > No. of column
c) No. of rows < No. of column
d) No. of rows = No. of columns

5) Major elements of queuing system are _____.
a) Customer b) Queue
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6) Games without a saddle point require player to play _____.
a) Mixed strategies b) Pure strategies
c) Dominated strategies d) None of these

7) Optimization means _____.
   a) Maximization
   b) Minimization or Maximization
   c) Minimization
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8) EOQ model helps to find _____.
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9) If F = Fixed Cost, V = Variable Cost, S = Selling Price then, BEP (Quantity) = _____.
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13) The size of the payoff matrix of a game can be reduced by using the principle of _____.
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   b) rotation reduction
   c) dominance
   d) game transpose

14) In ABC analysis least monitoring and control is required for _____.
   a) A class item
   b) B class items
   c) C class items
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Seat No.	

Set **P**

T.Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Operation Research and Management (CIVMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
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SECTION – I

Q.2 Attempt Any Two.

a) Discuss 14 principles of modern management. **14**

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$X_1 - X_2 \geq 0;$

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$0 \leq X_1 \leq 20;$

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Q.3 Attempt Any Two. **14**

a) Determine IBFS of the following transportation problem using LCM. And calculate Transportation Cost.

		Destination					
		A1	B1	C1	D1	E1	Supply
Origin	A	2	11	10	3	7	4
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Demand		3	3	4	5	6	

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c) Explain the Waiting Line Theory with all its characteristics to single channel waiting line. Also Discuss with the graph showing Waiting Time Cost, Idle time Cost & Total Expected Cost.

SECTION – II

Q.4 Attempt Any Two. **14**

a) What is a Genetic Algorithm? Explain the basic biological concept behind GA and list its key operators (Selection, Crossover, and Mutation).

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Seat No.	

Set **Q**

T.Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Operation Research and Management (CIVMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternative from the options. 14

1) EOQ model helps to find _____.
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c) Service Channel
d) All the above

13) Games without a saddle point require player to play _____.
a) Mixed strategies
b) Pure strategies
c) Dominated strategies
d) None of these

14) Optimization means _____.
a) Maximization
b) Minimization or Maximization
c) Minimization
d) Avg. Minimization & Maximization

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Operation Research and Management (CIVMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume additional suitable data, if necessary and mention it clearly

SECTION – I

Q.2 Attempt Any Two.

a) Discuss 14 principles of modern management. **14**

b) What are qualities of 'Leader'? Elaborate Leadership in with practical orientation.

c) Graphical Using Graphical method, solve

Maximize $Z = 2X_1 + 3X_2$

Subject to, $X_1 + X_2 \leq 30;$

$X_1 - X_2 \geq 0;$

$X_2 \geq 3;$

$0 \leq X_1 \leq 20;$

$0 \leq X_2 \leq 12;$

Q.3 Attempt Any Two. **14**

a) Determine IBFS of the following transportation problem using LCM. And calculate Transportation Cost.

		Destination					
		A1	B1	C1	D1	E1	Supply
Origin	A	2	11	10	3	7	4
	B	1	4	7	2	1	8
	C	3	9	4	8	12	9
Demand		3	3	4	5	6	

b) Four different jobs can be done on 4 different machines. The set-up takedown time cost are assumed to be prohibitively high for changeovers. The matrix below gives the cost in rupees for producing job i on machine j.

		Machines			
		M1	M2	M3	M4
Jobs	J1	51	77	49	55
	J2	32	34	59	68
	J3	37	44	70	54
	J4	55	55	58	55

c) Explain the Waiting Line Theory with all its characteristics to single channel waiting line. Also Discuss with the graph showing Waiting Time Cost, Idle time Cost & Total Expected Cost.

SECTION – II

Q.4 Attempt Any Two. **14**

a) What is a Genetic Algorithm? Explain the basic biological concept behind GA and list its key operators (Selection, Crossover, and Mutation).

b) What are advantages of Simulation? Give its applications & limitations. Elaborate stepwise procedure of 'Monte Carlo Simulation.

c) A company is bringing out a new product in market with three strategies of production line like full, patrial, and minimal. The state of nature may be good demand, fair demand, and poor demand, with following payoff of profit as shown in table below:

State of Nature (Demand)	Production Line: Full	Production Line: Partial	Production Line: Minimal
Good	80	70	50
Fair	50	45	40
Poor	−25	−10	0

Take optimal decision under each of the following decision rules

i) Maximax
ii) Maximin
iii) Laplace

Q.5 Attempt Any Two. **14**

a) A construction company consumes 4000 bags of cement per month. Price per bag of cement is Rs. 320/-. Inventory carrying cost per bag per year is Rs. 30/- and procurement cost per order is Rs. 500/-. Find economic order quantity and number of orders to be placed per month.

b) Write a note various types inventory cost. Explain graphically how the Economic Order Quantity (EOQ) balances the trade-off between Inventory Carrying Cost and Ordering Cost.

c) Write a detailed note on ABC analysis. Explain with a graphical representation.

Seat No.	

Set **R**

T.Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Operation Research and Management (CIVMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary and mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternative from the options. **14**

1) Maximisation problem in LPP will involve _____.
a) Slack variable b) Surplus variable
c) Both a and b d) None of these

2) Allocation of units is not dependent on transport cost in _____.
a) VAM method b) NW corner method
c) Both of these d) None of these

3) The size of the payoff matrix of a game can be reduced by using the principle of _____.
a) game inversion b) rotation reduction
c) dominance d) game transpose

4) In ABC analysis least monitoring and control is required for _____.
a) A class item b) B class items
c) C class items d) All of these

5) MBO is developed by _____.
a) Peter Drucker b) Gilbert
c) F. W. Taylor d) Henry Fayol

6) Graphical Method is most suitable if number of decision variables are _____.
a) Two b) Three
c) Four d) Zero

7) Dual of the Dual is _____.
a) Dual b) Zero
c) Primal d) Infinity

8) What is the condition of Balance Assignment Problem?
a) $\sum$ Demand = $\sum$ Supply
b) No. of rows > No. of column
c) No. of rows < No. of column
d) No. of rows = No. of columns

9) Major elements of queuing system are _____.
a) Customer
b) Queue
c) Service Channel
d) All the above

10) Games without a saddle point require player to play _____.
a) Mixed strategies
b) Pure strategies
c) Dominated strategies
d) None of these

11) Optimization means _____.
a) Maximization
b) Minimization or Maximization
c) Minimization
d) Avg. Minimization & Maximization

12) EOQ model helps to find _____.
a) Optimum size of order
b) Time interval between order
c) Both a) and b)
d) None of these

13) If F = Fixed Cost, V = Variable Cost, S = Selling Price then, BEP (Quantity) = _____.
a) $\mathrm{V}/(\mathrm{S}-\mathrm{F})$
b) $\mathrm{F}/(\mathrm{S}-\mathrm{V})$
c) $\mathrm{V}+\mathrm{S}+\mathrm{F}$
d) $(\mathrm{S}-\mathrm{V})2$

14) Functional organization is invented by _____.
a) F.W. Taylor
b) Gilbert
c) Peter Drucker
d) Henry Fayol

Seat No.	

Set **R**

T.Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Operation Research and Management (CIVMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume additional suitable data, if necessary and mention it clearly

SECTION – I

Q.2 Attempt Any Two.

a) Discuss 14 principles of modern management. **14**

b) What are qualities of 'Leader'? Elaborate Leadership in with practical orientation.

c) Graphical Using Graphical method, solve

Maximize $Z = 2X_1 + 3X_2$

Subject to, $X_1 + X_2 \leq 30;$

$X_1 - X_2 \geq 0;$

$X_2 \geq 3;$

$0 \leq X_1 \leq 20;$

$0 \leq X_2 \leq 12;$

Q.3 Attempt Any Two. **14**

a) Determine IBFS of the following transportation problem using LCM. And calculate Transportation Cost.

		Destination					
		A1	B1	C1	D1	E1	Supply
Origin	A	2	11	10	3	7	4
	B	1	4	7	2	1	8
	C	3	9	4	8	12	9
Demand		3	3	4	5	6	

b) Four different jobs can be done on 4 different machines. The set-up takedown time cost are assumed to be prohibitively high for changeovers. The matrix below gives the cost in rupees for producing job i on machine j.

		Machines			
		M1	M2	M3	M4
Jobs	J1	51	77	49	55
	J2	32	34	59	68
	J3	37	44	70	54
	J4	55	55	58	55

c) Explain the Waiting Line Theory with all its characteristics to single channel waiting line. Also Discuss with the graph showing Waiting Time Cost, Idle time Cost & Total Expected Cost.

SECTION – II

Q.4 Attempt Any Two. **14**

a) What is a Genetic Algorithm? Explain the basic biological concept behind GA and list its key operators (Selection, Crossover, and Mutation).

b) What are advantages of Simulation? Give its applications & limitations. Elaborate stepwise procedure of 'Monte Carlo Simulation.

c) A company is bringing out a new product in market with three strategies of production line like full, patrial, and minimal. The state of nature may be good demand, fair demand, and poor demand, with following payoff of profit as shown in table below:

State of Nature (Demand)	Production Line: Full	Production Line: Partial	Production Line: Minimal
Good	80	70	50
Fair	50	45	40
Poor	−25	−10	0

Take optimal decision under each of the following decision rules

i) Maximax
ii) Maximin
iii) Laplace

Q.5 Attempt Any Two. **14**

a) A construction company consumes 4000 bags of cement per month. Price per bag of cement is Rs. 320/-. Inventory carrying cost per bag per year is Rs. 30/- and procurement cost per order is Rs. 500/-. Find economic order quantity and number of orders to be placed per month.

b) Write a note various types inventory cost. Explain graphically how the Economic Order Quantity (EOQ) balances the trade-off between Inventory Carrying Cost and Ordering Cost.

c) Write a detailed note on ABC analysis. Explain with a graphical representation.

Seat No.	

Set **S**

T.Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Operation Research and Management (CIVMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary and mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternative from the options. 14

1) Games without a saddle point require player to play _____.
a) Mixed strategies b) Pure strategies
c) Dominated strategies d) None of these

2) Optimization means _____.
a) Maximization
b) Minimization or Maximization
c) Minimization
d) Avg. Minimization & Maximization

3) EOQ model helps to find _____.
a) Optimum size of order
b) Time interval between order
c) Both a) and b)
d) None of these

4) If F = Fixed Cost, V = Variable Cost, S = Selling Price then, BEP (Quantity) = _____.
a) $\mathrm{V}/(\mathrm{S}-\mathrm{F})$ b) $\mathrm{F}/(\mathrm{S}-\mathrm{V})$
c) $\mathrm{V}+\mathrm{S}+\mathrm{F}$ d) $(\mathrm{S}-\mathrm{V})2$

5) Functional organization is invented by _____.
a) F.W. Taylor b) Gilbert
c) Peter Drucker d) Henry Fayol

6) Maximisation problem in LPP will involve _____.
a) Slack variable b) Surplus variable
c) Both a and b d) None of these

7) Allocation of units is not dependent on transport cost in _____.
a) VAM method
b) NW corner method
c) Both of these
d) None of these

8) The size of the payoff matrix of a game can be reduced by using the principle of _____.
a) game inversion
b) rotation reduction
c) dominance
d) game transpose

9) In ABC analysis least monitoring and control is required for _____.
a) A class item
b) B class items
c) C class items
d) All of these

10) MBO is developed by _____.
a) Peter Drucker
b) Gilbert
c) F. W. Taylor
d) Henry Fayol

11) Graphical Method is most suitable if number of decision variables are _____.
a) Two
b) Three
c) Four
d) Zero

12) Dual of the Dual is _____.
a) Dual
b) Zero
c) Primal
d) Infinity

13) What is the condition of Balance Assignment Problem?
a) $\sum$ Demand = $\sum$ Supply
b) No. of rows > No. of column
c) No. of rows < No. of column
d) No. of rows = No. of columns

14) Major elements of queuing system are _____.
a) Customer
b) Queue
c) Service Channel
d) All the above

Seat No.	

Set **S**

T.Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Operation Research and Management (CIVMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume additional suitable data, if necessary and mention it clearly

SECTION – I

Q.2 Attempt Any Two.

a) Discuss 14 principles of modern management. **14**

b) What are qualities of 'Leader'? Elaborate Leadership in with practical orientation.

c) Graphical Using Graphical method, solve

Maximize $Z = 2X_1 + 3X_2$

Subject to, $X_1 + X_2 \leq 30;$

$X_1 - X_2 \geq 0;$

$X_2 \geq 3;$

$0 \leq X_1 \leq 20;$

$0 \leq X_2 \leq 12;$

Q.3 Attempt Any Two. **14**

a) Determine IBFS of the following transportation problem using LCM. And calculate Transportation Cost.

		Destination					
		A1	B1	C1	D1	E1	Supply
Origin	A	2	11	10	3	7	4
	B	1	4	7	2	1	8
	C	3	9	4	8	12	9
Demand		3	3	4	5	6	

b) Four different jobs can be done on 4 different machines. The set-up takedown time cost are assumed to be prohibitively high for changeovers. The matrix below gives the cost in rupees for producing job i on machine j.

		Machines			
		M1	M2	M3	M4
Jobs	J1	51	77	49	55
	J2	32	34	59	68
	J3	37	44	70	54
	J4	55	55	58	55

c) Explain the Waiting Line Theory with all its characteristics to single channel waiting line. Also Discuss with the graph showing Waiting Time Cost, Idle time Cost & Total Expected Cost.

SECTION – II

Q.4 Attempt Any Two. **14**

a) What is a Genetic Algorithm? Explain the basic biological concept behind GA and list its key operators (Selection, Crossover, and Mutation).

b) What are advantages of Simulation? Give its applications & limitations. Elaborate stepwise procedure of 'Monte Carlo Simulation.

c) A company is bringing out a new product in market with three strategies of production line like full, patrial, and minimal. The state of nature may be good demand, fair demand, and poor demand, with following payoff of profit as shown in table below:

State of Nature (Demand)	Production Line: Full	Production Line: Partial	Production Line: Minimal
Good	80	70	50
Fair	50	45	40
Poor	−25	−10	0

Take optimal decision under each of the following decision rules

i) Maximax
ii) Maximin
iii) Laplace

Q.5 Attempt Any Two. **14**

a) A construction company consumes 4000 bags of cement per month. Price per bag of cement is Rs. 320/-. Inventory carrying cost per bag per year is Rs. 30/- and procurement cost per order is Rs. 500/-. Find economic order quantity and number of orders to be placed per month.

b) Write a note various types inventory cost. Explain graphically how the Economic Order Quantity (EOQ) balances the trade-off between Inventory Carrying Cost and Ordering Cost.

c) Write a detailed note on ABC analysis. Explain with a graphical representation.

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Seat No.	

Set P

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Operation Research and Management (CIVMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary and mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternative from the options. 14

1) MBO is developed by _____.
a) Peter Drucker b) Gilbert
c) F. W. Taylor d) Henry Fayol

2) Graphical Method is most suitable if number of decision variables are _____.
a) Two b) Three
c) Four d) Zero

3) Dual of the Dual is _____.
a) Dual b) Zero
c) Primal d) Infinity

4) What is the condition of Balance Assignment Problem?
a) ∑ Demand = ∑ Supply
b) No. of rows > No. of column
c) No. of rows < No. of column
d) No. of rows = No. of columns

5) Major elements of queuing system are _____.
a) Customer b) Queue
c) Service Channel d) All the above

6) Games without a saddle point require player to play _____.
a) Mixed strategies b) Pure strategies
c) Dominated strategies d) None of these

7) Optimization means _____.
   a) Maximization
   b) Minimization or Maximization
   c) Minimization
   d) Avg. Minimization & Maximization

8) EOQ model helps to find _____.
   a) Optimum size of order
   b) Time interval between order
   c) Both a) and b)
   d) None of these

9) If F = Fixed Cost, V = Variable Cost, S = Selling Price then, BEP (Quantity) = _____.
   a) $\mathrm{V}/(\mathrm{S}-\mathrm{F})$
   b) $\mathrm{F}/(\mathrm{S}-\mathrm{V})$
   c) $\mathrm{V}+\mathrm{S}+\mathrm{F}$
   d) $(\mathrm{S}-\mathrm{V})2$

10) Functional organization is invented by _____.
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11) Maximisation problem in LPP will involve _____.
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12) Allocation of units is not dependent on transport cost in _____.
   a) VAM method
   b) NW corner method
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   d) None of these

13) The size of the payoff matrix of a game can be reduced by using the principle of _____.
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14) In ABC analysis least monitoring and control is required for _____.
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Seat No.	

Set **P**

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Operation Research and Management (CIVMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume additional suitable data, if necessary and mention it clearly

SECTION – I

Q.2 Attempt Any Two.

a) Discuss 14 principles of modern management. **14**

b) What are qualities of 'Leader'? Elaborate Leadership in with practical orientation.

c) Graphical Using Graphical method, solve

Maximize $Z = 2X_1 + 3X_2$

Subject to, $X_1 + X_2 \leq 30;$

$X_1 - X_2 \geq 0;$

$X_2 \geq 3;$

$0 \leq X_1 \leq 20;$

$0 \leq X_2 \leq 12;$

Q.3 Attempt Any Two. **14**

a) Determine IBFS of the following transportation problem using LCM. And calculate Transportation Cost.

		Destination					
		A1	B1	C1	D1	E1	Supply
Origin	A	2	11	10	3	7	4
	B	1	4	7	2	1	8
	C	3	9	4	8	12	9
Demand		3	3	4	5	6	

b) Four different jobs can be done on 4 different machines. The set-up takedown time cost are assumed to be prohibitively high for changeovers. The matrix below gives the cost in rupees for producing job i on machine j.

		Machines			
		M1	M2	M3	M4
Jobs	J1	51	77	49	55
	J2	32	34	59	68
	J3	37	44	70	54
	J4	55	55	58	55

c) Explain the Waiting Line Theory with all its characteristics to single channel waiting line. Also Discuss with the graph showing Waiting Time Cost, Idle time Cost & Total Expected Cost.

SECTION – II

Q.4 Attempt Any Two. **14**

a) What is a Genetic Algorithm? Explain the basic biological concept behind GA and list its key operators (Selection, Crossover, and Mutation).

b) What are advantages of Simulation? Give its applications & limitations. Elaborate stepwise procedure of 'Monte Carlo Simulation.

c) A company is bringing out a new product in market with three strategies of production line like full, patrial, and minimal. The state of nature may be good demand, fair demand, and poor demand, with following payoff of profit as shown in table below:

State of Nature (Demand)	Production Line: Full	Production Line: Partial	Production Line: Minimal
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Take optimal decision under each of the following decision rules

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Seat No.	

Set **Q**

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Operation Research and Management (CIVMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternative from the options. 14

1) EOQ model helps to find _____.
a) Optimum size of order
b) Time interval between order
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2) If F = Fixed Cost, V = Variable Cost, S = Selling Price then, BEP (Quantity) = _____.
a) $V/(S-F)$ b) $F/(S-V)$
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Seat No.	

Set **Q**

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Operation Research and Management (CIVMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
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SECTION – I

Q.2 Attempt Any Two.

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$X_1 - X_2 \geq 0;$

$X_2 \geq 3;$

$0 \leq X_1 \leq 20;$

$0 \leq X_2 \leq 12;$

Q.3 Attempt Any Two. **14**

a) Determine IBFS of the following transportation problem using LCM. And calculate Transportation Cost.

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		A1	B1	C1	D1	E1	Supply
Origin	A	2	11	10	3	7	4
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	J3	37	44	70	54
	J4	55	55	58	55

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SECTION – II

Q.4 Attempt Any Two. **14**

a) What is a Genetic Algorithm? Explain the basic biological concept behind GA and list its key operators (Selection, Crossover, and Mutation).

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ii) Maximin
iii) Laplace

Q.5 Attempt Any Two. **14**

a) A construction company consumes 4000 bags of cement per month. Price per bag of cement is Rs. 320/-. Inventory carrying cost per bag per year is Rs. 30/- and procurement cost per order is Rs. 500/-. Find economic order quantity and number of orders to be placed per month.

b) Write a note various types inventory cost. Explain graphically how the Economic Order Quantity (EOQ) balances the trade-off between Inventory Carrying Cost and Ordering Cost.

c) Write a detailed note on ABC analysis. Explain with a graphical representation.

Seat No.	

Set **R**

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Operation Research and Management (CIVMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary and mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternative from the options. 14

1) Maximisation problem in LPP will involve _____.
a) Slack variable b) Surplus variable
c) Both a and b d) None of these

2) Allocation of units is not dependent on transport cost in _____.
a) VAM method b) NW corner method
c) Both of these d) None of these

3) The size of the payoff matrix of a game can be reduced by using the principle of _____.
a) game inversion b) rotation reduction
c) dominance d) game transpose

4) In ABC analysis least monitoring and control is required for _____.
a) A class item b) B class items
c) C class items d) All of these

5) MBO is developed by _____.
a) Peter Drucker b) Gilbert
c) F. W. Taylor d) Henry Fayol

6) Graphical Method is most suitable if number of decision variables are _____.
a) Two b) Three
c) Four d) Zero

7) Dual of the Dual is _____.
a) Dual b) Zero
c) Primal d) Infinity

8) What is the condition of Balance Assignment Problem?
a) $\sum$ Demand = $\sum$ Supply
b) No. of rows > No. of column
c) No. of rows < No. of column
d) No. of rows = No. of columns

9) Major elements of queuing system are _____.
a) Customer
b) Queue
c) Service Channel
d) All the above

10) Games without a saddle point require player to play _____.
a) Mixed strategies
b) Pure strategies
c) Dominated strategies
d) None of these

11) Optimization means _____.
a) Maximization
b) Minimization or Maximization
c) Minimization
d) Avg. Minimization & Maximization

12) EOQ model helps to find _____.
a) Optimum size of order
b) Time interval between order
c) Both a) and b)
d) None of these

13) If F = Fixed Cost, V = Variable Cost, S = Selling Price then, BEP (Quantity) = _____.
a) $\mathrm{V}/(\mathrm{S}-\mathrm{F})$
b) $\mathrm{F}/(\mathrm{S}-\mathrm{V})$
c) $\mathrm{V}+\mathrm{S}+\mathrm{F}$
d) $(\mathrm{S}-\mathrm{V})2$

14) Functional organization is invented by _____.
a) F.W. Taylor
b) Gilbert
c) Peter Drucker
d) Henry Fayol

Seat No.	

Set **R**

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Operation Research and Management (CIVMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume additional suitable data, if necessary and mention it clearly

SECTION – I

Q.2 Attempt Any Two.

a) Discuss 14 principles of modern management. **14**

b) What are qualities of 'Leader'? Elaborate Leadership in with practical orientation.

c) Graphical Using Graphical method, solve

Maximize $Z = 2X_1 + 3X_2$

Subject to, $X_1 + X_2 \leq 30;$

$X_1 - X_2 \geq 0;$

$X_2 \geq 3;$

$0 \leq X_1 \leq 20;$

$0 \leq X_2 \leq 12;$

Q.3 Attempt Any Two. **14**

a) Determine IBFS of the following transportation problem using LCM. And calculate Transportation Cost.

		Destination					
		A1	B1	C1	D1	E1	Supply
Origin	A	2	11	10	3	7	4
	B	1	4	7	2	1	8
	C	3	9	4	8	12	9
Demand		3	3	4	5	6	

b) Four different jobs can be done on 4 different machines. The set-up takedown time cost are assumed to be prohibitively high for changeovers. The matrix below gives the cost in rupees for producing job i on machine j.

		Machines			
		M1	M2	M3	M4
Jobs	J1	51	77	49	55
	J2	32	34	59	68
	J3	37	44	70	54
	J4	55	55	58	55

c) Explain the Waiting Line Theory with all its characteristics to single channel waiting line. Also Discuss with the graph showing Waiting Time Cost, Idle time Cost & Total Expected Cost.

SECTION – II

Q.4 Attempt Any Two. **14**

a) What is a Genetic Algorithm? Explain the basic biological concept behind GA and list its key operators (Selection, Crossover, and Mutation).

b) What are advantages of Simulation? Give its applications & limitations. Elaborate stepwise procedure of 'Monte Carlo Simulation.

c) A company is bringing out a new product in market with three strategies of production line like full, patrial, and minimal. The state of nature may be good demand, fair demand, and poor demand, with following payoff of profit as shown in table below:

State of Nature (Demand)	Production Line: Full	Production Line: Partial	Production Line: Minimal
Good	80	70	50
Fair	50	45	40
Poor	−25	−10	0

Take optimal decision under each of the following decision rules

i) Maximax
ii) Maximin
iii) Laplace

Q.5 Attempt Any Two. **14**

a) A construction company consumes 4000 bags of cement per month. Price per bag of cement is Rs. 320/-. Inventory carrying cost per bag per year is Rs. 30/- and procurement cost per order is Rs. 500/-. Find economic order quantity and number of orders to be placed per month.

b) Write a note various types inventory cost. Explain graphically how the Economic Order Quantity (EOQ) balances the trade-off between Inventory Carrying Cost and Ordering Cost.

c) Write a detailed note on ABC analysis. Explain with a graphical representation.

Seat No.	

Set **S**

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Operation Research and Management (CIVMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary and mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternative from the options. 14

1) Games without a saddle point require player to play _____.
a) Mixed strategies b) Pure strategies
c) Dominated strategies d) None of these

2) Optimization means _____.
a) Maximization
b) Minimization or Maximization
c) Minimization
d) Avg. Minimization & Maximization

3) EOQ model helps to find _____.
a) Optimum size of order
b) Time interval between order
c) Both a) and b)
d) None of these

4) If F = Fixed Cost, V = Variable Cost, S = Selling Price then, BEP (Quantity) = _____.
a) $V/(S-F)$ b) $F/(S-V)$
c) $V+S+F$ d) $(S-V)2$

5) Functional organization is invented by _____.
a) F.W. Taylor b) Gilbert
c) Peter Drucker d) Henry Fayol

6) Maximisation problem in LPP will involve _____.
a) Slack variable b) Surplus variable
c) Both a and b d) None of these

7) Allocation of units is not dependent on transport cost in _____.
a) VAM method
b) NW corner method
c) Both of these
d) None of these

8) The size of the payoff matrix of a game can be reduced by using the principle of _____.
a) game inversion
b) rotation reduction
c) dominance
d) game transpose

9) In ABC analysis least monitoring and control is required for _____.
a) A class item
b) B class items
c) C class items
d) All of these

10) MBO is developed by _____.
a) Peter Drucker
b) Gilbert
c) F. W. Taylor
d) Henry Fayol

11) Graphical Method is most suitable if number of decision variables are _____.
a) Two
b) Three
c) Four
d) Zero

12) Dual of the Dual is _____.
a) Dual
b) Zero
c) Primal
d) Infinity

13) What is the condition of Balance Assignment Problem?
a) $\sum$ Demand = $\sum$ Supply
b) No. of rows > No. of column
c) No. of rows < No. of column
d) No. of rows = No. of columns

14) Major elements of queuing system are _____.
a) Customer
b) Queue
c) Service Channel
d) All the above

Seat No.	

Set **S**

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Operation Research and Management (CIVMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume additional suitable data, if necessary and mention it clearly

SECTION – I

Q.2 Attempt Any Two.

a) Discuss 14 principles of modern management. **14**

b) What are qualities of 'Leader'? Elaborate Leadership in with practical orientation.

c) Graphical Using Graphical method, solve

Maximize $Z = 2X_1 + 3X_2$

Subject to, $X_1 + X_2 \leq 30;$

$X_1 - X_2 \geq 0;$

$X_2 \geq 3;$

$0 \leq X_1 \leq 20;$

$0 \leq X_2 \leq 12;$

Q.3 Attempt Any Two. **14**

a) Determine IBFS of the following transportation problem using LCM. And calculate Transportation Cost.

		Destination					
		A1	B1	C1	D1	E1	Supply
Origin	A	2	11	10	3	7	4
	B	1	4	7	2	1	8
	C	3	9	4	8	12	9
Demand		3	3	4	5	6	

b) Four different jobs can be done on 4 different machines. The set-up takedown time cost are assumed to be prohibitively high for changeovers. The matrix below gives the cost in rupees for producing job i on machine j.

		Machines			
		M1	M2	M3	M4
Jobs	J1	51	77	49	55
	J2	32	34	59	68
	J3	37	44	70	54
	J4	55	55	58	55

c) Explain the Waiting Line Theory with all its characteristics to single channel waiting line. Also Discuss with the graph showing Waiting Time Cost, Idle time Cost & Total Expected Cost.

SECTION – II

Q.4 Attempt Any Two. **14**

a) What is a Genetic Algorithm? Explain the basic biological concept behind GA and list its key operators (Selection, Crossover, and Mutation).

b) What are advantages of Simulation? Give its applications & limitations. Elaborate stepwise procedure of 'Monte Carlo Simulation.

c) A company is bringing out a new product in market with three strategies of production line like full, patrial, and minimal. The state of nature may be good demand, fair demand, and poor demand, with following payoff of profit as shown in table below:

State of Nature (Demand)	Production Line: Full	Production Line: Partial	Production Line: Minimal
Good	80	70	50
Fair	50	45	40
Poor	−25	−10	0

Take optimal decision under each of the following decision rules

i) Maximax
ii) Maximin
iii) Laplace

Q.5 Attempt Any Two. **14**

a) A construction company consumes 4000 bags of cement per month. Price per bag of cement is Rs. 320/-. Inventory carrying cost per bag per year is Rs. 30/- and procurement cost per order is Rs. 500/-. Find economic order quantity and number of orders to be placed per month.

b) Write a note various types inventory cost. Explain graphically how the Economic Order Quantity (EOQ) balances the trade-off between Inventory Carrying Cost and Ordering Cost.

c) Write a detailed note on ABC analysis. Explain with a graphical representation.

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Seat No.	

Set P

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Operation Research and Management (CIVMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary and mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternative from the options. 14

1) MBO is developed by _____.
a) Peter Drucker b) Gilbert
c) F. W. Taylor d) Henry Fayol

2) Graphical Method is most suitable if number of decision variables are _____.
a) Two b) Three
c) Four d) Zero

3) Dual of the Dual is _____.
a) Dual b) Zero
c) Primal d) Infinity

4) What is the condition of Balance Assignment Problem?
a) ∑ Demand = ∑ Supply
b) No. of rows > No. of column
c) No. of rows < No. of column
d) No. of rows = No. of columns

5) Major elements of queuing system are _____.
a) Customer b) Queue
c) Service Channel d) All the above

6) Games without a saddle point require player to play _____.
a) Mixed strategies b) Pure strategies
c) Dominated strategies d) None of these

7) Optimization means _____.
   a) Maximization
   b) Minimization or Maximization
   c) Minimization
   d) Avg. Minimization & Maximization

8) EOQ model helps to find _____.
   a) Optimum size of order
   b) Time interval between order
   c) Both a) and b)
   d) None of these

9) If F = Fixed Cost, V = Variable Cost, S = Selling Price then, BEP (Quantity) = _____.
   a) $\mathrm{V}/(\mathrm{S}-\mathrm{F})$
   b) $\mathrm{F}/(\mathrm{S}-\mathrm{V})$
   c) $\mathrm{V}+\mathrm{S}+\mathrm{F}$
   d) $(\mathrm{S}-\mathrm{V})2$

10) Functional organization is invented by _____.
   a) F.W. Taylor
   b) Gilbert
   c) Peter Drucker
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11) Maximisation problem in LPP will involve _____.
   a) Slack variable
   b) Surplus variable
   c) Both a and b
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12) Allocation of units is not dependent on transport cost in _____.
   a) VAM method
   b) NW corner method
   c) Both of these
   d) None of these

13) The size of the payoff matrix of a game can be reduced by using the principle of _____.
   a) game inversion
   b) rotation reduction
   c) dominance
   d) game transpose

14) In ABC analysis least monitoring and control is required for _____.
   a) A class item
   b) B class items
   c) C class items
   d) All of these

Seat No.	

Set **P**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Operation Research and Management (CIVMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume additional suitable data, if necessary and mention it clearly

SECTION – I

Q.2 Attempt Any Two.

a) Discuss 14 principles of modern management. **14**

b) What are qualities of 'Leader'? Elaborate Leadership in with practical orientation.

c) Graphical Using Graphical method, solve

Maximize $Z = 2X_1 + 3X_2$

Subject to, $X_1 + X_2 \leq 30;$

$X_1 - X_2 \geq 0;$

$X_2 \geq 3;$

$0 \leq X_1 \leq 20;$

$0 \leq X_2 \leq 12;$

Q.3 Attempt Any Two. **14**

a) Determine IBFS of the following transportation problem using LCM. And calculate Transportation Cost.

		Destination					
		A1	B1	C1	D1	E1	Supply
Origin	A	2	11	10	3	7	4
	B	1	4	7	2	1	8
	C	3	9	4	8	12	9
Demand		3	3	4	5	6	

b) Four different jobs can be done on 4 different machines. The set-up takedown time cost are assumed to be prohibitively high for changeovers. The matrix below gives the cost in rupees for producing job i on machine j.

		Machines			
		M1	M2	M3	M4
Jobs	J1	51	77	49	55
	J2	32	34	59	68
	J3	37	44	70	54
	J4	55	55	58	55

c) Explain the Waiting Line Theory with all its characteristics to single channel waiting line. Also Discuss with the graph showing Waiting Time Cost, Idle time Cost & Total Expected Cost.

SECTION – II

Q.4 Attempt Any Two. **14**

a) What is a Genetic Algorithm? Explain the basic biological concept behind GA and list its key operators (Selection, Crossover, and Mutation).

b) What are advantages of Simulation? Give its applications & limitations. Elaborate stepwise procedure of 'Monte Carlo Simulation.

c) A company is bringing out a new product in market with three strategies of production line like full, patrial, and minimal. The state of nature may be good demand, fair demand, and poor demand, with following payoff of profit as shown in table below:

State of Nature (Demand)	Production Line: Full	Production Line: Partial	Production Line: Minimal
Good	80	70	50
Fair	50	45	40
Poor	−25	−10	0

Take optimal decision under each of the following decision rules

i) Maximax
ii) Maximin
iii) Laplace

Q.5 Attempt Any Two. **14**

a) A construction company consumes 4000 bags of cement per month. Price per bag of cement is Rs. 320/-. Inventory carrying cost per bag per year is Rs. 30/- and procurement cost per order is Rs. 500/-. Find economic order quantity and number of orders to be placed per month.

b) Write a note various types inventory cost. Explain graphically how the Economic Order Quantity (EOQ) balances the trade-off between Inventory Carrying Cost and Ordering Cost.

c) Write a detailed note on ABC analysis. Explain with a graphical representation.

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Operation Research and Management (CIVMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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4) Assume suitable data if necessary and mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternative from the options. 14

1) EOQ model helps to find _____.
a) Optimum size of order
b) Time interval between order
c) Both a) and b)
d) None of these

2) If F = Fixed Cost, V = Variable Cost, S = Selling Price then, BEP (Quantity) = _____.
a) $V/(S-F)$ b) $F/(S-V)$
c) $V+S+F$ d) $(S-V)2$

3) Functional organization is invented by _____.
a) F.W. Taylor b) Gilbert
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4) Maximisation problem in LPP will involve _____.
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b) Three
c) Four
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10) Dual of the Dual is _____.
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11) What is the condition of Balance Assignment Problem?
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14) Optimization means _____.
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Seat No.	

Set **Q**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Operation Research and Management (CIVMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
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SECTION – I

Q.2 Attempt Any Two.

a) Discuss 14 principles of modern management. **14**

b) What are qualities of 'Leader'? Elaborate Leadership in with practical orientation.

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Subject to, $X_1 + X_2 \leq 30;$

$X_1 - X_2 \geq 0;$

$X_2 \geq 3;$

$0 \leq X_1 \leq 20;$

$0 \leq X_2 \leq 12;$

Q.3 Attempt Any Two. **14**

a) Determine IBFS of the following transportation problem using LCM. And calculate Transportation Cost.

		Destination					
		A1	B1	C1	D1	E1	Supply
Origin	A	2	11	10	3	7	4
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Demand		3	3	4	5	6	

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Jobs	J1	51	77	49	55
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	J3	37	44	70	54
	J4	55	55	58	55

c) Explain the Waiting Line Theory with all its characteristics to single channel waiting line. Also Discuss with the graph showing Waiting Time Cost, Idle time Cost & Total Expected Cost.

SECTION – II

Q.4 Attempt Any Two. **14**

a) What is a Genetic Algorithm? Explain the basic biological concept behind GA and list its key operators (Selection, Crossover, and Mutation).

b) What are advantages of Simulation? Give its applications & limitations. Elaborate stepwise procedure of 'Monte Carlo Simulation.

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Take optimal decision under each of the following decision rules

i) Maximax
ii) Maximin
iii) Laplace

Q.5 Attempt Any Two. **14**

a) A construction company consumes 4000 bags of cement per month. Price per bag of cement is Rs. 320/-. Inventory carrying cost per bag per year is Rs. 30/- and procurement cost per order is Rs. 500/-. Find economic order quantity and number of orders to be placed per month.

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c) Write a detailed note on ABC analysis. Explain with a graphical representation.

Seat No.	

Set **R**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Operation Research and Management (CIVMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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3) Figures to the right indicates full marks.
4) Assume suitable data if necessary and mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternative from the options. 14

1) Maximisation problem in LPP will involve _____.
a) Slack variable b) Surplus variable
c) Both a and b d) None of these

2) Allocation of units is not dependent on transport cost in _____.
a) VAM method b) NW corner method
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13) If F = Fixed Cost, V = Variable Cost, S = Selling Price then, BEP (Quantity) = _____.
a) $\mathrm{V}/(\mathrm{S}-\mathrm{F})$
b) $\mathrm{F}/(\mathrm{S}-\mathrm{V})$
c) $\mathrm{V}+\mathrm{S}+\mathrm{F}$
d) $(\mathrm{S}-\mathrm{V})2$

14) Functional organization is invented by _____.
a) F.W. Taylor
b) Gilbert
c) Peter Drucker
d) Henry Fayol

Seat No.	

Set **R**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Operation Research and Management (CIVMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume additional suitable data, if necessary and mention it clearly

SECTION – I

Q.2 Attempt Any Two.

a) Discuss 14 principles of modern management. **14**

b) What are qualities of 'Leader'? Elaborate Leadership in with practical orientation.

c) Graphical Using Graphical method, solve

Maximize $Z = 2X_1 + 3X_2$

Subject to, $X_1 + X_2 \leq 30;$

$X_1 - X_2 \geq 0;$

$X_2 \geq 3;$

$0 \leq X_1 \leq 20;$

$0 \leq X_2 \leq 12;$

Q.3 Attempt Any Two. **14**

a) Determine IBFS of the following transportation problem using LCM. And calculate Transportation Cost.

		Destination					
		A1	B1	C1	D1	E1	Supply
Origin	A	2	11	10	3	7	4
	B	1	4	7	2	1	8
	C	3	9	4	8	12	9
Demand		3	3	4	5	6	

b) Four different jobs can be done on 4 different machines. The set-up takedown time cost are assumed to be prohibitively high for changeovers. The matrix below gives the cost in rupees for producing job i on machine j.

		Machines			
		M1	M2	M3	M4
Jobs	J1	51	77	49	55
	J2	32	34	59	68
	J3	37	44	70	54
	J4	55	55	58	55

c) Explain the Waiting Line Theory with all its characteristics to single channel waiting line. Also Discuss with the graph showing Waiting Time Cost, Idle time Cost & Total Expected Cost.

SECTION – II

Q.4 Attempt Any Two. **14**

a) What is a Genetic Algorithm? Explain the basic biological concept behind GA and list its key operators (Selection, Crossover, and Mutation).

b) What are advantages of Simulation? Give its applications & limitations. Elaborate stepwise procedure of 'Monte Carlo Simulation.

c) A company is bringing out a new product in market with three strategies of production line like full, patrial, and minimal. The state of nature may be good demand, fair demand, and poor demand, with following payoff of profit as shown in table below:

State of Nature (Demand)	Production Line: Full	Production Line: Partial	Production Line: Minimal
Good	80	70	50
Fair	50	45	40
Poor	−25	−10	0

Take optimal decision under each of the following decision rules

i) Maximax
ii) Maximin
iii) Laplace

Q.5 Attempt Any Two. **14**

a) A construction company consumes 4000 bags of cement per month. Price per bag of cement is Rs. 320/-. Inventory carrying cost per bag per year is Rs. 30/- and procurement cost per order is Rs. 500/-. Find economic order quantity and number of orders to be placed per month.

b) Write a note various types inventory cost. Explain graphically how the Economic Order Quantity (EOQ) balances the trade-off between Inventory Carrying Cost and Ordering Cost.

c) Write a detailed note on ABC analysis. Explain with a graphical representation.

Seat No.	

Set **S**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Operation Research and Management (CIVMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
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4) Assume suitable data if necessary and mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternative from the options. 14

1) Games without a saddle point require player to play _____.
a) Mixed strategies b) Pure strategies
c) Dominated strategies d) None of these

2) Optimization means _____.
a) Maximization
b) Minimization or Maximization
c) Minimization
d) Avg. Minimization & Maximization

3) EOQ model helps to find _____.
a) Optimum size of order
b) Time interval between order
c) Both a) and b)
d) None of these

4) If F = Fixed Cost, V = Variable Cost, S = Selling Price then, BEP (Quantity) = _____.
a) $\mathrm{V}/(\mathrm{S}-\mathrm{F})$ b) $\mathrm{F}/(\mathrm{S}-\mathrm{V})$
c) $\mathrm{V}+\mathrm{S}+\mathrm{F}$ d) $(\mathrm{S}-\mathrm{V})2$

5) Functional organization is invented by _____.
a) F.W. Taylor b) Gilbert
c) Peter Drucker d) Henry Fayol

6) Maximisation problem in LPP will involve _____.
a) Slack variable b) Surplus variable
c) Both a and b d) None of these

7) Allocation of units is not dependent on transport cost in _____.
a) VAM method
b) NW corner method
c) Both of these
d) None of these

8) The size of the payoff matrix of a game can be reduced by using the principle of _____.
a) game inversion
b) rotation reduction
c) dominance
d) game transpose

9) In ABC analysis least monitoring and control is required for _____.
a) A class item
b) B class items
c) C class items
d) All of these

10) MBO is developed by _____.
a) Peter Drucker
b) Gilbert
c) F. W. Taylor
d) Henry Fayol

11) Graphical Method is most suitable if number of decision variables are _____.
a) Two
b) Three
c) Four
d) Zero

12) Dual of the Dual is _____.
a) Dual
b) Zero
c) Primal
d) Infinity

13) What is the condition of Balance Assignment Problem?
a) $\sum$ Demand = $\sum$ Supply
b) No. of rows > No. of column
c) No. of rows < No. of column
d) No. of rows = No. of columns

14) Major elements of queuing system are _____.
a) Customer
b) Queue
c) Service Channel
d) All the above

Seat No.	

Set **S**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Operation Research and Management (CIVMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
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SECTION – I

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Demand		3	3	4	5	6	

b) Four different jobs can be done on 4 different machines. The set-up takedown time cost are assumed to be prohibitively high for changeovers. The matrix below gives the cost in rupees for producing job i on machine j.

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b) Write a note various types inventory cost. Explain graphically how the Economic Order Quantity (EOQ) balances the trade-off between Inventory Carrying Cost and Ordering Cost.

c) Write a detailed note on ABC analysis. Explain with a graphical representation.

SLR-QH-637

Seat No.	

Set P

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Advanced Materials and Manufacturing Process (MECHMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answers from the given options. 14

1) Composite materials with copper as a matrix are typically used for _____.
a) Fuel tanks
b) Electrical and thermal applications
c) Optical fibers
d) Bulletproof vests

2) The ability of a material to withstand high-stress concentration for a long time without failure refers to _____.
a) Ductility b) Wear resistance
c) Fatigue strength d) Hardness

3) Selection of materials for marine applications mainly depends on _____.
a) Thermal conductivity b) Corrosion resistance
c) Electrical resistivity d) Machinability

4) Composite materials are made by combining two or more materials to _____.
a) Increase cost
b) Improve overall performance
c) Reduce quality
d) Increase weight

5) Shape Memory Alloys (SMAs) are mainly used in biomedical applications because they can _____.
a) Conduct electricity like copper
b) Remember and return to their original shape when heated
c) Resist corrosion like stainless steel
d) Glow under ultraviolet light

6) Carbon nanotubes are a type of _____.
a) Polymer fiber
b) Ceramic powder
c) Cylindrical nanostructure made of carbon atoms
d) Composite alloy

7) Which of the following is a major factor affecting the machining rate in Water Jet Machining?
a) Type of abrasive used
b) Pressure of the water jet
c) Type of material
d) Frequency of vibration

8) Varistors are primarily used for _____.
a) Filtering light
b) Enhancing thermal conductivity
c) Protecting circuits from voltage surges
d) Insulation

9) The In the powder preparation process for ceramics, which of the following is essential for ensuring uniformity in the powder?
a) Crushing
b) Pulverization
c) Mixing
d) Heating

10) In the preparation of composite materials, which of the following is used as reinforcement?
a) Metal alloys
b) Ceramics
c) Fibers or particulates
d) Alloys

11) In Electrical Discharge Machining (EDM), the material removal occurs due to _____.
a) Electrical discharges
b) Abrasive action
c) Laser heat generation
d) Ionization of air

12) Laser-based automation in manufacturing allows for _____.
a) Reduced precision
b) Slower production rates
c) Improved repeatability
d) Increased tool wear

13) The main advantage of hard machining using single point tools is _____.
a) Faster machining time
b) Better surface finish
c) Ability to machine hard materials
d) Lower tooling costs

14) In-process sensing with lasers is most commonly used for _____.
a) Tool wear detection
b) Material composition analysis
c) Dimensional Measurement
d) Cutting speed control

SLR-QH-637

Seat No.	

Set P

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Advanced Materials and Manufacturing Process (MECHMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw neat-labelled diagrams wherever necessary.

SECTION – I

Q.2 Attempt Any Two Questions.

a) Describe the role of epoxy resins and unsaturated polyesters in composites. What makes them popular as matrix materials? **05**

b) Explain with examples the structure and applications of polymer matrix composites and metallic matrix composites. **05**

c) Discuss the characteristics and properties of fiber-reinforced composites and their applications in aerospace. **05**

Q.3 Attempt Any Two Questions.

a) Explain the criteria for selecting materials based on strength, toughness, fatigue, and creep. Give one example for each. **05**

b) Discuss the interrelationship between material selection and manufacturing processes. Illustrate with one case study from the automotive industry. **05**

c) Describe the factors influencing the cost-based material selection process and its industrial significance. **05**

Q.4 Write Short Note. (Any Two)

a) High-speed and high-performance grinding in industry. **04**

b) Shape Memory Alloys - composition and working principle. **04**

c) Smart materials used in biomedical systems. **04**

SECTION – II

Q.5 Attempt Any Two Questions.

a) Explain the steps in processing of particulate ceramics - powder preparation, drying, and sintering. **05**

b) Describe the structure and applications of MMC, CMC, and PMC. **05**

c) Explain finishing operations in ceramics and their significance. **05**

Q.6 Attempt Any Two Questions.

a) Explain the working principle of Water Jet Machining and its industrial uses. **05**

b) Compare AJM, USM, and WJM in terms of mechanism and suitability. **05**

c) Discuss the need for non-traditional machining and name at least three such processes. **05**

Q.7 Write Short Note. (Any Two)

a) Laser applications in automation and process control. **04**

b) Automation and in-process sensing in modern machining. **04**

c) Hard machining and its applications in manufacturing hardened steels. **04**

SLR-QH-637

Seat No.	

Set Q

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Advanced Materials and Manufacturing Process (MECHMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top on page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answers from the given options. 14

1) Varistors are primarily used for _____.
a) Filtering light
b) Enhancing thermal conductivity
c) Protecting circuits from voltage surges
d) Insulation

2) The In the powder preparation process for ceramics, which of the following is essential for ensuring uniformity in the powder?
a) Crushing b) Pulverization
c) Mixing d) Heating

3) In the preparation of composite materials, which of the following is used as reinforcement?
a) Metal alloys b) Ceramics
c) Fibers or particulates d) Alloys

4) In Electrical Discharge Machining (EDM), the material removal occurs due to _____.
a) Electrical discharges b) Abrasive action
c) Laser heat generation d) Ionization of air

5) Laser-based automation in manufacturing allows for _____.
a) Reduced precision b) Slower production rates
c) Improved repeatability d) Increased tool wear

6) The main advantage of hard machining using single point tools is _____.
a) Faster machining time
b) Better surface finish
c) Ability to machine hard materials
d) Lower tooling costs

7) In-process sensing with lasers is most commonly used for _____.
a) Tool wear detection
b) Material composition analysis
c) Dimensional Measurement
d) Cutting speed control

8) Composite materials with copper as a matrix are typically used for _____.
a) Fuel tanks
b) Electrical and thermal applications
c) Optical fibers
d) Bulletproof vests

9) The ability of a material to withstand high-stress concentration for a long time without failure refers to _____.
a) Ductility
b) Wear resistance
c) Fatigue strength
d) Hardness

10) Selection of materials for marine applications mainly depends on _____.
a) Thermal conductivity
b) Corrosion resistance
c) Electrical resistivity
d) Machinability

11) Composite materials are made by combining two or more materials to _____.
a) Increase cost
b) Improve overall performance
c) Reduce quality
d) Increase weight

12) Shape Memory Alloys (SMAs) are mainly used in biomedical applications because they can _____.
a) Conduct electricity like copper
b) Remember and return to their original shape when heated
c) Resist corrosion like stainless steel
d) Glow under ultraviolet light

13) Carbon nanotubes are a type of _____.
a) Polymer fiber
b) Ceramic powder
c) Cylindrical nanostructure made of carbon atoms
d) Composite alloy

14) Which of the following is a major factor affecting the machining rate in Water Jet Machining?
a) Type of abrasive used
b) Pressure of the water jet
c) Type of material
d) Frequency of vibration

SLR-QH-637

Seat No.	

Set Q

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Advanced Materials and Manufacturing Process (MECHMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
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SECTION – I

Q.2 Attempt Any Two Questions.

a) Describe the role of epoxy resins and unsaturated polyesters in composites. What makes them popular as matrix materials? **05**

b) Explain with examples the structure and applications of polymer matrix composites and metallic matrix composites. **05**

c) Discuss the characteristics and properties of fiber-reinforced composites and their applications in aerospace. **05**

Q.3 Attempt Any Two Questions.

a) Explain the criteria for selecting materials based on strength, toughness, fatigue, and creep. Give one example for each. **05**

b) Discuss the interrelationship between material selection and manufacturing processes. Illustrate with one case study from the automotive industry. **05**

c) Describe the factors influencing the cost-based material selection process and its industrial significance. **05**

Q.4 Write Short Note. (Any Two)

a) High-speed and high-performance grinding in industry. **04**

b) Shape Memory Alloys - composition and working principle. **04**

c) Smart materials used in biomedical systems. **04**

SECTION – II

Q.5 Attempt Any Two Questions.

a) Explain the steps in processing of particulate ceramics - powder preparation, drying, and sintering. **05**

b) Describe the structure and applications of MMC, CMC, and PMC. **05**

c) Explain finishing operations in ceramics and their significance. **05**

Q.6 Attempt Any Two Questions.

a) Explain the working principle of Water Jet Machining and its industrial uses. **05**

b) Compare AJM, USM, and WJM in terms of mechanism and suitability. **05**

c) Discuss the need for non-traditional machining and name at least three such processes. **05**

Q.7 Write Short Note. (Any Two)

a) Laser applications in automation and process control. **04**

b) Automation and in-process sensing in modern machining. **04**

c) Hard machining and its applications in manufacturing hardened steels. **04**

Seat No.	

Set **R**

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Advanced Materials and Manufacturing Process (MECHMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answers from the given options. **14**

1) In Electrical Discharge Machining (EDM), the material removal occurs due to _____.
a) Electrical discharges b) Abrasive action
c) Laser heat generation d) Ionization of air

2) Laser-based automation in manufacturing allows for _____.
a) Reduced precision b) Slower production rates
c) Improved repeatability d) Increased tool wear

3) The main advantage of hard machining using single point tools is _____.
a) Faster machining time
b) Better surface finish
c) Ability to machine hard materials
d) Lower tooling costs

4) In-process sensing with lasers is most commonly used for _____.
a) Tool wear detection
b) Material composition analysis
c) Dimensional Measurement
d) Cutting speed control

5) Composite materials with copper as a matrix are typically used for _____.
a) Fuel tanks
b) Electrical and thermal applications
c) Optical fibers
d) Bulletproof vests

6) The ability of a material to withstand high-stress concentration for a long time without failure refers to _____.
a) Ductility b) Wear resistance
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SLR-QH-637

Seat No.	

Set R

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Examination: March/April – 2026
Advanced Materials and Manufacturing Process (MECHMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
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Seat No.	

Set | S

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Advanced Materials and Manufacturing Process (MECHMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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Duration: 30 Minutes Marks:14

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d) Lower tooling costs

9) In-process sensing with lasers is most commonly used for _____.
a) Tool wear detection
b) Material composition analysis
c) Dimensional Measurement
d) Cutting speed control

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b) Electrical and thermal applications
c) Optical fibers
d) Bulletproof vests

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c) Fatigue strength
d) Hardness

12) Selection of materials for marine applications mainly depends on _____.
a) Thermal conductivity
b) Corrosion resistance
c) Electrical resistivity
d) Machinability

13) Composite materials are made by combining two or more materials to _____.
a) Increase cost
b) Improve overall performance
c) Reduce quality
d) Increase weight

14) Shape Memory Alloys (SMAs) are mainly used in biomedical applications because they can _____.
a) Conduct electricity like copper
b) Remember and return to their original shape when heated
c) Resist corrosion like stainless steel
d) Glow under ultraviolet light

SLR-QH-637

Seat No.	

Set S

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Advanced Materials and Manufacturing Process (MECHMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw neat-labelled diagrams wherever necessary.

SECTION – I

Q.2 Attempt Any Two Questions.

a) Describe the role of epoxy resins and unsaturated polyesters in composites. What makes them popular as matrix materials? **05**

b) Explain with examples the structure and applications of polymer matrix composites and metallic matrix composites. **05**

c) Discuss the characteristics and properties of fiber-reinforced composites and their applications in aerospace. **05**

Q.3 Attempt Any Two Questions.

a) Explain the criteria for selecting materials based on strength, toughness, fatigue, and creep. Give one example for each. **05**

b) Discuss the interrelationship between material selection and manufacturing processes. Illustrate with one case study from the automotive industry. **05**

c) Describe the factors influencing the cost-based material selection process and its industrial significance. **05**

Q.4 Write Short Note. (Any Two)

a) High-speed and high-performance grinding in industry. **04**

b) Shape Memory Alloys - composition and working principle. **04**

c) Smart materials used in biomedical systems. **04**

SECTION – II

Q.5 Attempt Any Two Questions.

a) Explain the steps in processing of particulate ceramics - powder preparation, drying, and sintering. **05**

b) Describe the structure and applications of MMC, CMC, and PMC. **05**

c) Explain finishing operations in ceramics and their significance. **05**

Q.6 Attempt Any Two Questions.

a) Explain the working principle of Water Jet Machining and its industrial uses. **05**

b) Compare AJM, USM, and WJM in terms of mechanism and suitability. **05**

c) Discuss the need for non-traditional machining and name at least three such processes. **05**

Q.7 Write Short Note. (Any Two)

a) Laser applications in automation and process control. **04**

b) Automation and in-process sensing in modern machining. **04**

c) Hard machining and its applications in manufacturing hardened steels. **04**

SLR-QH-637

Seat No.	

Set P

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Advanced Materials and Manufacturing Process (MECHMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top on page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answers from the given options. 14

1) Composite materials with copper as a matrix are typically used for _____.
a) Fuel tanks
b) Electrical and thermal applications
c) Optical fibers
d) Bulletproof vests

2) The ability of a material to withstand high-stress concentration for a long time without failure refers to _____.
a) Ductility b) Wear resistance
c) Fatigue strength d) Hardness

3) Selection of materials for marine applications mainly depends on _____.
a) Thermal conductivity b) Corrosion resistance
c) Electrical resistivity d) Machinability

4) Composite materials are made by combining two or more materials to _____.
a) Increase cost
b) Improve overall performance
c) Reduce quality
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d) Glow under ultraviolet light

6) Carbon nanotubes are a type of _____.
a) Polymer fiber
b) Ceramic powder
c) Cylindrical nanostructure made of carbon atoms
d) Composite alloy

7) Which of the following is a major factor affecting the machining rate in Water Jet Machining?
a) Type of abrasive used
b) Pressure of the water jet
c) Type of material
d) Frequency of vibration

8) Varistors are primarily used for _____.
a) Filtering light
b) Enhancing thermal conductivity
c) Protecting circuits from voltage surges
d) Insulation

9) The In the powder preparation process for ceramics, which of the following is essential for ensuring uniformity in the powder?
a) Crushing
b) Pulverization
c) Mixing
d) Heating

10) In the preparation of composite materials, which of the following is used as reinforcement?
a) Metal alloys
b) Ceramics
c) Fibers or particulates
d) Alloys

11) In Electrical Discharge Machining (EDM), the material removal occurs due to _____.
a) Electrical discharges
b) Abrasive action
c) Laser heat generation
d) Ionization of air

12) Laser-based automation in manufacturing allows for _____.
a) Reduced precision
b) Slower production rates
c) Improved repeatability
d) Increased tool wear

13) The main advantage of hard machining using single point tools is _____.
a) Faster machining time
b) Better surface finish
c) Ability to machine hard materials
d) Lower tooling costs

14) In-process sensing with lasers is most commonly used for _____.
a) Tool wear detection
b) Material composition analysis
c) Dimensional Measurement
d) Cutting speed control

SLR-QH-637

Seat No.	

Set P

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Advanced Materials and Manufacturing Process (MECHMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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3) Draw neat-labelled diagrams wherever necessary.

SECTION – I

Q.2 Attempt Any Two Questions.

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b) Explain with examples the structure and applications of polymer matrix composites and metallic matrix composites. **05**

c) Discuss the characteristics and properties of fiber-reinforced composites and their applications in aerospace. **05**

Q.3 Attempt Any Two Questions.

a) Explain the criteria for selecting materials based on strength, toughness, fatigue, and creep. Give one example for each. **05**

b) Discuss the interrelationship between material selection and manufacturing processes. Illustrate with one case study from the automotive industry. **05**

c) Describe the factors influencing the cost-based material selection process and its industrial significance. **05**

Q.4 Write Short Note. (Any Two)

a) High-speed and high-performance grinding in industry. **04**

b) Shape Memory Alloys - composition and working principle. **04**

c) Smart materials used in biomedical systems. **04**

SECTION – II

Q.5 Attempt Any Two Questions.

a) Explain the steps in processing of particulate ceramics - powder preparation, drying, and sintering. **05**

b) Describe the structure and applications of MMC, CMC, and PMC. **05**

c) Explain finishing operations in ceramics and their significance. **05**

Q.6 Attempt Any Two Questions.

a) Explain the working principle of Water Jet Machining and its industrial uses. **05**

b) Compare AJM, USM, and WJM in terms of mechanism and suitability. **05**

c) Discuss the need for non-traditional machining and name at least three such processes. **05**

Q.7 Write Short Note. (Any Two)

a) Laser applications in automation and process control. **04**

b) Automation and in-process sensing in modern machining. **04**

c) Hard machining and its applications in manufacturing hardened steels. **04**

SLR-QH-637

Seat No.	

Set Q

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Advanced Materials and Manufacturing Process (MECHMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answers from the given options. 14

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5) Laser-based automation in manufacturing allows for _____.
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c) Improved repeatability d) Increased tool wear

6) The main advantage of hard machining using single point tools is _____.
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b) Better surface finish
c) Ability to machine hard materials
d) Lower tooling costs

7) In-process sensing with lasers is most commonly used for _____.
a) Tool wear detection
b) Material composition analysis
c) Dimensional Measurement
d) Cutting speed control

8) Composite materials with copper as a matrix are typically used for _____.
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d) Bulletproof vests

9) The ability of a material to withstand high-stress concentration for a long time without failure refers to _____.
a) Ductility
b) Wear resistance
c) Fatigue strength
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b) Improve overall performance
c) Reduce quality
d) Increase weight

12) Shape Memory Alloys (SMAs) are mainly used in biomedical applications because they can _____.
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b) Remember and return to their original shape when heated
c) Resist corrosion like stainless steel
d) Glow under ultraviolet light

13) Carbon nanotubes are a type of _____.
a) Polymer fiber
b) Ceramic powder
c) Cylindrical nanostructure made of carbon atoms
d) Composite alloy

14) Which of the following is a major factor affecting the machining rate in Water Jet Machining?
a) Type of abrasive used
b) Pressure of the water jet
c) Type of material
d) Frequency of vibration

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Advanced Materials and Manufacturing Process (MECHMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw neat-labelled diagrams wherever necessary.

SECTION – I

Q.2 Attempt Any Two Questions.

a) Describe the role of epoxy resins and unsaturated polyesters in composites. What makes them popular as matrix materials? **05**

b) Explain with examples the structure and applications of polymer matrix composites and metallic matrix composites. **05**

c) Discuss the characteristics and properties of fiber-reinforced composites and their applications in aerospace. **05**

Q.3 Attempt Any Two Questions.

a) Explain the criteria for selecting materials based on strength, toughness, fatigue, and creep. Give one example for each. **05**

b) Discuss the interrelationship between material selection and manufacturing processes. Illustrate with one case study from the automotive industry. **05**

c) Describe the factors influencing the cost-based material selection process and its industrial significance. **05**

Q.4 Write Short Note. (Any Two)

a) High-speed and high-performance grinding in industry. **04**

b) Shape Memory Alloys - composition and working principle. **04**

c) Smart materials used in biomedical systems. **04**

SECTION – II

Q.5 Attempt Any Two Questions.

a) Explain the steps in processing of particulate ceramics - powder preparation, drying, and sintering. **05**

b) Describe the structure and applications of MMC, CMC, and PMC. **05**

c) Explain finishing operations in ceramics and their significance. **05**

Q.6 Attempt Any Two Questions.

a) Explain the working principle of Water Jet Machining and its industrial uses. **05**

b) Compare AJM, USM, and WJM in terms of mechanism and suitability. **05**

c) Discuss the need for non-traditional machining and name at least three such processes. **05**

Q.7 Write Short Note. (Any Two)

a) Laser applications in automation and process control. **04**

b) Automation and in-process sensing in modern machining. **04**

c) Hard machining and its applications in manufacturing hardened steels. **04**

Seat No.	

Set **R**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Advanced Materials and Manufacturing Process (MECHMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top on page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answers from the given options. **14**

1) In Electrical Discharge Machining (EDM), the material removal occurs due to _____.
a) Electrical discharges b) Abrasive action
c) Laser heat generation d) Ionization of air

2) Laser-based automation in manufacturing allows for _____.
a) Reduced precision b) Slower production rates
c) Improved repeatability d) Increased tool wear

3) The main advantage of hard machining using single point tools is _____.
a) Faster machining time
b) Better surface finish
c) Ability to machine hard materials
d) Lower tooling costs

4) In-process sensing with lasers is most commonly used for _____.
a) Tool wear detection
b) Material composition analysis
c) Dimensional Measurement
d) Cutting speed control

5) Composite materials with copper as a matrix are typically used for _____.
a) Fuel tanks
b) Electrical and thermal applications
c) Optical fibers
d) Bulletproof vests

6) The ability of a material to withstand high-stress concentration for a long time without failure refers to _____.
a) Ductility b) Wear resistance
c) Fatigue strength d) Hardness

7) Selection of materials for marine applications mainly depends on _____.
a) Thermal conductivity b) Corrosion resistance
c) Electrical resistivity d) Machinability

8) Composite materials are made by combining two or more materials to _____.
a) Increase cost
b) Improve overall performance
c) Reduce quality
d) Increase weight

9) Shape Memory Alloys (SMAs) are mainly used in biomedical applications because they can _____.
a) Conduct electricity like copper
b) Remember and return to their original shape when heated
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d) Glow under ultraviolet light

10) Carbon nanotubes are a type of _____.
a) Polymer fiber
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11) Which of the following is a major factor affecting the machining rate in Water Jet Machining?
a) Type of abrasive used b) Pressure of the water jet
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12) Varistors are primarily used for _____.
a) Filtering light
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13) The In the powder preparation process for ceramics, which of the following is essential for ensuring uniformity in the powder?
a) Crushing b) Pulverization
c) Mixing d) Heating

14) In the preparation of composite materials, which of the following is used as reinforcement?
a) Metal alloys b) Ceramics
c) Fibers or particulates d) Alloys

SLR-QH-637

Seat No.	

Set R

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Advanced Materials and Manufacturing Process (MECHMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw neat-labelled diagrams wherever necessary.

SECTION – I

Q.2 Attempt Any Two Questions.

a) Describe the role of epoxy resins and unsaturated polyesters in composites. What makes them popular as matrix materials? **05**

b) Explain with examples the structure and applications of polymer matrix composites and metallic matrix composites. **05**

c) Discuss the characteristics and properties of fiber-reinforced composites and their applications in aerospace. **05**

Q.3 Attempt Any Two Questions.

a) Explain the criteria for selecting materials based on strength, toughness, fatigue, and creep. Give one example for each. **05**

b) Discuss the interrelationship between material selection and manufacturing processes. Illustrate with one case study from the automotive industry. **05**

c) Describe the factors influencing the cost-based material selection process and its industrial significance. **05**

Q.4 Write Short Note. (Any Two)

a) High-speed and high-performance grinding in industry. **04**

b) Shape Memory Alloys - composition and working principle. **04**

c) Smart materials used in biomedical systems. **04**

SECTION – II

Q.5 Attempt Any Two Questions.

a) Explain the steps in processing of particulate ceramics - powder preparation, drying, and sintering. **05**

b) Describe the structure and applications of MMC, CMC, and PMC. **05**

c) Explain finishing operations in ceramics and their significance. **05**

Q.6 Attempt Any Two Questions.

a) Explain the working principle of Water Jet Machining and its industrial uses. **05**

b) Compare AJM, USM, and WJM in terms of mechanism and suitability. **05**

c) Discuss the need for non-traditional machining and name at least three such processes. **05**

Q.7 Write Short Note. (Any Two)

a) Laser applications in automation and process control. **04**

b) Automation and in-process sensing in modern machining. **04**

c) Hard machining and its applications in manufacturing hardened steels. **04**

SLR-QH-637

Seat No.	

Set S

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Advanced Materials and Manufacturing Process (MECHMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answers from the given options. 14

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c) Cylindrical nanostructure made of carbon atoms
d) Composite alloy

2) Which of the following is a major factor affecting the machining rate in Water Jet Machining?
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3) Varistors are primarily used for _____.
a) Filtering light
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4) The In the powder preparation process for ceramics, which of the following is essential for ensuring uniformity in the powder?
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10) Composite materials with copper as a matrix are typically used for _____.
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SLR-QH-637

Seat No.	

Set S

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Advanced Materials and Manufacturing Process (MECHMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
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SECTION – I

Q.2 Attempt Any Two Questions.

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c) Describe the factors influencing the cost-based material selection process and its industrial significance. **05**

Q.4 Write Short Note. (Any Two)

a) High-speed and high-performance grinding in industry. **04**

b) Shape Memory Alloys - composition and working principle. **04**

c) Smart materials used in biomedical systems. **04**

SECTION – II

Q.5 Attempt Any Two Questions.

a) Explain the steps in processing of particulate ceramics - powder preparation, drying, and sintering. **05**

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c) Explain finishing operations in ceramics and their significance. **05**

Q.6 Attempt Any Two Questions.

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SLR-QH-637

Seat No.	

Set P

T.Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Advanced Materials and Manufacturing Process (MECHMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answers from the given options. 14

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14) In-process sensing with lasers is most commonly used for _____.
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b) Material composition analysis
c) Dimensional Measurement
d) Cutting speed control

Seat No.	

Set **P**

T.Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Advanced Materials and Manufacturing Process (MECHMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
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SECTION – I

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Q.4 Write Short Note. (Any Two)

a) High-speed and high-performance grinding in industry. **04**

b) Shape Memory Alloys - composition and working principle. **04**

c) Smart materials used in biomedical systems. **04**

SECTION – II

Q.5 Attempt Any Two Questions.

a) Explain the steps in processing of particulate ceramics - powder preparation, drying, and sintering. **05**

b) Describe the structure and applications of MMC, CMC, and PMC. **05**

c) Explain finishing operations in ceramics and their significance. **05**

Q.6 Attempt Any Two Questions.

a) Explain the working principle of Water Jet Machining and its industrial uses. **05**

b) Compare AJM, USM, and WJM in terms of mechanism and suitability. **05**

c) Discuss the need for non-traditional machining and name at least three such processes. **05**

Q.7 Write Short Note. (Any Two)

a) Laser applications in automation and process control. **04**

b) Automation and in-process sensing in modern machining. **04**

c) Hard machining and its applications in manufacturing hardened steels. **04**

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Advanced Materials and Manufacturing Process (MECHMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top on page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answers from the given options. **14**

1) Varistors are primarily used for _____.
a) Filtering light
b) Enhancing thermal conductivity
c) Protecting circuits from voltage surges
d) Insulation

2) The In the powder preparation process for ceramics, which of the following is essential for ensuring uniformity in the powder?
a) Crushing b) Pulverization
c) Mixing d) Heating

3) In the preparation of composite materials, which of the following is used as reinforcement?
a) Metal alloys b) Ceramics
c) Fibers or particulates d) Alloys

4) In Electrical Discharge Machining (EDM), the material removal occurs due to _____.
a) Electrical discharges b) Abrasive action
c) Laser heat generation d) Ionization of air

5) Laser-based automation in manufacturing allows for _____.
a) Reduced precision b) Slower production rates
c) Improved repeatability d) Increased tool wear

6) The main advantage of hard machining using single point tools is _____.
a) Faster machining time
b) Better surface finish
c) Ability to machine hard materials
d) Lower tooling costs

7) In-process sensing with lasers is most commonly used for _____.
a) Tool wear detection
b) Material composition analysis
c) Dimensional Measurement
d) Cutting speed control

8) Composite materials with copper as a matrix are typically used for _____.
a) Fuel tanks
b) Electrical and thermal applications
c) Optical fibers
d) Bulletproof vests

9) The ability of a material to withstand high-stress concentration for a long time without failure refers to _____.
a) Ductility
b) Wear resistance
c) Fatigue strength
d) Hardness

10) Selection of materials for marine applications mainly depends on _____.
a) Thermal conductivity
b) Corrosion resistance
c) Electrical resistivity
d) Machinability

11) Composite materials are made by combining two or more materials to _____.
a) Increase cost
b) Improve overall performance
c) Reduce quality
d) Increase weight

12) Shape Memory Alloys (SMAs) are mainly used in biomedical applications because they can _____.
a) Conduct electricity like copper
b) Remember and return to their original shape when heated
c) Resist corrosion like stainless steel
d) Glow under ultraviolet light

13) Carbon nanotubes are a type of _____.
a) Polymer fiber
b) Ceramic powder
c) Cylindrical nanostructure made of carbon atoms
d) Composite alloy

14) Which of the following is a major factor affecting the machining rate in Water Jet Machining?
a) Type of abrasive used
b) Pressure of the water jet
c) Type of material
d) Frequency of vibration

SLR-QH-637

Seat No.	

Set Q

T.Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Advanced Materials and Manufacturing Process (MECHMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw neat-labelled diagrams wherever necessary.

SECTION – I

Q.2 Attempt Any Two Questions.

a) Describe the role of epoxy resins and unsaturated polyesters in composites. What makes them popular as matrix materials? **05**

b) Explain with examples the structure and applications of polymer matrix composites and metallic matrix composites. **05**

c) Discuss the characteristics and properties of fiber-reinforced composites and their applications in aerospace. **05**

Q.3 Attempt Any Two Questions.

a) Explain the criteria for selecting materials based on strength, toughness, fatigue, and creep. Give one example for each. **05**

b) Discuss the interrelationship between material selection and manufacturing processes. Illustrate with one case study from the automotive industry. **05**

c) Describe the factors influencing the cost-based material selection process and its industrial significance. **05**

Q.4 Write Short Note. (Any Two)

a) High-speed and high-performance grinding in industry. **04**

b) Shape Memory Alloys - composition and working principle. **04**

c) Smart materials used in biomedical systems. **04**

SECTION – II

Q.5 Attempt Any Two Questions.

a) Explain the steps in processing of particulate ceramics - powder preparation, drying, and sintering. **05**

b) Describe the structure and applications of MMC, CMC, and PMC. **05**

c) Explain finishing operations in ceramics and their significance. **05**

Q.6 Attempt Any Two Questions.

a) Explain the working principle of Water Jet Machining and its industrial uses. **05**

b) Compare AJM, USM, and WJM in terms of mechanism and suitability. **05**

c) Discuss the need for non-traditional machining and name at least three such processes. **05**

Q.7 Write Short Note. (Any Two)

a) Laser applications in automation and process control. **04**

b) Automation and in-process sensing in modern machining. **04**

c) Hard machining and its applications in manufacturing hardened steels. **04**

Seat No.	

Set **R**

T.Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Advanced Materials and Manufacturing Process (MECHMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top on page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answers from the given options. **14**

1) In Electrical Discharge Machining (EDM), the material removal occurs due to _____.
a) Electrical discharges b) Abrasive action
c) Laser heat generation d) Ionization of air

2) Laser-based automation in manufacturing allows for _____.
a) Reduced precision b) Slower production rates
c) Improved repeatability d) Increased tool wear

3) The main advantage of hard machining using single point tools is _____.
a) Faster machining time
b) Better surface finish
c) Ability to machine hard materials
d) Lower tooling costs

4) In-process sensing with lasers is most commonly used for _____.
a) Tool wear detection
b) Material composition analysis
c) Dimensional Measurement
d) Cutting speed control

5) Composite materials with copper as a matrix are typically used for _____.
a) Fuel tanks
b) Electrical and thermal applications
c) Optical fibers
d) Bulletproof vests

6) The ability of a material to withstand high-stress concentration for a long time without failure refers to _____.
a) Ductility b) Wear resistance
c) Fatigue strength d) Hardness

7) Selection of materials for marine applications mainly depends on _____.
a) Thermal conductivity b) Corrosion resistance
c) Electrical resistivity d) Machinability

8) Composite materials are made by combining two or more materials to _____.
a) Increase cost
b) Improve overall performance
c) Reduce quality
d) Increase weight

9) Shape Memory Alloys (SMAs) are mainly used in biomedical applications because they can _____.
a) Conduct electricity like copper
b) Remember and return to their original shape when heated
c) Resist corrosion like stainless steel
d) Glow under ultraviolet light

10) Carbon nanotubes are a type of _____.
a) Polymer fiber
b) Ceramic powder
c) Cylindrical nanostructure made of carbon atoms
d) Composite alloy

11) Which of the following is a major factor affecting the machining rate in Water Jet Machining?
a) Type of abrasive used b) Pressure of the water jet
c) Type of material d) Frequency of vibration

12) Varistors are primarily used for _____.
a) Filtering light
b) Enhancing thermal conductivity
c) Protecting circuits from voltage surges
d) Insulation

13) The In the powder preparation process for ceramics, which of the following is essential for ensuring uniformity in the powder?
a) Crushing b) Pulverization
c) Mixing d) Heating

14) In the preparation of composite materials, which of the following is used as reinforcement?
a) Metal alloys b) Ceramics
c) Fibers or particulates d) Alloys

Seat No.	

Set **R**

T.Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Advanced Materials and Manufacturing Process (MECHMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw neat-labelled diagrams wherever necessary.

SECTION – I

Q.2 Attempt Any Two Questions.

a) Describe the role of epoxy resins and unsaturated polyesters in composites. What makes them popular as matrix materials? **05**

b) Explain with examples the structure and applications of polymer matrix composites and metallic matrix composites. **05**

c) Discuss the characteristics and properties of fiber-reinforced composites and their applications in aerospace. **05**

Q.3 Attempt Any Two Questions.

a) Explain the criteria for selecting materials based on strength, toughness, fatigue, and creep. Give one example for each. **05**

b) Discuss the interrelationship between material selection and manufacturing processes. Illustrate with one case study from the automotive industry. **05**

c) Describe the factors influencing the cost-based material selection process and its industrial significance. **05**

Q.4 Write Short Note. (Any Two)

a) High-speed and high-performance grinding in industry. **04**

b) Shape Memory Alloys - composition and working principle. **04**

c) Smart materials used in biomedical systems. **04**

SECTION – II

Q.5 Attempt Any Two Questions.

a) Explain the steps in processing of particulate ceramics - powder preparation, drying, and sintering. **05**

b) Describe the structure and applications of MMC, CMC, and PMC. **05**

c) Explain finishing operations in ceramics and their significance. **05**

Q.6 Attempt Any Two Questions.

a) Explain the working principle of Water Jet Machining and its industrial uses. **05**

b) Compare AJM, USM, and WJM in terms of mechanism and suitability. **05**

c) Discuss the need for non-traditional machining and name at least three such processes. **05**

Q.7 Write Short Note. (Any Two)

a) Laser applications in automation and process control. **04**

b) Automation and in-process sensing in modern machining. **04**

c) Hard machining and its applications in manufacturing hardened steels. **04**

Seat No.		Set	S

T.Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Advanced Materials and Manufacturing Process (MECHMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top on page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answers from the given options. 14

1) Carbon nanotubes are a type of _____.
a) Polymer fiber
b) Ceramic powder
c) Cylindrical nanostructure made of carbon atoms
d) Composite alloy

2) Which of the following is a major factor affecting the machining rate in Water Jet Machining?
a) Type of abrasive used b) Pressure of the water jet
c) Type of material d) Frequency of vibration

3) Varistors are primarily used for _____.
a) Filtering light
b) Enhancing thermal conductivity
c) Protecting circuits from voltage surges
d) Insulation

4) The In the powder preparation process for ceramics, which of the following is essential for ensuring uniformity in the powder?
a) Crushing b) Pulverization
c) Mixing d) Heating

5) In the preparation of composite materials, which of the following is used as reinforcement?
a) Metal alloys b) Ceramics
c) Fibers or particulates d) Alloys

6) In Electrical Discharge Machining (EDM), the material removal occurs due to _____.
a) Electrical discharges b) Abrasive action
c) Laser heat generation d) Ionization of air

7) Laser-based automation in manufacturing allows for _____.
a) Reduced precision
b) Slower production rates
c) Improved repeatability
d) Increased tool wear

8) The main advantage of hard machining using single point tools is _____.
a) Faster machining time
b) Better surface finish
c) Ability to machine hard materials
d) Lower tooling costs

9) In-process sensing with lasers is most commonly used for _____.
a) Tool wear detection
b) Material composition analysis
c) Dimensional Measurement
d) Cutting speed control

10) Composite materials with copper as a matrix are typically used for _____.
a) Fuel tanks
b) Electrical and thermal applications
c) Optical fibers
d) Bulletproof vests

11) The ability of a material to withstand high-stress concentration for a long time without failure refers to _____.
a) Ductility
b) Wear resistance
c) Fatigue strength
d) Hardness

12) Selection of materials for marine applications mainly depends on _____.
a) Thermal conductivity
b) Corrosion resistance
c) Electrical resistivity
d) Machinability

13) Composite materials are made by combining two or more materials to _____.
a) Increase cost
b) Improve overall performance
c) Reduce quality
d) Increase weight

14) Shape Memory Alloys (SMAs) are mainly used in biomedical applications because they can _____.
a) Conduct electricity like copper
b) Remember and return to their original shape when heated
c) Resist corrosion like stainless steel
d) Glow under ultraviolet light

SLR-QH-637

Seat No.	

Set S

T.Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Advanced Materials and Manufacturing Process (MECHMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw neat-labelled diagrams wherever necessary.

SECTION – I

Q.2 Attempt Any Two Questions.

a) Describe the role of epoxy resins and unsaturated polyesters in composites. What makes them popular as matrix materials? **05**

b) Explain with examples the structure and applications of polymer matrix composites and metallic matrix composites. **05**

c) Discuss the characteristics and properties of fiber-reinforced composites and their applications in aerospace. **05**

Q.3 Attempt Any Two Questions.

a) Explain the criteria for selecting materials based on strength, toughness, fatigue, and creep. Give one example for each. **05**

b) Discuss the interrelationship between material selection and manufacturing processes. Illustrate with one case study from the automotive industry. **05**

c) Describe the factors influencing the cost-based material selection process and its industrial significance. **05**

Q.4 Write Short Note. (Any Two)

a) High-speed and high-performance grinding in industry. **04**

b) Shape Memory Alloys - composition and working principle. **04**

c) Smart materials used in biomedical systems. **04**

SECTION – II

Q.5 Attempt Any Two Questions.

a) Explain the steps in processing of particulate ceramics - powder preparation, drying, and sintering. **05**

b) Describe the structure and applications of MMC, CMC, and PMC. **05**

c) Explain finishing operations in ceramics and their significance. **05**

Q.6 Attempt Any Two Questions.

a) Explain the working principle of Water Jet Machining and its industrial uses. **05**

b) Compare AJM, USM, and WJM in terms of mechanism and suitability. **05**

c) Discuss the need for non-traditional machining and name at least three such processes. **05**

Q.7 Write Short Note. (Any Two)

a) Laser applications in automation and process control. **04**

b) Automation and in-process sensing in modern machining. **04**

c) Hard machining and its applications in manufacturing hardened steels. **04**

SLR-QH-637

Seat No.	

Set P

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Advanced Materials and Manufacturing Process (MECHMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top on page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answers from the given options. 14

1) Composite materials with copper as a matrix are typically used for _____.
a) Fuel tanks
b) Electrical and thermal applications
c) Optical fibers
d) Bulletproof vests

2) The ability of a material to withstand high-stress concentration for a long time without failure refers to _____.
a) Ductility b) Wear resistance
c) Fatigue strength d) Hardness

3) Selection of materials for marine applications mainly depends on _____.
a) Thermal conductivity b) Corrosion resistance
c) Electrical resistivity d) Machinability

4) Composite materials are made by combining two or more materials to _____.
a) Increase cost
b) Improve overall performance
c) Reduce quality
d) Increase weight

5) Shape Memory Alloys (SMAs) are mainly used in biomedical applications because they can _____.
a) Conduct electricity like copper
b) Remember and return to their original shape when heated
c) Resist corrosion like stainless steel
d) Glow under ultraviolet light

6) Carbon nanotubes are a type of _____.
a) Polymer fiber
b) Ceramic powder
c) Cylindrical nanostructure made of carbon atoms
d) Composite alloy

7) Which of the following is a major factor affecting the machining rate in Water Jet Machining?
a) Type of abrasive used
b) Pressure of the water jet
c) Type of material
d) Frequency of vibration

8) Varistors are primarily used for _____.
a) Filtering light
b) Enhancing thermal conductivity
c) Protecting circuits from voltage surges
d) Insulation

9) The In the powder preparation process for ceramics, which of the following is essential for ensuring uniformity in the powder?
a) Crushing
b) Pulverization
c) Mixing
d) Heating

10) In the preparation of composite materials, which of the following is used as reinforcement?
a) Metal alloys
b) Ceramics
c) Fibers or particulates
d) Alloys

11) In Electrical Discharge Machining (EDM), the material removal occurs due to _____.
a) Electrical discharges
b) Abrasive action
c) Laser heat generation
d) Ionization of air

12) Laser-based automation in manufacturing allows for _____.
a) Reduced precision
b) Slower production rates
c) Improved repeatability
d) Increased tool wear

13) The main advantage of hard machining using single point tools is _____.
a) Faster machining time
b) Better surface finish
c) Ability to machine hard materials
d) Lower tooling costs

14) In-process sensing with lasers is most commonly used for _____.
a) Tool wear detection
b) Material composition analysis
c) Dimensional Measurement
d) Cutting speed control

Seat No.	

Set **P**

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Advanced Materials and Manufacturing Process (MECHMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw neat-labelled diagrams wherever necessary.

SECTION – I

Q.2 Attempt Any Two Questions.

a) Describe the role of epoxy resins and unsaturated polyesters in composites. What makes them popular as matrix materials? **05**

b) Explain with examples the structure and applications of polymer matrix composites and metallic matrix composites. **05**

c) Discuss the characteristics and properties of fiber-reinforced composites and their applications in aerospace. **05**

Q.3 Attempt Any Two Questions.

a) Explain the criteria for selecting materials based on strength, toughness, fatigue, and creep. Give one example for each. **05**

b) Discuss the interrelationship between material selection and manufacturing processes. Illustrate with one case study from the automotive industry. **05**

c) Describe the factors influencing the cost-based material selection process and its industrial significance. **05**

Q.4 Write Short Note. (Any Two)

a) High-speed and high-performance grinding in industry. **04**

b) Shape Memory Alloys - composition and working principle. **04**

c) Smart materials used in biomedical systems. **04**

SECTION – II

Q.5 Attempt Any Two Questions.

a) Explain the steps in processing of particulate ceramics - powder preparation, drying, and sintering. **05**

b) Describe the structure and applications of MMC, CMC, and PMC. **05**

c) Explain finishing operations in ceramics and their significance. **05**

Q.6 Attempt Any Two Questions.

a) Explain the working principle of Water Jet Machining and its industrial uses. **05**

b) Compare AJM, USM, and WJM in terms of mechanism and suitability. **05**

c) Discuss the need for non-traditional machining and name at least three such processes. **05**

Q.7 Write Short Note. (Any Two)

a) Laser applications in automation and process control. **04**

b) Automation and in-process sensing in modern machining. **04**

c) Hard machining and its applications in manufacturing hardened steels. **04**

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Advanced Materials and Manufacturing Process (MECHMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top on page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answers from the given options. **14**

1) Varistors are primarily used for _____.
a) Filtering light
b) Enhancing thermal conductivity
c) Protecting circuits from voltage surges
d) Insulation

2) The In the powder preparation process for ceramics, which of the following is essential for ensuring uniformity in the powder?
a) Crushing b) Pulverization
c) Mixing d) Heating

3) In the preparation of composite materials, which of the following is used as reinforcement?
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4) In Electrical Discharge Machining (EDM), the material removal occurs due to _____.
a) Electrical discharges b) Abrasive action
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5) Laser-based automation in manufacturing allows for _____.
a) Reduced precision b) Slower production rates
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6) The main advantage of hard machining using single point tools is _____.
a) Faster machining time
b) Better surface finish
c) Ability to machine hard materials
d) Lower tooling costs

7) In-process sensing with lasers is most commonly used for _____.
a) Tool wear detection
b) Material composition analysis
c) Dimensional Measurement
d) Cutting speed control

8) Composite materials with copper as a matrix are typically used for _____.
a) Fuel tanks
b) Electrical and thermal applications
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9) The ability of a material to withstand high-stress concentration for a long time without failure refers to _____.
a) Ductility
b) Wear resistance
c) Fatigue strength
d) Hardness

10) Selection of materials for marine applications mainly depends on _____.
a) Thermal conductivity
b) Corrosion resistance
c) Electrical resistivity
d) Machinability

11) Composite materials are made by combining two or more materials to _____.
a) Increase cost
b) Improve overall performance
c) Reduce quality
d) Increase weight

12) Shape Memory Alloys (SMAs) are mainly used in biomedical applications because they can _____.
a) Conduct electricity like copper
b) Remember and return to their original shape when heated
c) Resist corrosion like stainless steel
d) Glow under ultraviolet light

13) Carbon nanotubes are a type of _____.
a) Polymer fiber
b) Ceramic powder
c) Cylindrical nanostructure made of carbon atoms
d) Composite alloy

14) Which of the following is a major factor affecting the machining rate in Water Jet Machining?
a) Type of abrasive used
b) Pressure of the water jet
c) Type of material
d) Frequency of vibration

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Advanced Materials and Manufacturing Process (MECHMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw neat-labelled diagrams wherever necessary.

SECTION – I

Q.2 Attempt Any Two Questions.

a) Describe the role of epoxy resins and unsaturated polyesters in composites. What makes them popular as matrix materials? **05**

b) Explain with examples the structure and applications of polymer matrix composites and metallic matrix composites. **05**

c) Discuss the characteristics and properties of fiber-reinforced composites and their applications in aerospace. **05**

Q.3 Attempt Any Two Questions.

a) Explain the criteria for selecting materials based on strength, toughness, fatigue, and creep. Give one example for each. **05**

b) Discuss the interrelationship between material selection and manufacturing processes. Illustrate with one case study from the automotive industry. **05**

c) Describe the factors influencing the cost-based material selection process and its industrial significance. **05**

Q.4 Write Short Note. (Any Two)

a) High-speed and high-performance grinding in industry. **04**

b) Shape Memory Alloys - composition and working principle. **04**

c) Smart materials used in biomedical systems. **04**

SECTION – II

Q.5 Attempt Any Two Questions.

a) Explain the steps in processing of particulate ceramics - powder preparation, drying, and sintering. **05**

b) Describe the structure and applications of MMC, CMC, and PMC. **05**

c) Explain finishing operations in ceramics and their significance. **05**

Q.6 Attempt Any Two Questions.

a) Explain the working principle of Water Jet Machining and its industrial uses. **05**

b) Compare AJM, USM, and WJM in terms of mechanism and suitability. **05**

c) Discuss the need for non-traditional machining and name at least three such processes. **05**

Q.7 Write Short Note. (Any Two)

a) Laser applications in automation and process control. **04**

b) Automation and in-process sensing in modern machining. **04**

c) Hard machining and its applications in manufacturing hardened steels. **04**

Seat No.	

Set **R**

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Advanced Materials and Manufacturing Process (MECHMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top on page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answers from the given options. **14**

1) In Electrical Discharge Machining (EDM), the material removal occurs due to _____.
a) Electrical discharges b) Abrasive action
c) Laser heat generation d) Ionization of air

2) Laser-based automation in manufacturing allows for _____.
a) Reduced precision b) Slower production rates
c) Improved repeatability d) Increased tool wear

3) The main advantage of hard machining using single point tools is _____.
a) Faster machining time
b) Better surface finish
c) Ability to machine hard materials
d) Lower tooling costs

4) In-process sensing with lasers is most commonly used for _____.
a) Tool wear detection
b) Material composition analysis
c) Dimensional Measurement
d) Cutting speed control

5) Composite materials with copper as a matrix are typically used for _____.
a) Fuel tanks
b) Electrical and thermal applications
c) Optical fibers
d) Bulletproof vests

6) The ability of a material to withstand high-stress concentration for a long time without failure refers to _____.
a) Ductility b) Wear resistance
c) Fatigue strength d) Hardness

7) Selection of materials for marine applications mainly depends on _____.
a) Thermal conductivity b) Corrosion resistance
c) Electrical resistivity d) Machinability

8) Composite materials are made by combining two or more materials to _____.
a) Increase cost
b) Improve overall performance
c) Reduce quality
d) Increase weight

9) Shape Memory Alloys (SMAs) are mainly used in biomedical applications because they can _____.
a) Conduct electricity like copper
b) Remember and return to their original shape when heated
c) Resist corrosion like stainless steel
d) Glow under ultraviolet light

10) Carbon nanotubes are a type of _____.
a) Polymer fiber
b) Ceramic powder
c) Cylindrical nanostructure made of carbon atoms
d) Composite alloy

11) Which of the following is a major factor affecting the machining rate in Water Jet Machining?
a) Type of abrasive used b) Pressure of the water jet
c) Type of material d) Frequency of vibration

12) Varistors are primarily used for _____.
a) Filtering light
b) Enhancing thermal conductivity
c) Protecting circuits from voltage surges
d) Insulation

13) The In the powder preparation process for ceramics, which of the following is essential for ensuring uniformity in the powder?
a) Crushing b) Pulverization
c) Mixing d) Heating

14) In the preparation of composite materials, which of the following is used as reinforcement?
a) Metal alloys b) Ceramics
c) Fibers or particulates d) Alloys

Seat No.	

Set **R**

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Advanced Materials and Manufacturing Process (MECHMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw neat-labelled diagrams wherever necessary.

SECTION – I

Q.2 Attempt Any Two Questions.

a) Describe the role of epoxy resins and unsaturated polyesters in composites. What makes them popular as matrix materials? **05**

b) Explain with examples the structure and applications of polymer matrix composites and metallic matrix composites. **05**

c) Discuss the characteristics and properties of fiber-reinforced composites and their applications in aerospace. **05**

Q.3 Attempt Any Two Questions.

a) Explain the criteria for selecting materials based on strength, toughness, fatigue, and creep. Give one example for each. **05**

b) Discuss the interrelationship between material selection and manufacturing processes. Illustrate with one case study from the automotive industry. **05**

c) Describe the factors influencing the cost-based material selection process and its industrial significance. **05**

Q.4 Write Short Note. (Any Two)

a) High-speed and high-performance grinding in industry. **04**

b) Shape Memory Alloys - composition and working principle. **04**

c) Smart materials used in biomedical systems. **04**

SECTION – II

Q.5 Attempt Any Two Questions.

a) Explain the steps in processing of particulate ceramics - powder preparation, drying, and sintering. **05**

b) Describe the structure and applications of MMC, CMC, and PMC. **05**

c) Explain finishing operations in ceramics and their significance. **05**

Q.6 Attempt Any Two Questions.

a) Explain the working principle of Water Jet Machining and its industrial uses. **05**

b) Compare AJM, USM, and WJM in terms of mechanism and suitability. **05**

c) Discuss the need for non-traditional machining and name at least three such processes. **05**

Q.7 Write Short Note. (Any Two)

a) Laser applications in automation and process control. **04**

b) Automation and in-process sensing in modern machining. **04**

c) Hard machining and its applications in manufacturing hardened steels. **04**

Seat No.	

Set | S

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Advanced Materials and Manufacturing Process (MECHMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top on page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answers from the given options. 14

1) Carbon nanotubes are a type of _____.
a) Polymer fiber
b) Ceramic powder
c) Cylindrical nanostructure made of carbon atoms
d) Composite alloy

2) Which of the following is a major factor affecting the machining rate in Water Jet Machining?
a) Type of abrasive used b) Pressure of the water jet
c) Type of material d) Frequency of vibration

3) Varistors are primarily used for _____.
a) Filtering light
b) Enhancing thermal conductivity
c) Protecting circuits from voltage surges
d) Insulation

4) The In the powder preparation process for ceramics, which of the following is essential for ensuring uniformity in the powder?
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5) In the preparation of composite materials, which of the following is used as reinforcement?
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c) Fibers or particulates d) Alloys

6) In Electrical Discharge Machining (EDM), the material removal occurs due to _____.
a) Electrical discharges b) Abrasive action
c) Laser heat generation d) Ionization of air

7) Laser-based automation in manufacturing allows for _____.
a) Reduced precision
b) Slower production rates
c) Improved repeatability
d) Increased tool wear

8) The main advantage of hard machining using single point tools is _____.
a) Faster machining time
b) Better surface finish
c) Ability to machine hard materials
d) Lower tooling costs

9) In-process sensing with lasers is most commonly used for _____.
a) Tool wear detection
b) Material composition analysis
c) Dimensional Measurement
d) Cutting speed control

10) Composite materials with copper as a matrix are typically used for _____.
a) Fuel tanks
b) Electrical and thermal applications
c) Optical fibers
d) Bulletproof vests

11) The ability of a material to withstand high-stress concentration for a long time without failure refers to _____.
a) Ductility
b) Wear resistance
c) Fatigue strength
d) Hardness

12) Selection of materials for marine applications mainly depends on _____.
a) Thermal conductivity
b) Corrosion resistance
c) Electrical resistivity
d) Machinability

13) Composite materials are made by combining two or more materials to _____.
a) Increase cost
b) Improve overall performance
c) Reduce quality
d) Increase weight

14) Shape Memory Alloys (SMAs) are mainly used in biomedical applications because they can _____.
a) Conduct electricity like copper
b) Remember and return to their original shape when heated
c) Resist corrosion like stainless steel
d) Glow under ultraviolet light

Seat No.	

Set **S**

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Advanced Materials and Manufacturing Process (MECHMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw neat-labelled diagrams wherever necessary.

SECTION – I

Q.2 Attempt Any Two Questions.

a) Describe the role of epoxy resins and unsaturated polyesters in composites. What makes them popular as matrix materials? **05**

b) Explain with examples the structure and applications of polymer matrix composites and metallic matrix composites. **05**

c) Discuss the characteristics and properties of fiber-reinforced composites and their applications in aerospace. **05**

Q.3 Attempt Any Two Questions.

a) Explain the criteria for selecting materials based on strength, toughness, fatigue, and creep. Give one example for each. **05**

b) Discuss the interrelationship between material selection and manufacturing processes. Illustrate with one case study from the automotive industry. **05**

c) Describe the factors influencing the cost-based material selection process and its industrial significance. **05**

Q.4 Write Short Note. (Any Two)

a) High-speed and high-performance grinding in industry. **04**

b) Shape Memory Alloys - composition and working principle. **04**

c) Smart materials used in biomedical systems. **04**

SECTION – II

Q.5 Attempt Any Two Questions.

a) Explain the steps in processing of particulate ceramics - powder preparation, drying, and sintering. **05**

b) Describe the structure and applications of MMC, CMC, and PMC. **05**

c) Explain finishing operations in ceramics and their significance. **05**

Q.6 Attempt Any Two Questions.

a) Explain the working principle of Water Jet Machining and its industrial uses. **05**

b) Compare AJM, USM, and WJM in terms of mechanism and suitability. **05**

c) Discuss the need for non-traditional machining and name at least three such processes. **05**

Q.7 Write Short Note. (Any Two)

a) Laser applications in automation and process control. **04**

b) Automation and in-process sensing in modern machining. **04**

c) Hard machining and its applications in manufacturing hardened steels. **04**

SLR-QH-637

Seat No.		Set	P

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Advanced Materials and Manufacturing Process (MECHMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answers from the given options. 14

1) Composite materials with copper as a matrix are typically used for _____.
a) Fuel tanks
b) Electrical and thermal applications
c) Optical fibers
d) Bulletproof vests

2) The ability of a material to withstand high-stress concentration for a long time without failure refers to _____.
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c) Fatigue strength d) Hardness

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d) Glow under ultraviolet light

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a) Polymer fiber
b) Ceramic powder
c) Cylindrical nanostructure made of carbon atoms
d) Composite alloy

7) Which of the following is a major factor affecting the machining rate in Water Jet Machining?
a) Type of abrasive used
b) Pressure of the water jet
c) Type of material
d) Frequency of vibration

8) Varistors are primarily used for _____.
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b) Enhancing thermal conductivity
c) Protecting circuits from voltage surges
d) Insulation

9) The In the powder preparation process for ceramics, which of the following is essential for ensuring uniformity in the powder?
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b) Pulverization
c) Mixing
d) Heating

10) In the preparation of composite materials, which of the following is used as reinforcement?
a) Metal alloys
b) Ceramics
c) Fibers or particulates
d) Alloys

11) In Electrical Discharge Machining (EDM), the material removal occurs due to _____.
a) Electrical discharges
b) Abrasive action
c) Laser heat generation
d) Ionization of air

12) Laser-based automation in manufacturing allows for _____.
a) Reduced precision
b) Slower production rates
c) Improved repeatability
d) Increased tool wear

13) The main advantage of hard machining using single point tools is _____.
a) Faster machining time
b) Better surface finish
c) Ability to machine hard materials
d) Lower tooling costs

14) In-process sensing with lasers is most commonly used for _____.
a) Tool wear detection
b) Material composition analysis
c) Dimensional Measurement
d) Cutting speed control

SLR-QH-637

Seat No.	

Set P

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Advanced Materials and Manufacturing Process (MECHMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw neat-labelled diagrams wherever necessary.

SECTION – I

Q.2 Attempt Any Two Questions.

a) Describe the role of epoxy resins and unsaturated polyesters in composites. What makes them popular as matrix materials? **05**

b) Explain with examples the structure and applications of polymer matrix composites and metallic matrix composites. **05**

c) Discuss the characteristics and properties of fiber-reinforced composites and their applications in aerospace. **05**

Q.3 Attempt Any Two Questions.

a) Explain the criteria for selecting materials based on strength, toughness, fatigue, and creep. Give one example for each. **05**

b) Discuss the interrelationship between material selection and manufacturing processes. Illustrate with one case study from the automotive industry. **05**

c) Describe the factors influencing the cost-based material selection process and its industrial significance. **05**

Q.4 Write Short Note. (Any Two)

a) High-speed and high-performance grinding in industry. **04**

b) Shape Memory Alloys - composition and working principle. **04**

c) Smart materials used in biomedical systems. **04**

SECTION – II

Q.5 Attempt Any Two Questions.

a) Explain the steps in processing of particulate ceramics - powder preparation, drying, and sintering. **05**

b) Describe the structure and applications of MMC, CMC, and PMC. **05**

c) Explain finishing operations in ceramics and their significance. **05**

Q.6 Attempt Any Two Questions.

a) Explain the working principle of Water Jet Machining and its industrial uses. **05**

b) Compare AJM, USM, and WJM in terms of mechanism and suitability. **05**

c) Discuss the need for non-traditional machining and name at least three such processes. **05**

Q.7 Write Short Note. (Any Two)

a) Laser applications in automation and process control. **04**

b) Automation and in-process sensing in modern machining. **04**

c) Hard machining and its applications in manufacturing hardened steels. **04**

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Advanced Materials and Manufacturing Process (MECHMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top on page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answers from the given options. **14**

1) Varistors are primarily used for _____.
a) Filtering light
b) Enhancing thermal conductivity
c) Protecting circuits from voltage surges
d) Insulation

2) The In the powder preparation process for ceramics, which of the following is essential for ensuring uniformity in the powder?
a) Crushing b) Pulverization
c) Mixing d) Heating

3) In the preparation of composite materials, which of the following is used as reinforcement?
a) Metal alloys b) Ceramics
c) Fibers or particulates d) Alloys

4) In Electrical Discharge Machining (EDM), the material removal occurs due to _____.
a) Electrical discharges b) Abrasive action
c) Laser heat generation d) Ionization of air

5) Laser-based automation in manufacturing allows for _____.
a) Reduced precision b) Slower production rates
c) Improved repeatability d) Increased tool wear

6) The main advantage of hard machining using single point tools is _____.
a) Faster machining time
b) Better surface finish
c) Ability to machine hard materials
d) Lower tooling costs

7) In-process sensing with lasers is most commonly used for _____.
a) Tool wear detection
b) Material composition analysis
c) Dimensional Measurement
d) Cutting speed control

8) Composite materials with copper as a matrix are typically used for _____.
a) Fuel tanks
b) Electrical and thermal applications
c) Optical fibers
d) Bulletproof vests

9) The ability of a material to withstand high-stress concentration for a long time without failure refers to _____.
a) Ductility
b) Wear resistance
c) Fatigue strength
d) Hardness

10) Selection of materials for marine applications mainly depends on _____.
a) Thermal conductivity
b) Corrosion resistance
c) Electrical resistivity
d) Machinability

11) Composite materials are made by combining two or more materials to _____.
a) Increase cost
b) Improve overall performance
c) Reduce quality
d) Increase weight

12) Shape Memory Alloys (SMAs) are mainly used in biomedical applications because they can _____.
a) Conduct electricity like copper
b) Remember and return to their original shape when heated
c) Resist corrosion like stainless steel
d) Glow under ultraviolet light

13) Carbon nanotubes are a type of _____.
a) Polymer fiber
b) Ceramic powder
c) Cylindrical nanostructure made of carbon atoms
d) Composite alloy

14) Which of the following is a major factor affecting the machining rate in Water Jet Machining?
a) Type of abrasive used
b) Pressure of the water jet
c) Type of material
d) Frequency of vibration

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Advanced Materials and Manufacturing Process (MECHMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw neat-labelled diagrams wherever necessary.

SECTION – I

Q.2 Attempt Any Two Questions.

a) Describe the role of epoxy resins and unsaturated polyesters in composites. What makes them popular as matrix materials? **05**

b) Explain with examples the structure and applications of polymer matrix composites and metallic matrix composites. **05**

c) Discuss the characteristics and properties of fiber-reinforced composites and their applications in aerospace. **05**

Q.3 Attempt Any Two Questions.

a) Explain the criteria for selecting materials based on strength, toughness, fatigue, and creep. Give one example for each. **05**

b) Discuss the interrelationship between material selection and manufacturing processes. Illustrate with one case study from the automotive industry. **05**

c) Describe the factors influencing the cost-based material selection process and its industrial significance. **05**

Q.4 Write Short Note. (Any Two)

a) High-speed and high-performance grinding in industry. **04**

b) Shape Memory Alloys - composition and working principle. **04**

c) Smart materials used in biomedical systems. **04**

SECTION – II

Q.5 Attempt Any Two Questions.

a) Explain the steps in processing of particulate ceramics - powder preparation, drying, and sintering. **05**

b) Describe the structure and applications of MMC, CMC, and PMC. **05**

c) Explain finishing operations in ceramics and their significance. **05**

Q.6 Attempt Any Two Questions.

a) Explain the working principle of Water Jet Machining and its industrial uses. **05**

b) Compare AJM, USM, and WJM in terms of mechanism and suitability. **05**

c) Discuss the need for non-traditional machining and name at least three such processes. **05**

Q.7 Write Short Note. (Any Two)

a) Laser applications in automation and process control. **04**

b) Automation and in-process sensing in modern machining. **04**

c) Hard machining and its applications in manufacturing hardened steels. **04**

Seat No.	

Set **R**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Advanced Materials and Manufacturing Process (MECHMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answers from the given options. **14**

1) In Electrical Discharge Machining (EDM), the material removal occurs due to _____.
a) Electrical discharges b) Abrasive action
c) Laser heat generation d) Ionization of air

2) Laser-based automation in manufacturing allows for _____.
a) Reduced precision b) Slower production rates
c) Improved repeatability d) Increased tool wear

3) The main advantage of hard machining using single point tools is _____.
a) Faster machining time
b) Better surface finish
c) Ability to machine hard materials
d) Lower tooling costs

4) In-process sensing with lasers is most commonly used for _____.
a) Tool wear detection
b) Material composition analysis
c) Dimensional Measurement
d) Cutting speed control

5) Composite materials with copper as a matrix are typically used for _____.
a) Fuel tanks
b) Electrical and thermal applications
c) Optical fibers
d) Bulletproof vests

6) The ability of a material to withstand high-stress concentration for a long time without failure refers to _____.
a) Ductility b) Wear resistance
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7) Selection of materials for marine applications mainly depends on _____.
a) Thermal conductivity b) Corrosion resistance
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8) Composite materials are made by combining two or more materials to _____.
a) Increase cost
b) Improve overall performance
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d) Increase weight

9) Shape Memory Alloys (SMAs) are mainly used in biomedical applications because they can _____.
a) Conduct electricity like copper
b) Remember and return to their original shape when heated
c) Resist corrosion like stainless steel
d) Glow under ultraviolet light

10) Carbon nanotubes are a type of _____.
a) Polymer fiber
b) Ceramic powder
c) Cylindrical nanostructure made of carbon atoms
d) Composite alloy

11) Which of the following is a major factor affecting the machining rate in Water Jet Machining?
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a) Filtering light
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13) The In the powder preparation process for ceramics, which of the following is essential for ensuring uniformity in the powder?
a) Crushing b) Pulverization
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14) In the preparation of composite materials, which of the following is used as reinforcement?
a) Metal alloys b) Ceramics
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Seat No.	

Set **R**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Advanced Materials and Manufacturing Process (MECHMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw neat-labelled diagrams wherever necessary.

SECTION – I

Q.2 Attempt Any Two Questions.

a) Describe the role of epoxy resins and unsaturated polyesters in composites. What makes them popular as matrix materials? **05**

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c) Discuss the characteristics and properties of fiber-reinforced composites and their applications in aerospace. **05**

Q.3 Attempt Any Two Questions.

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b) Discuss the interrelationship between material selection and manufacturing processes. Illustrate with one case study from the automotive industry. **05**

c) Describe the factors influencing the cost-based material selection process and its industrial significance. **05**

Q.4 Write Short Note. (Any Two)

a) High-speed and high-performance grinding in industry. **04**

b) Shape Memory Alloys - composition and working principle. **04**

c) Smart materials used in biomedical systems. **04**

SECTION – II

Q.5 Attempt Any Two Questions.

a) Explain the steps in processing of particulate ceramics - powder preparation, drying, and sintering. **05**

b) Describe the structure and applications of MMC, CMC, and PMC. **05**

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a) Explain the working principle of Water Jet Machining and its industrial uses. **05**

b) Compare AJM, USM, and WJM in terms of mechanism and suitability. **05**

c) Discuss the need for non-traditional machining and name at least three such processes. **05**

Q.7 Write Short Note. (Any Two)

a) Laser applications in automation and process control. **04**

b) Automation and in-process sensing in modern machining. **04**

c) Hard machining and its applications in manufacturing hardened steels. **04**

Seat No.	

Set **S**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Advanced Materials and Manufacturing Process (MECHMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answers from the given options. **14**

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Seat No.	

Set **S**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Advanced Materials and Manufacturing Process (MECHMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
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SECTION – I

Q.2 Attempt Any Two Questions.

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b) Explain with examples the structure and applications of polymer matrix composites and metallic matrix composites. **05**

c) Discuss the characteristics and properties of fiber-reinforced composites and their applications in aerospace. **05**

Q.3 Attempt Any Two Questions.

a) Explain the criteria for selecting materials based on strength, toughness, fatigue, and creep. Give one example for each. **05**

b) Discuss the interrelationship between material selection and manufacturing processes. Illustrate with one case study from the automotive industry. **05**

c) Describe the factors influencing the cost-based material selection process and its industrial significance. **05**

Q.4 Write Short Note. (Any Two)

a) High-speed and high-performance grinding in industry. **04**

b) Shape Memory Alloys - composition and working principle. **04**

c) Smart materials used in biomedical systems. **04**

SECTION – II

Q.5 Attempt Any Two Questions.

a) Explain the steps in processing of particulate ceramics - powder preparation, drying, and sintering. **05**

b) Describe the structure and applications of MMC, CMC, and PMC. **05**

c) Explain finishing operations in ceramics and their significance. **05**

Q.6 Attempt Any Two Questions.

a) Explain the working principle of Water Jet Machining and its industrial uses. **05**

b) Compare AJM, USM, and WJM in terms of mechanism and suitability. **05**

c) Discuss the need for non-traditional machining and name at least three such processes. **05**

Q.7 Write Short Note. (Any Two)

a) Laser applications in automation and process control. **04**

b) Automation and in-process sensing in modern machining. **04**

c) Hard machining and its applications in manufacturing hardened steels. **04**

SLR-QH-638

Seat No.		Set	P

T. Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Operation Research (MECHMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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4) Assume additional suitable data if necessary and state it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Multiple Choice Questions. **14**

1) Operations research approach is _____.
a) Qualitative managerial skill
b) Operational management skill
c) Scientific approach to decision making
d) Quantitative management skills

2) OR is said to be _____.
a) Only art b) Only science
c) Art as well as science d) None of these

3) Linear programming model which involves funds allocation of limited investment is classified as _____.
a) ordination budgeting model b) capital budgeting models
c) funds investment models d) funds origin models

4) As for maximization in assignment problem, the objective is to maximize the _____.
a) profit b) optimization
c) cost d) None of the above

5) _____ is one of the fundamental combinatorial optimization problems.
a) Assignment Problem b) Transportation Problem
c) Optimization Problem d) None of the above

6) A feasible solution is called a basic feasible solution if the number of non-negative allocations is equal to _____.
a) $m - n + 1$ b) $m - n - 1$
c) $m + n - 1$ d) None of the above

7) Which method usually gives a very good solution to the assignment problem?
   a) Northwest corner rule
   b) Vogel's approximation method
   c) MODI method
   d) Stepping-stone method

8) In applying Vogel's approximation method to a profit maximization problem, row and column penalties are determined by _____.
   a) finding the smallest unit cost in each row or column
   b) finding the sum of the unit costs in each row or column
   c) finding the difference between the two lowest unit costs in each row and column
   d) finding the difference between the two highest unit costs in each row and column

9) Which of the following is NOT a characteristic of a queuing system?
   a) Customer population
   b) Arrival process
   c) Service mechanism
   d) None of the above

10) In a M/M/1 queuing system, what does the first "M" represent?
   a) The number of servers
   b) The arrival process distribution
   c) The service time distribution
   d) The maximum queue length

11) The objective of sequencing problem is _____.
   a) To find the order in which jobs are to be made
   b) To find the time required for completing all the jobs on hand
   c) To find the sequence in which jobs on hand are to be processed to minimize the total time required for processing the jobs
   d) To maximize the effectiveness

12) The time required for printing of four books *A, B, C* and *D* is 5, 8, 10 and 7 hours. While its data entry requires 7, 4, 3 and 6 hours respectively. The sequence time that minimizes total elapsed time is _____.
   a) ACBD
   b) ABCD
   c) ADCB
   d) CBDA

13) In a project network, the critical path _____.
   a) may be the shortest path
   b) is the longest path
   c) may be longest path
   d) is the shortest path

14) Network models help in project management for _____.
   a) Planning
   b) Scheduling
   c) Controlling
   d) All of the above

Seat No.	

Set P

T. Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Operation Research (MECHMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Solve any two questions from Section – I and Section – II
2) Figures to the right indicates full marks.
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4) Use of scientific calculator is allowed.

SECTION – I

Q.2 a) Explain O.R. Models and their applications. **06**

b) Solve the following linear programming problem using graphical method. **08**

Maximize $Z = 6X_1 + 8X_2$
Subject to $5X_1 + 10X_2 \leq 60$
$4X_1 + 4X_2 \leq 40$
$X_1 \ \& \ X_2 \geq 0$

Q.3 a) A company has a team of four salesmen and there are four districts where the company wants to start its business. After taking into account the capabilities of salesman & the nature of districts the company estimates that the profit per day in rupees for each salesman in each district is as below. **07**

	I	II	III	IV
A	16	10	14	11
B	14	11	15	15
C	15	15	13	12
D	13	12	14	15

Find the assignment of salesmen to various districts which will yield maximum profit.

b) Solve the following problem by using NWCM and VAM Method. **07**

		DISTRIBUTER				
Company		P	Q	R	S	Supply
	A	2	3	11	7	6
	B	1	0	6	1	1
	C	5	8	15	9	10
Requirement		7	5	3	2	

Q.4 a) Solve the following transportation problem by using NWCM and VAM method. **07**

		Warehouses				
		W1	W2	W3	W4	Supply
Factories	A	19	30	50	10	7
	B	70	30	40	60	9
	C	40	8	70	20	18
Requirement		5	8	7	14	

b) Solve the following Assignment problem (Assign the jobs to the operators) so as to minimize the cost. **07**

		Jobs			
		I	II	III	IV
Operators	A	5	7	11	6
	B	8	5	9	6
	C	4	7	10	7
	D	10	4	8	3

SECTION – II

Q.5 Attempt the following questions.

a) There are five jobs, each of which has to go through Machine A and Machine B & Machine C in the order ABC. Processing time in hours are as given below: **07**

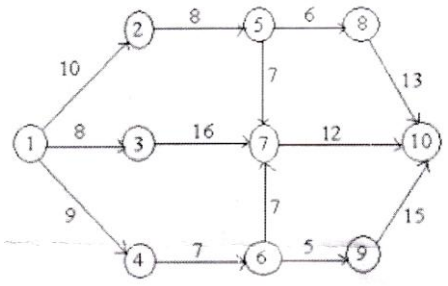
Job	1	2	3	4	5
M/C A	8	10	6	7	11
M/C B	5	6	2	3	4
M/C C	4	9	8	6	5

Determine sequence of jobs that will minimize total elapsed time, Ideal time for job.

b) Explain uniform series factors in detail. **07**

Q.6 Attempt the following questions.

a) Determine the earliest and latest timings in respect of all node points and identify critical path for the following network **07**



b) Explain in detail with example about steps for sequencing of n jobs which are being processed on three machines? **07**

Q.7 Attempt the following questions. **07**

a) Explain in details about:

i) Types of interests

ii) Types of costs

b) Differentiate between CPM & PERT. **07**

Seat No.	

Set **Q**

T. Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Operation Research (MECHMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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4) Assume additional suitable data if necessary and state it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Multiple Choice Questions. **14**

1) In applying Vogel's approximation method to a profit maximization problem, row and column penalties are determined by _____.
a) finding the smallest unit cost in each row or column
b) finding the sum of the unit costs in each row or column
c) finding the difference between the two lowest unit costs in each row and column
d) finding the difference between the two highest unit costs in each row and column

2) Which of the following is NOT a characteristic of a queuing system?
a) Customer population b) Arrival process
c) Service mechanism d) None of the above

3) In a M/M/1 queuing system, what does the first "M" represent?
a) The number of servers
b) The arrival process distribution
c) The service time distribution
d) The maximum queue length

4) The objective of sequencing problem is _____.
a) To find the order in which jobs are to be made
b) To find the time required for completing all the jobs on hand
c) To find the sequence in which jobs on hand are to be processed to minimize the total time required for processing the jobs
d) To maximize the effectiveness

5) The time required for printing of four books *A, B, C* and *D* is 5, 8, 10 and 7 hours. While its data entry requires 7, 4, 3 and 6 hours respectively. The sequence time that minimizes total elapsed time is _____.

a) ACBD b) ABCD
c) ADCB d) CBDA

6) In a project network, the critical path _____.

a) may be the shortest path b) is the longest path
c) may be longest path d) is the shortest path

7) Network models help in project management for _____.

a) Planning b) Scheduling
c) Controlling d) All of the above

8) Operations research approach is _____.

a) Qualitative managerial skill
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c) Scientific approach to decision making
d) Quantitative management skills

9) OR is said to be _____.

a) Only art b) Only science
c) Art as well as science d) None of these

10) Linear programming model which involves funds allocation of limited investment is classified as _____.

a) ordination budgeting model b) capital budgeting models
c) funds investment models d) funds origin models

11) As for maximization in assignment problem, the objective is to maximize the _____.

a) profit b) optimization
c) cost d) None of the above

12) _____ is one of the fundamental combinatorial optimization problems.

a) Assignment Problem b) Transportation Problem
c) Optimization Problem d) None of the above

13) A feasible solution is called a basic feasible solution if the number of non-negative allocations is equal to _____.

a) $m - n + 1$ b) $m - n - 1$
c) $m + n - 1$ d) None of the above

14) Which method usually gives a very good solution to the assignment problem?

a) Northwest corner rule
b) Vogel's approximation method
c) MODI method
d) Stepping-stone method

Seat No.	

Set **Q**

T. Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Operation Research (MECHMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Solve any two questions from Section – I and Section – II
2) Figures to the right indicates full marks.
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4) Use of scientific calculator is allowed.

SECTION – I

Q.2 a) Explain O.R. Models and their applications. **06**

b) Solve the following linear programming problem using graphical method. **08**

Maximize $Z = 6X_1 + 8X_2$
Subject to $5X_1 + 10X_2 \leq 60$
$4X_1 + 4X_2 \leq 40$
$X_1 \ \& \ X_2 \geq 0$

Q.3 a) A company has a team of four salesmen and there are four districts where the company wants to start its business. After taking into account the capabilities of salesman & the nature of districts the company estimates that the profit per day in rupees for each salesman in each district is as below. **07**

	I	II	III	IV
A	16	10	14	11
B	14	11	15	15
C	15	15	13	12
D	13	12	14	15

Find the assignment of salesmen to various districts which will yield maximum profit.

b) Solve the following problem by using NWCM and VAM Method. **07**

		DISTRIBUTER				
Company		P	Q	R	S	Supply
	A	2	3	11	7	6
	B	1	0	6	1	1
	C	5	8	15	9	10
Requirement		7	5	3	2	

Q.4 a) Solve the following transportation problem by using NWCM and VAM method. **07**

		Warehouses				
		W1	W2	W3	W4	Supply
Factories	A	19	30	50	10	7
	B	70	30	40	60	9
	C	40	8	70	20	18
Requirement		5	8	7	14	

b) Solve the following Assignment problem (Assign the jobs to the operators) so as to minimize the cost. **07**

		Jobs			
		I	II	III	IV
Operators	A	5	7	11	6
	B	8	5	9	6
	C	4	7	10	7
	D	10	4	8	3

SECTION – II

Q.5 Attempt the following questions.

a) There are five jobs, each of which has to go through Machine A and Machine B & Machine C in the order ABC. Processing time in hours are as given below: **07**

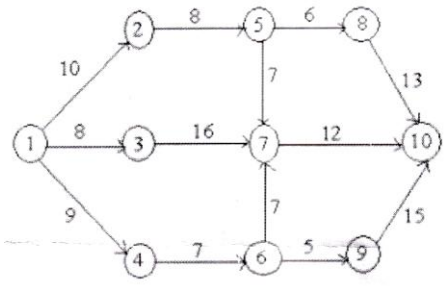
Job	1	2	3	4	5
M/C A	8	10	6	7	11
M/C B	5	6	2	3	4
M/C C	4	9	8	6	5

Determine sequence of jobs that will minimize total elapsed time, Ideal time for job.

b) Explain uniform series factors in detail. **07**

Q.6 Attempt the following questions.

a) Determine the earliest and latest timings in respect of all node points and identify critical path for the following network **07**



b) Explain in detail with example about steps for sequencing of n jobs which are being processed on three machines? **07**

Q.7 Attempt the following questions. **07**

a) Explain in details about:

i) Types of interests

ii) Types of costs

b) Differentiate between CPM & PERT. **07**

SLR-QH-638

Seat No.	

Set R

T. Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Operation Research (MECHMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
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MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Multiple Choice Questions. **14**

1) The objective of sequencing problem is _____.
a) To find the order in which jobs are to be made
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2) The time required for printing of four books *A, B, C* and *D* is 5, 8, 10 and 7 hours. While its data entry requires 7, 4, 3 and 6 hours respectively. The sequence time that minimizes total elapsed time is _____.
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7) Linear programming model which involves funds allocation of limited investment is classified as _____.

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8) As for maximization in assignment problem, the objective is to maximize the _____.

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b) optimization
c) cost
d) None of the above

9) _____ is one of the fundamental combinatorial optimization problems.

a) Assignment Problem
b) Transportation Problem
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10) A feasible solution is called a basic feasible solution if the number of non-negative allocations is equal to _____.

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12) In applying Vogel's approximation method to a profit maximization problem, row and column penalties are determined by _____.

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13) Which of the following is NOT a characteristic of a queuing system?

a) Customer population
b) Arrival process
c) Service mechanism
d) None of the above

14) In a M/M/1 queuing system, what does the first "M" represent?

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b) The arrival process distribution
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d) The maximum queue length

Seat No.	

Set R

T. Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Operation Research (MECHMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Solve any two questions from Section – I and Section – II
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SECTION – I

Q.2 a) Explain O.R. Models and their applications. **06**

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Find the assignment of salesmen to various districts which will yield maximum profit.

b) Solve the following problem by using NWCM and VAM Method. **07**

		DISTRIBUTER				
Company		P	Q	R	S	Supply
	A	2	3	11	7	6
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	C	5	8	15	9	10
Requirement		7	5	3	2	

Q.4 a) Solve the following transportation problem by using NWCM and VAM method. **07**

		Warehouses				
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Factories	A	19	30	50	10	7
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		Jobs			
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Operators	A	5	7	11	6
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SECTION – II

Q.5 Attempt the following questions.

a) There are five jobs, each of which has to go through Machine A and Machine B & Machine C in the order ABC. Processing time in hours are as given below: **07**

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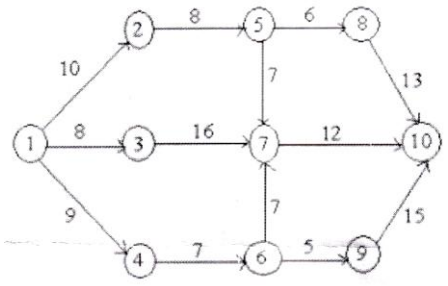

b) Explain in detail with example about steps for sequencing of n jobs which are being processed on three machines? **07**

Q.7 Attempt the following questions. **07**

a) Explain in details about:

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ii) Types of costs

b) Differentiate between CPM & PERT. **07**

Seat No.	

Set **S**

T. Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Operation Research (MECHMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Multiple Choice Questions. **14**

1) A feasible solution is called a basic feasible solution if the number of non-negative allocations is equal to _____.
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3) In applying Vogel's approximation method to a profit maximization problem, row and column penalties are determined by _____.
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   c) cost
   d) None of the above

14) _____ is one of the fundamental combinatorial optimization problems.
   a) Assignment Problem
   b) Transportation Problem
   c) Optimization Problem
   d) None of the above

Seat No.	

Set S

T. Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Operation Research (MECHMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Solve any two questions from Section – I and Section – II
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SECTION – I

Q.2 a) Explain O.R. Models and their applications. **06**

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B	14	11	15	15
C	15	15	13	12
D	13	12	14	15

Find the assignment of salesmen to various districts which will yield maximum profit.

b) Solve the following problem by using NWCM and VAM Method. **07**

		DISTRIBUTER				
Company		P	Q	R	S	Supply
	A	2	3	11	7	6
	B	1	0	6	1	1
	C	5	8	15	9	10
Requirement		7	5	3	2	

Q.4 a) Solve the following transportation problem by using NWCM and VAM method. **07**

		Warehouses				
		W1	W2	W3	W4	Supply
Factories	A	19	30	50	10	7
	B	70	30	40	60	9
	C	40	8	70	20	18
Requirement		5	8	7	14	

b) Solve the following Assignment problem (Assign the jobs to the operators) so as to minimize the cost. **07**

		Jobs			
		I	II	III	IV
Operators	A	5	7	11	6
	B	8	5	9	6
	C	4	7	10	7
	D	10	4	8	3

SECTION – II

Q.5 Attempt the following questions.

a) There are five jobs, each of which has to go through Machine A and Machine B & Machine C in the order ABC. Processing time in hours are as given below: **07**

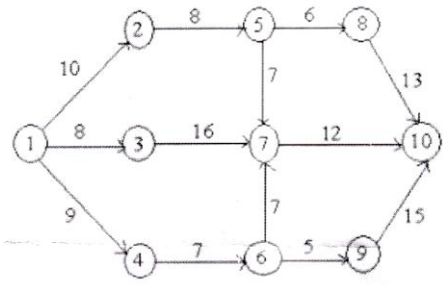
Job	1	2	3	4	5
M/C A	8	10	6	7	11
M/C B	5	6	2	3	4
M/C C	4	9	8	6	5

Determine sequence of jobs that will minimize total elapsed time, Ideal time for job.

b) Explain uniform series factors in detail. **07**

Q.6 Attempt the following questions.

a) Determine the earliest and latest timings in respect of all node points and identify critical path for the following network **07**



b) Explain in detail with example about steps for sequencing of n jobs which are being processed on three machines? **07**

Q.7 Attempt the following questions. **07**

a) Explain in details about:

i) Types of interests

ii) Types of costs

b) Differentiate between CPM & PERT. **07**

SLR-QH-638

Seat No.		Set	P

T. Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Operation Research (MECHMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top on page.
3) Figures to the right indicates full marks.
4) Assume additional suitable data if necessary and state it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Multiple Choice Questions. **14**

1) Operations research approach is _____.
a) Qualitative managerial skill
b) Operational management skill
c) Scientific approach to decision making
d) Quantitative management skills

2) OR is said to be _____.
a) Only art b) Only science
c) Art as well as science d) None of these

3) Linear programming model which involves funds allocation of limited investment is classified as _____.
a) ordination budgeting model b) capital budgeting models
c) funds investment models d) funds origin models

4) As for maximization in assignment problem, the objective is to maximize the _____.
a) profit b) optimization
c) cost d) None of the above

5) _____ is one of the fundamental combinatorial optimization problems.
a) Assignment Problem b) Transportation Problem
c) Optimization Problem d) None of the above

6) A feasible solution is called a basic feasible solution if the number of non-negative allocations is equal to _____.
a) $m - n + 1$ b) $m - n - 1$
c) $m + n - 1$ d) None of the above

7) Which method usually gives a very good solution to the assignment problem?
   a) Northwest corner rule
   b) Vogel's approximation method
   c) MODI method
   d) Stepping-stone method

8) In applying Vogel's approximation method to a profit maximization problem, row and column penalties are determined by _____.
   a) finding the smallest unit cost in each row or column
   b) finding the sum of the unit costs in each row or column
   c) finding the difference between the two lowest unit costs in each row and column
   d) finding the difference between the two highest unit costs in each row and column

9) Which of the following is NOT a characteristic of a queuing system?
   a) Customer population
   b) Arrival process
   c) Service mechanism
   d) None of the above

10) In a M/M/1 queuing system, what does the first "M" represent?
   a) The number of servers
   b) The arrival process distribution
   c) The service time distribution
   d) The maximum queue length

11) The objective of sequencing problem is _____.
   a) To find the order in which jobs are to be made
   b) To find the time required for completing all the jobs on hand
   c) To find the sequence in which jobs on hand are to be processed to minimize the total time required for processing the jobs
   d) To maximize the effectiveness

12) The time required for printing of four books *A, B, C* and *D* is 5, 8, 10 and 7 hours. While its data entry requires 7, 4, 3 and 6 hours respectively. The sequence time that minimizes total elapsed time is _____.
   a) ACBD
   b) ABCD
   c) ADCB
   d) CBDA

13) In a project network, the critical path _____.
   a) may be the shortest path
   b) is the longest path
   c) may be longest path
   d) is the shortest path

14) Network models help in project management for _____.
   a) Planning
   b) Scheduling
   c) Controlling
   d) All of the above

Seat No.	

Set P

T. Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Operation Research (MECHMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Solve any two questions from Section – I and Section – II
2) Figures to the right indicates full marks.
3) Assume additional suitable data if necessary and state it clearly.
4) Use of scientific calculator is allowed.

SECTION – I

Q.2 a) Explain O.R. Models and their applications. **06**

b) Solve the following linear programming problem using graphical method. **08**

Maximize $Z = 6X_1 + 8X_2$
Subject to $5X_1 + 10X_2 \leq 60$
$4X_1 + 4X_2 \leq 40$
$X_1 \ \& \ X_2 \geq 0$

Q.3 a) A company has a team of four salesmen and there are four districts where the company wants to start its business. After taking into account the capabilities of salesman & the nature of districts the company estimates that the profit per day in rupees for each salesman in each district is as below. **07**

	I	II	III	IV
A	16	10	14	11
B	14	11	15	15
C	15	15	13	12
D	13	12	14	15

Find the assignment of salesmen to various districts which will yield maximum profit.

b) Solve the following problem by using NWCM and VAM Method. **07**

		DISTRIBUTER				
Company		P	Q	R	S	Supply
	A	2	3	11	7	6
	B	1	0	6	1	1
	C	5	8	15	9	10
Requirement		7	5	3	2	

Q.4 a) Solve the following transportation problem by using NWCM and VAM method. **07**

		Warehouses				
		W1	W2	W3	W4	Supply
Factories	A	19	30	50	10	7
	B	70	30	40	60	9
	C	40	8	70	20	18
Requirement		5	8	7	14	

b) Solve the following Assignment problem (Assign the jobs to the operators) so as to minimize the cost. **07**

		Jobs			
		I	II	III	IV
Operators	A	5	7	11	6
	B	8	5	9	6
	C	4	7	10	7
	D	10	4	8	3

SECTION – II

Q.5 Attempt the following questions.

a) There are five jobs, each of which has to go through Machine A and Machine B & Machine C in the order ABC. Processing time in hours are as given below: **07**

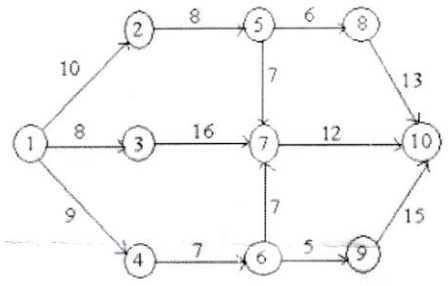
Job	1	2	3	4	5
M/C A	8	10	6	7	11
M/C B	5	6	2	3	4
M/C C	4	9	8	6	5

Determine sequence of jobs that will minimize total elapsed time, Ideal time for job.

b) Explain uniform series factors in detail. **07**

Q.6 Attempt the following questions.

a) Determine the earliest and latest timings in respect of all node points and identify critical path for the following network **07**



b) Explain in detail with example about steps for sequencing of n jobs which are being processed on three machines? **07**

Q.7 Attempt the following questions. **07**

a) Explain in details about:

i) Types of interests

ii) Types of costs

b) Differentiate between CPM & PERT. **07**

Seat No.	

Set **Q**

T. Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Operation Research (MECHMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top on page.
3) Figures to the right indicates full marks.
4) Assume additional suitable data if necessary and state it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Multiple Choice Questions. **14**

1) In applying Vogel's approximation method to a profit maximization problem, row and column penalties are determined by _____.
a) finding the smallest unit cost in each row or column
b) finding the sum of the unit costs in each row or column
c) finding the difference between the two lowest unit costs in each row and column
d) finding the difference between the two highest unit costs in each row and column

2) Which of the following is NOT a characteristic of a queuing system?
a) Customer population b) Arrival process
c) Service mechanism d) None of the above

3) In a M/M/1 queuing system, what does the first "M" represent?
a) The number of servers
b) The arrival process distribution
c) The service time distribution
d) The maximum queue length

4) The objective of sequencing problem is _____.
a) To find the order in which jobs are to be made
b) To find the time required for completing all the jobs on hand
c) To find the sequence in which jobs on hand are to be processed to minimize the total time required for processing the jobs
d) To maximize the effectiveness

5) The time required for printing of four books *A, B, C* and *D* is 5, 8, 10 and 7 hours. While its data entry requires 7, 4, 3 and 6 hours respectively. The sequence time that minimizes total elapsed time is _____.

a) ACBD b) ABCD
c) ADCB d) CBDA

6) In a project network, the critical path _____.

a) may be the shortest path b) is the longest path
c) may be longest path d) is the shortest path

7) Network models help in project management for _____.

a) Planning b) Scheduling
c) Controlling d) All of the above

8) Operations research approach is _____.

a) Qualitative managerial skill
b) Operational management skill
c) Scientific approach to decision making
d) Quantitative management skills

9) OR is said to be _____.

a) Only art b) Only science
c) Art as well as science d) None of these

10) Linear programming model which involves funds allocation of limited investment is classified as _____.

a) ordination budgeting model b) capital budgeting models
c) funds investment models d) funds origin models

11) As for maximization in assignment problem, the objective is to maximize the _____.

a) profit b) optimization
c) cost d) None of the above

12) _____ is one of the fundamental combinatorial optimization problems.

a) Assignment Problem b) Transportation Problem
c) Optimization Problem d) None of the above

13) A feasible solution is called a basic feasible solution if the number of non-negative allocations is equal to _____.

a) $m - n + 1$ b) $m - n - 1$
c) $m + n - 1$ d) None of the above

14) Which method usually gives a very good solution to the assignment problem?

a) Northwest corner rule
b) Vogel's approximation method
c) MODI method
d) Stepping-stone method

Seat No.	

Set **Q**

T. Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Operation Research (MECHMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Solve any two questions from Section – I and Section – II
2) Figures to the right indicates full marks.
3) Assume additional suitable data if necessary and state it clearly.
4) Use of scientific calculator is allowed.

SECTION – I

Q.2 a) Explain O.R. Models and their applications. **06**

b) Solve the following linear programming problem using graphical method. **08**

Maximize $Z = 6X_1 + 8X_2$
Subject to $5X_1 + 10X_2 \leq 60$
$4X_1 + 4X_2 \leq 40$
$X_1 \ \& \ X_2 \geq 0$

Q.3 a) A company has a team of four salesmen and there are four districts where the company wants to start its business. After taking into account the capabilities of salesman & the nature of districts the company estimates that the profit per day in rupees for each salesman in each district is as below. **07**

	I	II	III	IV
A	16	10	14	11
B	14	11	15	15
C	15	15	13	12
D	13	12	14	15

Find the assignment of salesmen to various districts which will yield maximum profit.

b) Solve the following problem by using NWCM and VAM Method. **07**

		DISTRIBUTER				
Company		P	Q	R	S	Supply
	A	2	3	11	7	6
	B	1	0	6	1	1
	C	5	8	15	9	10
Requirement		7	5	3	2	

Q.4 a) Solve the following transportation problem by using NWCM and VAM method. **07**

		Warehouses				
		W1	W2	W3	W4	Supply
Factories	A	19	30	50	10	7
	B	70	30	40	60	9
	C	40	8	70	20	18
Requirement		5	8	7	14	

b) Solve the following Assignment problem (Assign the jobs to the operators) so as to minimize the cost. **07**

		Jobs			
		I	II	III	IV
Operators	A	5	7	11	6
	B	8	5	9	6
	C	4	7	10	7
	D	10	4	8	3

SECTION – II

Q.5 Attempt the following questions.

a) There are five jobs, each of which has to go through Machine A and Machine B & Machine C in the order ABC. Processing time in hours are as given below: **07**

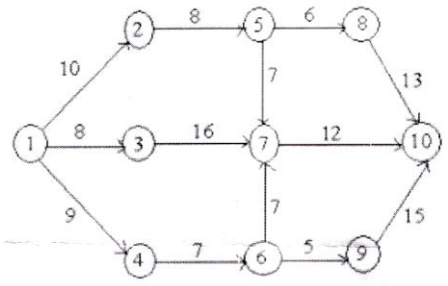
Job	1	2	3	4	5
M/C A	8	10	6	7	11
M/C B	5	6	2	3	4
M/C C	4	9	8	6	5

Determine sequence of jobs that will minimize total elapsed time, Ideal time for job.

b) Explain uniform series factors in detail. **07**

Q.6 Attempt the following questions.

a) Determine the earliest and latest timings in respect of all node points and identify critical path for the following network **07**



b) Explain in detail with example about steps for sequencing of n jobs which are being processed on three machines? **07**

Q.7 Attempt the following questions. **07**

a) Explain in details about:

i) Types of interests

ii) Types of costs

b) Differentiate between CPM & PERT. **07**

SLR-QH-638

Seat No.		Set	R

T. Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Operation Research (MECHMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Multiple Choice Questions. **14**

1) The objective of sequencing problem is _____.
a) To find the order in which jobs are to be made
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2) The time required for printing of four books *A, B, C* and *D* is 5, 8, 10 and 7 hours. While its data entry requires 7, 4, 3 and 6 hours respectively. The sequence time that minimizes total elapsed time is _____.
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c) ADCB d) CBDA

3) In a project network, the critical path _____.
a) may be the shortest path b) is the longest path
c) may be longest path d) is the shortest path

4) Network models help in project management for _____.
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5) Operations research approach is _____.
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6) OR is said to be _____.
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7) Linear programming model which involves funds allocation of limited investment is classified as _____.

a) ordination budgeting model
b) capital budgeting models
c) funds investment models
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8) As for maximization in assignment problem, the objective is to maximize the _____.

a) profit
b) optimization
c) cost
d) None of the above

9) _____ is one of the fundamental combinatorial optimization problems.

a) Assignment Problem
b) Transportation Problem
c) Optimization Problem
d) None of the above

10) A feasible solution is called a basic feasible solution if the number of non-negative allocations is equal to _____.

a) $m - n + 1$
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11) Which method usually gives a very good solution to the assignment problem?

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12) In applying Vogel's approximation method to a profit maximization problem, row and column penalties are determined by _____.

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c) finding the difference between the two lowest unit costs in each row and column
d) finding the difference between the two highest unit costs in each row and column

13) Which of the following is NOT a characteristic of a queuing system?

a) Customer population
b) Arrival process
c) Service mechanism
d) None of the above

14) In a M/M/1 queuing system, what does the first "M" represent?

a) The number of servers
b) The arrival process distribution
c) The service time distribution
d) The maximum queue length

Seat No.	

Set R

T. Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Operation Research (MECHMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Solve any two questions from Section – I and Section – II
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4) Use of scientific calculator is allowed.

SECTION – I

Q.2 a) Explain O.R. Models and their applications. **06**

b) Solve the following linear programming problem using graphical method. **08**

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Subject to $5X_1 + 10X_2 \leq 60$
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B	14	11	15	15
C	15	15	13	12
D	13	12	14	15

Find the assignment of salesmen to various districts which will yield maximum profit.

b) Solve the following problem by using NWCM and VAM Method. **07**

		DISTRIBUTER				
Company		P	Q	R	S	Supply
	A	2	3	11	7	6
	B	1	0	6	1	1
	C	5	8	15	9	10
Requirement		7	5	3	2	

Q.4 a) Solve the following transportation problem by using NWCM and VAM method. **07**

		Warehouses				
		W1	W2	W3	W4	Supply
Factories	A	19	30	50	10	7
	B	70	30	40	60	9
	C	40	8	70	20	18
Requirement		5	8	7	14	

b) Solve the following Assignment problem (Assign the jobs to the operators) so as to minimize the cost. **07**

		Jobs			
		I	II	III	IV
Operators	A	5	7	11	6
	B	8	5	9	6
	C	4	7	10	7
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SECTION – II

Q.5 Attempt the following questions.

a) There are five jobs, each of which has to go through Machine A and Machine B & Machine C in the order ABC. Processing time in hours are as given below: **07**

Job	1	2	3	4	5
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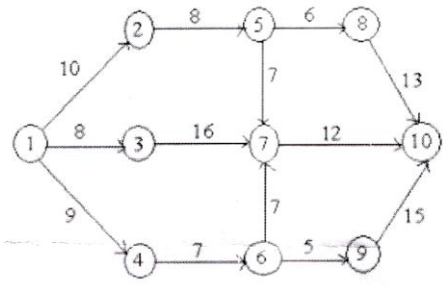
Determine sequence of jobs that will minimize total elapsed time, Ideal time for job.

b) Explain uniform series factors in detail. **07**

Q.6 Attempt the following questions.

a) Determine the earliest and latest timings in respect of all node points and identify critical path for the following network **07**



b) Explain in detail with example about steps for sequencing of n jobs which are being processed on three machines? **07**

Q.7 Attempt the following questions. **07**

a) Explain in details about:

i) Types of interests

ii) Types of costs

b) Differentiate between CPM & PERT. **07**

Seat No.		Set	S

T. Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Operation Research (MECHMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top on page.
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4) Assume additional suitable data if necessary and state it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Multiple Choice Questions. **14**

1) A feasible solution is called a basic feasible solution if the number of non-negative allocations is equal to _____.
a) $m - n + 1$ b) $m - n - 1$
c) $m + n - 1$ d) None of the above

2) Which method usually gives a very good solution to the assignment problem?
a) Northwest corner rule
b) Vogel's approximation method
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3) In applying Vogel's approximation method to a profit maximization problem, row and column penalties are determined by _____.
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b) finding the sum of the unit costs in each row or column
c) finding the difference between the two lowest unit costs in each row and column
d) finding the difference between the two highest unit costs in each row and column

4) Which of the following is NOT a characteristic of a queuing system?
a) Customer population b) Arrival process
c) Service mechanism d) None of the above

5) In a M/M/1 queuing system, what does the first "M" represent?
a) The number of servers
b) The arrival process distribution
c) The service time distribution
d) The maximum queue length

6) The objective of sequencing problem is _____.
   a) To find the order in which jobs are to be made
   b) To find the time required for completing all the jobs on hand
   c) To find the sequence in which jobs on hand are to be processed to minimize the total time required for processing the jobs
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7) The time required for printing of four books *A, B, C* and *D* is 5, 8, 10 and 7 hours. While its data entry requires 7, 4, 3 and 6 hours respectively. The sequence time that minimizes total elapsed time is _____.
   a) ACBD
   b) ABCD
   c) ADCB
   d) CBDA

8) In a project network, the critical path _____.
   a) may be the shortest path
   b) is the longest path
   c) may be longest path
   d) is the shortest path

9) Network models help in project management for _____.
   a) Planning
   b) Scheduling
   c) Controlling
   d) All of the above

10) Operations research approach is _____.
   a) Qualitative managerial skill
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11) OR is said to be _____.
   a) Only art
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13) As for maximization in assignment problem, the objective is to maximize the _____.
   a) profit
   b) optimization
   c) cost
   d) None of the above

14) _____ is one of the fundamental combinatorial optimization problems.
   a) Assignment Problem
   b) Transportation Problem
   c) Optimization Problem
   d) None of the above

Seat No.	

Set **S**

T. Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Operation Research (MECHMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Solve any two questions from Section – I and Section – II
2) Figures to the right indicates full marks.
3) Assume additional suitable data if necessary and state it clearly.
4) Use of scientific calculator is allowed.

SECTION – I

Q.2 a) Explain O.R. Models and their applications. **06**

b) Solve the following linear programming problem using graphical method. **08**

Maximize $Z = 6X_1 + 8X_2$
Subject to $5X_1 + 10X_2 \leq 60$
$4X_1 + 4X_2 \leq 40$
$X_1 \ \& \ X_2 \geq 0$

Q.3 a) A company has a team of four salesmen and there are four districts where the company wants to start its business. After taking into account the capabilities of salesman & the nature of districts the company estimates that the profit per day in rupees for each salesman in each district is as below. **07**

	I	II	III	IV
A	16	10	14	11
B	14	11	15	15
C	15	15	13	12
D	13	12	14	15

Find the assignment of salesmen to various districts which will yield maximum profit.

b) Solve the following problem by using NWCM and VAM Method. **07**

		DISTRIBUTER				
Company		P	Q	R	S	Supply
	A	2	3	11	7	6
	B	1	0	6	1	1
	C	5	8	15	9	10
Requirement		7	5	3	2	

Q.4 a) Solve the following transportation problem by using NWCM and VAM method. **07**

		Warehouses				
		W1	W2	W3	W4	Supply
Factories	A	19	30	50	10	7
	B	70	30	40	60	9
	C	40	8	70	20	18
Requirement		5	8	7	14	

b) Solve the following Assignment problem (Assign the jobs to the operators) so as to minimize the cost. **07**

		Jobs			
		I	II	III	IV
Operators	A	5	7	11	6
	B	8	5	9	6
	C	4	7	10	7
	D	10	4	8	3

SECTION – II

Q.5 Attempt the following questions.

a) There are five jobs, each of which has to go through Machine A and Machine B & Machine C in the order ABC. Processing time in hours are as given below: **07**

Job	1	2	3	4	5
M/C A	8	10	6	7	11
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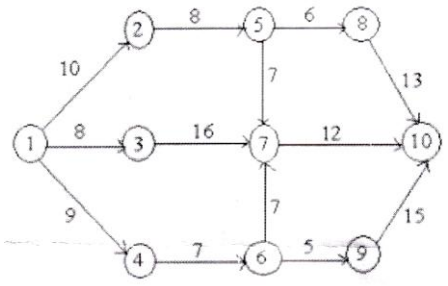
Determine sequence of jobs that will minimize total elapsed time, Ideal time for job.

b) Explain uniform series factors in detail. **07**

Q.6 Attempt the following questions.

a) Determine the earliest and latest timings in respect of all node points and identify critical path for the following network **07**



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a) Explain in details about:

i) Types of interests

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Seat No.		Set	P

T. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
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MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Multiple Choice Questions. **14**

1) Operations research approach is _____.
a) Qualitative managerial skill
b) Operational management skill
c) Scientific approach to decision making
d) Quantitative management skills

2) OR is said to be _____.
a) Only art b) Only science
c) Art as well as science d) None of these

3) Linear programming model which involves funds allocation of limited investment is classified as _____.
a) ordination budgeting model b) capital budgeting models
c) funds investment models d) funds origin models

4) As for maximization in assignment problem, the objective is to maximize the _____.
a) profit b) optimization
c) cost d) None of the above

5) _____ is one of the fundamental combinatorial optimization problems.
a) Assignment Problem b) Transportation Problem
c) Optimization Problem d) None of the above

6) A feasible solution is called a basic feasible solution if the number of non-negative allocations is equal to _____.
a) $m - n + 1$ b) $m - n - 1$
c) $m + n - 1$ d) None of the above

7) Which method usually gives a very good solution to the assignment problem?
   a) Northwest corner rule
   b) Vogel's approximation method
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8) In applying Vogel's approximation method to a profit maximization problem, row and column penalties are determined by _____.
   a) finding the smallest unit cost in each row or column
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9) Which of the following is NOT a characteristic of a queuing system?
   a) Customer population
   b) Arrival process
   c) Service mechanism
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10) In a M/M/1 queuing system, what does the first "M" represent?
   a) The number of servers
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11) The objective of sequencing problem is _____.
   a) To find the order in which jobs are to be made
   b) To find the time required for completing all the jobs on hand
   c) To find the sequence in which jobs on hand are to be processed to minimize the total time required for processing the jobs
   d) To maximize the effectiveness

12) The time required for printing of four books *A, B, C* and *D* is 5, 8, 10 and 7 hours. While its data entry requires 7, 4, 3 and 6 hours respectively. The sequence time that minimizes total elapsed time is _____.
   a) ACBD
   b) ABCD
   c) ADCB
   d) CBDA

13) In a project network, the critical path _____.
   a) may be the shortest path
   b) is the longest path
   c) may be longest path
   d) is the shortest path

14) Network models help in project management for _____.
   a) Planning
   b) Scheduling
   c) Controlling
   d) All of the above

Seat No.	

Set P

T. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Operation Research (MECHMDM-03B)

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D	13	12	14	15

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b) Solve the following problem by using NWCM and VAM Method. **07**

		DISTRIBUTER				
Company		P	Q	R	S	Supply
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	C	5	8	15	9	10
Requirement		7	5	3	2	

Q.4 a) Solve the following transportation problem by using NWCM and VAM method. **07**

		Warehouses				
		W1	W2	W3	W4	Supply
Factories	A	19	30	50	10	7
	B	70	30	40	60	9
	C	40	8	70	20	18
Requirement		5	8	7	14	

b) Solve the following Assignment problem (Assign the jobs to the operators) so as to minimize the cost. **07**

		Jobs			
		I	II	III	IV
Operators	A	5	7	11	6
	B	8	5	9	6
	C	4	7	10	7
	D	10	4	8	3

SECTION – II

Q.5 Attempt the following questions.

a) There are five jobs, each of which has to go through Machine A and Machine B & Machine C in the order ABC. Processing time in hours are as given below: **07**

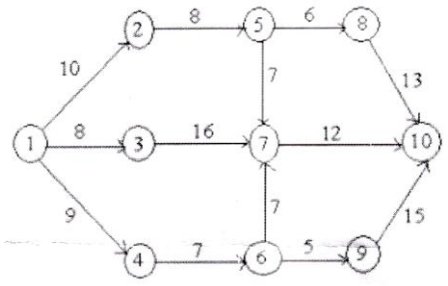
Job	1	2	3	4	5
M/C A	8	10	6	7	11
M/C B	5	6	2	3	4
M/C C	4	9	8	6	5

Determine sequence of jobs that will minimize total elapsed time, Ideal time for job.

b) Explain uniform series factors in detail. **07**

Q.6 Attempt the following questions.

a) Determine the earliest and latest timings in respect of all node points and identify critical path for the following network **07**



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Seat No.	

Set **Q**

T. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
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MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Multiple Choice Questions. **14**

1) In applying Vogel's approximation method to a profit maximization problem, row and column penalties are determined by _____.
a) finding the smallest unit cost in each row or column
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2) Which of the following is NOT a characteristic of a queuing system?
a) Customer population b) Arrival process
c) Service mechanism d) None of the above

3) In a M/M/1 queuing system, what does the first "M" represent?
a) The number of servers
b) The arrival process distribution
c) The service time distribution
d) The maximum queue length

4) The objective of sequencing problem is _____.
a) To find the order in which jobs are to be made
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5) The time required for printing of four books *A, B, C* and *D* is 5, 8, 10 and 7 hours. While its data entry requires 7, 4, 3 and 6 hours respectively. The sequence time that minimizes total elapsed time is _____.

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7) Network models help in project management for _____.

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13) A feasible solution is called a basic feasible solution if the number of non-negative allocations is equal to _____.

a) $m - n + 1$ b) $m - n - 1$
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Seat No.	

Set **Q**

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SECTION – II

Q.5 Attempt the following questions.

a) There are five jobs, each of which has to go through Machine A and Machine B & Machine C in the order ABC. Processing time in hours are as given below: **07**

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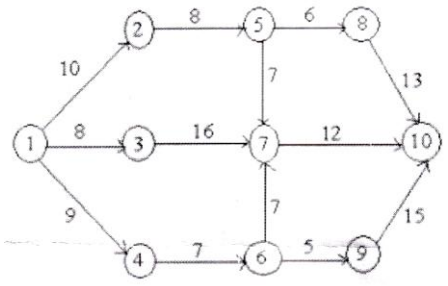

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Seat No.	

Set **R**

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MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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Seat No.	

Set R

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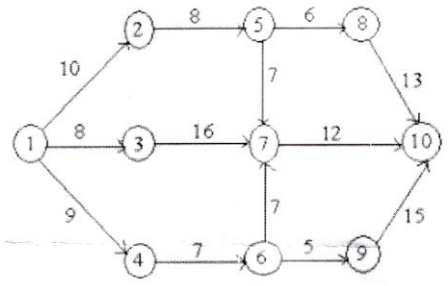

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9) Network models help in project management for _____.
   a) Planning
   b) Scheduling
   c) Controlling
   d) All of the above

10) Operations research approach is _____.
   a) Qualitative managerial skill
   b) Operational management skill
   c) Scientific approach to decision making
   d) Quantitative management skills

11) OR is said to be _____.
   a) Only art
   b) Only science
   c) Art as well as science
   d) None of these

12) Linear programming model which involves funds allocation of limited investment is classified as _____.
   a) ordination budgeting model
   b) capital budgeting models
   c) funds investment models
   d) funds origin models

13) As for maximization in assignment problem, the objective is to maximize the _____.
   a) profit
   b) optimization
   c) cost
   d) None of the above

14) _____ is one of the fundamental combinatorial optimization problems.
   a) Assignment Problem
   b) Transportation Problem
   c) Optimization Problem
   d) None of the above

Seat No.	

Set **S**

T. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Operation Research (MECHMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Solve any two questions from Section – I and Section – II
2) Figures to the right indicates full marks.
3) Assume additional suitable data if necessary and state it clearly.
4) Use of scientific calculator is allowed.

SECTION – I

Q.2 a) Explain O.R. Models and their applications. **06**

b) Solve the following linear programming problem using graphical method. **08**

Maximize $Z = 6X_1 + 8X_2$
Subject to $5X_1 + 10X_2 \leq 60$
$4X_1 + 4X_2 \leq 40$
$X_1 \ \& \ X_2 \geq 0$

Q.3 a) A company has a team of four salesmen and there are four districts where the company wants to start its business. After taking into account the capabilities of salesman & the nature of districts the company estimates that the profit per day in rupees for each salesman in each district is as below. **07**

	I	II	III	IV
A	16	10	14	11
B	14	11	15	15
C	15	15	13	12
D	13	12	14	15

Find the assignment of salesmen to various districts which will yield maximum profit.

b) Solve the following problem by using NWCM and VAM Method. **07**

		DISTRIBUTER				
Company		P	Q	R	S	Supply
	A	2	3	11	7	6
	B	1	0	6	1	1
	C	5	8	15	9	10
Requirement		7	5	3	2	

Q.4 a) Solve the following transportation problem by using NWCM and VAM method. **07**

		Warehouses				
		W1	W2	W3	W4	Supply
Factories	A	19	30	50	10	7
	B	70	30	40	60	9
	C	40	8	70	20	18
Requirement		5	8	7	14	

b) Solve the following Assignment problem (Assign the jobs to the operators) so as to minimize the cost. **07**

		Jobs			
		I	II	III	IV
Operators	A	5	7	11	6
	B	8	5	9	6
	C	4	7	10	7
	D	10	4	8	3

SECTION – II

Q.5 Attempt the following questions.

a) There are five jobs, each of which has to go through Machine A and Machine B & Machine C in the order ABC. Processing time in hours are as given below: **07**

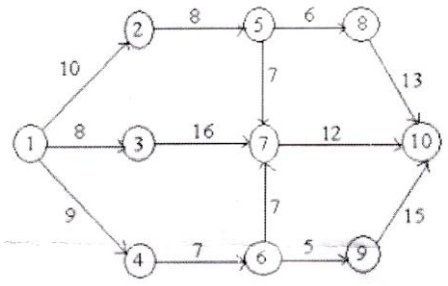
Job	1	2	3	4	5
M/C A	8	10	6	7	11
M/C B	5	6	2	3	4
M/C C	4	9	8	6	5

Determine sequence of jobs that will minimize total elapsed time, Ideal time for job.

b) Explain uniform series factors in detail. **07**

Q.6 Attempt the following questions.

a) Determine the earliest and latest timings in respect of all node points and identify critical path for the following network **07**



b) Explain in detail with example about steps for sequencing of n jobs which are being processed on three machines? **07**

Q.7 Attempt the following questions. **07**

a) Explain in details about:

i) Types of interests

ii) Types of costs

b) Differentiate between CPM & PERT. **07**

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Seat No.	

Set P

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Operation Research (MECHMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top on page.
3) Figures to the right indicates full marks.
4) Assume additional suitable data if necessary and state it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Multiple Choice Questions. **14**

1) Operations research approach is _____.
a) Qualitative managerial skill
b) Operational management skill
c) Scientific approach to decision making
d) Quantitative management skills

2) OR is said to be _____.
a) Only art b) Only science
c) Art as well as science d) None of these

3) Linear programming model which involves funds allocation of limited investment is classified as _____.
a) ordination budgeting model b) capital budgeting models
c) funds investment models d) funds origin models

4) As for maximization in assignment problem, the objective is to maximize the _____.
a) profit b) optimization
c) cost d) None of the above

5) _____ is one of the fundamental combinatorial optimization problems.
a) Assignment Problem b) Transportation Problem
c) Optimization Problem d) None of the above

6) A feasible solution is called a basic feasible solution if the number of non-negative allocations is equal to _____.
a) $m - n + 1$ b) $m - n - 1$
c) $m + n - 1$ d) None of the above

7) Which method usually gives a very good solution to the assignment problem?
   a) Northwest corner rule
   b) Vogel's approximation method
   c) MODI method
   d) Stepping-stone method

8) In applying Vogel's approximation method to a profit maximization problem, row and column penalties are determined by _____.
   a) finding the smallest unit cost in each row or column
   b) finding the sum of the unit costs in each row or column
   c) finding the difference between the two lowest unit costs in each row and column
   d) finding the difference between the two highest unit costs in each row and column

9) Which of the following is NOT a characteristic of a queuing system?
   a) Customer population
   b) Arrival process
   c) Service mechanism
   d) None of the above

10) In a M/M/1 queuing system, what does the first "M" represent?
   a) The number of servers
   b) The arrival process distribution
   c) The service time distribution
   d) The maximum queue length

11) The objective of sequencing problem is _____.
   a) To find the order in which jobs are to be made
   b) To find the time required for completing all the jobs on hand
   c) To find the sequence in which jobs on hand are to be processed to minimize the total time required for processing the jobs
   d) To maximize the effectiveness

12) The time required for printing of four books *A, B, C* and *D* is 5, 8, 10 and 7 hours. While its data entry requires 7, 4, 3 and 6 hours respectively. The sequence time that minimizes total elapsed time is _____.
   a) ACBD
   b) ABCD
   c) ADCB
   d) CBDA

13) In a project network, the critical path _____.
   a) may be the shortest path
   b) is the longest path
   c) may be longest path
   d) is the shortest path

14) Network models help in project management for _____.
   a) Planning
   b) Scheduling
   c) Controlling
   d) All of the above

Seat No.	

Set **P**

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Operation Research (MECHMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Solve any two questions from Section – I and Section – II
2) Figures to the right indicates full marks.
3) Assume additional suitable data if necessary and state it clearly.
4) Use of scientific calculator is allowed.

SECTION – I

Q.2 a) Explain O.R. Models and their applications. **06**

b) Solve the following linear programming problem using graphical method. **08**

Maximize $Z = 6X_1 + 8X_2$
Subject to $5X_1 + 10X_2 \leq 60$
$4X_1 + 4X_2 \leq 40$
$X_1 \ \& \ X_2 \geq 0$

Q.3 a) A company has a team of four salesmen and there are four districts where the company wants to start its business. After taking into account the capabilities of salesman & the nature of districts the company estimates that the profit per day in rupees for each salesman in each district is as below. **07**

	I	II	III	IV
A	16	10	14	11
B	14	11	15	15
C	15	15	13	12
D	13	12	14	15

Find the assignment of salesmen to various districts which will yield maximum profit.

b) Solve the following problem by using NWCM and VAM Method. **07**

		DISTRIBUTER				
Company		P	Q	R	S	Supply
	A	2	3	11	7	6
	B	1	0	6	1	1
	C	5	8	15	9	10
Requirement		7	5	3	2	

Q.4 a) Solve the following transportation problem by using NWCM and VAM method. **07**

		Warehouses				
		W1	W2	W3	W4	Supply
Factories	A	19	30	50	10	7
	B	70	30	40	60	9
	C	40	8	70	20	18
Requirement		5	8	7	14	

b) Solve the following Assignment problem (Assign the jobs to the operators) so as to minimize the cost. **07**

		Jobs			
		I	II	III	IV
Operators	A	5	7	11	6
	B	8	5	9	6
	C	4	7	10	7
	D	10	4	8	3

SECTION – II

Q.5 Attempt the following questions.

a) There are five jobs, each of which has to go through Machine A and Machine B & Machine C in the order ABC. Processing time in hours are as given below: **07**

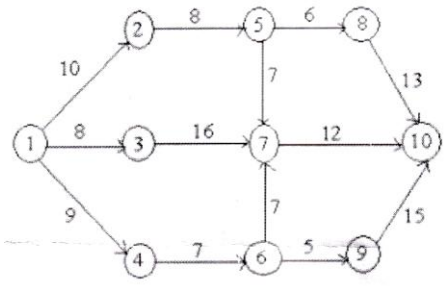
Job	1	2	3	4	5
M/C A	8	10	6	7	11
M/C B	5	6	2	3	4
M/C C	4	9	8	6	5

Determine sequence of jobs that will minimize total elapsed time, Ideal time for job.

b) Explain uniform series factors in detail. **07**

Q.6 Attempt the following questions.

a) Determine the earliest and latest timings in respect of all node points and identify critical path for the following network **07**



b) Explain in detail with example about steps for sequencing of n jobs which are being processed on three machines? **07**

Q.7 Attempt the following questions. **07**

a) Explain in details about:

i) Types of interests

ii) Types of costs

b) Differentiate between CPM & PERT. **07**

Seat No.	

Set **Q**

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Operation Research (MECHMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top on page.
3) Figures to the right indicates full marks.
4) Assume additional suitable data if necessary and state it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Multiple Choice Questions. **14**

1) In applying Vogel's approximation method to a profit maximization problem, row and column penalties are determined by _____.
a) finding the smallest unit cost in each row or column
b) finding the sum of the unit costs in each row or column
c) finding the difference between the two lowest unit costs in each row and column
d) finding the difference between the two highest unit costs in each row and column

2) Which of the following is NOT a characteristic of a queuing system?
a) Customer population b) Arrival process
c) Service mechanism d) None of the above

3) In a M/M/1 queuing system, what does the first "M" represent?
a) The number of servers
b) The arrival process distribution
c) The service time distribution
d) The maximum queue length

4) The objective of sequencing problem is _____.
a) To find the order in which jobs are to be made
b) To find the time required for completing all the jobs on hand
c) To find the sequence in which jobs on hand are to be processed to minimize the total time required for processing the jobs
d) To maximize the effectiveness

5) The time required for printing of four books *A, B, C* and *D* is 5, 8, 10 and 7 hours. While its data entry requires 7, 4, 3 and 6 hours respectively. The sequence time that minimizes total elapsed time is _____.

a) ACBD b) ABCD
c) ADCB d) CBDA

6) In a project network, the critical path _____.

a) may be the shortest path b) is the longest path
c) may be longest path d) is the shortest path

7) Network models help in project management for _____.

a) Planning b) Scheduling
c) Controlling d) All of the above

8) Operations research approach is _____.

a) Qualitative managerial skill
b) Operational management skill
c) Scientific approach to decision making
d) Quantitative management skills

9) OR is said to be _____.

a) Only art b) Only science
c) Art as well as science d) None of these

10) Linear programming model which involves funds allocation of limited investment is classified as _____.

a) ordination budgeting model b) capital budgeting models
c) funds investment models d) funds origin models

11) As for maximization in assignment problem, the objective is to maximize the _____.

a) profit b) optimization
c) cost d) None of the above

12) _____ is one of the fundamental combinatorial optimization problems.

a) Assignment Problem b) Transportation Problem
c) Optimization Problem d) None of the above

13) A feasible solution is called a basic feasible solution if the number of non-negative allocations is equal to _____.

a) $m - n + 1$ b) $m - n - 1$
c) $m + n - 1$ d) None of the above

14) Which method usually gives a very good solution to the assignment problem?

a) Northwest corner rule
b) Vogel's approximation method
c) MODI method
d) Stepping-stone method

Seat No.	

Set **Q**

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Operation Research (MECHMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Solve any two questions from Section – I and Section – II
2) Figures to the right indicates full marks.
3) Assume additional suitable data if necessary and state it clearly.
4) Use of scientific calculator is allowed.

SECTION – I

Q.2 a) Explain O.R. Models and their applications. **06**

b) Solve the following linear programming problem using graphical method. **08**

Maximize $Z = 6X_1 + 8X_2$
Subject to $5X_1 + 10X_2 \leq 60$
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$X_1 \ \& \ X_2 \geq 0$

Q.3 a) A company has a team of four salesmen and there are four districts where the company wants to start its business. After taking into account the capabilities of salesman & the nature of districts the company estimates that the profit per day in rupees for each salesman in each district is as below. **07**

	I	II	III	IV
A	16	10	14	11
B	14	11	15	15
C	15	15	13	12
D	13	12	14	15

Find the assignment of salesmen to various districts which will yield maximum profit.

b) Solve the following problem by using NWCM and VAM Method. **07**

		DISTRIBUTER				
Company		P	Q	R	S	Supply
	A	2	3	11	7	6
	B	1	0	6	1	1
	C	5	8	15	9	10
Requirement		7	5	3	2	

Q.4 a) Solve the following transportation problem by using NWCM and VAM method. **07**

		Warehouses				
		W1	W2	W3	W4	Supply
Factories	A	19	30	50	10	7
	B	70	30	40	60	9
	C	40	8	70	20	18
Requirement		5	8	7	14	

b) Solve the following Assignment problem (Assign the jobs to the operators) so as to minimize the cost. **07**

		Jobs			
		I	II	III	IV
Operators	A	5	7	11	6
	B	8	5	9	6
	C	4	7	10	7
	D	10	4	8	3

SECTION – II

Q.5 Attempt the following questions.

a) There are five jobs, each of which has to go through Machine A and Machine B & Machine C in the order ABC. Processing time in hours are as given below: **07**

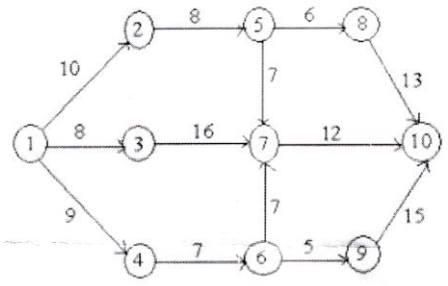
Job	1	2	3	4	5
M/C A	8	10	6	7	11
M/C B	5	6	2	3	4
M/C C	4	9	8	6	5

Determine sequence of jobs that will minimize total elapsed time, Ideal time for job.

b) Explain uniform series factors in detail. **07**

Q.6 Attempt the following questions.

a) Determine the earliest and latest timings in respect of all node points and identify critical path for the following network **07**



b) Explain in detail with example about steps for sequencing of n jobs which are being processed on three machines? **07**

Q.7 Attempt the following questions. **07**

a) Explain in details about:

i) Types of interests

ii) Types of costs

b) Differentiate between CPM & PERT. **07**

Seat No.	

Set **R**

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Operation Research (MECHMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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4) Assume additional suitable data if necessary and state it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Multiple Choice Questions. **14**

1) The objective of sequencing problem is _____.
a) To find the order in which jobs are to be made
b) To find the time required for completing all the jobs on hand
c) To find the sequence in which jobs on hand are to be processed to minimize the total time required for processing the jobs
d) To maximize the effectiveness

2) The time required for printing of four books *A, B, C* and *D* is 5, 8, 10 and 7 hours. While its data entry requires 7, 4, 3 and 6 hours respectively. The sequence time that minimizes total elapsed time is _____.
a) ACBD b) ABCD
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3) In a project network, the critical path _____.
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c) may be longest path d) is the shortest path

4) Network models help in project management for _____.
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7) Linear programming model which involves funds allocation of limited investment is classified as _____.

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8) As for maximization in assignment problem, the objective is to maximize the _____.

a) profit
b) optimization
c) cost
d) None of the above

9) _____ is one of the fundamental combinatorial optimization problems.

a) Assignment Problem
b) Transportation Problem
c) Optimization Problem
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10) A feasible solution is called a basic feasible solution if the number of non-negative allocations is equal to _____.

a) $m - n + 1$
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c) $m + n - 1$
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11) Which method usually gives a very good solution to the assignment problem?

a) Northwest corner rule
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c) MODI method
d) Stepping-stone method

12) In applying Vogel's approximation method to a profit maximization problem, row and column penalties are determined by _____.

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13) Which of the following is NOT a characteristic of a queuing system?

a) Customer population
b) Arrival process
c) Service mechanism
d) None of the above

14) In a M/M/1 queuing system, what does the first "M" represent?

a) The number of servers
b) The arrival process distribution
c) The service time distribution
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Seat No.	

Set R

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Operation Research (MECHMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Solve any two questions from Section – I and Section – II
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3) Assume additional suitable data if necessary and state it clearly.
4) Use of scientific calculator is allowed.

SECTION – I

Q.2 a) Explain O.R. Models and their applications. **06**

b) Solve the following linear programming problem using graphical method. **08**

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C	15	15	13	12
D	13	12	14	15

Find the assignment of salesmen to various districts which will yield maximum profit.

b) Solve the following problem by using NWCM and VAM Method. **07**

		DISTRIBUTER				
Company		P	Q	R	S	Supply
	A	2	3	11	7	6
	B	1	0	6	1	1
	C	5	8	15	9	10
Requirement		7	5	3	2	

Q.4 a) Solve the following transportation problem by using NWCM and VAM method. **07**

		Warehouses				
		W1	W2	W3	W4	Supply
Factories	A	19	30	50	10	7
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	C	40	8	70	20	18
Requirement		5	8	7	14	

b) Solve the following Assignment problem (Assign the jobs to the operators) so as to minimize the cost. **07**

		Jobs			
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Operators	A	5	7	11	6
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SECTION – II

Q.5 Attempt the following questions.

a) There are five jobs, each of which has to go through Machine A and Machine B & Machine C in the order ABC. Processing time in hours are as given below: **07**

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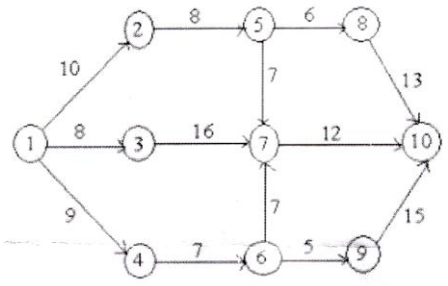
b) Explain uniform series factors in detail. **07**

Q.6 Attempt the following questions.

a) Determine the earliest and latest timings in respect of all node points and identify critical path for the following network **07**



b) Explain in detail with example about steps for sequencing of n jobs which are being processed on three machines? **07**

Q.7 Attempt the following questions. **07**

a) Explain in details about:

i) Types of interests

ii) Types of costs

b) Differentiate between CPM & PERT. **07**

Seat No.	

Set **S**

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Operation Research (MECHMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Multiple Choice Questions. **14**

1) A feasible solution is called a basic feasible solution if the number of non-negative allocations is equal to _____.
a) $m - n + 1$ b) $m - n - 1$
c) $m + n - 1$ d) None of the above

2) Which method usually gives a very good solution to the assignment problem?
a) Northwest corner rule
b) Vogel's approximation method
c) MODI method
d) Stepping-stone method

3) In applying Vogel's approximation method to a profit maximization problem, row and column penalties are determined by _____.
a) finding the smallest unit cost in each row or column
b) finding the sum of the unit costs in each row or column
c) finding the difference between the two lowest unit costs in each row and column
d) finding the difference between the two highest unit costs in each row and column

4) Which of the following is NOT a characteristic of a queuing system?
a) Customer population b) Arrival process
c) Service mechanism d) None of the above

5) In a M/M/1 queuing system, what does the first "M" represent?
a) The number of servers
b) The arrival process distribution
c) The service time distribution
d) The maximum queue length

6) The objective of sequencing problem is _____.
   a) To find the order in which jobs are to be made
   b) To find the time required for completing all the jobs on hand
   c) To find the sequence in which jobs on hand are to be processed to minimize the total time required for processing the jobs
   d) To maximize the effectiveness

7) The time required for printing of four books *A, B, C* and *D* is 5, 8, 10 and 7 hours. While its data entry requires 7, 4, 3 and 6 hours respectively. The sequence time that minimizes total elapsed time is _____.
   a) ACBD
   b) ABCD
   c) ADCB
   d) CBDA

8) In a project network, the critical path _____.
   a) may be the shortest path
   b) is the longest path
   c) may be longest path
   d) is the shortest path

9) Network models help in project management for _____.
   a) Planning
   b) Scheduling
   c) Controlling
   d) All of the above

10) Operations research approach is _____.
   a) Qualitative managerial skill
   b) Operational management skill
   c) Scientific approach to decision making
   d) Quantitative management skills

11) OR is said to be _____.
   a) Only art
   b) Only science
   c) Art as well as science
   d) None of these

12) Linear programming model which involves funds allocation of limited investment is classified as _____.
   a) ordination budgeting model
   b) capital budgeting models
   c) funds investment models
   d) funds origin models

13) As for maximization in assignment problem, the objective is to maximize the _____.
   a) profit
   b) optimization
   c) cost
   d) None of the above

14) _____ is one of the fundamental combinatorial optimization problems.
   a) Assignment Problem
   b) Transportation Problem
   c) Optimization Problem
   d) None of the above

Seat No.	

Set **S**

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Operation Research (MECHMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Solve any two questions from Section – I and Section – II
2) Figures to the right indicates full marks.
3) Assume additional suitable data if necessary and state it clearly.
4) Use of scientific calculator is allowed.

SECTION – I

Q.2 a) Explain O.R. Models and their applications. **06**

b) Solve the following linear programming problem using graphical method. **08**

Maximize $Z = 6X_1 + 8X_2$
Subject to $5X_1 + 10X_2 \leq 60$
$4X_1 + 4X_2 \leq 40$
$X_1 \ \& \ X_2 \geq 0$

Q.3 a) A company has a team of four salesmen and there are four districts where the company wants to start its business. After taking into account the capabilities of salesman & the nature of districts the company estimates that the profit per day in rupees for each salesman in each district is as below. **07**

	I	II	III	IV
A	16	10	14	11
B	14	11	15	15
C	15	15	13	12
D	13	12	14	15

Find the assignment of salesmen to various districts which will yield maximum profit.

b) Solve the following problem by using NWCM and VAM Method. **07**

		DISTRIBUTER				
Company		P	Q	R	S	Supply
	A	2	3	11	7	6
	B	1	0	6	1	1
	C	5	8	15	9	10
Requirement		7	5	3	2	

Q.4 a) Solve the following transportation problem by using NWCM and VAM method. **07**

		Warehouses				
		W1	W2	W3	W4	Supply
Factories	A	19	30	50	10	7
	B	70	30	40	60	9
	C	40	8	70	20	18
Requirement		5	8	7	14	

b) Solve the following Assignment problem (Assign the jobs to the operators) so as to minimize the cost. **07**

		Jobs			
		I	II	III	IV
Operators	A	5	7	11	6
	B	8	5	9	6
	C	4	7	10	7
	D	10	4	8	3

SECTION – II

Q.5 Attempt the following questions.

a) There are five jobs, each of which has to go through Machine A and Machine B & Machine C in the order ABC. Processing time in hours are as given below: **07**

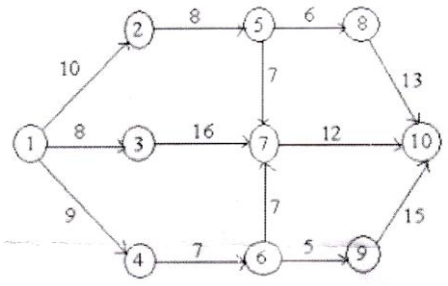
Job	1	2	3	4	5
M/C A	8	10	6	7	11
M/C B	5	6	2	3	4
M/C C	4	9	8	6	5

Determine sequence of jobs that will minimize total elapsed time, Ideal time for job.

b) Explain uniform series factors in detail. **07**

Q.6 Attempt the following questions.

a) Determine the earliest and latest timings in respect of all node points and identify critical path for the following network **07**



b) Explain in detail with example about steps for sequencing of n jobs which are being processed on three machines? **07**

Q.7 Attempt the following questions. **07**

a) Explain in details about:

i) Types of interests

ii) Types of costs

b) Differentiate between CPM & PERT. **07**

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Seat No.		Set	P

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Operation Research (MECHMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top on page.
3) Figures to the right indicates full marks.
4) Assume additional suitable data if necessary and state it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Multiple Choice Questions. **14**

1) Operations research approach is _____.
a) Qualitative managerial skill
b) Operational management skill
c) Scientific approach to decision making
d) Quantitative management skills

2) OR is said to be _____.
a) Only art b) Only science
c) Art as well as science d) None of these

3) Linear programming model which involves funds allocation of limited investment is classified as _____.
a) ordination budgeting model b) capital budgeting models
c) funds investment models d) funds origin models

4) As for maximization in assignment problem, the objective is to maximize the _____.
a) profit b) optimization
c) cost d) None of the above

5) _____ is one of the fundamental combinatorial optimization problems.
a) Assignment Problem b) Transportation Problem
c) Optimization Problem d) None of the above

6) A feasible solution is called a basic feasible solution if the number of non-negative allocations is equal to _____.
a) $m - n + 1$ b) $m - n - 1$
c) $m + n - 1$ d) None of the above

7) Which method usually gives a very good solution to the assignment problem?
   a) Northwest corner rule
   b) Vogel's approximation method
   c) MODI method
   d) Stepping-stone method

8) In applying Vogel's approximation method to a profit maximization problem, row and column penalties are determined by _____.
   a) finding the smallest unit cost in each row or column
   b) finding the sum of the unit costs in each row or column
   c) finding the difference between the two lowest unit costs in each row and column
   d) finding the difference between the two highest unit costs in each row and column

9) Which of the following is NOT a characteristic of a queuing system?
   a) Customer population
   b) Arrival process
   c) Service mechanism
   d) None of the above

10) In a M/M/1 queuing system, what does the first "M" represent?
   a) The number of servers
   b) The arrival process distribution
   c) The service time distribution
   d) The maximum queue length

11) The objective of sequencing problem is _____.
   a) To find the order in which jobs are to be made
   b) To find the time required for completing all the jobs on hand
   c) To find the sequence in which jobs on hand are to be processed to minimize the total time required for processing the jobs
   d) To maximize the effectiveness

12) The time required for printing of four books *A, B, C* and *D* is 5, 8, 10 and 7 hours. While its data entry requires 7, 4, 3 and 6 hours respectively. The sequence time that minimizes total elapsed time is _____.
   a) ACBD
   b) ABCD
   c) ADCB
   d) CBDA

13) In a project network, the critical path _____.
   a) may be the shortest path
   b) is the longest path
   c) may be longest path
   d) is the shortest path

14) Network models help in project management for _____.
   a) Planning
   b) Scheduling
   c) Controlling
   d) All of the above

Seat No.	

Set P

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Operation Research (MECHMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Solve any two questions from Section – I and Section – II
2) Figures to the right indicates full marks.
3) Assume additional suitable data if necessary and state it clearly.
4) Use of scientific calculator is allowed.

SECTION – I

Q.2 a) Explain O.R. Models and their applications. **06**

b) Solve the following linear programming problem using graphical method. **08**

Maximize $Z = 6X_1 + 8X_2$
Subject to $5X_1 + 10X_2 \leq 60$
$4X_1 + 4X_2 \leq 40$
$X_1 \ \& \ X_2 \geq 0$

Q.3 a) A company has a team of four salesmen and there are four districts where the company wants to start its business. After taking into account the capabilities of salesman & the nature of districts the company estimates that the profit per day in rupees for each salesman in each district is as below. **07**

	I	II	III	IV
A	16	10	14	11
B	14	11	15	15
C	15	15	13	12
D	13	12	14	15

Find the assignment of salesmen to various districts which will yield maximum profit.

b) Solve the following problem by using NWCM and VAM Method. **07**

		DISTRIBUTER				
Company		P	Q	R	S	Supply
	A	2	3	11	7	6
	B	1	0	6	1	1
	C	5	8	15	9	10
Requirement		7	5	3	2	

Q.4 a) Solve the following transportation problem by using NWCM and VAM method. **07**

		Warehouses				
		W1	W2	W3	W4	Supply
Factories	A	19	30	50	10	7
	B	70	30	40	60	9
	C	40	8	70	20	18
Requirement		5	8	7	14	

b) Solve the following Assignment problem (Assign the jobs to the operators) so as to minimize the cost. **07**

		Jobs			
		I	II	III	IV
Operators	A	5	7	11	6
	B	8	5	9	6
	C	4	7	10	7
	D	10	4	8	3

SECTION – II

Q.5 Attempt the following questions.

a) There are five jobs, each of which has to go through Machine A and Machine B & Machine C in the order ABC. Processing time in hours are as given below: **07**

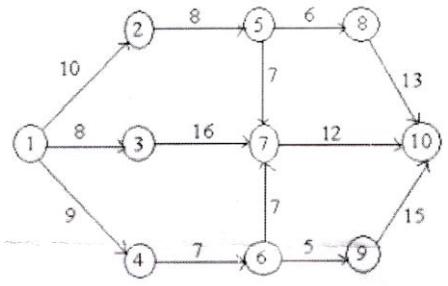
Job	1	2	3	4	5
M/C A	8	10	6	7	11
M/C B	5	6	2	3	4
M/C C	4	9	8	6	5

Determine sequence of jobs that will minimize total elapsed time, Ideal time for job.

b) Explain uniform series factors in detail. **07**

Q.6 Attempt the following questions.

a) Determine the earliest and latest timings in respect of all node points and identify critical path for the following network **07**



b) Explain in detail with example about steps for sequencing of n jobs which are being processed on three machines? **07**

Q.7 Attempt the following questions. **07**

a) Explain in details about:

i) Types of interests

ii) Types of costs

b) Differentiate between CPM & PERT. **07**

Seat No.	

Set **Q**

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Operation Research (MECHMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top on page.
3) Figures to the right indicates full marks.
4) Assume additional suitable data if necessary and state it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Multiple Choice Questions. **14**

1) In applying Vogel's approximation method to a profit maximization problem, row and column penalties are determined by _____.
a) finding the smallest unit cost in each row or column
b) finding the sum of the unit costs in each row or column
c) finding the difference between the two lowest unit costs in each row and column
d) finding the difference between the two highest unit costs in each row and column

2) Which of the following is NOT a characteristic of a queuing system?
a) Customer population b) Arrival process
c) Service mechanism d) None of the above

3) In a M/M/1 queuing system, what does the first "M" represent?
a) The number of servers
b) The arrival process distribution
c) The service time distribution
d) The maximum queue length

4) The objective of sequencing problem is _____.
a) To find the order in which jobs are to be made
b) To find the time required for completing all the jobs on hand
c) To find the sequence in which jobs on hand are to be processed to minimize the total time required for processing the jobs
d) To maximize the effectiveness

5) The time required for printing of four books *A, B, C* and *D* is 5, 8, 10 and 7 hours. While its data entry requires 7, 4, 3 and 6 hours respectively. The sequence time that minimizes total elapsed time is _____.

a) ACBD b) ABCD
c) ADCB d) CBDA

6) In a project network, the critical path _____.

a) may be the shortest path b) is the longest path
c) may be longest path d) is the shortest path

7) Network models help in project management for _____.

a) Planning b) Scheduling
c) Controlling d) All of the above

8) Operations research approach is _____.

a) Qualitative managerial skill
b) Operational management skill
c) Scientific approach to decision making
d) Quantitative management skills

9) OR is said to be _____.

a) Only art b) Only science
c) Art as well as science d) None of these

10) Linear programming model which involves funds allocation of limited investment is classified as _____.

a) ordination budgeting model b) capital budgeting models
c) funds investment models d) funds origin models

11) As for maximization in assignment problem, the objective is to maximize the _____.

a) profit b) optimization
c) cost d) None of the above

12) _____ is one of the fundamental combinatorial optimization problems.

a) Assignment Problem b) Transportation Problem
c) Optimization Problem d) None of the above

13) A feasible solution is called a basic feasible solution if the number of non-negative allocations is equal to _____.

a) $m - n + 1$ b) $m - n - 1$
c) $m + n - 1$ d) None of the above

14) Which method usually gives a very good solution to the assignment problem?

a) Northwest corner rule
b) Vogel's approximation method
c) MODI method
d) Stepping-stone method

Seat No.	

Set **Q**

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Operation Research (MECHMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Solve any two questions from Section – I and Section – II
2) Figures to the right indicates full marks.
3) Assume additional suitable data if necessary and state it clearly.
4) Use of scientific calculator is allowed.

SECTION – I

Q.2 a) Explain O.R. Models and their applications. **06**

b) Solve the following linear programming problem using graphical method. **08**

Maximize $Z = 6X_1 + 8X_2$
Subject to $5X_1 + 10X_2 \leq 60$
$4X_1 + 4X_2 \leq 40$
$X_1 \ \& \ X_2 \geq 0$

Q.3 a) A company has a team of four salesmen and there are four districts where the company wants to start its business. After taking into account the capabilities of salesman & the nature of districts the company estimates that the profit per day in rupees for each salesman in each district is as below. **07**

	I	II	III	IV
A	16	10	14	11
B	14	11	15	15
C	15	15	13	12
D	13	12	14	15

Find the assignment of salesmen to various districts which will yield maximum profit.

b) Solve the following problem by using NWCM and VAM Method. **07**

		DISTRIBUTER				
Company		P	Q	R	S	Supply
	A	2	3	11	7	6
	B	1	0	6	1	1
	C	5	8	15	9	10
Requirement		7	5	3	2	

Q.4 a) Solve the following transportation problem by using NWCM and VAM method. **07**

		Warehouses				
		W1	W2	W3	W4	Supply
Factories	A	19	30	50	10	7
	B	70	30	40	60	9
	C	40	8	70	20	18
Requirement		5	8	7	14	

b) Solve the following Assignment problem (Assign the jobs to the operators) so as to minimize the cost. **07**

		Jobs			
		I	II	III	IV
Operators	A	5	7	11	6
	B	8	5	9	6
	C	4	7	10	7
	D	10	4	8	3

SECTION – II

Q.5 Attempt the following questions.

a) There are five jobs, each of which has to go through Machine A and Machine B & Machine C in the order ABC. Processing time in hours are as given below: **07**

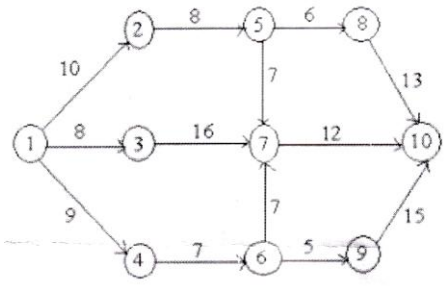
Job	1	2	3	4	5
M/C A	8	10	6	7	11
M/C B	5	6	2	3	4
M/C C	4	9	8	6	5

Determine sequence of jobs that will minimize total elapsed time, Ideal time for job.

b) Explain uniform series factors in detail. **07**

Q.6 Attempt the following questions.

a) Determine the earliest and latest timings in respect of all node points and identify critical path for the following network **07**



b) Explain in detail with example about steps for sequencing of n jobs which are being processed on three machines? **07**

Q.7 Attempt the following questions. **07**

a) Explain in details about:

i) Types of interests

ii) Types of costs

b) Differentiate between CPM & PERT. **07**

Seat No.	

Set R

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Operation Research (MECHMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top on page.
3) Figures to the right indicates full marks.
4) Assume additional suitable data if necessary and state it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Multiple Choice Questions. **14**

1) The objective of sequencing problem is _____.
a) To find the order in which jobs are to be made
b) To find the time required for completing all the jobs on hand
c) To find the sequence in which jobs on hand are to be processed to minimize the total time required for processing the jobs
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2) The time required for printing of four books *A, B, C* and *D* is 5, 8, 10 and 7 hours. While its data entry requires 7, 4, 3 and 6 hours respectively. The sequence time that minimizes total elapsed time is _____.
a) ACBD b) ABCD
c) ADCB d) CBDA

3) In a project network, the critical path _____.
a) may be the shortest path b) is the longest path
c) may be longest path d) is the shortest path

4) Network models help in project management for _____.
a) Planning b) Scheduling
c) Controlling d) All of the above

5) Operations research approach is _____.
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7) Linear programming model which involves funds allocation of limited investment is classified as _____.

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a) profit
b) optimization
c) cost
d) None of the above

9) _____ is one of the fundamental combinatorial optimization problems.

a) Assignment Problem
b) Transportation Problem
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13) Which of the following is NOT a characteristic of a queuing system?

a) Customer population
b) Arrival process
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14) In a M/M/1 queuing system, what does the first "M" represent?

a) The number of servers
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c) The service time distribution
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Seat No.	

Set R

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Operation Research (MECHMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Solve any two questions from Section – I and Section – II
2) Figures to the right indicates full marks.
3) Assume additional suitable data if necessary and state it clearly.
4) Use of scientific calculator is allowed.

SECTION – I

Q.2 a) Explain O.R. Models and their applications. **06**

b) Solve the following linear programming problem using graphical method. **08**

Maximize $Z = 6X_1 + 8X_2$
Subject to $5X_1 + 10X_2 \leq 60$
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B	14	11	15	15
C	15	15	13	12
D	13	12	14	15

Find the assignment of salesmen to various districts which will yield maximum profit.

b) Solve the following problem by using NWCM and VAM Method. **07**

		DISTRIBUTER				
Company		P	Q	R	S	Supply
	A	2	3	11	7	6
	B	1	0	6	1	1
	C	5	8	15	9	10
Requirement		7	5	3	2	

Q.4 a) Solve the following transportation problem by using NWCM and VAM method. **07**

		Warehouses				
		W1	W2	W3	W4	Supply
Factories	A	19	30	50	10	7
	B	70	30	40	60	9
	C	40	8	70	20	18
Requirement		5	8	7	14	

b) Solve the following Assignment problem (Assign the jobs to the operators) so as to minimize the cost. **07**

		Jobs			
		I	II	III	IV
Operators	A	5	7	11	6
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	C	4	7	10	7
	D	10	4	8	3

SECTION – II

Q.5 Attempt the following questions.

a) There are five jobs, each of which has to go through Machine A and Machine B & Machine C in the order ABC. Processing time in hours are as given below: **07**

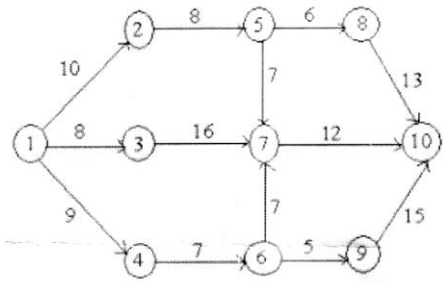
Job	1	2	3	4	5
M/C A	8	10	6	7	11
M/C B	5	6	2	3	4
M/C C	4	9	8	6	5

Determine sequence of jobs that will minimize total elapsed time, Ideal time for job.

b) Explain uniform series factors in detail. **07**

Q.6 Attempt the following questions.

a) Determine the earliest and latest timings in respect of all node points and identify critical path for the following network **07**



b) Explain in detail with example about steps for sequencing of n jobs which are being processed on three machines? **07**

Q.7 Attempt the following questions. **07**

a) Explain in details about:

i) Types of interests

ii) Types of costs

b) Differentiate between CPM & PERT. **07**

Seat No.	

Set **S**

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Operation Research (MECHMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top on page.
3) Figures to the right indicates full marks.
4) Assume additional suitable data if necessary and state it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Multiple Choice Questions. **14**

1) A feasible solution is called a basic feasible solution if the number of non-negative allocations is equal to _____.
a) $m - n + 1$ b) $m - n - 1$
c) $m + n - 1$ d) None of the above

2) Which method usually gives a very good solution to the assignment problem?
a) Northwest corner rule
b) Vogel's approximation method
c) MODI method
d) Stepping-stone method

3) In applying Vogel's approximation method to a profit maximization problem, row and column penalties are determined by _____.
a) finding the smallest unit cost in each row or column
b) finding the sum of the unit costs in each row or column
c) finding the difference between the two lowest unit costs in each row and column
d) finding the difference between the two highest unit costs in each row and column

4) Which of the following is NOT a characteristic of a queuing system?
a) Customer population b) Arrival process
c) Service mechanism d) None of the above

5) In a M/M/1 queuing system, what does the first "M" represent?
a) The number of servers
b) The arrival process distribution
c) The service time distribution
d) The maximum queue length

6) The objective of sequencing problem is _____.
   a) To find the order in which jobs are to be made
   b) To find the time required for completing all the jobs on hand
   c) To find the sequence in which jobs on hand are to be processed to minimize the total time required for processing the jobs
   d) To maximize the effectiveness

7) The time required for printing of four books *A, B, C* and *D* is 5, 8, 10 and 7 hours. While its data entry requires 7, 4, 3 and 6 hours respectively. The sequence time that minimizes total elapsed time is _____.
   a) ACBD
   b) ABCD
   c) ADCB
   d) CBDA

8) In a project network, the critical path _____.
   a) may be the shortest path
   b) is the longest path
   c) may be longest path
   d) is the shortest path

9) Network models help in project management for _____.
   a) Planning
   b) Scheduling
   c) Controlling
   d) All of the above

10) Operations research approach is _____.
   a) Qualitative managerial skill
   b) Operational management skill
   c) Scientific approach to decision making
   d) Quantitative management skills

11) OR is said to be _____.
   a) Only art
   b) Only science
   c) Art as well as science
   d) None of these

12) Linear programming model which involves funds allocation of limited investment is classified as _____.
   a) ordination budgeting model
   b) capital budgeting models
   c) funds investment models
   d) funds origin models

13) As for maximization in assignment problem, the objective is to maximize the _____.
   a) profit
   b) optimization
   c) cost
   d) None of the above

14) _____ is one of the fundamental combinatorial optimization problems.
   a) Assignment Problem
   b) Transportation Problem
   c) Optimization Problem
   d) None of the above

Seat No.	

Set **S**

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Operation Research (MECHMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Solve any two questions from Section – I and Section – II
2) Figures to the right indicates full marks.
3) Assume additional suitable data if necessary and state it clearly.
4) Use of scientific calculator is allowed.

SECTION – I

Q.2 a) Explain O.R. Models and their applications. **06**

b) Solve the following linear programming problem using graphical method. **08**

Maximize $Z = 6X_1 + 8X_2$
Subject to $5X_1 + 10X_2 \leq 60$
$4X_1 + 4X_2 \leq 40$
$X_1 \ \& \ X_2 \geq 0$

Q.3 a) A company has a team of four salesmen and there are four districts where the company wants to start its business. After taking into account the capabilities of salesman & the nature of districts the company estimates that the profit per day in rupees for each salesman in each district is as below. **07**

	I	II	III	IV
A	16	10	14	11
B	14	11	15	15
C	15	15	13	12
D	13	12	14	15

Find the assignment of salesmen to various districts which will yield maximum profit.

b) Solve the following problem by using NWCM and VAM Method. **07**

		DISTRIBUTER				
Company		P	Q	R	S	Supply
	A	2	3	11	7	6
	B	1	0	6	1	1
	C	5	8	15	9	10
Requirement		7	5	3	2	

Q.4 a) Solve the following transportation problem by using NWCM and VAM method. **07**

		Warehouses				
		W1	W2	W3	W4	Supply
Factories	A	19	30	50	10	7
	B	70	30	40	60	9
	C	40	8	70	20	18
Requirement		5	8	7	14	

b) Solve the following Assignment problem (Assign the jobs to the operators) so as to minimize the cost. **07**

		Jobs			
		I	II	III	IV
Operators	A	5	7	11	6
	B	8	5	9	6
	C	4	7	10	7
	D	10	4	8	3

SECTION – II

Q.5 Attempt the following questions.

a) There are five jobs, each of which has to go through Machine A and Machine B & Machine C in the order ABC. Processing time in hours are as given below: **07**

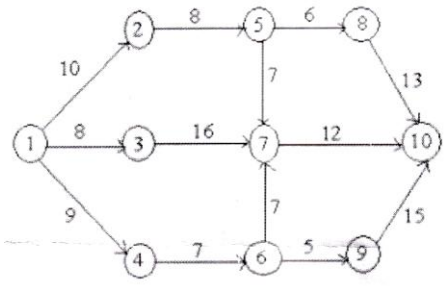
Job	1	2	3	4	5
M/C A	8	10	6	7	11
M/C B	5	6	2	3	4
M/C C	4	9	8	6	5

Determine sequence of jobs that will minimize total elapsed time, Ideal time for job.

b) Explain uniform series factors in detail. **07**

Q.6 Attempt the following questions.

a) Determine the earliest and latest timings in respect of all node points and identify critical path for the following network **07**



b) Explain in detail with example about steps for sequencing of n jobs which are being processed on three machines? **07**

Q.7 Attempt the following questions. **07**

a) Explain in details about:

i) Types of interests

ii) Types of costs

b) Differentiate between CPM & PERT. **07**

SLR-QH-639

Seat No.	

Set P

T. Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April - 2026
PIC Microcontroller (ENTMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives. **14**

1) PIC16F877A has a _____ bit architecture.
a) 8-bit b) 16-bit
c) 32-bit d) 4-bit

2) PIC16F877A uses which type of memory for program storage?
a) ROM b) EPROM
c) Flash d) EEPROM

3) The STATUS register in PIC is used for _____.
a) Arithmetic flag status b) Control of peripherals
c) Interrupt enable d) I/O configuration

4) PIC16F877A has how many I/O ports?
a) 3 b) 4
c) 5 d) 6

5) The oscillator section in PIC provides _____.
a) Timing and synchronization b) Power control
c) Data transfer d) Interrupt control

6) The instruction set of PIC16F877A is _____.
a) 33 instructions b) 35 instructions
c) 37 instructions d) 40 instructions

7) C programming for PIC requires which compiler?
a) MPLAB XC8 b) Turbo C
c) Code::Blocks d) Visual Studio

8) The CLRWDT instruction is used to _____.
   a) Clear Watchdog Timer b) Clear Working Register
   c) Clear RAM d) Clear Program Counter

9) The ADCON0 register controls _____.
   a) ADC channel selection and conversion
   b) Oscillator
   c) Timers
   d) Interrupts

10) CCP stands for _____.
   a) Capture/Compare/PWM b) Control/Command/Power
   c) Counter/Compare/Power d) Capture/Count/Phase

11) The MSSP module supports _____.
   a) SPI and I^2C b) UART only
   c) PWM d) ADC

12) LEDs are interfaced to PIC through _____.
   a) Output ports b) Input ports
   c) Serial ports d) ADC ports

13) LCD display commonly used with PIC is _____.
   a) 16×2 b) 4×4
   c) 8×2 d) 20×4

14) Automation refers to _____.
   a) Control with minimal human intervention
   b) Manual control
   c) Mechanical control
   d) None

SLR-QH-639

Seat No.		Set	P

T. Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
PIC Microcontroller (ENTMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt Any Four from the following. **16**

a) Draw & explain memory organization of PIC16F877 in detail.

b) Explain different I/O ports available in PIC 16F877.

c) Describe the functional any 4 pin description of PIC 16F877.

d) Interpret the functions of following SFR using suitable diagram.
i) STATUS
ii) OPTION_REG

e) Explain timer 0 operation in PIC 16F877.

Q.3 Attempt Any Two from following. **12**

a) Draw & explain architecture of PIC 16F877 microcontroller.

b) Write a C or assembly language program to perform addition & subtraction of two numbers(0×35,0×12) & send result of addition to PORT B & subtraction to PORT D in PIC 16F877.

c) What is interrupt? List out types of interrupts in PIC 16F877A.

SECTION – II

Q.4 Attempt Any Four from the following. **16**

a) Explain the SFR ADCON0 and ADCON1 Resistor.

b) Explain the serial communication using USART.

c) Explain capture module in PIC 16F877A in detail.

d) Describe interfacing of DC motor with PIC 16F877

e) Explain how LED's are interfaced with PIC 16F877.

Q.5 Attempt Any Two from following. **12**

a) Explain interfacing of 7 Segment with PIC Microcontroller.

b) Explain any one Master Synchronous Serial Port (MSSP) module.

c) Explain interfacing of LCD 16×2 with PIC 16f877.

SLR-QH-639

Seat No.	

Set Q

T. Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April - 2026
PIC Microcontroller (ENTMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives. **14**

1) The CLRWDT instruction is used to _____.
a) Clear Watchdog Timer b) Clear Working Register
c) Clear RAM d) Clear Program Counter

2) The ADCON0 register controls _____.
a) ADC channel selection and conversion
b) Oscillator
c) Timers
d) Interrupts

3) CCP stands for _____.
a) Capture/Compare/PWM b) Control/Command/Power
c) Counter/Compare/Power d) Capture/Count/Phase

4) The MSSP module supports _____.
a) SPI and I^2C b) UART only
c) PWM d) ADC

5) LEDs are interfaced to PIC through _____.
a) Output ports b) Input ports
c) Serial ports d) ADC ports

6) LCD display commonly used with PIC is _____.
a) 16×2 b) 4×4
c) 8×2 d) 20×4

7) Automation refers to _____.
   a) Control with minimal human intervention
   b) Manual control
   c) Mechanical control
   d) None

8) PIC16F877A has a _____ bit architecture.
   a) 8-bit
   b) 16-bit
   c) 32-bit
   d) 4-bit

9) PIC16F877A uses which type of memory for program storage?
   a) ROM
   b) EPROM
   c) Flash
   d) EEPROM

10) The STATUS register in PIC is used for _____.
   a) Arithmetic flag status
   b) Control of peripherals
   c) Interrupt enable
   d) I/O configuration

11) PIC16F877A has how many I/O ports?
   a) 3
   b) 4
   c) 5
   d) 6

12) The oscillator section in PIC provides _____.
   a) Timing and synchronization
   b) Power control
   c) Data transfer
   d) Interrupt control

13) The instruction set of PIC16F877A is _____.
   a) 33 instructions
   b) 35 instructions
   c) 37 instructions
   d) 40 instructions

14) C programming for PIC requires which compiler?
   a) MPLAB XC8
   b) Turbo C
   c) Code::Blocks
   d) Visual Studio

SLR-QH-639

Seat No.	

Set Q

T. Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
PIC Microcontroller (ENTMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt Any Four from the following. **16**

a) Draw & explain memory organization of PIC16F877 in detail.

b) Explain different I/O ports available in PIC 16F877.

c) Describe the functional any 4 pin description of PIC 16F877.

d) Interpret the functions of following SFR using suitable diagram.
i) STATUS
ii) OPTION_REG

e) Explain timer 0 operation in PIC 16F877.

Q.3 Attempt Any Two from following. **12**

a) Draw & explain architecture of PIC 16F877 microcontroller.

b) Write a C or assembly language program to perform addition & subtraction of two numbers(0×35,0×12) & send result of addition to PORT B & subtraction to PORT D in PIC 16F877.

c) What is interrupt? List out types of interrupts in PIC 16F877A.

SECTION – II

Q.4 Attempt Any Four from the following. **16**

a) Explain the SFR ADCON0 and ADCON1 Resistor.

b) Explain the serial communication using USART.

c) Explain capture module in PIC 16F877A in detail.

d) Describe interfacing of DC motor with PIC 16F877

e) Explain how LED's are interfaced with PIC 16F877.

Q.5 Attempt Any Two from following. **12**

a) Explain interfacing of 7 Segment with PIC Microcontroller.

b) Explain any one Master Synchronous Serial Port (MSSP) module.

c) Explain interfacing of LCD 16×2 with PIC 16f877.

SLR-QH-639

Seat No.	

Set | **R**

T. Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April - 2026
PIC Microcontroller (ENTMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives. **14**

1) The MSSP module supports _____.
a) SPI and I^2C b) UART only
c) PWM d) ADC

2) LEDs are interfaced to PIC through _____.
a) Output ports b) Input ports
c) Serial ports d) ADC ports

3) LCD display commonly used with PIC is _____.
a) 16×2 b) 4×4
c) 8×2 d) 20×4

4) Automation refers to _____.
a) Control with minimal human intervention
b) Manual control
c) Mechanical control
d) None

5) PIC16F877A has a _____ bit architecture.
a) 8-bit b) 16-bit
c) 32-bit d) 4-bit

6) PIC16F877A uses which type of memory for program storage?
a) ROM b) EPROM
c) Flash d) EEPROM

7) The STATUS register in PIC is used for _____.
- a) Arithmetic flag status
- b) Control of peripherals
- c) Interrupt enable
- d) I/O configuration

8) PIC16F877A has how many I/O ports?
- a) 3
- b) 4
- c) 5
- d) 6

9) The oscillator section in PIC provides _____.
- a) Timing and synchronization
- b) Power control
- c) Data transfer
- d) Interrupt control

10) The instruction set of PIC16F877A is _____.
- a) 33 instructions
- b) 35 instructions
- c) 37 instructions
- d) 40 instructions

11) C programming for PIC requires which compiler?
- a) MPLAB XC8
- b) Turbo C
- c) Code::Blocks
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12) The CLRWDT instruction is used to _____.
- a) Clear Watchdog Timer
- b) Clear Working Register
- c) Clear RAM
- d) Clear Program Counter

13) The ADCON0 register controls _____.
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- b) Oscillator
- c) Timers
- d) Interrupts

14) CCP stands for _____.
- a) Capture/Compare/PWM
- b) Control/Command/Power
- c) Counter/Compare/Power
- d) Capture/Count/Phase

SLR-QH-639

Seat No.	

Set | **R**

T. Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
PIC Microcontroller (ENTMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt Any Four from the following. **16**

a) Draw & explain memory organization of PIC16F877 in detail.

b) Explain different I/O ports available in PIC 16F877.

c) Describe the functional any 4 pin description of PIC 16F877.

d) Interpret the functions of following SFR using suitable diagram.
i) STATUS
ii) OPTION_REG

e) Explain timer 0 operation in PIC 16F877.

Q.3 Attempt Any Two from following. **12**

a) Draw & explain architecture of PIC 16F877 microcontroller.

b) Write a C or assembly language program to perform addition & subtraction of two numbers(0×35,0×12) & send result of addition to PORT B & subtraction to PORT D in PIC 16F877.

c) What is interrupt? List out types of interrupts in PIC 16F877A.

SECTION – II

Q.4 Attempt Any Four from the following. **16**

a) Explain the SFR ADCON0 and ADCON1 Resistor.

b) Explain the serial communication using USART.

c) Explain capture module in PIC 16F877A in detail.

d) Describe interfacing of DC motor with PIC 16F877

e) Explain how LED's are interfaced with PIC 16F877.

Q.5 Attempt Any Two from following. **12**

a) Explain interfacing of 7 Segment with PIC Microcontroller.

b) Explain any one Master Synchronous Serial Port (MSSP) module.

c) Explain interfacing of LCD 16×2 with PIC 16f877.

SLR-QH-639

Seat No.	

Set S

T. Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April - 2026
PIC Microcontroller (ENTMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives. **14**

1) The instruction set of PIC16F877A is _____.
a) 33 instructions b) 35 instructions
c) 37 instructions d) 40 instructions

2) C programming for PIC requires which compiler?
a) MPLAB XC8 b) Turbo C
c) Code::Blocks d) Visual Studio

3) The CLRWDT instruction is used to _____.
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4) The ADCON0 register controls _____.
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8) LCD display commonly used with PIC is _____.
a) 16×2 b) 4×4
c) 8×2 d) 20×4

9) Automation refers to _____.
a) Control with minimal human intervention
b) Manual control
c) Mechanical control
d) None

10) PIC16F877A has a _____ bit architecture.
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13) PIC16F877A has how many I/O ports?
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14) The oscillator section in PIC provides _____.
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c) Data transfer d) Interrupt control

SLR-QH-639

Seat No.	

Set S

T. Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
PIC Microcontroller (ENTMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt Any Four from the following. **16**

a) Draw & explain memory organization of PIC16F877 in detail.

b) Explain different I/O ports available in PIC 16F877.

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d) Interpret the functions of following SFR using suitable diagram.
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ii) OPTION_REG

e) Explain timer 0 operation in PIC 16F877.

Q.3 Attempt Any Two from following. **12**

a) Draw & explain architecture of PIC 16F877 microcontroller.

b) Write a C or assembly language program to perform addition & subtraction of two numbers(0×35,0×12) & send result of addition to PORT B & subtraction to PORT D in PIC 16F877.

c) What is interrupt? List out types of interrupts in PIC 16F877A.

SECTION – II

Q.4 Attempt Any Four from the following. **16**

a) Explain the SFR ADCON0 and ADCON1 Resistor.

b) Explain the serial communication using USART.

c) Explain capture module in PIC 16F877A in detail.

d) Describe interfacing of DC motor with PIC 16F877

e) Explain how LED's are interfaced with PIC 16F877.

Q.5 Attempt Any Two from following. **12**

a) Explain interfacing of 7 Segment with PIC Microcontroller.

b) Explain any one Master Synchronous Serial Port (MSSP) module.

c) Explain interfacing of LCD 16×2 with PIC 16f877.

SLR-QH-639

Seat No.	

Set P

T. Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
PIC Microcontroller (ENTMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives. **14**

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4) PIC16F877A has how many I/O ports?
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11) The MSSP module supports _____.
   a) SPI and I^2C b) UART only
   c) PWM d) ADC

12) LEDs are interfaced to PIC through _____.
   a) Output ports b) Input ports
   c) Serial ports d) ADC ports

13) LCD display commonly used with PIC is _____.
   a) 16×2 b) 4×4
   c) 8×2 d) 20×4

14) Automation refers to _____.
   a) Control with minimal human intervention
   b) Manual control
   c) Mechanical control
   d) None

SLR-QH-639

Seat No.	

Set | **P**

T. Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
PIC Microcontroller (ENTMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt Any Four from the following. **16**

a) Draw & explain memory organization of PIC16F877 in detail.

b) Explain different I/O ports available in PIC 16F877.

c) Describe the functional any 4 pin description of PIC 16F877.

d) Interpret the functions of following SFR using suitable diagram.
i) STATUS
ii) OPTION_REG

e) Explain timer 0 operation in PIC 16F877.

Q.3 Attempt Any Two from following. **12**

a) Draw & explain architecture of PIC 16F877 microcontroller.

b) Write a C or assembly language program to perform addition & subtraction of two numbers(0×35,0×12) & send result of addition to PORT B & subtraction to PORT D in PIC 16F877.

c) What is interrupt? List out types of interrupts in PIC 16F877A.

SECTION – II

Q.4 Attempt Any Four from the following. **16**

a) Explain the SFR ADCON0 and ADCON1 Resistor.

b) Explain the serial communication using USART.

c) Explain capture module in PIC 16F877A in detail.

d) Describe interfacing of DC motor with PIC 16F877

e) Explain how LED's are interfaced with PIC 16F877.

Q.5 Attempt Any Two from following. **12**

a) Explain interfacing of 7 Segment with PIC Microcontroller.

b) Explain any one Master Synchronous Serial Port (MSSP) module.

c) Explain interfacing of LCD 16×2 with PIC 16f877.

SLR-QH-639

Seat No.	

Set Q

T. Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
PIC Microcontroller (ENTMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives. **14**

1) The CLRWDT instruction is used to _____.
a) Clear Watchdog Timer b) Clear Working Register
c) Clear RAM d) Clear Program Counter

2) The ADCON0 register controls _____.
a) ADC channel selection and conversion
b) Oscillator
c) Timers
d) Interrupts

3) CCP stands for _____.
a) Capture/Compare/PWM b) Control/Command/Power
c) Counter/Compare/Power d) Capture/Count/Phase

4) The MSSP module supports _____.
a) SPI and I^2C b) UART only
c) PWM d) ADC

5) LEDs are interfaced to PIC through _____.
a) Output ports b) Input ports
c) Serial ports d) ADC ports

6) LCD display commonly used with PIC is _____.
a) 16×2 b) 4×4
c) 8×2 d) 20×4

7) Automation refers to _____.
   a) Control with minimal human intervention
   b) Manual control
   c) Mechanical control
   d) None

8) PIC16F877A has a _____ bit architecture.
   a) 8-bit
   b) 16-bit
   c) 32-bit
   d) 4-bit

9) PIC16F877A uses which type of memory for program storage?
   a) ROM
   b) EPROM
   c) Flash
   d) EEPROM

10) The STATUS register in PIC is used for _____.
   a) Arithmetic flag status
   b) Control of peripherals
   c) Interrupt enable
   d) I/O configuration

11) PIC16F877A has how many I/O ports?
   a) 3
   b) 4
   c) 5
   d) 6

12) The oscillator section in PIC provides _____.
   a) Timing and synchronization
   b) Power control
   c) Data transfer
   d) Interrupt control

13) The instruction set of PIC16F877A is _____.
   a) 33 instructions
   b) 35 instructions
   c) 37 instructions
   d) 40 instructions

14) C programming for PIC requires which compiler?
   a) MPLAB XC8
   b) Turbo C
   c) Code::Blocks
   d) Visual Studio

SLR-QH-639

Seat No.	

Set Q

T. Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
PIC Microcontroller (ENTMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt Any Four from the following. **16**

a) Draw & explain memory organization of PIC16F877 in detail.

b) Explain different I/O ports available in PIC 16F877.

c) Describe the functional any 4 pin description of PIC 16F877.

d) Interpret the functions of following SFR using suitable diagram.
i) STATUS
ii) OPTION_REG

e) Explain timer 0 operation in PIC 16F877.

Q.3 Attempt Any Two from following. **12**

a) Draw & explain architecture of PIC 16F877 microcontroller.

b) Write a C or assembly language program to perform addition & subtraction of two numbers(0×35,0×12) & send result of addition to PORT B & subtraction to PORT D in PIC 16F877.

c) What is interrupt? List out types of interrupts in PIC 16F877A.

SECTION – II

Q.4 Attempt Any Four from the following. **16**

a) Explain the SFR ADCON0 and ADCON1 Resistor.

b) Explain the serial communication using USART.

c) Explain capture module in PIC 16F877A in detail.

d) Describe interfacing of DC motor with PIC 16F877

e) Explain how LED's are interfaced with PIC 16F877.

Q.5 Attempt Any Two from following. **12**

a) Explain interfacing of 7 Segment with PIC Microcontroller.

b) Explain any one Master Synchronous Serial Port (MSSP) module.

c) Explain interfacing of LCD 16×2 with PIC 16f877.

SLR-QH-639

Seat No.	

Set | **R**

T. Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
PIC Microcontroller (ENTMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives. **14**

1) The MSSP module supports _____.
a) SPI and I^2C b) UART only
c) PWM d) ADC

2) LEDs are interfaced to PIC through _____.
a) Output ports b) Input ports
c) Serial ports d) ADC ports

3) LCD display commonly used with PIC is _____.
a) 16×2 b) 4×4
c) 8×2 d) 20×4

4) Automation refers to _____.
a) Control with minimal human intervention
b) Manual control
c) Mechanical control
d) None

5) PIC16F877A has a _____ bit architecture.
a) 8-bit b) 16-bit
c) 32-bit d) 4-bit

6) PIC16F877A uses which type of memory for program storage?
a) ROM b) EPROM
c) Flash d) EEPROM

7) The STATUS register in PIC is used for _____.
- a) Arithmetic flag status
- b) Control of peripherals
- c) Interrupt enable
- d) I/O configuration

8) PIC16F877A has how many I/O ports?
- a) 3
- b) 4
- c) 5
- d) 6

9) The oscillator section in PIC provides _____.
- a) Timing and synchronization
- b) Power control
- c) Data transfer
- d) Interrupt control

10) The instruction set of PIC16F877A is _____.
- a) 33 instructions
- b) 35 instructions
- c) 37 instructions
- d) 40 instructions

11) C programming for PIC requires which compiler?
- a) MPLAB XC8
- b) Turbo C
- c) Code::Blocks
- d) Visual Studio

12) The CLRWDT instruction is used to _____.
- a) Clear Watchdog Timer
- b) Clear Working Register
- c) Clear RAM
- d) Clear Program Counter

13) The ADCON0 register controls _____.
- a) ADC channel selection and conversion
- b) Oscillator
- c) Timers
- d) Interrupts

14) CCP stands for _____.
- a) Capture/Compare/PWM
- b) Control/Command/Power
- c) Counter/Compare/Power
- d) Capture/Count/Phase

SLR-QH-639

Seat No.	

Set | **R**

T. Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
PIC Microcontroller (ENTMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt Any Four from the following. **16**

a) Draw & explain memory organization of PIC16F877 in detail.

b) Explain different I/O ports available in PIC 16F877.

c) Describe the functional any 4 pin description of PIC 16F877.

d) Interpret the functions of following SFR using suitable diagram.
i) STATUS
ii) OPTION_REG

e) Explain timer 0 operation in PIC 16F877.

Q.3 Attempt Any Two from following. **12**

a) Draw & explain architecture of PIC 16F877 microcontroller.

b) Write a C or assembly language program to perform addition & subtraction of two numbers(0×35,0×12) & send result of addition to PORT B & subtraction to PORT D in PIC 16F877.

c) What is interrupt? List out types of interrupts in PIC 16F877A.

SECTION – II

Q.4 Attempt Any Four from the following. **16**

a) Explain the SFR ADCON0 and ADCON1 Resistor.

b) Explain the serial communication using USART.

c) Explain capture module in PIC 16F877A in detail.

d) Describe interfacing of DC motor with PIC 16F877

e) Explain how LED's are interfaced with PIC 16F877.

Q.5 Attempt Any Two from following. **12**

a) Explain interfacing of 7 Segment with PIC Microcontroller.

b) Explain any one Master Synchronous Serial Port (MSSP) module.

c) Explain interfacing of LCD 16×2 with PIC 16f877.

SLR-QH-639

Seat No.	

Set S

T. Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
PIC Microcontroller (ENTMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives. **14**

1) The instruction set of PIC16F877A is _____.
a) 33 instructions b) 35 instructions
c) 37 instructions d) 40 instructions

2) C programming for PIC requires which compiler?
a) MPLAB XC8 b) Turbo C
c) Code::Blocks d) Visual Studio

3) The CLRWDT instruction is used to _____.
a) Clear Watchdog Timer b) Clear Working Register
c) Clear RAM d) Clear Program Counter

4) The ADCON0 register controls _____.
a) ADC channel selection and conversion
b) Oscillator
c) Timers
d) Interrupts

5) CCP stands for _____.
a) Capture/Compare/PWM b) Control/Command/Power
c) Counter/Compare/Power d) Capture/Count/Phase

6) The MSSP module supports _____.
a) SPI and I^2C b) UART only
c) PWM d) ADC

7) LEDs are interfaced to PIC through _____.
a) Output ports b) Input ports
c) Serial ports d) ADC ports

8) LCD display commonly used with PIC is _____.
a) 16×2 b) 4×4
c) 8×2 d) 20×4

9) Automation refers to _____.
a) Control with minimal human intervention
b) Manual control
c) Mechanical control
d) None

10) PIC16F877A has a _____ bit architecture.
a) 8-bit b) 16-bit
c) 32-bit d) 4-bit

11) PIC16F877A uses which type of memory for program storage?
a) ROM b) EPROM
c) Flash d) EEPROM

12) The STATUS register in PIC is used for _____.
a) Arithmetic flag status b) Control of peripherals
c) Interrupt enable d) I/O configuration

13) PIC16F877A has how many I/O ports?
a) 3 b) 4
c) 5 d) 6

14) The oscillator section in PIC provides _____.
a) Timing and synchronization b) Power control
c) Data transfer d) Interrupt control

SLR-QH-639

Seat No.		Set	S

T. Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
PIC Microcontroller (ENTMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt Any Four from the following. **16**

a) Draw & explain memory organization of PIC16F877 in detail.

b) Explain different I/O ports available in PIC 16F877.

c) Describe the functional any 4 pin description of PIC 16F877.

d) Interpret the functions of following SFR using suitable diagram.
i) STATUS
ii) OPTION_REG

e) Explain timer 0 operation in PIC 16F877.

Q.3 Attempt Any Two from following. **12**

a) Draw & explain architecture of PIC 16F877 microcontroller.

b) Write a C or assembly language program to perform addition & subtraction of two numbers(0×35,0×12) & send result of addition to PORT B & subtraction to PORT D in PIC 16F877.

c) What is interrupt? List out types of interrupts in PIC 16F877A.

SECTION – II

Q.4 Attempt Any Four from the following. **16**

a) Explain the SFR ADCON0 and ADCON1 Resistor.

b) Explain the serial communication using USART.

c) Explain capture module in PIC 16F877A in detail.

d) Describe interfacing of DC motor with PIC 16F877

e) Explain how LED's are interfaced with PIC 16F877.

Q.5 Attempt Any Two from following. **12**

a) Explain interfacing of 7 Segment with PIC Microcontroller.

b) Explain any one Master Synchronous Serial Port (MSSP) module.

c) Explain interfacing of LCD 16×2 with PIC 16f877.

SLR-QH-639

Seat No.	

Set P

T. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
PIC Microcontroller (ENTMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives. **14**

1) PIC16F877A has a _____ bit architecture.
a) 8-bit b) 16-bit
c) 32-bit d) 4-bit

2) PIC16F877A uses which type of memory for program storage?
a) ROM b) EPROM
c) Flash d) EEPROM

3) The STATUS register in PIC is used for _____.
a) Arithmetic flag status b) Control of peripherals
c) Interrupt enable d) I/O configuration

4) PIC16F877A has how many I/O ports?
a) 3 b) 4
c) 5 d) 6

5) The oscillator section in PIC provides _____.
a) Timing and synchronization b) Power control
c) Data transfer d) Interrupt control

6) The instruction set of PIC16F877A is _____.
a) 33 instructions b) 35 instructions
c) 37 instructions d) 40 instructions

7) C programming for PIC requires which compiler?
a) MPLAB XC8 b) Turbo C
c) Code::Blocks d) Visual Studio

8) The CLRWDT instruction is used to _____.
   a) Clear Watchdog Timer b) Clear Working Register
   c) Clear RAM d) Clear Program Counter

9) The ADCON0 register controls _____.
   a) ADC channel selection and conversion
   b) Oscillator
   c) Timers
   d) Interrupts

10) CCP stands for _____.
   a) Capture/Compare/PWM b) Control/Command/Power
   c) Counter/Compare/Power d) Capture/Count/Phase

11) The MSSP module supports _____.
   a) SPI and I^2C b) UART only
   c) PWM d) ADC

12) LEDs are interfaced to PIC through _____.
   a) Output ports b) Input ports
   c) Serial ports d) ADC ports

13) LCD display commonly used with PIC is _____.
   a) 16×2 b) 4×4
   c) 8×2 d) 20×4

14) Automation refers to _____.
   a) Control with minimal human intervention
   b) Manual control
   c) Mechanical control
   d) None

Seat No.	

Set | P

T. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
PIC Microcontroller (ENTMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
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SECTION – I

Q.2 Attempt Any Four from the following. **16**

a) Draw & explain memory organization of PIC16F877 in detail.

b) Explain different I/O ports available in PIC 16F877.

c) Describe the functional any 4 pin description of PIC 16F877.

d) Interpret the functions of following SFR using suitable diagram.
i) STATUS
ii) OPTION_REG

e) Explain timer 0 operation in PIC 16F877.

Q.3 Attempt Any Two from following. **12**

a) Draw & explain architecture of PIC 16F877 microcontroller.

b) Write a C or assembly language program to perform addition & subtraction of two numbers(0×35,0×12) & send result of addition to PORT B & subtraction to PORT D in PIC 16F877.

c) What is interrupt? List out types of interrupts in PIC 16F877A.

SECTION – II

Q.4 Attempt Any Four from the following. **16**

a) Explain the SFR ADCON0 and ADCON1 Resistor.

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c) Explain capture module in PIC 16F877A in detail.

d) Describe interfacing of DC motor with PIC 16F877

e) Explain how LED's are interfaced with PIC 16F877.

Q.5 Attempt Any Two from following. **12**

a) Explain interfacing of 7 Segment with PIC Microcontroller.

b) Explain any one Master Synchronous Serial Port (MSSP) module.

c) Explain interfacing of LCD 16×2 with PIC 16f877.

SLR-QH-639

Seat No.	

Set Q

T. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
PIC Microcontroller (ENTMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

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MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives. **14**

1) The CLRWDT instruction is used to _____.
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2) The ADCON0 register controls _____.
a) ADC channel selection and conversion
b) Oscillator
c) Timers
d) Interrupts

3) CCP stands for _____.
a) Capture/Compare/PWM b) Control/Command/Power
c) Counter/Compare/Power d) Capture/Count/Phase

4) The MSSP module supports _____.
a) SPI and I^2C b) UART only
c) PWM d) ADC

5) LEDs are interfaced to PIC through _____.
a) Output ports b) Input ports
c) Serial ports d) ADC ports

6) LCD display commonly used with PIC is _____.
a) 16×2 b) 4×4
c) 8×2 d) 20×4

7) Automation refers to _____.
   a) Control with minimal human intervention
   b) Manual control
   c) Mechanical control
   d) None

8) PIC16F877A has a _____ bit architecture.
   a) 8-bit
   b) 16-bit
   c) 32-bit
   d) 4-bit

9) PIC16F877A uses which type of memory for program storage?
   a) ROM
   b) EPROM
   c) Flash
   d) EEPROM

10) The STATUS register in PIC is used for _____.
   a) Arithmetic flag status
   b) Control of peripherals
   c) Interrupt enable
   d) I/O configuration

11) PIC16F877A has how many I/O ports?
   a) 3
   b) 4
   c) 5
   d) 6

12) The oscillator section in PIC provides _____.
   a) Timing and synchronization
   b) Power control
   c) Data transfer
   d) Interrupt control

13) The instruction set of PIC16F877A is _____.
   a) 33 instructions
   b) 35 instructions
   c) 37 instructions
   d) 40 instructions

14) C programming for PIC requires which compiler?
   a) MPLAB XC8
   b) Turbo C
   c) Code::Blocks
   d) Visual Studio

Seat No.	

Set **Q**

T. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
PIC Microcontroller (ENTMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt Any Four from the following. **16**

a) Draw & explain memory organization of PIC16F877 in detail.

b) Explain different I/O ports available in PIC 16F877.

c) Describe the functional any 4 pin description of PIC 16F877.

d) Interpret the functions of following SFR using suitable diagram.
i) STATUS
ii) OPTION_REG

e) Explain timer 0 operation in PIC 16F877.

Q.3 Attempt Any Two from following. **12**

a) Draw & explain architecture of PIC 16F877 microcontroller.

b) Write a C or assembly language program to perform addition & subtraction of two numbers(0×35,0×12) & send result of addition to PORT B & subtraction to PORT D in PIC 16F877.

c) What is interrupt? List out types of interrupts in PIC 16F877A.

SECTION – II

Q.4 Attempt Any Four from the following. **16**

a) Explain the SFR ADCON0 and ADCON1 Resistor.

b) Explain the serial communication using USART.

c) Explain capture module in PIC 16F877A in detail.

d) Describe interfacing of DC motor with PIC 16F877

e) Explain how LED's are interfaced with PIC 16F877.

Q.5 Attempt Any Two from following. **12**

a) Explain interfacing of 7 Segment with PIC Microcontroller.

b) Explain any one Master Synchronous Serial Port (MSSP) module.

c) Explain interfacing of LCD 16×2 with PIC 16f877.

SLR-QH-639

Seat No.	

Set | **R**

T. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
PIC Microcontroller (ENTMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives. **14**

1) The MSSP module supports _____.
a) SPI and I^2C b) UART only
c) PWM d) ADC

2) LEDs are interfaced to PIC through _____.
a) Output ports b) Input ports
c) Serial ports d) ADC ports

3) LCD display commonly used with PIC is _____.
a) 16×2 b) 4×4
c) 8×2 d) 20×4

4) Automation refers to _____.
a) Control with minimal human intervention
b) Manual control
c) Mechanical control
d) None

5) PIC16F877A has a _____ bit architecture.
a) 8-bit b) 16-bit
c) 32-bit d) 4-bit

6) PIC16F877A uses which type of memory for program storage?
a) ROM b) EPROM
c) Flash d) EEPROM

7) The STATUS register in PIC is used for _____.
a) Arithmetic flag status b) Control of peripherals
c) Interrupt enable d) I/O configuration

8) PIC16F877A has how many I/O ports?
a) 3 b) 4
c) 5 d) 6

9) The oscillator section in PIC provides _____.
a) Timing and synchronization b) Power control
c) Data transfer d) Interrupt control

10) The instruction set of PIC16F877A is _____.
a) 33 instructions b) 35 instructions
c) 37 instructions d) 40 instructions

11) C programming for PIC requires which compiler?
a) MPLAB XC8 b) Turbo C
c) Code::Blocks d) Visual Studio

12) The CLRWDT instruction is used to _____.
a) Clear Watchdog Timer b) Clear Working Register
c) Clear RAM d) Clear Program Counter

13) The ADCON0 register controls _____.
a) ADC channel selection and conversion
b) Oscillator
c) Timers
d) Interrupts

14) CCP stands for _____.
a) Capture/Compare/PWM b) Control/Command/Power
c) Counter/Compare/Power d) Capture/Count/Phase

Seat No.	

Set **R**

T. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
PIC Microcontroller (ENTMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt Any Four from the following. **16**

a) Draw & explain memory organization of PIC16F877 in detail.

b) Explain different I/O ports available in PIC 16F877.

c) Describe the functional any 4 pin description of PIC 16F877.

d) Interpret the functions of following SFR using suitable diagram.
i) STATUS
ii) OPTION_REG

e) Explain timer 0 operation in PIC 16F877.

Q.3 Attempt Any Two from following. **12**

a) Draw & explain architecture of PIC 16F877 microcontroller.

b) Write a C or assembly language program to perform addition & subtraction of two numbers(0×35,0×12) & send result of addition to PORT B & subtraction to PORT D in PIC 16F877.

c) What is interrupt? List out types of interrupts in PIC 16F877A.

SECTION – II

Q.4 Attempt Any Four from the following. **16**

a) Explain the SFR ADCON0 and ADCON1 Resistor.

b) Explain the serial communication using USART.

c) Explain capture module in PIC 16F877A in detail.

d) Describe interfacing of DC motor with PIC 16F877

e) Explain how LED's are interfaced with PIC 16F877.

Q.5 Attempt Any Two from following. **12**

a) Explain interfacing of 7 Segment with PIC Microcontroller.

b) Explain any one Master Synchronous Serial Port (MSSP) module.

c) Explain interfacing of LCD 16×2 with PIC 16f877.

SLR-QH-639

Seat No.	

Set S

T. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
PIC Microcontroller (ENTMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives. **14**

1) The instruction set of PIC16F877A is _____.
a) 33 instructions b) 35 instructions
c) 37 instructions d) 40 instructions

2) C programming for PIC requires which compiler?
a) MPLAB XC8 b) Turbo C
c) Code::Blocks d) Visual Studio

3) The CLRWDT instruction is used to _____.
a) Clear Watchdog Timer b) Clear Working Register
c) Clear RAM d) Clear Program Counter

4) The ADCON0 register controls _____.
a) ADC channel selection and conversion
b) Oscillator
c) Timers
d) Interrupts

5) CCP stands for _____.
a) Capture/Compare/PWM b) Control/Command/Power
c) Counter/Compare/Power d) Capture/Count/Phase

6) The MSSP module supports _____.
a) SPI and I^2C b) UART only
c) PWM d) ADC

7) LEDs are interfaced to PIC through _____.
a) Output ports b) Input ports
c) Serial ports d) ADC ports

8) LCD display commonly used with PIC is _____.
a) 16×2 b) 4×4
c) 8×2 d) 20×4

9) Automation refers to _____.
a) Control with minimal human intervention
b) Manual control
c) Mechanical control
d) None

10) PIC16F877A has a _____ bit architecture.
a) 8-bit b) 16-bit
c) 32-bit d) 4-bit

11) PIC16F877A uses which type of memory for program storage?
a) ROM b) EPROM
c) Flash d) EEPROM

12) The STATUS register in PIC is used for _____.
a) Arithmetic flag status b) Control of peripherals
c) Interrupt enable d) I/O configuration

13) PIC16F877A has how many I/O ports?
a) 3 b) 4
c) 5 d) 6

14) The oscillator section in PIC provides _____.
a) Timing and synchronization b) Power control
c) Data transfer d) Interrupt control

SLR-QH-639

Seat No.		Set	S

T. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
PIC Microcontroller (ENTMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt Any Four from the following. **16**

a) Draw & explain memory organization of PIC16F877 in detail.

b) Explain different I/O ports available in PIC 16F877.

c) Describe the functional any 4 pin description of PIC 16F877.

d) Interpret the functions of following SFR using suitable diagram.
i) STATUS
ii) OPTION_REG

e) Explain timer 0 operation in PIC 16F877.

Q.3 Attempt Any Two from following. **12**

a) Draw & explain architecture of PIC 16F877 microcontroller.

b) Write a C or assembly language program to perform addition & subtraction of two numbers(0×35,0×12) & send result of addition to PORT B & subtraction to PORT D in PIC 16F877.

c) What is interrupt? List out types of interrupts in PIC 16F877A.

SECTION – II

Q.4 Attempt Any Four from the following. **16**

a) Explain the SFR ADCON0 and ADCON1 Resistor.

b) Explain the serial communication using USART.

c) Explain capture module in PIC 16F877A in detail.

d) Describe interfacing of DC motor with PIC 16F877

e) Explain how LED's are interfaced with PIC 16F877.

Q.5 Attempt Any Two from following. **12**

a) Explain interfacing of 7 Segment with PIC Microcontroller.

b) Explain any one Master Synchronous Serial Port (MSSP) module.

c) Explain interfacing of LCD 16×2 with PIC 16f877.

SLR-QH-639

Seat No.	

Set P

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
PIC Microcontroller (ENTMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives. **14**

1) PIC16F877A has a _____ bit architecture.
a) 8-bit b) 16-bit
c) 32-bit d) 4-bit

2) PIC16F877A uses which type of memory for program storage?
a) ROM b) EPROM
c) Flash d) EEPROM

3) The STATUS register in PIC is used for _____.
a) Arithmetic flag status b) Control of peripherals
c) Interrupt enable d) I/O configuration

4) PIC16F877A has how many I/O ports?
a) 3 b) 4
c) 5 d) 6

5) The oscillator section in PIC provides _____.
a) Timing and synchronization b) Power control
c) Data transfer d) Interrupt control

6) The instruction set of PIC16F877A is _____.
a) 33 instructions b) 35 instructions
c) 37 instructions d) 40 instructions

7) C programming for PIC requires which compiler?
a) MPLAB XC8 b) Turbo C
c) Code::Blocks d) Visual Studio

8) The CLRWDT instruction is used to _____.
   a) Clear Watchdog Timer b) Clear Working Register
   c) Clear RAM d) Clear Program Counter

9) The ADCON0 register controls _____.
   a) ADC channel selection and conversion
   b) Oscillator
   c) Timers
   d) Interrupts

10) CCP stands for _____.
   a) Capture/Compare/PWM b) Control/Command/Power
   c) Counter/Compare/Power d) Capture/Count/Phase

11) The MSSP module supports _____.
   a) SPI and I^2C b) UART only
   c) PWM d) ADC

12) LEDs are interfaced to PIC through _____.
   a) Output ports b) Input ports
   c) Serial ports d) ADC ports

13) LCD display commonly used with PIC is _____.
   a) 16×2 b) 4×4
   c) 8×2 d) 20×4

14) Automation refers to _____.
   a) Control with minimal human intervention
   b) Manual control
   c) Mechanical control
   d) None

Seat No.	

Set **P**

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
PIC Microcontroller (ENTMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt Any Four from the following. **16**

a) Draw & explain memory organization of PIC16F877 in detail.

b) Explain different I/O ports available in PIC 16F877.

c) Describe the functional any 4 pin description of PIC 16F877.

d) Interpret the functions of following SFR using suitable diagram.
i) STATUS
ii) OPTION_REG

e) Explain timer 0 operation in PIC 16F877.

Q.3 Attempt Any Two from following. **12**

a) Draw & explain architecture of PIC 16F877 microcontroller.

b) Write a C or assembly language program to perform addition & subtraction of two numbers(0×35,0×12) & send result of addition to PORT B & subtraction to PORT D in PIC 16F877.

c) What is interrupt? List out types of interrupts in PIC 16F877A.

SECTION – II

Q.4 Attempt Any Four from the following. **16**

a) Explain the SFR ADCON0 and ADCON1 Resistor.

b) Explain the serial communication using USART.

c) Explain capture module in PIC 16F877A in detail.

d) Describe interfacing of DC motor with PIC 16F877

e) Explain how LED's are interfaced with PIC 16F877.

Q.5 Attempt Any Two from following. **12**

a) Explain interfacing of 7 Segment with PIC Microcontroller.

b) Explain any one Master Synchronous Serial Port (MSSP) module.

c) Explain interfacing of LCD 16×2 with PIC 16f877.

SLR-QH-639

Seat No.	

Set Q

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
PIC Microcontroller (ENTMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives. **14**

1) The CLRWDT instruction is used to _____.
a) Clear Watchdog Timer b) Clear Working Register
c) Clear RAM d) Clear Program Counter

2) The ADCON0 register controls _____.
a) ADC channel selection and conversion
b) Oscillator
c) Timers
d) Interrupts

3) CCP stands for _____.
a) Capture/Compare/PWM b) Control/Command/Power
c) Counter/Compare/Power d) Capture/Count/Phase

4) The MSSP module supports _____.
a) SPI and I^2C b) UART only
c) PWM d) ADC

5) LEDs are interfaced to PIC through _____.
a) Output ports b) Input ports
c) Serial ports d) ADC ports

6) LCD display commonly used with PIC is _____.
a) 16×2 b) 4×4
c) 8×2 d) 20×4

7) Automation refers to _____.
   a) Control with minimal human intervention
   b) Manual control
   c) Mechanical control
   d) None

8) PIC16F877A has a _____ bit architecture.
   a) 8-bit
   b) 16-bit
   c) 32-bit
   d) 4-bit

9) PIC16F877A uses which type of memory for program storage?
   a) ROM
   b) EPROM
   c) Flash
   d) EEPROM

10) The STATUS register in PIC is used for _____.
   a) Arithmetic flag status
   b) Control of peripherals
   c) Interrupt enable
   d) I/O configuration

11) PIC16F877A has how many I/O ports?
   a) 3
   b) 4
   c) 5
   d) 6

12) The oscillator section in PIC provides _____.
   a) Timing and synchronization
   b) Power control
   c) Data transfer
   d) Interrupt control

13) The instruction set of PIC16F877A is _____.
   a) 33 instructions
   b) 35 instructions
   c) 37 instructions
   d) 40 instructions

14) C programming for PIC requires which compiler?
   a) MPLAB XC8
   b) Turbo C
   c) Code::Blocks
   d) Visual Studio

Seat No.	

Set **Q**

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
PIC Microcontroller (ENTMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt Any Four from the following. **16**

a) Draw & explain memory organization of PIC16F877 in detail.

b) Explain different I/O ports available in PIC 16F877.

c) Describe the functional any 4 pin description of PIC 16F877.

d) Interpret the functions of following SFR using suitable diagram.
i) STATUS
ii) OPTION_REG

e) Explain timer 0 operation in PIC 16F877.

Q.3 Attempt Any Two from following. **12**

a) Draw & explain architecture of PIC 16F877 microcontroller.

b) Write a C or assembly language program to perform addition & subtraction of two numbers(0×35,0×12) & send result of addition to PORT B & subtraction to PORT D in PIC 16F877.

c) What is interrupt? List out types of interrupts in PIC 16F877A.

SECTION – II

Q.4 Attempt Any Four from the following. **16**

a) Explain the SFR ADCON0 and ADCON1 Resistor.

b) Explain the serial communication using USART.

c) Explain capture module in PIC 16F877A in detail.

d) Describe interfacing of DC motor with PIC 16F877

e) Explain how LED's are interfaced with PIC 16F877.

Q.5 Attempt Any Two from following. **12**

a) Explain interfacing of 7 Segment with PIC Microcontroller.

b) Explain any one Master Synchronous Serial Port (MSSP) module.

c) Explain interfacing of LCD 16×2 with PIC 16f877.

SLR-QH-639

Seat No.	

Set R

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
PIC Microcontroller (ENTMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives. **14**

1) The MSSP module supports _____.
a) SPI and I^2C b) UART only
c) PWM d) ADC

2) LEDs are interfaced to PIC through _____.
a) Output ports b) Input ports
c) Serial ports d) ADC ports

3) LCD display commonly used with PIC is _____.
a) 16×2 b) 4×4
c) 8×2 d) 20×4

4) Automation refers to _____.
a) Control with minimal human intervention
b) Manual control
c) Mechanical control
d) None

5) PIC16F877A has a _____ bit architecture.
a) 8-bit b) 16-bit
c) 32-bit d) 4-bit

6) PIC16F877A uses which type of memory for program storage?
a) ROM b) EPROM
c) Flash d) EEPROM

7) The STATUS register in PIC is used for _____.
- a) Arithmetic flag status
- b) Control of peripherals
- c) Interrupt enable
- d) I/O configuration

8) PIC16F877A has how many I/O ports?
- a) 3
- b) 4
- c) 5
- d) 6

9) The oscillator section in PIC provides _____.
- a) Timing and synchronization
- b) Power control
- c) Data transfer
- d) Interrupt control

10) The instruction set of PIC16F877A is _____.
- a) 33 instructions
- b) 35 instructions
- c) 37 instructions
- d) 40 instructions

11) C programming for PIC requires which compiler?
- a) MPLAB XC8
- b) Turbo C
- c) Code::Blocks
- d) Visual Studio

12) The CLRWDT instruction is used to _____.
- a) Clear Watchdog Timer
- b) Clear Working Register
- c) Clear RAM
- d) Clear Program Counter

13) The ADCON0 register controls _____.
- a) ADC channel selection and conversion
- b) Oscillator
- c) Timers
- d) Interrupts

14) CCP stands for _____.
- a) Capture/Compare/PWM
- b) Control/Command/Power
- c) Counter/Compare/Power
- d) Capture/Count/Phase

Seat No.	

Set **R**

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
PIC Microcontroller (ENTMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt Any Four from the following. **16**

a) Draw & explain memory organization of PIC16F877 in detail.

b) Explain different I/O ports available in PIC 16F877.

c) Describe the functional any 4 pin description of PIC 16F877.

d) Interpret the functions of following SFR using suitable diagram.
i) STATUS
ii) OPTION_REG

e) Explain timer 0 operation in PIC 16F877.

Q.3 Attempt Any Two from following. **12**

a) Draw & explain architecture of PIC 16F877 microcontroller.

b) Write a C or assembly language program to perform addition & subtraction of two numbers(0×35,0×12) & send result of addition to PORT B & subtraction to PORT D in PIC 16F877.

c) What is interrupt? List out types of interrupts in PIC 16F877A.

SECTION – II

Q.4 Attempt Any Four from the following. **16**

a) Explain the SFR ADCON0 and ADCON1 Resistor.

b) Explain the serial communication using USART.

c) Explain capture module in PIC 16F877A in detail.

d) Describe interfacing of DC motor with PIC 16F877

e) Explain how LED's are interfaced with PIC 16F877.

Q.5 Attempt Any Two from following. **12**

a) Explain interfacing of 7 Segment with PIC Microcontroller.

b) Explain any one Master Synchronous Serial Port (MSSP) module.

c) Explain interfacing of LCD 16×2 with PIC 16f877.

SLR-QH-639

Seat No.	

Set S

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
PIC Microcontroller (ENTMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives. **14**

1) The instruction set of PIC16F877A is _____.
a) 33 instructions b) 35 instructions
c) 37 instructions d) 40 instructions

2) C programming for PIC requires which compiler?
a) MPLAB XC8 b) Turbo C
c) Code::Blocks d) Visual Studio

3) The CLRWDT instruction is used to _____.
a) Clear Watchdog Timer b) Clear Working Register
c) Clear RAM d) Clear Program Counter

4) The ADCON0 register controls _____.
a) ADC channel selection and conversion
b) Oscillator
c) Timers
d) Interrupts

5) CCP stands for _____.
a) Capture/Compare/PWM b) Control/Command/Power
c) Counter/Compare/Power d) Capture/Count/Phase

6) The MSSP module supports _____.
a) SPI and I^2C b) UART only
c) PWM d) ADC

7) LEDs are interfaced to PIC through _____.
a) Output ports b) Input ports
c) Serial ports d) ADC ports

8) LCD display commonly used with PIC is _____.
a) 16×2 b) 4×4
c) 8×2 d) 20×4

9) Automation refers to _____.
a) Control with minimal human intervention
b) Manual control
c) Mechanical control
d) None

10) PIC16F877A has a _____ bit architecture.
a) 8-bit b) 16-bit
c) 32-bit d) 4-bit

11) PIC16F877A uses which type of memory for program storage?
a) ROM b) EPROM
c) Flash d) EEPROM

12) The STATUS register in PIC is used for _____.
a) Arithmetic flag status b) Control of peripherals
c) Interrupt enable d) I/O configuration

13) PIC16F877A has how many I/O ports?
a) 3 b) 4
c) 5 d) 6

14) The oscillator section in PIC provides _____.
a) Timing and synchronization b) Power control
c) Data transfer d) Interrupt control

SLR-QH-639

Seat No.		Set	S

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
PIC Microcontroller (ENTMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt Any Four from the following. **16**

a) Draw & explain memory organization of PIC16F877 in detail.

b) Explain different I/O ports available in PIC 16F877.

c) Describe the functional any 4 pin description of PIC 16F877.

d) Interpret the functions of following SFR using suitable diagram.
i) STATUS
ii) OPTION_REG

e) Explain timer 0 operation in PIC 16F877.

Q.3 Attempt Any Two from following. **12**

a) Draw & explain architecture of PIC 16F877 microcontroller.

b) Write a C or assembly language program to perform addition & subtraction of two numbers(0×35,0×12) & send result of addition to PORT B & subtraction to PORT D in PIC 16F877.

c) What is interrupt? List out types of interrupts in PIC 16F877A.

SECTION – II

Q.4 Attempt Any Four from the following. **16**

a) Explain the SFR ADCON0 and ADCON1 Resistor.

b) Explain the serial communication using USART.

c) Explain capture module in PIC 16F877A in detail.

d) Describe interfacing of DC motor with PIC 16F877

e) Explain how LED's are interfaced with PIC 16F877.

Q.5 Attempt Any Two from following. **12**

a) Explain interfacing of 7 Segment with PIC Microcontroller.

b) Explain any one Master Synchronous Serial Port (MSSP) module.

c) Explain interfacing of LCD 16×2 with PIC 16f877.

SLR-QH-639

Seat No.	

Set P

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
PIC Microcontroller (ENTMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives. **14**

1) PIC16F877A has a _____ bit architecture.
a) 8-bit b) 16-bit
c) 32-bit d) 4-bit

2) PIC16F877A uses which type of memory for program storage?
a) ROM b) EPROM
c) Flash d) EEPROM

3) The STATUS register in PIC is used for _____.
a) Arithmetic flag status b) Control of peripherals
c) Interrupt enable d) I/O configuration

4) PIC16F877A has how many I/O ports?
a) 3 b) 4
c) 5 d) 6

5) The oscillator section in PIC provides _____.
a) Timing and synchronization b) Power control
c) Data transfer d) Interrupt control

6) The instruction set of PIC16F877A is _____.
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7) C programming for PIC requires which compiler?
a) MPLAB XC8 b) Turbo C
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8) The CLRWDT instruction is used to _____.
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9) The ADCON0 register controls _____.
   a) ADC channel selection and conversion
   b) Oscillator
   c) Timers
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10) CCP stands for _____.
   a) Capture/Compare/PWM b) Control/Command/Power
   c) Counter/Compare/Power d) Capture/Count/Phase

11) The MSSP module supports _____.
   a) SPI and I^2C b) UART only
   c) PWM d) ADC

12) LEDs are interfaced to PIC through _____.
   a) Output ports b) Input ports
   c) Serial ports d) ADC ports

13) LCD display commonly used with PIC is _____.
   a) 16×2 b) 4×4
   c) 8×2 d) 20×4

14) Automation refers to _____.
   a) Control with minimal human intervention
   b) Manual control
   c) Mechanical control
   d) None

SLR-QH-639

Seat No.		Set	P

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
PIC Microcontroller (ENTMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt Any Four from the following. **16**

a) Draw & explain memory organization of PIC16F877 in detail.

b) Explain different I/O ports available in PIC 16F877.

c) Describe the functional any 4 pin description of PIC 16F877.

d) Interpret the functions of following SFR using suitable diagram.
i) STATUS
ii) OPTION_REG

e) Explain timer 0 operation in PIC 16F877.

Q.3 Attempt Any Two from following. **12**

a) Draw & explain architecture of PIC 16F877 microcontroller.

b) Write a C or assembly language program to perform addition & subtraction of two numbers(0×35,0×12) & send result of addition to PORT B & subtraction to PORT D in PIC 16F877.

c) What is interrupt? List out types of interrupts in PIC 16F877A.

SECTION – II

Q.4 Attempt Any Four from the following. **16**

a) Explain the SFR ADCON0 and ADCON1 Resistor.

b) Explain the serial communication using USART.

c) Explain capture module in PIC 16F877A in detail.

d) Describe interfacing of DC motor with PIC 16F877

e) Explain how LED's are interfaced with PIC 16F877.

Q.5 Attempt Any Two from following. **12**

a) Explain interfacing of 7 Segment with PIC Microcontroller.

b) Explain any one Master Synchronous Serial Port (MSSP) module.

c) Explain interfacing of LCD 16×2 with PIC 16f877.

SLR-QH-639

Seat No.	

Set Q

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
PIC Microcontroller (ENTMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives. **14**

1) The CLRWDT instruction is used to _____.
a) Clear Watchdog Timer b) Clear Working Register
c) Clear RAM d) Clear Program Counter

2) The ADCON0 register controls _____.
a) ADC channel selection and conversion
b) Oscillator
c) Timers
d) Interrupts

3) CCP stands for _____.
a) Capture/Compare/PWM b) Control/Command/Power
c) Counter/Compare/Power d) Capture/Count/Phase

4) The MSSP module supports _____.
a) SPI and I^2C b) UART only
c) PWM d) ADC

5) LEDs are interfaced to PIC through _____.
a) Output ports b) Input ports
c) Serial ports d) ADC ports

6) LCD display commonly used with PIC is _____.
a) 16×2 b) 4×4
c) 8×2 d) 20×4

7) Automation refers to _____.
   a) Control with minimal human intervention
   b) Manual control
   c) Mechanical control
   d) None

8) PIC16F877A has a _____ bit architecture.
   a) 8-bit
   b) 16-bit
   c) 32-bit
   d) 4-bit

9) PIC16F877A uses which type of memory for program storage?
   a) ROM
   b) EPROM
   c) Flash
   d) EEPROM

10) The STATUS register in PIC is used for _____.
   a) Arithmetic flag status
   b) Control of peripherals
   c) Interrupt enable
   d) I/O configuration

11) PIC16F877A has how many I/O ports?
   a) 3
   b) 4
   c) 5
   d) 6

12) The oscillator section in PIC provides _____.
   a) Timing and synchronization
   b) Power control
   c) Data transfer
   d) Interrupt control

13) The instruction set of PIC16F877A is _____.
   a) 33 instructions
   b) 35 instructions
   c) 37 instructions
   d) 40 instructions

14) C programming for PIC requires which compiler?
   a) MPLAB XC8
   b) Turbo C
   c) Code::Blocks
   d) Visual Studio

SLR-QH-639

Seat No.	

Set Q

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
PIC Microcontroller (ENTMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt Any Four from the following. **16**

a) Draw & explain memory organization of PIC16F877 in detail.

b) Explain different I/O ports available in PIC 16F877.

c) Describe the functional any 4 pin description of PIC 16F877.

d) Interpret the functions of following SFR using suitable diagram.
i) STATUS
ii) OPTION_REG

e) Explain timer 0 operation in PIC 16F877.

Q.3 Attempt Any Two from following. **12**

a) Draw & explain architecture of PIC 16F877 microcontroller.

b) Write a C or assembly language program to perform addition & subtraction of two numbers(0×35,0×12) & send result of addition to PORT B & subtraction to PORT D in PIC 16F877.

c) What is interrupt? List out types of interrupts in PIC 16F877A.

SECTION – II

Q.4 Attempt Any Four from the following. **16**

a) Explain the SFR ADCON0 and ADCON1 Resistor.

b) Explain the serial communication using USART.

c) Explain capture module in PIC 16F877A in detail.

d) Describe interfacing of DC motor with PIC 16F877

e) Explain how LED's are interfaced with PIC 16F877.

Q.5 Attempt Any Two from following. **12**

a) Explain interfacing of 7 Segment with PIC Microcontroller.

b) Explain any one Master Synchronous Serial Port (MSSP) module.

c) Explain interfacing of LCD 16×2 with PIC 16f877.

SLR-QH-639

Seat No.	

Set | **R**

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
PIC Microcontroller (ENTMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives. **14**

1) The MSSP module supports _____.
a) SPI and I^2C b) UART only
c) PWM d) ADC

2) LEDs are interfaced to PIC through _____.
a) Output ports b) Input ports
c) Serial ports d) ADC ports

3) LCD display commonly used with PIC is _____.
a) 16×2 b) 4×4
c) 8×2 d) 20×4

4) Automation refers to _____.
a) Control with minimal human intervention
b) Manual control
c) Mechanical control
d) None

5) PIC16F877A has a _____ bit architecture.
a) 8-bit b) 16-bit
c) 32-bit d) 4-bit

6) PIC16F877A uses which type of memory for program storage?
a) ROM b) EPROM
c) Flash d) EEPROM

7) The STATUS register in PIC is used for _____.
- a) Arithmetic flag status
- b) Control of peripherals
- c) Interrupt enable
- d) I/O configuration

8) PIC16F877A has how many I/O ports?
- a) 3
- b) 4
- c) 5
- d) 6

9) The oscillator section in PIC provides _____.
- a) Timing and synchronization
- b) Power control
- c) Data transfer
- d) Interrupt control

10) The instruction set of PIC16F877A is _____.
- a) 33 instructions
- b) 35 instructions
- c) 37 instructions
- d) 40 instructions

11) C programming for PIC requires which compiler?
- a) MPLAB XC8
- b) Turbo C
- c) Code::Blocks
- d) Visual Studio

12) The CLRWDT instruction is used to _____.
- a) Clear Watchdog Timer
- b) Clear Working Register
- c) Clear RAM
- d) Clear Program Counter

13) The ADCON0 register controls _____.
- a) ADC channel selection and conversion
- b) Oscillator
- c) Timers
- d) Interrupts

14) CCP stands for _____.
- a) Capture/Compare/PWM
- b) Control/Command/Power
- c) Counter/Compare/Power
- d) Capture/Count/Phase

SLR-QH-639

Seat No.	

Set R

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
PIC Microcontroller (ENTMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt Any Four from the following. **16**

a) Draw & explain memory organization of PIC16F877 in detail.

b) Explain different I/O ports available in PIC 16F877.

c) Describe the functional any 4 pin description of PIC 16F877.

d) Interpret the functions of following SFR using suitable diagram.
i) STATUS
ii) OPTION_REG

e) Explain timer 0 operation in PIC 16F877.

Q.3 Attempt Any Two from following. **12**

a) Draw & explain architecture of PIC 16F877 microcontroller.

b) Write a C or assembly language program to perform addition & subtraction of two numbers(0×35,0×12) & send result of addition to PORT B & subtraction to PORT D in PIC 16F877.

c) What is interrupt? List out types of interrupts in PIC 16F877A.

SECTION – II

Q.4 Attempt Any Four from the following. **16**

a) Explain the SFR ADCON0 and ADCON1 Resistor.

b) Explain the serial communication using USART.

c) Explain capture module in PIC 16F877A in detail.

d) Describe interfacing of DC motor with PIC 16F877

e) Explain how LED's are interfaced with PIC 16F877.

Q.5 Attempt Any Two from following. **12**

a) Explain interfacing of 7 Segment with PIC Microcontroller.

b) Explain any one Master Synchronous Serial Port (MSSP) module.

c) Explain interfacing of LCD 16×2 with PIC 16f877.

SLR-QH-639

Seat No.	

Set S

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
PIC Microcontroller (ENTMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives. **14**

1) The instruction set of PIC16F877A is _____.
a) 33 instructions b) 35 instructions
c) 37 instructions d) 40 instructions

2) C programming for PIC requires which compiler?
a) MPLAB XC8 b) Turbo C
c) Code::Blocks d) Visual Studio

3) The CLRWDT instruction is used to _____.
a) Clear Watchdog Timer b) Clear Working Register
c) Clear RAM d) Clear Program Counter

4) The ADCON0 register controls _____.
a) ADC channel selection and conversion
b) Oscillator
c) Timers
d) Interrupts

5) CCP stands for _____.
a) Capture/Compare/PWM b) Control/Command/Power
c) Counter/Compare/Power d) Capture/Count/Phase

6) The MSSP module supports _____.
a) SPI and I^2C b) UART only
c) PWM d) ADC

7) LEDs are interfaced to PIC through _____.
a) Output ports b) Input ports
c) Serial ports d) ADC ports

8) LCD display commonly used with PIC is _____.
a) 16×2 b) 4×4
c) 8×2 d) 20×4

9) Automation refers to _____.
a) Control with minimal human intervention
b) Manual control
c) Mechanical control
d) None

10) PIC16F877A has a _____ bit architecture.
a) 8-bit b) 16-bit
c) 32-bit d) 4-bit

11) PIC16F877A uses which type of memory for program storage?
a) ROM b) EPROM
c) Flash d) EEPROM

12) The STATUS register in PIC is used for _____.
a) Arithmetic flag status b) Control of peripherals
c) Interrupt enable d) I/O configuration

13) PIC16F877A has how many I/O ports?
a) 3 b) 4
c) 5 d) 6

14) The oscillator section in PIC provides _____.
a) Timing and synchronization b) Power control
c) Data transfer d) Interrupt control

SLR-QH-639

Seat No.		Set	S

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
PIC Microcontroller (ENTMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt Any Four from the following. **16**

a) Draw & explain memory organization of PIC16F877 in detail.

b) Explain different I/O ports available in PIC 16F877.

c) Describe the functional any 4 pin description of PIC 16F877.

d) Interpret the functions of following SFR using suitable diagram.
i) STATUS
ii) OPTION_REG

e) Explain timer 0 operation in PIC 16F877.

Q.3 Attempt Any Two from following. **12**

a) Draw & explain architecture of PIC 16F877 microcontroller.

b) Write a C or assembly language program to perform addition & subtraction of two numbers(0×35,0×12) & send result of addition to PORT B & subtraction to PORT D in PIC 16F877.

c) What is interrupt? List out types of interrupts in PIC 16F877A.

SECTION – II

Q.4 Attempt Any Four from the following. **16**

a) Explain the SFR ADCON0 and ADCON1 Resistor.

b) Explain the serial communication using USART.

c) Explain capture module in PIC 16F877A in detail.

d) Describe interfacing of DC motor with PIC 16F877

e) Explain how LED's are interfaced with PIC 16F877.

Q.5 Attempt Any Two from following. **12**

a) Explain interfacing of 7 Segment with PIC Microcontroller.

b) Explain any one Master Synchronous Serial Port (MSSP) module.

c) Explain interfacing of LCD 16×2 with PIC 16f877.

SLR-QH-640

Seat No.	

Set P

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April - 2026
IoT Networks and Security (ENTMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Answer the following Objective Type Questions. 14

1) Which component is part of the perception/sensing layer?
a) ADC (Analog to Digital Converter)
b) Wi-Fi Router
c) Dashboard
d) Data Center

2) What is the key feature of Level 1 IoT system?
a) Uses multiple nodes
b) Sends data to the cloud
c) Local sensing and processing in a single node
d) Requires coordinator node

3) What technique is used to combine data from multiple sensors for accuracy?
a) Cloud Storage b) Sensor Fusion
c) Encryption d) MQTT Protocol

4) Which design best reduces power use in IoT wearables?
a) Continuous cloud link b) High sampling
c) Always-on sensors d) Sleep-wake cycles

5) Which of the following challenges is specific to physical design rather than logical design of IoT?
a) Protocol & API integration
b) Data flow management
c) Cloud integration
d) Hardware selection and power management

6) The first step in IoT design is _____.
a) Security planning
b) Choosing communication protocols
c) Understanding user needs
d) Creating cloud dashboards

7) An IoT application requires low-latency, bi-directional communication between client and server. Which communication API is most suitable?
a) REST API
b) WebSocket API
c) CoAP API
d) MQTT API

8) In a DDoS attack, compromised IoT devices are collectively called _____.
a) Botnets
b) Nodes
c) Clients
d) Servers

9) Which programming environment is directly supported by ThingSpeak for data analysis?
a) Python
b) MATLAB
c) R
d) C++

10) Which of the following is a characteristic of TCP?
a) Unreliable delivery
b) No sequencing
c) Connection-oriented and reliable
d) Only supports broadcast

11) Which protocol ensures end-to-end addressing in IoT devices?
a) UDP
b) TCP
c) IP
d) Zigbee

12) In IoT, end-to-end encryption ensures _____.
a) Only sender and receiver can read data
b) Data can be modified in transit
c) Data is compressed
d) Data is accessible to routers

13) Firmware updates are important because they _____.
a) Reduce power consumption
b) Fix security vulnerabilities
c) Increase memory
d) Change MAC address

14) How does IoT improve bridge maintenance compared to traditional inspection methods?
a) Reduces human involvement and enables real-time monitoring
b) Completely eliminates all maintenance needs
c) Makes bridges self-repairing
d) Only tracks traffic volume

Seat No.	

Set **P**

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April - 2026
IoT Networks and Security (ENTMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt Any Four Questions. **16**

a) Evaluate how design challenges affect IoT performance. Suggest solutions for each challenge.

b) Explain with neat diagram the four-layer IoT architecture with the role and key components of each layer.

c) Write short notes on Wireless Sensor Networks (WSN) and their role in IoT.

d) Differentiate between Physical Design & Logical Design of IOT based on following points: Purpose, Security Concern, Components & Connectivity.

e) Explain IaaS, PaaS, and SaaS in Cloud Computing with examples relevant to IoT.

Q.3 Attempt Any Two Questions. **12**

a) Describe Level 2 IoT system. How is it different from Level 1 in terms of data storage and analysis?

b) Define Internet of Everything (IoE). How is it different from IoT? Explain the four core elements of IoE with examples.

c) Explain the four IoT communication models — Request-Response, Publish-Subscribe, Push-Pull, and Exclusive Pair.

SECTION – II

Q.4 Attempt Any Four Questions. **16**

a) Discuss the workflow of Participatory Sensing in IoT with neat diagram.

b) Explain the concept of Confidentiality, Integrity, and Availability (CIA) in IoT.

c) Compare IPv4 and IPv6 addressing in IOT (Any 4 Points).

d) Describe different types of IoT attacks with examples.

e) Illustrate the components of Automotive IoT and discuss their role in connected vehicles.

Q.5 Attempt Any Two Question. **12**

a) Define M2M communication and list its key features. Also explain the role of sensors and communication networks in M2M architecture.

b) Evaluate the suitability of UDP & TCP in IoT applications with example.

c) The frequent breakdown of college buses due to overheating and poor maintenance has caused safety issues and delays. As an IoT engineer, design a Vehicle Health Monitoring System that detects and reports the engine temperature, battery status, Tyre pressure, fuel level, GPS location etc. in real time.

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April - 2026
IoT Networks and Security (ENTMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Answer the following Objective Type Questions. 14

1) In a DDoS attack, compromised IoT devices are collectively called _____.
a) Botnets b) Nodes
c) Clients d) Servers

2) Which programming environment is directly supported by ThingSpeak for data analysis?
a) Python b) MATLAB
c) R d) C++

3) Which of the following is a characteristic of TCP?
a) Unreliable delivery
b) No sequencing
c) Connection-oriented and reliable
d) Only supports broadcast

4) Which protocol ensures end-to-end addressing in IoT devices?
a) UDP b) TCP
c) IP d) Zigbee

5) In IoT, end-to-end encryption ensures _____.
a) Only sender and receiver can read data
b) Data can be modified in transit
c) Data is compressed
d) Data is accessible to routers

6) Firmware updates are important because they _____.
a) Reduce power consumption
b) Fix security vulnerabilities
c) Increase memory
d) Change MAC address

7) How does IoT improve bridge maintenance compared to traditional inspection methods?
   a) Reduces human involvement and enables real-time monitoring
   b) Completely eliminates all maintenance needs
   c) Makes bridges self-repairing
   d) Only tracks traffic volume

8) Which component is part of the perception/sensing layer?
   a) ADC (Analog to Digital Converter)
   b) Wi-Fi Router
   c) Dashboard
   d) Data Center

9) What is the key feature of Level 1 IoT system?
   a) Uses multiple nodes
   b) Sends data to the cloud
   c) Local sensing and processing in a single node
   d) Requires coordinator node

10) What technique is used to combine data from multiple sensors for accuracy?
   a) Cloud Storage
   b) Sensor Fusion
   c) Encryption
   d) MQTT Protocol

11) Which design best reduces power use in IoT wearables?
   a) Continuous cloud link
   b) High sampling
   c) Always-on sensors
   d) Sleep-wake cycles

12) Which of the following challenges is specific to physical design rather than logical design of IoT?
   a) Protocol & API integration
   b) Data flow management
   c) Cloud integration
   d) Hardware selection and power management

13) The first step in IoT design is _____.
   a) Security planning
   b) Choosing communication protocols
   c) Understanding user needs
   d) Creating cloud dashboards

14) An IoT application requires low-latency, bi-directional communication between client and server. Which communication API is most suitable?
   a) REST API
   b) WebSocket API
   c) CoAP API
   d) MQTT API

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April - 2026
IoT Networks and Security (ENTMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt Any Four Questions. **16**

a) Evaluate how design challenges affect IoT performance. Suggest solutions for each challenge.

b) Explain with neat diagram the four-layer IoT architecture with the role and key components of each layer.

c) Write short notes on Wireless Sensor Networks (WSN) and their role in IoT.

d) Differentiate between Physical Design & Logical Design of IOT based on following points: Purpose, Security Concern, Components & Connectivity.

e) Explain IaaS, PaaS, and SaaS in Cloud Computing with examples relevant to IoT.

Q.3 Attempt Any Two Questions. **12**

a) Describe Level 2 IoT system. How is it different from Level 1 in terms of data storage and analysis?

b) Define Internet of Everything (IoE). How is it different from IoT? Explain the four core elements of IoE with examples.

c) Explain the four IoT communication models — Request-Response, Publish-Subscribe, Push-Pull, and Exclusive Pair.

SECTION – II

Q.4 Attempt Any Four Questions. **16**

a) Discuss the workflow of Participatory Sensing in IoT with neat diagram.

b) Explain the concept of Confidentiality, Integrity, and Availability (CIA) in IoT.

c) Compare IPv4 and IPv6 addressing in IOT (Any 4 Points).

d) Describe different types of IoT attacks with examples.

e) Illustrate the components of Automotive IoT and discuss their role in connected vehicles.

Q.5 Attempt Any Two Question. **12**

a) Define M2M communication and list its key features. Also explain the role of sensors and communication networks in M2M architecture.

b) Evaluate the suitability of UDP & TCP in IoT applications with example.

c) The frequent breakdown of college buses due to overheating and poor maintenance has caused safety issues and delays. As an IoT engineer, design a Vehicle Health Monitoring System that detects and reports the engine temperature, battery status, Tyre pressure, fuel level, GPS location etc. in real time.

Seat No.	

Set **R**

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April - 2026
IoT Networks and Security (ENTMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Answer the following Objective Type Questions. 14

1) Which protocol ensures end-to-end addressing in IoT devices?
a) UDP b) TCP
c) IP d) Zigbee

2) In IoT, end-to-end encryption ensures _____.
a) Only sender and receiver can read data
b) Data can be modified in transit
c) Data is compressed
d) Data is accessible to routers

3) Firmware updates are important because they _____.
a) Reduce power consumption
b) Fix security vulnerabilities
c) Increase memory
d) Change MAC address

4) How does IoT improve bridge maintenance compared to traditional inspection methods?
a) Reduces human involvement and enables real-time monitoring
b) Completely eliminates all maintenance needs
c) Makes bridges self-repairing
d) Only tracks traffic volume

5) Which component is part of the perception/sensing layer?
a) ADC (Analog to Digital Converter)
b) Wi-Fi Router
c) Dashboard
d) Data Center

6) What is the key feature of Level 1 IoT system?
a) Uses multiple nodes
b) Sends data to the cloud
c) Local sensing and processing in a single node
d) Requires coordinator node

7) What technique is used to combine data from multiple sensors for accuracy?
a) Cloud Storage
b) Sensor Fusion
c) Encryption
d) MQTT Protocol

8) Which design best reduces power use in IoT wearables?
a) Continuous cloud link
b) High sampling
c) Always-on sensors
d) Sleep-wake cycles

9) Which of the following challenges is specific to physical design rather than logical design of IoT?
a) Protocol & API integration
b) Data flow management
c) Cloud integration
d) Hardware selection and power management

10) The first step in IoT design is _____.
a) Security planning
b) Choosing communication protocols
c) Understanding user needs
d) Creating cloud dashboards

11) An IoT application requires low-latency, bi-directional communication between client and server. Which communication API is most suitable?
a) REST API
b) WebSocket API
c) CoAP API
d) MQTT API

12) In a DDoS attack, compromised IoT devices are collectively called _____.
a) Botnets
b) Nodes
c) Clients
d) Servers

13) Which programming environment is directly supported by ThingSpeak for data analysis?
a) Python
b) MATLAB
c) R
d) C++

14) Which of the following is a characteristic of TCP?
a) Unreliable delivery
b) No sequencing
c) Connection-oriented and reliable
d) Only supports broadcast

Seat No.	

Set **R**

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April - 2026
IoT Networks and Security (ENTMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt Any Four Questions. **16**

a) Evaluate how design challenges affect IoT performance. Suggest solutions for each challenge.

b) Explain with neat diagram the four-layer IoT architecture with the role and key components of each layer.

c) Write short notes on Wireless Sensor Networks (WSN) and their role in IoT.

d) Differentiate between Physical Design & Logical Design of IOT based on following points: Purpose, Security Concern, Components & Connectivity.

e) Explain IaaS, PaaS, and SaaS in Cloud Computing with examples relevant to IoT.

Q.3 Attempt Any Two Questions. **12**

a) Describe Level 2 IoT system. How is it different from Level 1 in terms of data storage and analysis?

b) Define Internet of Everything (IoE). How is it different from IoT? Explain the four core elements of IoE with examples.

c) Explain the four IoT communication models — Request-Response, Publish-Subscribe, Push-Pull, and Exclusive Pair.

SECTION – II

Q.4 Attempt Any Four Questions. **16**

a) Discuss the workflow of Participatory Sensing in IoT with neat diagram.

b) Explain the concept of Confidentiality, Integrity, and Availability (CIA) in IoT.

c) Compare IPv4 and IPv6 addressing in IOT (Any 4 Points).

d) Describe different types of IoT attacks with examples.

e) Illustrate the components of Automotive IoT and discuss their role in connected vehicles.

Q.5 Attempt Any Two Question. **12**

a) Define M2M communication and list its key features. Also explain the role of sensors and communication networks in M2M architecture.

b) Evaluate the suitability of UDP & TCP in IoT applications with example.

c) The frequent breakdown of college buses due to overheating and poor maintenance has caused safety issues and delays. As an IoT engineer, design a Vehicle Health Monitoring System that detects and reports the engine temperature, battery status, Tyre pressure, fuel level, GPS location etc. in real time.

Seat No.	

Set **S**

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April - 2026
IoT Networks and Security (ENTMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Answer the following Objective Type Questions. **14**

1) The first step in IoT design is _____.
a) Security planning
b) Choosing communication protocols
c) Understanding user needs
d) Creating cloud dashboards

2) An IoT application requires low-latency, bi-directional communication between client and server. Which communication API is most suitable?
a) REST API b) WebSocket API
c) CoAP API d) MQTT API

3) In a DDoS attack, compromised IoT devices are collectively called _____.
a) Botnets b) Nodes
c) Clients d) Servers

4) Which programming environment is directly supported by ThingSpeak for data analysis?
a) Python b) MATLAB
c) R d) C++

5) Which of the following is a characteristic of TCP?
a) Unreliable delivery
b) No sequencing
c) Connection-oriented and reliable
d) Only supports broadcast

6) Which protocol ensures end-to-end addressing in IoT devices?
a) UDP b) TCP
c) IP d) Zigbee

7) In IoT, end-to-end encryption ensures _____.
   a) Only sender and receiver can read data
   b) Data can be modified in transit
   c) Data is compressed
   d) Data is accessible to routers

8) Firmware updates are important because they _____.
   a) Reduce power consumption
   b) Fix security vulnerabilities
   c) Increase memory
   d) Change MAC address

9) How does IoT improve bridge maintenance compared to traditional inspection methods?
   a) Reduces human involvement and enables real-time monitoring
   b) Completely eliminates all maintenance needs
   c) Makes bridges self-repairing
   d) Only tracks traffic volume

10) Which component is part of the perception/sensing layer?
   a) ADC (Analog to Digital Converter)
   b) Wi-Fi Router
   c) Dashboard
   d) Data Center

11) What is the key feature of Level 1 IoT system?
   a) Uses multiple nodes
   b) Sends data to the cloud
   c) Local sensing and processing in a single node
   d) Requires coordinator node

12) What technique is used to combine data from multiple sensors for accuracy?
   a) Cloud Storage
   b) Sensor Fusion
   c) Encryption
   d) MQTT Protocol

13) Which design best reduces power use in IoT wearables?
   a) Continuous cloud link
   b) High sampling
   c) Always-on sensors
   d) Sleep-wake cycles

14) Which of the following challenges is specific to physical design rather than logical design of IoT?
   a) Protocol & API integration
   b) Data flow management
   c) Cloud integration
   d) Hardware selection and power management

Seat No.	

Set **S**

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April - 2026
IoT Networks and Security (ENTMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt Any Four Questions. **16**

a) Evaluate how design challenges affect IoT performance. Suggest solutions for each challenge.

b) Explain with neat diagram the four-layer IoT architecture with the role and key components of each layer.

c) Write short notes on Wireless Sensor Networks (WSN) and their role in IoT.

d) Differentiate between Physical Design & Logical Design of IOT based on following points: Purpose, Security Concern, Components & Connectivity.

e) Explain IaaS, PaaS, and SaaS in Cloud Computing with examples relevant to IoT.

Q.3 Attempt Any Two Questions. **12**

a) Describe Level 2 IoT system. How is it different from Level 1 in terms of data storage and analysis?

b) Define Internet of Everything (IoE). How is it different from IoT? Explain the four core elements of IoE with examples.

c) Explain the four IoT communication models — Request-Response, Publish-Subscribe, Push-Pull, and Exclusive Pair.

SECTION – II

Q.4 Attempt Any Four Questions. **16**

a) Discuss the workflow of Participatory Sensing in IoT with neat diagram.

b) Explain the concept of Confidentiality, Integrity, and Availability (CIA) in IoT.

c) Compare IPv4 and IPv6 addressing in IOT (Any 4 Points).

d) Describe different types of IoT attacks with examples.

e) Illustrate the components of Automotive IoT and discuss their role in connected vehicles.

Q.5 Attempt Any Two Question. **12**

a) Define M2M communication and list its key features. Also explain the role of sensors and communication networks in M2M architecture.

b) Evaluate the suitability of UDP & TCP in IoT applications with example.

c) The frequent breakdown of college buses due to overheating and poor maintenance has caused safety issues and delays. As an IoT engineer, design a Vehicle Health Monitoring System that detects and reports the engine temperature, battery status, Tyre pressure, fuel level, GPS location etc. in real time.

SLR-QH-640

Seat No.	

Set P

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
IoT Networks and Security (ENTMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Answer the following Objective Type Questions. 14

1) Which component is part of the perception/sensing layer?
a) ADC (Analog to Digital Converter)
b) Wi-Fi Router
c) Dashboard
d) Data Center

2) What is the key feature of Level 1 IoT system?
a) Uses multiple nodes
b) Sends data to the cloud
c) Local sensing and processing in a single node
d) Requires coordinator node

3) What technique is used to combine data from multiple sensors for accuracy?
a) Cloud Storage b) Sensor Fusion
c) Encryption d) MQTT Protocol

4) Which design best reduces power use in IoT wearables?
a) Continuous cloud link b) High sampling
c) Always-on sensors d) Sleep-wake cycles

5) Which of the following challenges is specific to physical design rather than logical design of IoT?
a) Protocol & API integration
b) Data flow management
c) Cloud integration
d) Hardware selection and power management

6) The first step in IoT design is _____.
a) Security planning
b) Choosing communication protocols
c) Understanding user needs
d) Creating cloud dashboards

7) An IoT application requires low-latency, bi-directional communication between client and server. Which communication API is most suitable?
a) REST API
b) WebSocket API
c) CoAP API
d) MQTT API

8) In a DDoS attack, compromised IoT devices are collectively called _____.
a) Botnets
b) Nodes
c) Clients
d) Servers

9) Which programming environment is directly supported by ThingSpeak for data analysis?
a) Python
b) MATLAB
c) R
d) C++

10) Which of the following is a characteristic of TCP?
a) Unreliable delivery
b) No sequencing
c) Connection-oriented and reliable
d) Only supports broadcast

11) Which protocol ensures end-to-end addressing in IoT devices?
a) UDP
b) TCP
c) IP
d) Zigbee

12) In IoT, end-to-end encryption ensures _____.
a) Only sender and receiver can read data
b) Data can be modified in transit
c) Data is compressed
d) Data is accessible to routers

13) Firmware updates are important because they _____.
a) Reduce power consumption
b) Fix security vulnerabilities
c) Increase memory
d) Change MAC address

14) How does IoT improve bridge maintenance compared to traditional inspection methods?
a) Reduces human involvement and enables real-time monitoring
b) Completely eliminates all maintenance needs
c) Makes bridges self-repairing
d) Only tracks traffic volume

Seat No.	

Set **P**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
IoT Networks and Security (ENTMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt Any Four Questions. **16**

a) Evaluate how design challenges affect IoT performance. Suggest solutions for each challenge.

b) Explain with neat diagram the four-layer IoT architecture with the role and key components of each layer.

c) Write short notes on Wireless Sensor Networks (WSN) and their role in IoT.

d) Differentiate between Physical Design & Logical Design of IOT based on following points: Purpose, Security Concern, Components & Connectivity.

e) Explain IaaS, PaaS, and SaaS in Cloud Computing with examples relevant to IoT.

Q.3 Attempt Any Two Questions. **12**

a) Describe Level 2 IoT system. How is it different from Level 1 in terms of data storage and analysis?

b) Define Internet of Everything (IoE). How is it different from IoT? Explain the four core elements of IoE with examples.

c) Explain the four IoT communication models — Request-Response, Publish-Subscribe, Push-Pull, and Exclusive Pair.

SECTION – II

Q.4 Attempt Any Four Questions. **16**

a) Discuss the workflow of Participatory Sensing in IoT with neat diagram.

b) Explain the concept of Confidentiality, Integrity, and Availability (CIA) in IoT.

c) Compare IPv4 and IPv6 addressing in IOT (Any 4 Points).

d) Describe different types of IoT attacks with examples.

e) Illustrate the components of Automotive IoT and discuss their role in connected vehicles.

Q.5 Attempt Any Two Question. **12**

a) Define M2M communication and list its key features. Also explain the role of sensors and communication networks in M2M architecture.

b) Evaluate the suitability of UDP & TCP in IoT applications with example.

c) The frequent breakdown of college buses due to overheating and poor maintenance has caused safety issues and delays. As an IoT engineer, design a Vehicle Health Monitoring System that detects and reports the engine temperature, battery status, Tyre pressure, fuel level, GPS location etc. in real time.

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
IoT Networks and Security (ENTMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Answer the following Objective Type Questions. 14

1) In a DDoS attack, compromised IoT devices are collectively called _____.
a) Botnets b) Nodes
c) Clients d) Servers

2) Which programming environment is directly supported by ThingSpeak for data analysis?
a) Python b) MATLAB
c) R d) C++

3) Which of the following is a characteristic of TCP?
a) Unreliable delivery
b) No sequencing
c) Connection-oriented and reliable
d) Only supports broadcast

4) Which protocol ensures end-to-end addressing in IoT devices?
a) UDP b) TCP
c) IP d) Zigbee

5) In IoT, end-to-end encryption ensures _____.
a) Only sender and receiver can read data
b) Data can be modified in transit
c) Data is compressed
d) Data is accessible to routers

6) Firmware updates are important because they _____.
a) Reduce power consumption
b) Fix security vulnerabilities
c) Increase memory
d) Change MAC address

7) How does IoT improve bridge maintenance compared to traditional inspection methods?
   a) Reduces human involvement and enables real-time monitoring
   b) Completely eliminates all maintenance needs
   c) Makes bridges self-repairing
   d) Only tracks traffic volume

8) Which component is part of the perception/sensing layer?
   a) ADC (Analog to Digital Converter)
   b) Wi-Fi Router
   c) Dashboard
   d) Data Center

9) What is the key feature of Level 1 IoT system?
   a) Uses multiple nodes
   b) Sends data to the cloud
   c) Local sensing and processing in a single node
   d) Requires coordinator node

10) What technique is used to combine data from multiple sensors for accuracy?
   a) Cloud Storage
   b) Sensor Fusion
   c) Encryption
   d) MQTT Protocol

11) Which design best reduces power use in IoT wearables?
   a) Continuous cloud link
   b) High sampling
   c) Always-on sensors
   d) Sleep-wake cycles

12) Which of the following challenges is specific to physical design rather than logical design of IoT?
   a) Protocol & API integration
   b) Data flow management
   c) Cloud integration
   d) Hardware selection and power management

13) The first step in IoT design is _____.
   a) Security planning
   b) Choosing communication protocols
   c) Understanding user needs
   d) Creating cloud dashboards

14) An IoT application requires low-latency, bi-directional communication between client and server. Which communication API is most suitable?
   a) REST API
   b) WebSocket API
   c) CoAP API
   d) MQTT API

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
IoT Networks and Security (ENTMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt Any Four Questions. **16**

a) Evaluate how design challenges affect IoT performance. Suggest solutions for each challenge.

b) Explain with neat diagram the four-layer IoT architecture with the role and key components of each layer.

c) Write short notes on Wireless Sensor Networks (WSN) and their role in IoT.

d) Differentiate between Physical Design & Logical Design of IOT based on following points: Purpose, Security Concern, Components & Connectivity.

e) Explain IaaS, PaaS, and SaaS in Cloud Computing with examples relevant to IoT.

Q.3 Attempt Any Two Questions. **12**

a) Describe Level 2 IoT system. How is it different from Level 1 in terms of data storage and analysis?

b) Define Internet of Everything (IoE). How is it different from IoT? Explain the four core elements of IoE with examples.

c) Explain the four IoT communication models — Request-Response, Publish-Subscribe, Push-Pull, and Exclusive Pair.

SECTION – II

Q.4 Attempt Any Four Questions. **16**

a) Discuss the workflow of Participatory Sensing in IoT with neat diagram.

b) Explain the concept of Confidentiality, Integrity, and Availability (CIA) in IoT.

c) Compare IPv4 and IPv6 addressing in IOT (Any 4 Points).

d) Describe different types of IoT attacks with examples.

e) Illustrate the components of Automotive IoT and discuss their role in connected vehicles.

Q.5 Attempt Any Two Question. **12**

a) Define M2M communication and list its key features. Also explain the role of sensors and communication networks in M2M architecture.

b) Evaluate the suitability of UDP & TCP in IoT applications with example.

c) The frequent breakdown of college buses due to overheating and poor maintenance has caused safety issues and delays. As an IoT engineer, design a Vehicle Health Monitoring System that detects and reports the engine temperature, battery status, Tyre pressure, fuel level, GPS location etc. in real time.

Seat No.	

Set **R**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
IoT Networks and Security (ENTMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Answer the following Objective Type Questions. 14

1) Which protocol ensures end-to-end addressing in IoT devices?
a) UDP b) TCP
c) IP d) Zigbee

2) In IoT, end-to-end encryption ensures _____.
a) Only sender and receiver can read data
b) Data can be modified in transit
c) Data is compressed
d) Data is accessible to routers

3) Firmware updates are important because they _____.
a) Reduce power consumption
b) Fix security vulnerabilities
c) Increase memory
d) Change MAC address

4) How does IoT improve bridge maintenance compared to traditional inspection methods?
a) Reduces human involvement and enables real-time monitoring
b) Completely eliminates all maintenance needs
c) Makes bridges self-repairing
d) Only tracks traffic volume

5) Which component is part of the perception/sensing layer?
a) ADC (Analog to Digital Converter)
b) Wi-Fi Router
c) Dashboard
d) Data Center

6) What is the key feature of Level 1 IoT system?
a) Uses multiple nodes
b) Sends data to the cloud
c) Local sensing and processing in a single node
d) Requires coordinator node

7) What technique is used to combine data from multiple sensors for accuracy?
a) Cloud Storage
b) Sensor Fusion
c) Encryption
d) MQTT Protocol

8) Which design best reduces power use in IoT wearables?
a) Continuous cloud link
b) High sampling
c) Always-on sensors
d) Sleep-wake cycles

9) Which of the following challenges is specific to physical design rather than logical design of IoT?
a) Protocol & API integration
b) Data flow management
c) Cloud integration
d) Hardware selection and power management

10) The first step in IoT design is _____.
a) Security planning
b) Choosing communication protocols
c) Understanding user needs
d) Creating cloud dashboards

11) An IoT application requires low-latency, bi-directional communication between client and server. Which communication API is most suitable?
a) REST API
b) WebSocket API
c) CoAP API
d) MQTT API

12) In a DDoS attack, compromised IoT devices are collectively called _____.
a) Botnets
b) Nodes
c) Clients
d) Servers

13) Which programming environment is directly supported by ThingSpeak for data analysis?
a) Python
b) MATLAB
c) R
d) C++

14) Which of the following is a characteristic of TCP?
a) Unreliable delivery
b) No sequencing
c) Connection-oriented and reliable
d) Only supports broadcast

Seat No.	

Set **R**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
IoT Networks and Security (ENTMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt Any Four Questions. **16**

a) Evaluate how design challenges affect IoT performance. Suggest solutions for each challenge.

b) Explain with neat diagram the four-layer IoT architecture with the role and key components of each layer.

c) Write short notes on Wireless Sensor Networks (WSN) and their role in IoT.

d) Differentiate between Physical Design & Logical Design of IOT based on following points: Purpose, Security Concern, Components & Connectivity.

e) Explain IaaS, PaaS, and SaaS in Cloud Computing with examples relevant to IoT.

Q.3 Attempt Any Two Questions. **12**

a) Describe Level 2 IoT system. How is it different from Level 1 in terms of data storage and analysis?

b) Define Internet of Everything (IoE). How is it different from IoT? Explain the four core elements of IoE with examples.

c) Explain the four IoT communication models — Request-Response, Publish-Subscribe, Push-Pull, and Exclusive Pair.

SECTION – II

Q.4 Attempt Any Four Questions. **16**

a) Discuss the workflow of Participatory Sensing in IoT with neat diagram.

b) Explain the concept of Confidentiality, Integrity, and Availability (CIA) in IoT.

c) Compare IPv4 and IPv6 addressing in IOT (Any 4 Points).

d) Describe different types of IoT attacks with examples.

e) Illustrate the components of Automotive IoT and discuss their role in connected vehicles.

Q.5 Attempt Any Two Question. **12**

a) Define M2M communication and list its key features. Also explain the role of sensors and communication networks in M2M architecture.

b) Evaluate the suitability of UDP & TCP in IoT applications with example.

c) The frequent breakdown of college buses due to overheating and poor maintenance has caused safety issues and delays. As an IoT engineer, design a Vehicle Health Monitoring System that detects and reports the engine temperature, battery status, Tyre pressure, fuel level, GPS location etc. in real time.

Seat No.		Set	S

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
IoT Networks and Security (ENTMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Answer the following Objective Type Questions. 14

1) The first step in IoT design is _____.
a) Security planning
b) Choosing communication protocols
c) Understanding user needs
d) Creating cloud dashboards

2) An IoT application requires low-latency, bi-directional communication between client and server. Which communication API is most suitable?
a) REST API b) WebSocket API
c) CoAP API d) MQTT API

3) In a DDoS attack, compromised IoT devices are collectively called _____.
a) Botnets b) Nodes
c) Clients d) Servers

4) Which programming environment is directly supported by ThingSpeak for data analysis?
a) Python b) MATLAB
c) R d) C++

5) Which of the following is a characteristic of TCP?
a) Unreliable delivery
b) No sequencing
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d) Only supports broadcast

6) Which protocol ensures end-to-end addressing in IoT devices?
a) UDP b) TCP
c) IP d) Zigbee

7) In IoT, end-to-end encryption ensures _____.
   a) Only sender and receiver can read data
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   a) Reduce power consumption
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9) How does IoT improve bridge maintenance compared to traditional inspection methods?
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10) Which component is part of the perception/sensing layer?
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   b) Sensor Fusion
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13) Which design best reduces power use in IoT wearables?
   a) Continuous cloud link
   b) High sampling
   c) Always-on sensors
   d) Sleep-wake cycles

14) Which of the following challenges is specific to physical design rather than logical design of IoT?
   a) Protocol & API integration
   b) Data flow management
   c) Cloud integration
   d) Hardware selection and power management

Seat No.	

Set **S**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
IoT Networks and Security (ENTMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt Any Four Questions. **16**

a) Evaluate how design challenges affect IoT performance. Suggest solutions for each challenge.

b) Explain with neat diagram the four-layer IoT architecture with the role and key components of each layer.

c) Write short notes on Wireless Sensor Networks (WSN) and their role in IoT.

d) Differentiate between Physical Design & Logical Design of IOT based on following points: Purpose, Security Concern, Components & Connectivity.

e) Explain IaaS, PaaS, and SaaS in Cloud Computing with examples relevant to IoT.

Q.3 Attempt Any Two Questions. **12**

a) Describe Level 2 IoT system. How is it different from Level 1 in terms of data storage and analysis?

b) Define Internet of Everything (IoE). How is it different from IoT? Explain the four core elements of IoE with examples.

c) Explain the four IoT communication models — Request-Response, Publish-Subscribe, Push-Pull, and Exclusive Pair.

SECTION – II

Q.4 Attempt Any Four Questions. **16**

a) Discuss the workflow of Participatory Sensing in IoT with neat diagram.

b) Explain the concept of Confidentiality, Integrity, and Availability (CIA) in IoT.

c) Compare IPv4 and IPv6 addressing in IOT (Any 4 Points).

d) Describe different types of IoT attacks with examples.

e) Illustrate the components of Automotive IoT and discuss their role in connected vehicles.

Q.5 Attempt Any Two Question. **12**

a) Define M2M communication and list its key features. Also explain the role of sensors and communication networks in M2M architecture.

b) Evaluate the suitability of UDP & TCP in IoT applications with example.

c) The frequent breakdown of college buses due to overheating and poor maintenance has caused safety issues and delays. As an IoT engineer, design a Vehicle Health Monitoring System that detects and reports the engine temperature, battery status, Tyre pressure, fuel level, GPS location etc. in real time.

SLR-QH-640

Seat No.	

Set P

T.Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
IoT Networks and Security (ENTMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Answer the following Objective Type Questions. 14

1) Which component is part of the perception/sensing layer?
a) ADC (Analog to Digital Converter)
b) Wi-Fi Router
c) Dashboard
d) Data Center

2) What is the key feature of Level 1 IoT system?
a) Uses multiple nodes
b) Sends data to the cloud
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3) What technique is used to combine data from multiple sensors for accuracy?
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4) Which design best reduces power use in IoT wearables?
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5) Which of the following challenges is specific to physical design rather than logical design of IoT?
a) Protocol & API integration
b) Data flow management
c) Cloud integration
d) Hardware selection and power management

6) The first step in IoT design is _____.
a) Security planning
b) Choosing communication protocols
c) Understanding user needs
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7) An IoT application requires low-latency, bi-directional communication between client and server. Which communication API is most suitable?
a) REST API
b) WebSocket API
c) CoAP API
d) MQTT API

8) In a DDoS attack, compromised IoT devices are collectively called _____.
a) Botnets
b) Nodes
c) Clients
d) Servers

9) Which programming environment is directly supported by ThingSpeak for data analysis?
a) Python
b) MATLAB
c) R
d) C++

10) Which of the following is a characteristic of TCP?
a) Unreliable delivery
b) No sequencing
c) Connection-oriented and reliable
d) Only supports broadcast

11) Which protocol ensures end-to-end addressing in IoT devices?
a) UDP
b) TCP
c) IP
d) Zigbee

12) In IoT, end-to-end encryption ensures _____.
a) Only sender and receiver can read data
b) Data can be modified in transit
c) Data is compressed
d) Data is accessible to routers

13) Firmware updates are important because they _____.
a) Reduce power consumption
b) Fix security vulnerabilities
c) Increase memory
d) Change MAC address

14) How does IoT improve bridge maintenance compared to traditional inspection methods?
a) Reduces human involvement and enables real-time monitoring
b) Completely eliminates all maintenance needs
c) Makes bridges self-repairing
d) Only tracks traffic volume

Seat No.	

Set **P**

T.Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
IoT Networks and Security (ENTMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt Any Four Questions. **16**

a) Evaluate how design challenges affect IoT performance. Suggest solutions for each challenge.

b) Explain with neat diagram the four-layer IoT architecture with the role and key components of each layer.

c) Write short notes on Wireless Sensor Networks (WSN) and their role in IoT.

d) Differentiate between Physical Design & Logical Design of IOT based on following points: Purpose, Security Concern, Components & Connectivity.

e) Explain IaaS, PaaS, and SaaS in Cloud Computing with examples relevant to IoT.

Q.3 Attempt Any Two Questions. **12**

a) Describe Level 2 IoT system. How is it different from Level 1 in terms of data storage and analysis?

b) Define Internet of Everything (IoE). How is it different from IoT? Explain the four core elements of IoE with examples.

c) Explain the four IoT communication models — Request-Response, Publish-Subscribe, Push-Pull, and Exclusive Pair.

SECTION – II

Q.4 Attempt Any Four Questions. **16**

a) Discuss the workflow of Participatory Sensing in IoT with neat diagram.

b) Explain the concept of Confidentiality, Integrity, and Availability (CIA) in IoT.

c) Compare IPv4 and IPv6 addressing in IOT (Any 4 Points).

d) Describe different types of IoT attacks with examples.

e) Illustrate the components of Automotive IoT and discuss their role in connected vehicles.

Q.5 Attempt Any Two Question. **12**

a) Define M2M communication and list its key features. Also explain the role of sensors and communication networks in M2M architecture.

b) Evaluate the suitability of UDP & TCP in IoT applications with example.

c) The frequent breakdown of college buses due to overheating and poor maintenance has caused safety issues and delays. As an IoT engineer, design a Vehicle Health Monitoring System that detects and reports the engine temperature, battery status, Tyre pressure, fuel level, GPS location etc. in real time.

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
IoT Networks and Security (ENTMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Answer the following Objective Type Questions. 14

1) In a DDoS attack, compromised IoT devices are collectively called _____.
a) Botnets b) Nodes
c) Clients d) Servers

2) Which programming environment is directly supported by ThingSpeak for data analysis?
a) Python b) MATLAB
c) R d) C++

3) Which of the following is a characteristic of TCP?
a) Unreliable delivery
b) No sequencing
c) Connection-oriented and reliable
d) Only supports broadcast

4) Which protocol ensures end-to-end addressing in IoT devices?
a) UDP b) TCP
c) IP d) Zigbee

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6) Firmware updates are important because they _____.
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b) Fix security vulnerabilities
c) Increase memory
d) Change MAC address

7) How does IoT improve bridge maintenance compared to traditional inspection methods?
   a) Reduces human involvement and enables real-time monitoring
   b) Completely eliminates all maintenance needs
   c) Makes bridges self-repairing
   d) Only tracks traffic volume

8) Which component is part of the perception/sensing layer?
   a) ADC (Analog to Digital Converter)
   b) Wi-Fi Router
   c) Dashboard
   d) Data Center

9) What is the key feature of Level 1 IoT system?
   a) Uses multiple nodes
   b) Sends data to the cloud
   c) Local sensing and processing in a single node
   d) Requires coordinator node

10) What technique is used to combine data from multiple sensors for accuracy?
   a) Cloud Storage
   b) Sensor Fusion
   c) Encryption
   d) MQTT Protocol

11) Which design best reduces power use in IoT wearables?
   a) Continuous cloud link
   b) High sampling
   c) Always-on sensors
   d) Sleep-wake cycles

12) Which of the following challenges is specific to physical design rather than logical design of IoT?
   a) Protocol & API integration
   b) Data flow management
   c) Cloud integration
   d) Hardware selection and power management

13) The first step in IoT design is _____.
   a) Security planning
   b) Choosing communication protocols
   c) Understanding user needs
   d) Creating cloud dashboards

14) An IoT application requires low-latency, bi-directional communication between client and server. Which communication API is most suitable?
   a) REST API
   b) WebSocket API
   c) CoAP API
   d) MQTT API

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
IoT Networks and Security (ENTMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt Any Four Questions. **16**

a) Evaluate how design challenges affect IoT performance. Suggest solutions for each challenge.

b) Explain with neat diagram the four-layer IoT architecture with the role and key components of each layer.

c) Write short notes on Wireless Sensor Networks (WSN) and their role in IoT.

d) Differentiate between Physical Design & Logical Design of IOT based on following points: Purpose, Security Concern, Components & Connectivity.

e) Explain IaaS, PaaS, and SaaS in Cloud Computing with examples relevant to IoT.

Q.3 Attempt Any Two Questions. **12**

a) Describe Level 2 IoT system. How is it different from Level 1 in terms of data storage and analysis?

b) Define Internet of Everything (IoE). How is it different from IoT? Explain the four core elements of IoE with examples.

c) Explain the four IoT communication models — Request-Response, Publish-Subscribe, Push-Pull, and Exclusive Pair.

SECTION – II

Q.4 Attempt Any Four Questions. **16**

a) Discuss the workflow of Participatory Sensing in IoT with neat diagram.

b) Explain the concept of Confidentiality, Integrity, and Availability (CIA) in IoT.

c) Compare IPv4 and IPv6 addressing in IOT (Any 4 Points).

d) Describe different types of IoT attacks with examples.

e) Illustrate the components of Automotive IoT and discuss their role in connected vehicles.

Q.5 Attempt Any Two Question. **12**

a) Define M2M communication and list its key features. Also explain the role of sensors and communication networks in M2M architecture.

b) Evaluate the suitability of UDP & TCP in IoT applications with example.

c) The frequent breakdown of college buses due to overheating and poor maintenance has caused safety issues and delays. As an IoT engineer, design a Vehicle Health Monitoring System that detects and reports the engine temperature, battery status, Tyre pressure, fuel level, GPS location etc. in real time.

Seat No.	

Set **R**

T.Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
IoT Networks and Security (ENTMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Answer the following Objective Type Questions. 14

1) Which protocol ensures end-to-end addressing in IoT devices?
a) UDP b) TCP
c) IP d) Zigbee

2) In IoT, end-to-end encryption ensures _____.
a) Only sender and receiver can read data
b) Data can be modified in transit
c) Data is compressed
d) Data is accessible to routers

3) Firmware updates are important because they _____.
a) Reduce power consumption
b) Fix security vulnerabilities
c) Increase memory
d) Change MAC address

4) How does IoT improve bridge maintenance compared to traditional inspection methods?
a) Reduces human involvement and enables real-time monitoring
b) Completely eliminates all maintenance needs
c) Makes bridges self-repairing
d) Only tracks traffic volume

5) Which component is part of the perception/sensing layer?
a) ADC (Analog to Digital Converter)
b) Wi-Fi Router
c) Dashboard
d) Data Center

6) What is the key feature of Level 1 IoT system?
a) Uses multiple nodes
b) Sends data to the cloud
c) Local sensing and processing in a single node
d) Requires coordinator node

7) What technique is used to combine data from multiple sensors for accuracy?
a) Cloud Storage
b) Sensor Fusion
c) Encryption
d) MQTT Protocol

8) Which design best reduces power use in IoT wearables?
a) Continuous cloud link
b) High sampling
c) Always-on sensors
d) Sleep-wake cycles

9) Which of the following challenges is specific to physical design rather than logical design of IoT?
a) Protocol & API integration
b) Data flow management
c) Cloud integration
d) Hardware selection and power management

10) The first step in IoT design is _____.
a) Security planning
b) Choosing communication protocols
c) Understanding user needs
d) Creating cloud dashboards

11) An IoT application requires low-latency, bi-directional communication between client and server. Which communication API is most suitable?
a) REST API
b) WebSocket API
c) CoAP API
d) MQTT API

12) In a DDoS attack, compromised IoT devices are collectively called _____.
a) Botnets
b) Nodes
c) Clients
d) Servers

13) Which programming environment is directly supported by ThingSpeak for data analysis?
a) Python
b) MATLAB
c) R
d) C++

14) Which of the following is a characteristic of TCP?
a) Unreliable delivery
b) No sequencing
c) Connection-oriented and reliable
d) Only supports broadcast

Seat No.	

Set **R**

T.Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
IoT Networks and Security (ENTMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt Any Four Questions. **16**

a) Evaluate how design challenges affect IoT performance. Suggest solutions for each challenge.

b) Explain with neat diagram the four-layer IoT architecture with the role and key components of each layer.

c) Write short notes on Wireless Sensor Networks (WSN) and their role in IoT.

d) Differentiate between Physical Design & Logical Design of IOT based on following points: Purpose, Security Concern, Components & Connectivity.

e) Explain IaaS, PaaS, and SaaS in Cloud Computing with examples relevant to IoT.

Q.3 Attempt Any Two Questions. **12**

a) Describe Level 2 IoT system. How is it different from Level 1 in terms of data storage and analysis?

b) Define Internet of Everything (IoE). How is it different from IoT? Explain the four core elements of IoE with examples.

c) Explain the four IoT communication models — Request-Response, Publish-Subscribe, Push-Pull, and Exclusive Pair.

SECTION – II

Q.4 Attempt Any Four Questions. **16**

a) Discuss the workflow of Participatory Sensing in IoT with neat diagram.

b) Explain the concept of Confidentiality, Integrity, and Availability (CIA) in IoT.

c) Compare IPv4 and IPv6 addressing in IOT (Any 4 Points).

d) Describe different types of IoT attacks with examples.

e) Illustrate the components of Automotive IoT and discuss their role in connected vehicles.

Q.5 Attempt Any Two Question. **12**

a) Define M2M communication and list its key features. Also explain the role of sensors and communication networks in M2M architecture.

b) Evaluate the suitability of UDP & TCP in IoT applications with example.

c) The frequent breakdown of college buses due to overheating and poor maintenance has caused safety issues and delays. As an IoT engineer, design a Vehicle Health Monitoring System that detects and reports the engine temperature, battery status, Tyre pressure, fuel level, GPS location etc. in real time.

Seat No.	

Set **S**

T.Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
IoT Networks and Security (ENTMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Answer the following Objective Type Questions. **14**

1) The first step in IoT design is _____.
a) Security planning
b) Choosing communication protocols
c) Understanding user needs
d) Creating cloud dashboards

2) An IoT application requires low-latency, bi-directional communication between client and server. Which communication API is most suitable?
a) REST API b) WebSocket API
c) CoAP API d) MQTT API

3) In a DDoS attack, compromised IoT devices are collectively called _____.
a) Botnets b) Nodes
c) Clients d) Servers

4) Which programming environment is directly supported by ThingSpeak for data analysis?
a) Python b) MATLAB
c) R d) C++

5) Which of the following is a characteristic of TCP?
a) Unreliable delivery
b) No sequencing
c) Connection-oriented and reliable
d) Only supports broadcast

6) Which protocol ensures end-to-end addressing in IoT devices?
a) UDP b) TCP
c) IP d) Zigbee

7) In IoT, end-to-end encryption ensures _____.
   a) Only sender and receiver can read data
   b) Data can be modified in transit
   c) Data is compressed
   d) Data is accessible to routers

8) Firmware updates are important because they _____.
   a) Reduce power consumption
   b) Fix security vulnerabilities
   c) Increase memory
   d) Change MAC address

9) How does IoT improve bridge maintenance compared to traditional inspection methods?
   a) Reduces human involvement and enables real-time monitoring
   b) Completely eliminates all maintenance needs
   c) Makes bridges self-repairing
   d) Only tracks traffic volume

10) Which component is part of the perception/sensing layer?
   a) ADC (Analog to Digital Converter)
   b) Wi-Fi Router
   c) Dashboard
   d) Data Center

11) What is the key feature of Level 1 IoT system?
   a) Uses multiple nodes
   b) Sends data to the cloud
   c) Local sensing and processing in a single node
   d) Requires coordinator node

12) What technique is used to combine data from multiple sensors for accuracy?
   a) Cloud Storage
   b) Sensor Fusion
   c) Encryption
   d) MQTT Protocol

13) Which design best reduces power use in IoT wearables?
   a) Continuous cloud link
   b) High sampling
   c) Always-on sensors
   d) Sleep-wake cycles

14) Which of the following challenges is specific to physical design rather than logical design of IoT?
   a) Protocol & API integration
   b) Data flow management
   c) Cloud integration
   d) Hardware selection and power management

Seat No.	

Set **S**

T.Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
IoT Networks and Security (ENTMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt Any Four Questions. **16**

a) Evaluate how design challenges affect IoT performance. Suggest solutions for each challenge.

b) Explain with neat diagram the four-layer IoT architecture with the role and key components of each layer.

c) Write short notes on Wireless Sensor Networks (WSN) and their role in IoT.

d) Differentiate between Physical Design & Logical Design of IOT based on following points: Purpose, Security Concern, Components & Connectivity.

e) Explain IaaS, PaaS, and SaaS in Cloud Computing with examples relevant to IoT.

Q.3 Attempt Any Two Questions. **12**

a) Describe Level 2 IoT system. How is it different from Level 1 in terms of data storage and analysis?

b) Define Internet of Everything (IoE). How is it different from IoT? Explain the four core elements of IoE with examples.

c) Explain the four IoT communication models — Request-Response, Publish-Subscribe, Push-Pull, and Exclusive Pair.

SECTION – II

Q.4 Attempt Any Four Questions. **16**

a) Discuss the workflow of Participatory Sensing in IoT with neat diagram.

b) Explain the concept of Confidentiality, Integrity, and Availability (CIA) in IoT.

c) Compare IPv4 and IPv6 addressing in IOT (Any 4 Points).

d) Describe different types of IoT attacks with examples.

e) Illustrate the components of Automotive IoT and discuss their role in connected vehicles.

Q.5 Attempt Any Two Question. **12**

a) Define M2M communication and list its key features. Also explain the role of sensors and communication networks in M2M architecture.

b) Evaluate the suitability of UDP & TCP in IoT applications with example.

c) The frequent breakdown of college buses due to overheating and poor maintenance has caused safety issues and delays. As an IoT engineer, design a Vehicle Health Monitoring System that detects and reports the engine temperature, battery status, Tyre pressure, fuel level, GPS location etc. in real time.

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Seat No.	

Set P

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
IoT Networks and Security (ENTMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Answer the following Objective Type Questions. 14

1) Which component is part of the perception/sensing layer?
a) ADC (Analog to Digital Converter)
b) Wi-Fi Router
c) Dashboard
d) Data Center

2) What is the key feature of Level 1 IoT system?
a) Uses multiple nodes
b) Sends data to the cloud
c) Local sensing and processing in a single node
d) Requires coordinator node

3) What technique is used to combine data from multiple sensors for accuracy?
a) Cloud Storage b) Sensor Fusion
c) Encryption d) MQTT Protocol

4) Which design best reduces power use in IoT wearables?
a) Continuous cloud link b) High sampling
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5) Which of the following challenges is specific to physical design rather than logical design of IoT?
a) Protocol & API integration
b) Data flow management
c) Cloud integration
d) Hardware selection and power management

6) The first step in IoT design is _____.
a) Security planning
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7) An IoT application requires low-latency, bi-directional communication between client and server. Which communication API is most suitable?
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8) In a DDoS attack, compromised IoT devices are collectively called _____.
a) Botnets
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10) Which of the following is a characteristic of TCP?
a) Unreliable delivery
b) No sequencing
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d) Zigbee

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13) Firmware updates are important because they _____.
a) Reduce power consumption
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c) Increase memory
d) Change MAC address

14) How does IoT improve bridge maintenance compared to traditional inspection methods?
a) Reduces human involvement and enables real-time monitoring
b) Completely eliminates all maintenance needs
c) Makes bridges self-repairing
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Seat No.	

Set **P**

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
IoT Networks and Security (ENTMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt Any Four Questions. **16**

a) Evaluate how design challenges affect IoT performance. Suggest solutions for each challenge.

b) Explain with neat diagram the four-layer IoT architecture with the role and key components of each layer.

c) Write short notes on Wireless Sensor Networks (WSN) and their role in IoT.

d) Differentiate between Physical Design & Logical Design of IOT based on following points: Purpose, Security Concern, Components & Connectivity.

e) Explain IaaS, PaaS, and SaaS in Cloud Computing with examples relevant to IoT.

Q.3 Attempt Any Two Questions. **12**

a) Describe Level 2 IoT system. How is it different from Level 1 in terms of data storage and analysis?

b) Define Internet of Everything (IoE). How is it different from IoT? Explain the four core elements of IoE with examples.

c) Explain the four IoT communication models — Request-Response, Publish-Subscribe, Push-Pull, and Exclusive Pair.

SECTION – II

Q.4 Attempt Any Four Questions. **16**

a) Discuss the workflow of Participatory Sensing in IoT with neat diagram.

b) Explain the concept of Confidentiality, Integrity, and Availability (CIA) in IoT.

c) Compare IPv4 and IPv6 addressing in IOT (Any 4 Points).

d) Describe different types of IoT attacks with examples.

e) Illustrate the components of Automotive IoT and discuss their role in connected vehicles.

Q.5 Attempt Any Two Question. **12**

a) Define M2M communication and list its key features. Also explain the role of sensors and communication networks in M2M architecture.

b) Evaluate the suitability of UDP & TCP in IoT applications with example.

c) The frequent breakdown of college buses due to overheating and poor maintenance has caused safety issues and delays. As an IoT engineer, design a Vehicle Health Monitoring System that detects and reports the engine temperature, battery status, Tyre pressure, fuel level, GPS location etc. in real time.

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
IoT Networks and Security (ENTMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Answer the following Objective Type Questions. 14

1) In a DDoS attack, compromised IoT devices are collectively called _____.
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   a) REST API
   b) WebSocket API
   c) CoAP API
   d) MQTT API

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
IoT Networks and Security (ENTMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt Any Four Questions. **16**

a) Evaluate how design challenges affect IoT performance. Suggest solutions for each challenge.

b) Explain with neat diagram the four-layer IoT architecture with the role and key components of each layer.

c) Write short notes on Wireless Sensor Networks (WSN) and their role in IoT.

d) Differentiate between Physical Design & Logical Design of IOT based on following points: Purpose, Security Concern, Components & Connectivity.

e) Explain IaaS, PaaS, and SaaS in Cloud Computing with examples relevant to IoT.

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a) Describe Level 2 IoT system. How is it different from Level 1 in terms of data storage and analysis?

b) Define Internet of Everything (IoE). How is it different from IoT? Explain the four core elements of IoE with examples.

c) Explain the four IoT communication models — Request-Response, Publish-Subscribe, Push-Pull, and Exclusive Pair.

SECTION – II

Q.4 Attempt Any Four Questions. **16**

a) Discuss the workflow of Participatory Sensing in IoT with neat diagram.

b) Explain the concept of Confidentiality, Integrity, and Availability (CIA) in IoT.

c) Compare IPv4 and IPv6 addressing in IOT (Any 4 Points).

d) Describe different types of IoT attacks with examples.

e) Illustrate the components of Automotive IoT and discuss their role in connected vehicles.

Q.5 Attempt Any Two Question. **12**

a) Define M2M communication and list its key features. Also explain the role of sensors and communication networks in M2M architecture.

b) Evaluate the suitability of UDP & TCP in IoT applications with example.

c) The frequent breakdown of college buses due to overheating and poor maintenance has caused safety issues and delays. As an IoT engineer, design a Vehicle Health Monitoring System that detects and reports the engine temperature, battery status, Tyre pressure, fuel level, GPS location etc. in real time.

Seat No.	

Set **R**

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
IoT Networks and Security (ENTMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Answer the following Objective Type Questions. **14**

1) Which protocol ensures end-to-end addressing in IoT devices?
a) UDP b) TCP
c) IP d) Zigbee

2) In IoT, end-to-end encryption ensures _____.
a) Only sender and receiver can read data
b) Data can be modified in transit
c) Data is compressed
d) Data is accessible to routers

3) Firmware updates are important because they _____.
a) Reduce power consumption
b) Fix security vulnerabilities
c) Increase memory
d) Change MAC address

4) How does IoT improve bridge maintenance compared to traditional inspection methods?
a) Reduces human involvement and enables real-time monitoring
b) Completely eliminates all maintenance needs
c) Makes bridges self-repairing
d) Only tracks traffic volume

5) Which component is part of the perception/sensing layer?
a) ADC (Analog to Digital Converter)
b) Wi-Fi Router
c) Dashboard
d) Data Center

6) What is the key feature of Level 1 IoT system?
a) Uses multiple nodes
b) Sends data to the cloud
c) Local sensing and processing in a single node
d) Requires coordinator node

7) What technique is used to combine data from multiple sensors for accuracy?
a) Cloud Storage
b) Sensor Fusion
c) Encryption
d) MQTT Protocol

8) Which design best reduces power use in IoT wearables?
a) Continuous cloud link
b) High sampling
c) Always-on sensors
d) Sleep-wake cycles

9) Which of the following challenges is specific to physical design rather than logical design of IoT?
a) Protocol & API integration
b) Data flow management
c) Cloud integration
d) Hardware selection and power management

10) The first step in IoT design is _____.
a) Security planning
b) Choosing communication protocols
c) Understanding user needs
d) Creating cloud dashboards

11) An IoT application requires low-latency, bi-directional communication between client and server. Which communication API is most suitable?
a) REST API
b) WebSocket API
c) CoAP API
d) MQTT API

12) In a DDoS attack, compromised IoT devices are collectively called _____.
a) Botnets
b) Nodes
c) Clients
d) Servers

13) Which programming environment is directly supported by ThingSpeak for data analysis?
a) Python
b) MATLAB
c) R
d) C++

14) Which of the following is a characteristic of TCP?
a) Unreliable delivery
b) No sequencing
c) Connection-oriented and reliable
d) Only supports broadcast

Seat No.	

Set **R**

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
IoT Networks and Security (ENTMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt Any Four Questions. **16**

a) Evaluate how design challenges affect IoT performance. Suggest solutions for each challenge.

b) Explain with neat diagram the four-layer IoT architecture with the role and key components of each layer.

c) Write short notes on Wireless Sensor Networks (WSN) and their role in IoT.

d) Differentiate between Physical Design & Logical Design of IOT based on following points: Purpose, Security Concern, Components & Connectivity.

e) Explain IaaS, PaaS, and SaaS in Cloud Computing with examples relevant to IoT.

Q.3 Attempt Any Two Questions. **12**

a) Describe Level 2 IoT system. How is it different from Level 1 in terms of data storage and analysis?

b) Define Internet of Everything (IoE). How is it different from IoT? Explain the four core elements of IoE with examples.

c) Explain the four IoT communication models — Request-Response, Publish-Subscribe, Push-Pull, and Exclusive Pair.

SECTION – II

Q.4 Attempt Any Four Questions. **16**

a) Discuss the workflow of Participatory Sensing in IoT with neat diagram.

b) Explain the concept of Confidentiality, Integrity, and Availability (CIA) in IoT.

c) Compare IPv4 and IPv6 addressing in IOT (Any 4 Points).

d) Describe different types of IoT attacks with examples.

e) Illustrate the components of Automotive IoT and discuss their role in connected vehicles.

Q.5 Attempt Any Two Question. **12**

a) Define M2M communication and list its key features. Also explain the role of sensors and communication networks in M2M architecture.

b) Evaluate the suitability of UDP & TCP in IoT applications with example.

c) The frequent breakdown of college buses due to overheating and poor maintenance has caused safety issues and delays. As an IoT engineer, design a Vehicle Health Monitoring System that detects and reports the engine temperature, battery status, Tyre pressure, fuel level, GPS location etc. in real time.

Seat No.	

Set **S**

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
IoT Networks and Security (ENTMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Answer the following Objective Type Questions. **14**

1) The first step in IoT design is _____.
a) Security planning
b) Choosing communication protocols
c) Understanding user needs
d) Creating cloud dashboards

2) An IoT application requires low-latency, bi-directional communication between client and server. Which communication API is most suitable?
a) REST API b) WebSocket API
c) CoAP API d) MQTT API

3) In a DDoS attack, compromised IoT devices are collectively called _____.
a) Botnets b) Nodes
c) Clients d) Servers

4) Which programming environment is directly supported by ThingSpeak for data analysis?
a) Python b) MATLAB
c) R d) C++

5) Which of the following is a characteristic of TCP?
a) Unreliable delivery
b) No sequencing
c) Connection-oriented and reliable
d) Only supports broadcast

6) Which protocol ensures end-to-end addressing in IoT devices?
a) UDP b) TCP
c) IP d) Zigbee

7) In IoT, end-to-end encryption ensures _____.
   a) Only sender and receiver can read data
   b) Data can be modified in transit
   c) Data is compressed
   d) Data is accessible to routers

8) Firmware updates are important because they _____.
   a) Reduce power consumption
   b) Fix security vulnerabilities
   c) Increase memory
   d) Change MAC address

9) How does IoT improve bridge maintenance compared to traditional inspection methods?
   a) Reduces human involvement and enables real-time monitoring
   b) Completely eliminates all maintenance needs
   c) Makes bridges self-repairing
   d) Only tracks traffic volume

10) Which component is part of the perception/sensing layer?
   a) ADC (Analog to Digital Converter)
   b) Wi-Fi Router
   c) Dashboard
   d) Data Center

11) What is the key feature of Level 1 IoT system?
   a) Uses multiple nodes
   b) Sends data to the cloud
   c) Local sensing and processing in a single node
   d) Requires coordinator node

12) What technique is used to combine data from multiple sensors for accuracy?
   a) Cloud Storage
   b) Sensor Fusion
   c) Encryption
   d) MQTT Protocol

13) Which design best reduces power use in IoT wearables?
   a) Continuous cloud link
   b) High sampling
   c) Always-on sensors
   d) Sleep-wake cycles

14) Which of the following challenges is specific to physical design rather than logical design of IoT?
   a) Protocol & API integration
   b) Data flow management
   c) Cloud integration
   d) Hardware selection and power management

SLR-QH-640

Seat No.	

Set S

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
IoT Networks and Security (ENTMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt Any Four Questions. **16**

a) Evaluate how design challenges affect IoT performance. Suggest solutions for each challenge.

b) Explain with neat diagram the four-layer IoT architecture with the role and key components of each layer.

c) Write short notes on Wireless Sensor Networks (WSN) and their role in IoT.

d) Differentiate between Physical Design & Logical Design of IOT based on following points: Purpose, Security Concern, Components & Connectivity.

e) Explain IaaS, PaaS, and SaaS in Cloud Computing with examples relevant to IoT.

Q.3 Attempt Any Two Questions. **12**

a) Describe Level 2 IoT system. How is it different from Level 1 in terms of data storage and analysis?

b) Define Internet of Everything (IoE). How is it different from IoT? Explain the four core elements of IoE with examples.

c) Explain the four IoT communication models — Request-Response, Publish-Subscribe, Push-Pull, and Exclusive Pair.

SECTION – II

Q.4 Attempt Any Four Questions. **16**

a) Discuss the workflow of Participatory Sensing in IoT with neat diagram.

b) Explain the concept of Confidentiality, Integrity, and Availability (CIA) in IoT.

c) Compare IPv4 and IPv6 addressing in IOT (Any 4 Points).

d) Describe different types of IoT attacks with examples.

e) Illustrate the components of Automotive IoT and discuss their role in connected vehicles.

Q.5 Attempt Any Two Question. **12**

a) Define M2M communication and list its key features. Also explain the role of sensors and communication networks in M2M architecture.

b) Evaluate the suitability of UDP & TCP in IoT applications with example.

c) The frequent breakdown of college buses due to overheating and poor maintenance has caused safety issues and delays. As an IoT engineer, design a Vehicle Health Monitoring System that detects and reports the engine temperature, battery status, Tyre pressure, fuel level, GPS location etc. in real time.

SLR-QH-640

Seat No.		Set	P

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS)
Examination: March/April - 2026
IoT Networks and Security (ENTMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Answer the following Objective Type Questions. 14

1) Which component is part of the perception/sensing layer?
a) ADC (Analog to Digital Converter)
b) Wi-Fi Router
c) Dashboard
d) Data Center

2) What is the key feature of Level 1 IoT system?
a) Uses multiple nodes
b) Sends data to the cloud
c) Local sensing and processing in a single node
d) Requires coordinator node

3) What technique is used to combine data from multiple sensors for accuracy?
a) Cloud Storage b) Sensor Fusion
c) Encryption d) MQTT Protocol

4) Which design best reduces power use in IoT wearables?
a) Continuous cloud link b) High sampling
c) Always-on sensors d) Sleep-wake cycles

5) Which of the following challenges is specific to physical design rather than logical design of IoT?
a) Protocol & API integration
b) Data flow management
c) Cloud integration
d) Hardware selection and power management

6) The first step in IoT design is _____.
a) Security planning
b) Choosing communication protocols
c) Understanding user needs
d) Creating cloud dashboards

7) An IoT application requires low-latency, bi-directional communication between client and server. Which communication API is most suitable?
a) REST API
b) WebSocket API
c) CoAP API
d) MQTT API

8) In a DDoS attack, compromised IoT devices are collectively called _____.
a) Botnets
b) Nodes
c) Clients
d) Servers

9) Which programming environment is directly supported by ThingSpeak for data analysis?
a) Python
b) MATLAB
c) R
d) C++

10) Which of the following is a characteristic of TCP?
a) Unreliable delivery
b) No sequencing
c) Connection-oriented and reliable
d) Only supports broadcast

11) Which protocol ensures end-to-end addressing in IoT devices?
a) UDP
b) TCP
c) IP
d) Zigbee

12) In IoT, end-to-end encryption ensures _____.
a) Only sender and receiver can read data
b) Data can be modified in transit
c) Data is compressed
d) Data is accessible to routers

13) Firmware updates are important because they _____.
a) Reduce power consumption
b) Fix security vulnerabilities
c) Increase memory
d) Change MAC address

14) How does IoT improve bridge maintenance compared to traditional inspection methods?
a) Reduces human involvement and enables real-time monitoring
b) Completely eliminates all maintenance needs
c) Makes bridges self-repairing
d) Only tracks traffic volume

Seat No.	

Set **P**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS)
Examination: March/April - 2026
IoT Networks and Security (ENTMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt Any Four Questions. **16**

a) Evaluate how design challenges affect IoT performance. Suggest solutions for each challenge.

b) Explain with neat diagram the four-layer IoT architecture with the role and key components of each layer.

c) Write short notes on Wireless Sensor Networks (WSN) and their role in IoT.

d) Differentiate between Physical Design & Logical Design of IOT based on following points: Purpose, Security Concern, Components & Connectivity.

e) Explain IaaS, PaaS, and SaaS in Cloud Computing with examples relevant to IoT.

Q.3 Attempt Any Two Questions. **12**

a) Describe Level 2 IoT system. How is it different from Level 1 in terms of data storage and analysis?

b) Define Internet of Everything (IoE). How is it different from IoT? Explain the four core elements of IoE with examples.

c) Explain the four IoT communication models — Request-Response, Publish-Subscribe, Push-Pull, and Exclusive Pair.

SECTION – II

Q.4 Attempt Any Four Questions. **16**

a) Discuss the workflow of Participatory Sensing in IoT with neat diagram.

b) Explain the concept of Confidentiality, Integrity, and Availability (CIA) in IoT.

c) Compare IPv4 and IPv6 addressing in IOT (Any 4 Points).

d) Describe different types of IoT attacks with examples.

e) Illustrate the components of Automotive IoT and discuss their role in connected vehicles.

Q.5 Attempt Any Two Question. **12**

a) Define M2M communication and list its key features. Also explain the role of sensors and communication networks in M2M architecture.

b) Evaluate the suitability of UDP & TCP in IoT applications with example.

c) The frequent breakdown of college buses due to overheating and poor maintenance has caused safety issues and delays. As an IoT engineer, design a Vehicle Health Monitoring System that detects and reports the engine temperature, battery status, Tyre pressure, fuel level, GPS location etc. in real time.

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS)
Examination: March/April - 2026
IoT Networks and Security (ENTMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Answer the following Objective Type Questions. 14

1) In a DDoS attack, compromised IoT devices are collectively called _____.
a) Botnets b) Nodes
c) Clients d) Servers

2) Which programming environment is directly supported by ThingSpeak for data analysis?
a) Python b) MATLAB
c) R d) C++

3) Which of the following is a characteristic of TCP?
a) Unreliable delivery
b) No sequencing
c) Connection-oriented and reliable
d) Only supports broadcast

4) Which protocol ensures end-to-end addressing in IoT devices?
a) UDP b) TCP
c) IP d) Zigbee

5) In IoT, end-to-end encryption ensures _____.
a) Only sender and receiver can read data
b) Data can be modified in transit
c) Data is compressed
d) Data is accessible to routers

6) Firmware updates are important because they _____.
a) Reduce power consumption
b) Fix security vulnerabilities
c) Increase memory
d) Change MAC address

7) How does IoT improve bridge maintenance compared to traditional inspection methods?
   a) Reduces human involvement and enables real-time monitoring
   b) Completely eliminates all maintenance needs
   c) Makes bridges self-repairing
   d) Only tracks traffic volume

8) Which component is part of the perception/sensing layer?
   a) ADC (Analog to Digital Converter)
   b) Wi-Fi Router
   c) Dashboard
   d) Data Center

9) What is the key feature of Level 1 IoT system?
   a) Uses multiple nodes
   b) Sends data to the cloud
   c) Local sensing and processing in a single node
   d) Requires coordinator node

10) What technique is used to combine data from multiple sensors for accuracy?
   a) Cloud Storage
   b) Sensor Fusion
   c) Encryption
   d) MQTT Protocol

11) Which design best reduces power use in IoT wearables?
   a) Continuous cloud link
   b) High sampling
   c) Always-on sensors
   d) Sleep-wake cycles

12) Which of the following challenges is specific to physical design rather than logical design of IoT?
   a) Protocol & API integration
   b) Data flow management
   c) Cloud integration
   d) Hardware selection and power management

13) The first step in IoT design is _____.
   a) Security planning
   b) Choosing communication protocols
   c) Understanding user needs
   d) Creating cloud dashboards

14) An IoT application requires low-latency, bi-directional communication between client and server. Which communication API is most suitable?
   a) REST API
   b) WebSocket API
   c) CoAP API
   d) MQTT API

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS)
Examination: March/April - 2026
IoT Networks and Security (ENTMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt Any Four Questions. **16**

a) Evaluate how design challenges affect IoT performance. Suggest solutions for each challenge.

b) Explain with neat diagram the four-layer IoT architecture with the role and key components of each layer.

c) Write short notes on Wireless Sensor Networks (WSN) and their role in IoT.

d) Differentiate between Physical Design & Logical Design of IOT based on following points: Purpose, Security Concern, Components & Connectivity.

e) Explain IaaS, PaaS, and SaaS in Cloud Computing with examples relevant to IoT.

Q.3 Attempt Any Two Questions. **12**

a) Describe Level 2 IoT system. How is it different from Level 1 in terms of data storage and analysis?

b) Define Internet of Everything (IoE). How is it different from IoT? Explain the four core elements of IoE with examples.

c) Explain the four IoT communication models — Request-Response, Publish-Subscribe, Push-Pull, and Exclusive Pair.

SECTION – II

Q.4 Attempt Any Four Questions. **16**

a) Discuss the workflow of Participatory Sensing in IoT with neat diagram.

b) Explain the concept of Confidentiality, Integrity, and Availability (CIA) in IoT.

c) Compare IPv4 and IPv6 addressing in IOT (Any 4 Points).

d) Describe different types of IoT attacks with examples.

e) Illustrate the components of Automotive IoT and discuss their role in connected vehicles.

Q.5 Attempt Any Two Question. **12**

a) Define M2M communication and list its key features. Also explain the role of sensors and communication networks in M2M architecture.

b) Evaluate the suitability of UDP & TCP in IoT applications with example.

c) The frequent breakdown of college buses due to overheating and poor maintenance has caused safety issues and delays. As an IoT engineer, design a Vehicle Health Monitoring System that detects and reports the engine temperature, battery status, Tyre pressure, fuel level, GPS location etc. in real time.

Seat No.	

Set **R**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS)
Examination: March/April - 2026
IoT Networks and Security (ENTMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Answer the following Objective Type Questions. 14

1) Which protocol ensures end-to-end addressing in IoT devices?
a) UDP b) TCP
c) IP d) Zigbee

2) In IoT, end-to-end encryption ensures _____.
a) Only sender and receiver can read data
b) Data can be modified in transit
c) Data is compressed
d) Data is accessible to routers

3) Firmware updates are important because they _____.
a) Reduce power consumption
b) Fix security vulnerabilities
c) Increase memory
d) Change MAC address

4) How does IoT improve bridge maintenance compared to traditional inspection methods?
a) Reduces human involvement and enables real-time monitoring
b) Completely eliminates all maintenance needs
c) Makes bridges self-repairing
d) Only tracks traffic volume

5) Which component is part of the perception/sensing layer?
a) ADC (Analog to Digital Converter)
b) Wi-Fi Router
c) Dashboard
d) Data Center

6) What is the key feature of Level 1 IoT system?
a) Uses multiple nodes
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7) What technique is used to combine data from multiple sensors for accuracy?
a) Cloud Storage
b) Sensor Fusion
c) Encryption
d) MQTT Protocol

8) Which design best reduces power use in IoT wearables?
a) Continuous cloud link
b) High sampling
c) Always-on sensors
d) Sleep-wake cycles

9) Which of the following challenges is specific to physical design rather than logical design of IoT?
a) Protocol & API integration
b) Data flow management
c) Cloud integration
d) Hardware selection and power management

10) The first step in IoT design is _____.
a) Security planning
b) Choosing communication protocols
c) Understanding user needs
d) Creating cloud dashboards

11) An IoT application requires low-latency, bi-directional communication between client and server. Which communication API is most suitable?
a) REST API
b) WebSocket API
c) CoAP API
d) MQTT API

12) In a DDoS attack, compromised IoT devices are collectively called _____.
a) Botnets
b) Nodes
c) Clients
d) Servers

13) Which programming environment is directly supported by ThingSpeak for data analysis?
a) Python
b) MATLAB
c) R
d) C++

14) Which of the following is a characteristic of TCP?
a) Unreliable delivery
b) No sequencing
c) Connection-oriented and reliable
d) Only supports broadcast

Seat No.	

Set **R**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS)
Examination: March/April - 2026
IoT Networks and Security (ENTMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt Any Four Questions. **16**

a) Evaluate how design challenges affect IoT performance. Suggest solutions for each challenge.

b) Explain with neat diagram the four-layer IoT architecture with the role and key components of each layer.

c) Write short notes on Wireless Sensor Networks (WSN) and their role in IoT.

d) Differentiate between Physical Design & Logical Design of IOT based on following points: Purpose, Security Concern, Components & Connectivity.

e) Explain IaaS, PaaS, and SaaS in Cloud Computing with examples relevant to IoT.

Q.3 Attempt Any Two Questions. **12**

a) Describe Level 2 IoT system. How is it different from Level 1 in terms of data storage and analysis?

b) Define Internet of Everything (IoE). How is it different from IoT? Explain the four core elements of IoE with examples.

c) Explain the four IoT communication models — Request-Response, Publish-Subscribe, Push-Pull, and Exclusive Pair.

SECTION – II

Q.4 Attempt Any Four Questions. **16**

a) Discuss the workflow of Participatory Sensing in IoT with neat diagram.

b) Explain the concept of Confidentiality, Integrity, and Availability (CIA) in IoT.

c) Compare IPv4 and IPv6 addressing in IOT (Any 4 Points).

d) Describe different types of IoT attacks with examples.

e) Illustrate the components of Automotive IoT and discuss their role in connected vehicles.

Q.5 Attempt Any Two Question. **12**

a) Define M2M communication and list its key features. Also explain the role of sensors and communication networks in M2M architecture.

b) Evaluate the suitability of UDP & TCP in IoT applications with example.

c) The frequent breakdown of college buses due to overheating and poor maintenance has caused safety issues and delays. As an IoT engineer, design a Vehicle Health Monitoring System that detects and reports the engine temperature, battery status, Tyre pressure, fuel level, GPS location etc. in real time.

Seat No.		Set	S

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS)
Examination: March/April - 2026
IoT Networks and Security (ENTMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Answer the following Objective Type Questions. 14

1) The first step in IoT design is _____.
a) Security planning
b) Choosing communication protocols
c) Understanding user needs
d) Creating cloud dashboards

2) An IoT application requires low-latency, bi-directional communication between client and server. Which communication API is most suitable?
a) REST API b) WebSocket API
c) CoAP API d) MQTT API

3) In a DDoS attack, compromised IoT devices are collectively called _____.
a) Botnets b) Nodes
c) Clients d) Servers

4) Which programming environment is directly supported by ThingSpeak for data analysis?
a) Python b) MATLAB
c) R d) C++

5) Which of the following is a characteristic of TCP?
a) Unreliable delivery
b) No sequencing
c) Connection-oriented and reliable
d) Only supports broadcast

6) Which protocol ensures end-to-end addressing in IoT devices?
a) UDP b) TCP
c) IP d) Zigbee

7) In IoT, end-to-end encryption ensures _____.
   a) Only sender and receiver can read data
   b) Data can be modified in transit
   c) Data is compressed
   d) Data is accessible to routers

8) Firmware updates are important because they _____.
   a) Reduce power consumption
   b) Fix security vulnerabilities
   c) Increase memory
   d) Change MAC address

9) How does IoT improve bridge maintenance compared to traditional inspection methods?
   a) Reduces human involvement and enables real-time monitoring
   b) Completely eliminates all maintenance needs
   c) Makes bridges self-repairing
   d) Only tracks traffic volume

10) Which component is part of the perception/sensing layer?
   a) ADC (Analog to Digital Converter)
   b) Wi-Fi Router
   c) Dashboard
   d) Data Center

11) What is the key feature of Level 1 IoT system?
   a) Uses multiple nodes
   b) Sends data to the cloud
   c) Local sensing and processing in a single node
   d) Requires coordinator node

12) What technique is used to combine data from multiple sensors for accuracy?
   a) Cloud Storage
   b) Sensor Fusion
   c) Encryption
   d) MQTT Protocol

13) Which design best reduces power use in IoT wearables?
   a) Continuous cloud link
   b) High sampling
   c) Always-on sensors
   d) Sleep-wake cycles

14) Which of the following challenges is specific to physical design rather than logical design of IoT?
   a) Protocol & API integration
   b) Data flow management
   c) Cloud integration
   d) Hardware selection and power management

Seat No.	

Set **S**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS)
Examination: March/April - 2026
IoT Networks and Security (ENTMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt Any Four Questions. **16**

a) Evaluate how design challenges affect IoT performance. Suggest solutions for each challenge.

b) Explain with neat diagram the four-layer IoT architecture with the role and key components of each layer.

c) Write short notes on Wireless Sensor Networks (WSN) and their role in IoT.

d) Differentiate between Physical Design & Logical Design of IOT based on following points: Purpose, Security Concern, Components & Connectivity.

e) Explain IaaS, PaaS, and SaaS in Cloud Computing with examples relevant to IoT.

Q.3 Attempt Any Two Questions. **12**

a) Describe Level 2 IoT system. How is it different from Level 1 in terms of data storage and analysis?

b) Define Internet of Everything (IoE). How is it different from IoT? Explain the four core elements of IoE with examples.

c) Explain the four IoT communication models — Request-Response, Publish-Subscribe, Push-Pull, and Exclusive Pair.

SECTION – II

Q.4 Attempt Any Four Questions. **16**

a) Discuss the workflow of Participatory Sensing in IoT with neat diagram.

b) Explain the concept of Confidentiality, Integrity, and Availability (CIA) in IoT.

c) Compare IPv4 and IPv6 addressing in IOT (Any 4 Points).

d) Describe different types of IoT attacks with examples.

e) Illustrate the components of Automotive IoT and discuss their role in connected vehicles.

Q.5 Attempt Any Two Question. **12**

a) Define M2M communication and list its key features. Also explain the role of sensors and communication networks in M2M architecture.

b) Evaluate the suitability of UDP & TCP in IoT applications with example.

c) The frequent breakdown of college buses due to overheating and poor maintenance has caused safety issues and delays. As an IoT engineer, design a Vehicle Health Monitoring System that detects and reports the engine temperature, battery status, Tyre pressure, fuel level, GPS location etc. in real time.

SLR-QH-641

Seat No.	

Set P

T. Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April - 2026
Machine Learning (CSEMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the given options. 14

1) A well-posed learning problem is defined by _____.
a) Unclear inputs
b) Random outputs
c) Defined inputs, outputs, and success criteria
d) Infinite possibilities

2) Which of the following is not a category of machine learning?
a) Supervised learning b) Unsupervised learning
c) Reinforcement learning d) Complex learning

3) What is the purpose of the conditional probability in classification?
a) It reduces computation
b) It helps identify continuous variables
c) It estimates the likelihood of an event given evidence
d) It optimizes the cost function

4) Which algorithm is based on distance between data points?
a) Decision Tree b) k-Nearest Neighbors (k-NN)
c) Naïve Bayes d) Logistic Regression

5) What is entropy in the context of decision trees?
a) Data inconsistency b) Information gain
c) Measure of impurity d) Tree height

6) Which method randomly selects subsets of features and data samples?
a) Logistic Regression b) Random Forest
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7) In clustering, what does the “k” in k-means represent?
a) Number of data points
b) Number of clusters
c) Number of attributes
d) Number of iterations

8) Multiple linear regression has _____.
a) One independent variable
b) No dependent variable
c) Multiple dependent variables
d) Multiple independent variables

9) In association rules, A → B implies _____.
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d) A and B are unrelated

10) Which term describes a model performing well on training data but poorly on unseen data?
a) Underfitting
b) Overfitting
c) Regularization
d) Normalization

11) In Leave-One-Out Cross Validation (LOOCV), number of folds equals _____.
a) k
b) Size of dataset
c) Half of dataset
d) 10

12) What is hyperparameter tuning?
a) Adjusting test samples
b) Modifying model weights
c) Finding the best configuration settings for the model
d) Changing dataset

13) In reinforcement learning, the learning is driven by _____.
a) Labels
b) Direct instruction
c) Feedback in the form of rewards and punishments
d) Data clustering

14) Which model is generally easier to interpret?
a) Linear Regression
b) Deep Neural Networks
c) Random Forest
d) SVM

Seat No.	

Set P

T. Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Machine Learning (CSEMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt Any Four. **16**

a) Describe the steps involved in building a classification model.

b) Explain Simple linear regression and multiple linear regression algorithm.

c) Discuss how we should improve accuracy of linear regression model.

d) Explain Logistic regression in details.

e) What is the conditional probability that it is raining, given that someone is carrying an umbrella? i.e P(Rain I Umbrella).
Suppose you observed 100 people over several days and noted whether it was raining and whether they carried an umbrella:

Situation	Count
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No Rain and Umbrella	10
No Rain and No Umbrella	50
Total	100

Q.3 Attempt Any Two. **12**

a) List and briefly explain assumptions of linear regression analysis.

b) Compare between Supervised learning, Unsupervised learning, and Reinforcement learning.

c) Predict whether a new customer will churn using KNN classification algorithm for following dataset.
New Customer to Classify: Call Minutes: 160, Support Tickets: 2, Monthly Charge: 45

Customer ID	Call Minutes	Support Tickets	Monthly Charge	Churn
C1	200	1	50	No
C2	300	0	70	No
C3	100	3	30	Yes
C4	150	2	40	Yes
C5	250	1	60	No

SECTION – II

Q.4 Attempt Any Four. **16**

a) List & explain future trends of Machine Learning.

b) Explain the concept of clustering and Clustering Techniques.

c) Explain concept of Hierarchical Clustering.

d) Explain the steps of "Training a Model" for a given machine learning problem.

e) Describe any four applications of unsupervised learning.

Q.5 Attempt Any Two. **12**

a) What is model evaluation in ML? Why it is important in ML?

b) Define cost function & explain its types in detail.

c) Explain following partitioning methods with example.

i) K-means

ii) K-medoids

Seat No.	

Set **Q**

T. Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April - 2026
Machine Learning (CSEMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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   d) Logistic Regression

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   b) Information gain
   c) Measure of impurity
   d) Tree height

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   b) Random Forest
   c) Decision Tree
   d) Naïve Bayes

14) In clustering, what does the “k” in k-means represent?
   a) Number of data points
   b) Number of clusters
   c) Number of attributes
   d) Number of iterations

Seat No.	

Set **Q**

T. Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Machine Learning (CSEMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt Any Four. **16**

a) Describe the steps involved in building a classification model.

b) Explain Simple linear regression and multiple linear regression algorithm.

c) Discuss how we should improve accuracy of linear regression model.

d) Explain Logistic regression in details.

e) What is the conditional probability that it is raining, given that someone is carrying an umbrella? i.e P(Rain I Umbrella).
Suppose you observed 100 people over several days and noted whether it was raining and whether they carried an umbrella:

Situation	Count
Rain and Umbrella	30
Rain and No Umbrella	10
No Rain and Umbrella	10
No Rain and No Umbrella	50
Total	100

Q.3 Attempt Any Two. **12**

a) List and briefly explain assumptions of linear regression analysis.

b) Compare between Supervised learning, Unsupervised learning, and Reinforcement learning.

c) Predict whether a new customer will churn using KNN classification algorithm for following dataset.
New Customer to Classify: Call Minutes: 160, Support Tickets: 2, Monthly Charge: 45

Customer ID	Call Minutes	Support Tickets	Monthly Charge	Churn
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C4	150	2	40	Yes
C5	250	1	60	No

SECTION – II

Q.4 Attempt Any Four. **16**

a) List & explain future trends of Machine Learning.

b) Explain the concept of clustering and Clustering Techniques.

c) Explain concept of Hierarchical Clustering.

d) Explain the steps of "Training a Model" for a given machine learning problem.

e) Describe any four applications of unsupervised learning.

Q.5 Attempt Any Two. **12**

a) What is model evaluation in ML? Why it is important in ML?

b) Define cost function & explain its types in detail.

c) Explain following partitioning methods with example.

i) K-means

ii) K-medoids

SLR-QH-641

Seat No.	

Set R

T. Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April - 2026
Machine Learning (CSEMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the given options. 14

1) In Leave-One-Out Cross Validation (LOOCV), number of folds equals _____.
a) k b) Size of dataset
c) Half of dataset d) 10

2) What is hyperparameter tuning?
a) Adjusting test samples
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d) Changing dataset

3) In reinforcement learning, the learning is driven by _____.
a) Labels
b) Direct instruction
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4) Which model is generally easier to interpret?
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14) Which term describes a model performing well on training data but poorly on unseen data?
   a) Underfitting
   b) Overfitting
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   d) Normalization

Seat No.	

Set R

T. Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Machine Learning (CSEMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt Any Four. **16**

a) Describe the steps involved in building a classification model.

b) Explain Simple linear regression and multiple linear regression algorithm.

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e) What is the conditional probability that it is raining, given that someone is carrying an umbrella? i.e P(Rain I Umbrella).
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SECTION – II

Q.4 Attempt Any Four. **16**

a) List & explain future trends of Machine Learning.

b) Explain the concept of clustering and Clustering Techniques.

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d) Explain the steps of "Training a Model" for a given machine learning problem.

e) Describe any four applications of unsupervised learning.

Q.5 Attempt Any Two. **12**

a) What is model evaluation in ML? Why it is important in ML?

b) Define cost function & explain its types in detail.

c) Explain following partitioning methods with example.

i) K-means

ii) K-medoids

Seat No.		Set	S

T. Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April - 2026
Machine Learning (CSEMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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Seat No.	

Set **S**

T. Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Machine Learning (CSEMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt Any Four. **16**

a) Describe the steps involved in building a classification model.

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a) List and briefly explain assumptions of linear regression analysis.

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SECTION – II

Q.4 Attempt Any Four. **16**

a) List & explain future trends of Machine Learning.

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SLR-QH-641

Seat No.	

Set P

T. Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Machine Learning (CSEMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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Duration: 30 Minutes Marks:14

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Seat No.	

Set P

T. Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Machine Learning (CSEMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt Any Four. **16**

a) Describe the steps involved in building a classification model.

b) Explain Simple linear regression and multiple linear regression algorithm.

c) Discuss how we should improve accuracy of linear regression model.

d) Explain Logistic regression in details.

e) What is the conditional probability that it is raining, given that someone is carrying an umbrella? i.e P(Rain I Umbrella).
Suppose you observed 100 people over several days and noted whether it was raining and whether they carried an umbrella:

Situation	Count
Rain and Umbrella	30
Rain and No Umbrella	10
No Rain and Umbrella	10
No Rain and No Umbrella	50
Total	100

Q.3 Attempt Any Two. **12**

a) List and briefly explain assumptions of linear regression analysis.

b) Compare between Supervised learning, Unsupervised learning, and Reinforcement learning.

c) Predict whether a new customer will churn using KNN classification algorithm for following dataset.
New Customer to Classify: Call Minutes: 160, Support Tickets: 2, Monthly Charge: 45

Customer ID	Call Minutes	Support Tickets	Monthly Charge	Churn
C1	200	1	50	No
C2	300	0	70	No
C3	100	3	30	Yes
C4	150	2	40	Yes
C5	250	1	60	No

SECTION – II

Q.4 Attempt Any Four. **16**

a) List & explain future trends of Machine Learning.

b) Explain the concept of clustering and Clustering Techniques.

c) Explain concept of Hierarchical Clustering.

d) Explain the steps of "Training a Model" for a given machine learning problem.

e) Describe any four applications of unsupervised learning.

Q.5 Attempt Any Two. **12**

a) What is model evaluation in ML? Why it is important in ML?

b) Define cost function & explain its types in detail.

c) Explain following partitioning methods with example.

i) K-means

ii) K-medoids

Seat No.	

Set **Q**

T. Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Machine Learning (CSEMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the given options. **14**

1) Multiple linear regression has _____.
a) One independent variable
b) No dependent variable
c) Multiple dependent variables
d) Multiple independent variables

2) In association rules, A → B implies _____.
a) If A occurs, B never occurs
b) A and B are identical
c) If A occurs, B is likely to occur
d) A and B are unrelated

3) Which term describes a model performing well on training data but poorly on unseen data?
a) Underfitting b) Overfitting
c) Regularization d) Normalization

4) In Leave-One-Out Cross Validation (LOOCV), number of folds equals _____.
a) k b) Size of dataset
c) Half of dataset d) 10

5) What is hyperparameter tuning?
a) Adjusting test samples
b) Modifying model weights
c) Finding the best configuration settings for the model
d) Changing dataset

6) In reinforcement learning, the learning is driven by _____.
   a) Labels
   b) Direct instruction
   c) Feedback in the form of rewards and punishments
   d) Data clustering

7) Which model is generally easier to interpret?
   a) Linear Regression
   b) Deep Neural Networks
   c) Random Forest
   d) SVM

8) A well-posed learning problem is defined by _____.
   a) Unclear inputs
   b) Random outputs
   c) Defined inputs, outputs, and success criteria
   d) Infinite possibilities

9) Which of the following is not a category of machine learning?
   a) Supervised learning
   b) Unsupervised learning
   c) Reinforcement learning
   d) Complex learning

10) What is the purpose of the conditional probability in classification?
   a) It reduces computation
   b) It helps identify continuous variables
   c) It estimates the likelihood of an event given evidence
   d) It optimizes the cost function

11) Which algorithm is based on distance between data points?
   a) Decision Tree
   b) k-Nearest Neighbors (k-NN)
   c) Naïve Bayes
   d) Logistic Regression

12) What is entropy in the context of decision trees?
   a) Data inconsistency
   b) Information gain
   c) Measure of impurity
   d) Tree height

13) Which method randomly selects subsets of features and data samples?
   a) Logistic Regression
   b) Random Forest
   c) Decision Tree
   d) Naïve Bayes

14) In clustering, what does the “k” in k-means represent?
   a) Number of data points
   b) Number of clusters
   c) Number of attributes
   d) Number of iterations

Seat No.	

Set **Q**

T. Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Machine Learning (CSEMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt Any Four. **16**

a) Describe the steps involved in building a classification model.

b) Explain Simple linear regression and multiple linear regression algorithm.

c) Discuss how we should improve accuracy of linear regression model.

d) Explain Logistic regression in details.

e) What is the conditional probability that it is raining, given that someone is carrying an umbrella? i.e P(Rain I Umbrella).
Suppose you observed 100 people over several days and noted whether it was raining and whether they carried an umbrella:

Situation	Count
Rain and Umbrella	30
Rain and No Umbrella	10
No Rain and Umbrella	10
No Rain and No Umbrella	50
Total	100

Q.3 Attempt Any Two. **12**

a) List and briefly explain assumptions of linear regression analysis.

b) Compare between Supervised learning, Unsupervised learning, and Reinforcement learning.

c) Predict whether a new customer will churn using KNN classification algorithm for following dataset.
New Customer to Classify: Call Minutes: 160, Support Tickets: 2, Monthly Charge: 45

Customer ID	Call Minutes	Support Tickets	Monthly Charge	Churn
C1	200	1	50	No
C2	300	0	70	No
C3	100	3	30	Yes
C4	150	2	40	Yes
C5	250	1	60	No

SECTION – II

Q.4 Attempt Any Four. **16**

a) List & explain future trends of Machine Learning.

b) Explain the concept of clustering and Clustering Techniques.

c) Explain concept of Hierarchical Clustering.

d) Explain the steps of "Training a Model" for a given machine learning problem.

e) Describe any four applications of unsupervised learning.

Q.5 Attempt Any Two. **12**

a) What is model evaluation in ML? Why it is important in ML?

b) Define cost function & explain its types in detail.

c) Explain following partitioning methods with example.

i) K-means

ii) K-medoids

Seat No.	

Set **R**

T. Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Machine Learning (CSEMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the given options. 14

1) In Leave-One-Out Cross Validation (LOOCV), number of folds equals _____.
a) k b) Size of dataset
c) Half of dataset d) 10

2) What is hyperparameter tuning?
a) Adjusting test samples
b) Modifying model weights
c) Finding the best configuration settings for the model
d) Changing dataset

3) In reinforcement learning, the learning is driven by _____.
a) Labels
b) Direct instruction
c) Feedback in the form of rewards and punishments
d) Data clustering

4) Which model is generally easier to interpret?
a) Linear Regression b) Deep Neural Networks
c) Random Forest d) SVM

5) A well-posed learning problem is defined by _____.
a) Unclear inputs
b) Random outputs
c) Defined inputs, outputs, and success criteria
d) Infinite possibilities

6) Which of the following is not a category of machine learning?
a) Supervised learning b) Unsupervised learning
c) Reinforcement learning d) Complex learning

7) What is the purpose of the conditional probability in classification?
   a) It reduces computation
   b) It helps identify continuous variables
   c) It estimates the likelihood of an event given evidence
   d) It optimizes the cost function

8) Which algorithm is based on distance between data points?
   a) Decision Tree
   b) k-Nearest Neighbors (k-NN)
   c) Naïve Bayes
   d) Logistic Regression

9) What is entropy in the context of decision trees?
   a) Data inconsistency
   b) Information gain
   c) Measure of impurity
   d) Tree height

10) Which method randomly selects subsets of features and data samples?
   a) Logistic Regression
   b) Random Forest
   c) Decision Tree
   d) Naïve Bayes

11) In clustering, what does the “k” in k-means represent?
   a) Number of data points
   b) Number of clusters
   c) Number of attributes
   d) Number of iterations

12) Multiple linear regression has _____.
   a) One independent variable
   b) No dependent variable
   c) Multiple dependent variables
   d) Multiple independent variables

13) In association rules, A → B implies _____.
   a) If A occurs, B never occurs
   b) A and B are identical
   c) If A occurs, B is likely to occur
   d) A and B are unrelated

14) Which term describes a model performing well on training data but poorly on unseen data?
   a) Underfitting
   b) Overfitting
   c) Regularization
   d) Normalization

Seat No.	

Set R

T. Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Machine Learning (CSEMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt Any Four. **16**

a) Describe the steps involved in building a classification model.

b) Explain Simple linear regression and multiple linear regression algorithm.

c) Discuss how we should improve accuracy of linear regression model.

d) Explain Logistic regression in details.

e) What is the conditional probability that it is raining, given that someone is carrying an umbrella? i.e P(Rain I Umbrella).
Suppose you observed 100 people over several days and noted whether it was raining and whether they carried an umbrella:

Situation	Count
Rain and Umbrella	30
Rain and No Umbrella	10
No Rain and Umbrella	10
No Rain and No Umbrella	50
Total	100

Q.3 Attempt Any Two. **12**

a) List and briefly explain assumptions of linear regression analysis.

b) Compare between Supervised learning, Unsupervised learning, and Reinforcement learning.

c) Predict whether a new customer will churn using KNN classification algorithm for following dataset.
New Customer to Classify: Call Minutes: 160, Support Tickets: 2, Monthly Charge: 45

Customer ID	Call Minutes	Support Tickets	Monthly Charge	Churn
C1	200	1	50	No
C2	300	0	70	No
C3	100	3	30	Yes
C4	150	2	40	Yes
C5	250	1	60	No

SECTION – II

Q.4 Attempt Any Four. **16**

a) List & explain future trends of Machine Learning.

b) Explain the concept of clustering and Clustering Techniques.

c) Explain concept of Hierarchical Clustering.

d) Explain the steps of "Training a Model" for a given machine learning problem.

e) Describe any four applications of unsupervised learning.

Q.5 Attempt Any Two. **12**

a) What is model evaluation in ML? Why it is important in ML?

b) Define cost function & explain its types in detail.

c) Explain following partitioning methods with example.

i) K-means

ii) K-medoids

SLR-QH-641

Seat No.		Set	S

T. Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Machine Learning (CSEMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the given options. 14

1) Which method randomly selects subsets of features and data samples?
a) Logistic Regression b) Random Forest
c) Decision Tree d) Naïve Bayes

2) In clustering, what does the "k" in k-means represent?
a) Number of data points b) Number of clusters
c) Number of attributes d) Number of iterations

3) Multiple linear regression has _____.
a) One independent variable
b) No dependent variable
c) Multiple dependent variables
d) Multiple independent variables

4) In association rules, A → B implies _____.
a) If A occurs, B never occurs
b) A and B are identical
c) If A occurs, B is likely to occur
d) A and B are unrelated

5) Which term describes a model performing well on training data but poorly on unseen data?
a) Underfitting b) Overfitting
c) Regularization d) Normalization

6) In Leave-One-Out Cross Validation (LOOCV), number of folds equals _____.
a) k b) Size of dataset
c) Half of dataset d) 10

7) What is hyperparameter tuning?
   a) Adjusting test samples
   b) Modifying model weights
   c) Finding the best configuration settings for the model
   d) Changing dataset

8) In reinforcement learning, the learning is driven by _____.
   a) Labels
   b) Direct instruction
   c) Feedback in the form of rewards and punishments
   d) Data clustering

9) Which model is generally easier to interpret?
   a) Linear Regression
   b) Deep Neural Networks
   c) Random Forest
   d) SVM

10) A well-posed learning problem is defined by _____.
   a) Unclear inputs
   b) Random outputs
   c) Defined inputs, outputs, and success criteria
   d) Infinite possibilities

11) Which of the following is not a category of machine learning?
   a) Supervised learning
   b) Unsupervised learning
   c) Reinforcement learning
   d) Complex learning

12) What is the purpose of the conditional probability in classification?
   a) It reduces computation
   b) It helps identify continuous variables
   c) It estimates the likelihood of an event given evidence
   d) It optimizes the cost function

13) Which algorithm is based on distance between data points?
   a) Decision Tree
   b) k-Nearest Neighbors (k-NN)
   c) Naïve Bayes
   d) Logistic Regression

14) What is entropy in the context of decision trees?
   a) Data inconsistency
   b) Information gain
   c) Measure of impurity
   d) Tree height

Seat No.	

Set **S**

T. Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Machine Learning (CSEMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt Any Four. **16**

a) Describe the steps involved in building a classification model.

b) Explain Simple linear regression and multiple linear regression algorithm.

c) Discuss how we should improve accuracy of linear regression model.

d) Explain Logistic regression in details.

e) What is the conditional probability that it is raining, given that someone is carrying an umbrella? i.e P(Rain I Umbrella).
Suppose you observed 100 people over several days and noted whether it was raining and whether they carried an umbrella:

Situation	Count
Rain and Umbrella	30
Rain and No Umbrella	10
No Rain and Umbrella	10
No Rain and No Umbrella	50
Total	100

Q.3 Attempt Any Two. **12**

a) List and briefly explain assumptions of linear regression analysis.

b) Compare between Supervised learning, Unsupervised learning, and Reinforcement learning.

c) Predict whether a new customer will churn using KNN classification algorithm for following dataset.
New Customer to Classify: Call Minutes: 160, Support Tickets: 2, Monthly Charge: 45

Customer ID	Call Minutes	Support Tickets	Monthly Charge	Churn
C1	200	1	50	No
C2	300	0	70	No
C3	100	3	30	Yes
C4	150	2	40	Yes
C5	250	1	60	No

SECTION – II

Q.4 Attempt Any Four. **16**

a) List & explain future trends of Machine Learning.

b) Explain the concept of clustering and Clustering Techniques.

c) Explain concept of Hierarchical Clustering.

d) Explain the steps of "Training a Model" for a given machine learning problem.

e) Describe any four applications of unsupervised learning.

Q.5 Attempt Any Two. **12**

a) What is model evaluation in ML? Why it is important in ML?

b) Define cost function & explain its types in detail.

c) Explain following partitioning methods with example.

i) K-means

ii) K-medoids

SLR-QH-641

Seat No.		Set	P

T. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Machine Learning (CSEMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the given options. 14

1) A well-posed learning problem is defined by _____.
a) Unclear inputs
b) Random outputs
c) Defined inputs, outputs, and success criteria
d) Infinite possibilities

2) Which of the following is not a category of machine learning?
a) Supervised learning b) Unsupervised learning
c) Reinforcement learning d) Complex learning

3) What is the purpose of the conditional probability in classification?
a) It reduces computation
b) It helps identify continuous variables
c) It estimates the likelihood of an event given evidence
d) It optimizes the cost function

4) Which algorithm is based on distance between data points?
a) Decision Tree b) k-Nearest Neighbors (k-NN)
c) Naïve Bayes d) Logistic Regression

5) What is entropy in the context of decision trees?
a) Data inconsistency b) Information gain
c) Measure of impurity d) Tree height

6) Which method randomly selects subsets of features and data samples?
a) Logistic Regression b) Random Forest
c) Decision Tree d) Naïve Bayes

7) In clustering, what does the “k” in k-means represent?
a) Number of data points
b) Number of clusters
c) Number of attributes
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8) Multiple linear regression has _____.
a) One independent variable
b) No dependent variable
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9) In association rules, A → B implies _____.
a) If A occurs, B never occurs
b) A and B are identical
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10) Which term describes a model performing well on training data but poorly on unseen data?
a) Underfitting
b) Overfitting
c) Regularization
d) Normalization

11) In Leave-One-Out Cross Validation (LOOCV), number of folds equals _____.
a) k
b) Size of dataset
c) Half of dataset
d) 10

12) What is hyperparameter tuning?
a) Adjusting test samples
b) Modifying model weights
c) Finding the best configuration settings for the model
d) Changing dataset

13) In reinforcement learning, the learning is driven by _____.
a) Labels
b) Direct instruction
c) Feedback in the form of rewards and punishments
d) Data clustering

14) Which model is generally easier to interpret?
a) Linear Regression
b) Deep Neural Networks
c) Random Forest
d) SVM

Seat No.	

Set **P**

T. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Machine Learning (CSEMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt Any Four. **16**

a) Describe the steps involved in building a classification model.

b) Explain Simple linear regression and multiple linear regression algorithm.

c) Discuss how we should improve accuracy of linear regression model.

d) Explain Logistic regression in details.

e) What is the conditional probability that it is raining, given that someone is carrying an umbrella? i.e P(Rain I Umbrella).
Suppose you observed 100 people over several days and noted whether it was raining and whether they carried an umbrella:

Situation	Count
Rain and Umbrella	30
Rain and No Umbrella	10
No Rain and Umbrella	10
No Rain and No Umbrella	50
Total	100

Q.3 Attempt Any Two. **12**

a) List and briefly explain assumptions of linear regression analysis.

b) Compare between Supervised learning, Unsupervised learning, and Reinforcement learning.

c) Predict whether a new customer will churn using KNN classification algorithm for following dataset.
New Customer to Classify: Call Minutes: 160, Support Tickets: 2, Monthly Charge: 45

Customer ID	Call Minutes	Support Tickets	Monthly Charge	Churn
C1	200	1	50	No
C2	300	0	70	No
C3	100	3	30	Yes
C4	150	2	40	Yes
C5	250	1	60	No

SECTION – II

Q.4 Attempt Any Four. **16**

a) List & explain future trends of Machine Learning.

b) Explain the concept of clustering and Clustering Techniques.

c) Explain concept of Hierarchical Clustering.

d) Explain the steps of "Training a Model" for a given machine learning problem.

e) Describe any four applications of unsupervised learning.

Q.5 Attempt Any Two. **12**

a) What is model evaluation in ML? Why it is important in ML?

b) Define cost function & explain its types in detail.

c) Explain following partitioning methods with example.

i) K-means

ii) K-medoids

Seat No.	

Set **Q**

T. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Machine Learning (CSEMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the given options. 14

1) Multiple linear regression has _____.
a) One independent variable
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c) Multiple dependent variables
d) Multiple independent variables

2) In association rules, A → B implies _____.
a) If A occurs, B never occurs
b) A and B are identical
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   c) Feedback in the form of rewards and punishments
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   a) It reduces computation
   b) It helps identify continuous variables
   c) It estimates the likelihood of an event given evidence
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12) What is entropy in the context of decision trees?
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   b) Information gain
   c) Measure of impurity
   d) Tree height

13) Which method randomly selects subsets of features and data samples?
   a) Logistic Regression
   b) Random Forest
   c) Decision Tree
   d) Naïve Bayes

14) In clustering, what does the “k” in k-means represent?
   a) Number of data points
   b) Number of clusters
   c) Number of attributes
   d) Number of iterations

Seat No.	

Set **Q**

T. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Machine Learning (CSEMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt Any Four. **16**

a) Describe the steps involved in building a classification model.

b) Explain Simple linear regression and multiple linear regression algorithm.

c) Discuss how we should improve accuracy of linear regression model.

d) Explain Logistic regression in details.

e) What is the conditional probability that it is raining, given that someone is carrying an umbrella? i.e P(Rain I Umbrella).
Suppose you observed 100 people over several days and noted whether it was raining and whether they carried an umbrella:

Situation	Count
Rain and Umbrella	30
Rain and No Umbrella	10
No Rain and Umbrella	10
No Rain and No Umbrella	50
Total	100

Q.3 Attempt Any Two. **12**

a) List and briefly explain assumptions of linear regression analysis.

b) Compare between Supervised learning, Unsupervised learning, and Reinforcement learning.

c) Predict whether a new customer will churn using KNN classification algorithm for following dataset.
New Customer to Classify: Call Minutes: 160, Support Tickets: 2, Monthly Charge: 45

Customer ID	Call Minutes	Support Tickets	Monthly Charge	Churn
C1	200	1	50	No
C2	300	0	70	No
C3	100	3	30	Yes
C4	150	2	40	Yes
C5	250	1	60	No

SECTION – II

Q.4 Attempt Any Four. **16**

a) List & explain future trends of Machine Learning.

b) Explain the concept of clustering and Clustering Techniques.

c) Explain concept of Hierarchical Clustering.

d) Explain the steps of "Training a Model" for a given machine learning problem.

e) Describe any four applications of unsupervised learning.

Q.5 Attempt Any Two. **12**

a) What is model evaluation in ML? Why it is important in ML?

b) Define cost function & explain its types in detail.

c) Explain following partitioning methods with example.

i) K-means

ii) K-medoids

SLR-QH-641

Seat No.	

Set R

T. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Machine Learning (CSEMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the given options. 14

1) In Leave-One-Out Cross Validation (LOOCV), number of folds equals _____.
a) k b) Size of dataset
c) Half of dataset d) 10

2) What is hyperparameter tuning?
a) Adjusting test samples
b) Modifying model weights
c) Finding the best configuration settings for the model
d) Changing dataset

3) In reinforcement learning, the learning is driven by _____.
a) Labels
b) Direct instruction
c) Feedback in the form of rewards and punishments
d) Data clustering

4) Which model is generally easier to interpret?
a) Linear Regression b) Deep Neural Networks
c) Random Forest d) SVM

5) A well-posed learning problem is defined by _____.
a) Unclear inputs
b) Random outputs
c) Defined inputs, outputs, and success criteria
d) Infinite possibilities

6) Which of the following is not a category of machine learning?
a) Supervised learning b) Unsupervised learning
c) Reinforcement learning d) Complex learning

7) What is the purpose of the conditional probability in classification?
   a) It reduces computation
   b) It helps identify continuous variables
   c) It estimates the likelihood of an event given evidence
   d) It optimizes the cost function

8) Which algorithm is based on distance between data points?
   a) Decision Tree
   b) k-Nearest Neighbors (k-NN)
   c) Naïve Bayes
   d) Logistic Regression

9) What is entropy in the context of decision trees?
   a) Data inconsistency
   b) Information gain
   c) Measure of impurity
   d) Tree height

10) Which method randomly selects subsets of features and data samples?
   a) Logistic Regression
   b) Random Forest
   c) Decision Tree
   d) Naïve Bayes

11) In clustering, what does the “k” in k-means represent?
   a) Number of data points
   b) Number of clusters
   c) Number of attributes
   d) Number of iterations

12) Multiple linear regression has _____.
   a) One independent variable
   b) No dependent variable
   c) Multiple dependent variables
   d) Multiple independent variables

13) In association rules, A → B implies _____.
   a) If A occurs, B never occurs
   b) A and B are identical
   c) If A occurs, B is likely to occur
   d) A and B are unrelated

14) Which term describes a model performing well on training data but poorly on unseen data?
   a) Underfitting
   b) Overfitting
   c) Regularization
   d) Normalization

Seat No.	

Set **R**

T. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Machine Learning (CSEMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt Any Four. **16**

a) Describe the steps involved in building a classification model.

b) Explain Simple linear regression and multiple linear regression algorithm.

c) Discuss how we should improve accuracy of linear regression model.

d) Explain Logistic regression in details.

e) What is the conditional probability that it is raining, given that someone is carrying an umbrella? i.e P(Rain I Umbrella).
Suppose you observed 100 people over several days and noted whether it was raining and whether they carried an umbrella:

Situation	Count
Rain and Umbrella	30
Rain and No Umbrella	10
No Rain and Umbrella	10
No Rain and No Umbrella	50
Total	100

Q.3 Attempt Any Two. **12**

a) List and briefly explain assumptions of linear regression analysis.

b) Compare between Supervised learning, Unsupervised learning, and Reinforcement learning.

c) Predict whether a new customer will churn using KNN classification algorithm for following dataset.
New Customer to Classify: Call Minutes: 160, Support Tickets: 2, Monthly Charge: 45

Customer ID	Call Minutes	Support Tickets	Monthly Charge	Churn
C1	200	1	50	No
C2	300	0	70	No
C3	100	3	30	Yes
C4	150	2	40	Yes
C5	250	1	60	No

SECTION – II

Q.4 Attempt Any Four. **16**

a) List & explain future trends of Machine Learning.

b) Explain the concept of clustering and Clustering Techniques.

c) Explain concept of Hierarchical Clustering.

d) Explain the steps of "Training a Model" for a given machine learning problem.

e) Describe any four applications of unsupervised learning.

Q.5 Attempt Any Two. **12**

a) What is model evaluation in ML? Why it is important in ML?

b) Define cost function & explain its types in detail.

c) Explain following partitioning methods with example.

i) K-means

ii) K-medoids

Seat No.	

Set **S**

T. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Machine Learning (CSEMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the given options. 14

1) Which method randomly selects subsets of features and data samples?
a) Logistic Regression b) Random Forest
c) Decision Tree d) Naïve Bayes

2) In clustering, what does the "k" in k-means represent?
a) Number of data points b) Number of clusters
c) Number of attributes d) Number of iterations

3) Multiple linear regression has _____.
a) One independent variable
b) No dependent variable
c) Multiple dependent variables
d) Multiple independent variables

4) In association rules, A → B implies _____.
a) If A occurs, B never occurs
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d) A and B are unrelated

5) Which term describes a model performing well on training data but poorly on unseen data?
a) Underfitting b) Overfitting
c) Regularization d) Normalization

6) In Leave-One-Out Cross Validation (LOOCV), number of folds equals _____.
a) k b) Size of dataset
c) Half of dataset d) 10

7) What is hyperparameter tuning?
   a) Adjusting test samples
   b) Modifying model weights
   c) Finding the best configuration settings for the model
   d) Changing dataset

8) In reinforcement learning, the learning is driven by _____.
   a) Labels
   b) Direct instruction
   c) Feedback in the form of rewards and punishments
   d) Data clustering

9) Which model is generally easier to interpret?
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   b) Deep Neural Networks
   c) Random Forest
   d) SVM

10) A well-posed learning problem is defined by _____.
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   d) It optimizes the cost function

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   a) Decision Tree
   b) k-Nearest Neighbors (k-NN)
   c) Naïve Bayes
   d) Logistic Regression

14) What is entropy in the context of decision trees?
   a) Data inconsistency
   b) Information gain
   c) Measure of impurity
   d) Tree height

Seat No.	

Set **S**

T. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Machine Learning (CSEMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt Any Four. **16**

a) Describe the steps involved in building a classification model.

b) Explain Simple linear regression and multiple linear regression algorithm.

c) Discuss how we should improve accuracy of linear regression model.

d) Explain Logistic regression in details.

e) What is the conditional probability that it is raining, given that someone is carrying an umbrella? i.e P(Rain I Umbrella).
Suppose you observed 100 people over several days and noted whether it was raining and whether they carried an umbrella:

Situation	Count
Rain and Umbrella	30
Rain and No Umbrella	10
No Rain and Umbrella	10
No Rain and No Umbrella	50
Total	100

Q.3 Attempt Any Two. **12**

a) List and briefly explain assumptions of linear regression analysis.

b) Compare between Supervised learning, Unsupervised learning, and Reinforcement learning.

c) Predict whether a new customer will churn using KNN classification algorithm for following dataset.
New Customer to Classify: Call Minutes: 160, Support Tickets: 2, Monthly Charge: 45

Customer ID	Call Minutes	Support Tickets	Monthly Charge	Churn
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C2	300	0	70	No
C3	100	3	30	Yes
C4	150	2	40	Yes
C5	250	1	60	No

SECTION – II

Q.4 Attempt Any Four. **16**

a) List & explain future trends of Machine Learning.

b) Explain the concept of clustering and Clustering Techniques.

c) Explain concept of Hierarchical Clustering.

d) Explain the steps of "Training a Model" for a given machine learning problem.

e) Describe any four applications of unsupervised learning.

Q.5 Attempt Any Two. **12**

a) What is model evaluation in ML? Why it is important in ML?

b) Define cost function & explain its types in detail.

c) Explain following partitioning methods with example.

i) K-means

ii) K-medoids

SLR-QH-641

Seat No.	

Set P

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Machine Learning (CSEMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the given options. 14

1) A well-posed learning problem is defined by _____.
a) Unclear inputs
b) Random outputs
c) Defined inputs, outputs, and success criteria
d) Infinite possibilities

2) Which of the following is not a category of machine learning?
a) Supervised learning b) Unsupervised learning
c) Reinforcement learning d) Complex learning

3) What is the purpose of the conditional probability in classification?
a) It reduces computation
b) It helps identify continuous variables
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d) It optimizes the cost function

4) Which algorithm is based on distance between data points?
a) Decision Tree b) k-Nearest Neighbors (k-NN)
c) Naïve Bayes d) Logistic Regression

5) What is entropy in the context of decision trees?
a) Data inconsistency b) Information gain
c) Measure of impurity d) Tree height

6) Which method randomly selects subsets of features and data samples?
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c) Decision Tree d) Naïve Bayes

7) In clustering, what does the “k” in k-means represent?
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b) Overfitting
c) Regularization
d) Normalization

11) In Leave-One-Out Cross Validation (LOOCV), number of folds equals _____.
a) k
b) Size of dataset
c) Half of dataset
d) 10

12) What is hyperparameter tuning?
a) Adjusting test samples
b) Modifying model weights
c) Finding the best configuration settings for the model
d) Changing dataset

13) In reinforcement learning, the learning is driven by _____.
a) Labels
b) Direct instruction
c) Feedback in the form of rewards and punishments
d) Data clustering

14) Which model is generally easier to interpret?
a) Linear Regression
b) Deep Neural Networks
c) Random Forest
d) SVM

Seat No.	

Set **P**

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Machine Learning (CSEMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt Any Four. **16**

a) Describe the steps involved in building a classification model.

b) Explain Simple linear regression and multiple linear regression algorithm.

c) Discuss how we should improve accuracy of linear regression model.

d) Explain Logistic regression in details.

e) What is the conditional probability that it is raining, given that someone is carrying an umbrella? i.e P(Rain I Umbrella).
Suppose you observed 100 people over several days and noted whether it was raining and whether they carried an umbrella:

Situation	Count
Rain and Umbrella	30
Rain and No Umbrella	10
No Rain and Umbrella	10
No Rain and No Umbrella	50
Total	100

Q.3 Attempt Any Two. **12**

a) List and briefly explain assumptions of linear regression analysis.

b) Compare between Supervised learning, Unsupervised learning, and Reinforcement learning.

c) Predict whether a new customer will churn using KNN classification algorithm for following dataset.
New Customer to Classify: Call Minutes: 160, Support Tickets: 2, Monthly Charge: 45

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C4	150	2	40	Yes
C5	250	1	60	No

SECTION – II

Q.4 Attempt Any Four. **16**

a) List & explain future trends of Machine Learning.

b) Explain the concept of clustering and Clustering Techniques.

c) Explain concept of Hierarchical Clustering.

d) Explain the steps of "Training a Model" for a given machine learning problem.

e) Describe any four applications of unsupervised learning.

Q.5 Attempt Any Two. **12**

a) What is model evaluation in ML? Why it is important in ML?

b) Define cost function & explain its types in detail.

c) Explain following partitioning methods with example.

i) K-means

ii) K-medoids

SLR-QH-641

Seat No.	

Set Q

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Machine Learning (CSEMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the given options. 14

1) Multiple linear regression has _____.
a) One independent variable
b) No dependent variable
c) Multiple dependent variables
d) Multiple independent variables

2) In association rules, A → B implies _____.
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4) In Leave-One-Out Cross Validation (LOOCV), number of folds equals _____.
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c) Half of dataset d) 10

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a) Adjusting test samples
b) Modifying model weights
c) Finding the best configuration settings for the model
d) Changing dataset

6) In reinforcement learning, the learning is driven by _____.
   a) Labels
   b) Direct instruction
   c) Feedback in the form of rewards and punishments
   d) Data clustering

7) Which model is generally easier to interpret?
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   c) Random Forest
   d) SVM

8) A well-posed learning problem is defined by _____.
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   c) Reinforcement learning
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   c) It estimates the likelihood of an event given evidence
   d) It optimizes the cost function

11) Which algorithm is based on distance between data points?
   a) Decision Tree
   b) k-Nearest Neighbors (k-NN)
   c) Naïve Bayes
   d) Logistic Regression

12) What is entropy in the context of decision trees?
   a) Data inconsistency
   b) Information gain
   c) Measure of impurity
   d) Tree height

13) Which method randomly selects subsets of features and data samples?
   a) Logistic Regression
   b) Random Forest
   c) Decision Tree
   d) Naïve Bayes

14) In clustering, what does the “k” in k-means represent?
   a) Number of data points
   b) Number of clusters
   c) Number of attributes
   d) Number of iterations

Seat No.	

Set **Q**

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Machine Learning (CSEMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt Any Four. **16**

a) Describe the steps involved in building a classification model.

b) Explain Simple linear regression and multiple linear regression algorithm.

c) Discuss how we should improve accuracy of linear regression model.

d) Explain Logistic regression in details.

e) What is the conditional probability that it is raining, given that someone is carrying an umbrella? i.e P(Rain I Umbrella).
Suppose you observed 100 people over several days and noted whether it was raining and whether they carried an umbrella:

Situation	Count
Rain and Umbrella	30
Rain and No Umbrella	10
No Rain and Umbrella	10
No Rain and No Umbrella	50
Total	100

Q.3 Attempt Any Two. **12**

a) List and briefly explain assumptions of linear regression analysis.

b) Compare between Supervised learning, Unsupervised learning, and Reinforcement learning.

c) Predict whether a new customer will churn using KNN classification algorithm for following dataset.
New Customer to Classify: Call Minutes: 160, Support Tickets: 2, Monthly Charge: 45

Customer ID	Call Minutes	Support Tickets	Monthly Charge	Churn
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C2	300	0	70	No
C3	100	3	30	Yes
C4	150	2	40	Yes
C5	250	1	60	No

SECTION – II

Q.4 Attempt Any Four. **16**

a) List & explain future trends of Machine Learning.

b) Explain the concept of clustering and Clustering Techniques.

c) Explain concept of Hierarchical Clustering.

d) Explain the steps of "Training a Model" for a given machine learning problem.

e) Describe any four applications of unsupervised learning.

Q.5 Attempt Any Two. **12**

a) What is model evaluation in ML? Why it is important in ML?

b) Define cost function & explain its types in detail.

c) Explain following partitioning methods with example.

i) K-means

ii) K-medoids

SLR-QH-641

Seat No.	

Set R

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Machine Learning (CSEMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the given options. 14

1) In Leave-One-Out Cross Validation (LOOCV), number of folds equals _____.
a) k b) Size of dataset
c) Half of dataset d) 10

2) What is hyperparameter tuning?
a) Adjusting test samples
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d) Changing dataset

3) In reinforcement learning, the learning is driven by _____.
a) Labels
b) Direct instruction
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4) Which model is generally easier to interpret?
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10) Which method randomly selects subsets of features and data samples?
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12) Multiple linear regression has _____.
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   b) No dependent variable
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   c) If A occurs, B is likely to occur
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14) Which term describes a model performing well on training data but poorly on unseen data?
   a) Underfitting
   b) Overfitting
   c) Regularization
   d) Normalization

Seat No.	

Set **R**

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Machine Learning (CSEMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt Any Four. **16**

a) Describe the steps involved in building a classification model.

b) Explain Simple linear regression and multiple linear regression algorithm.

c) Discuss how we should improve accuracy of linear regression model.

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e) What is the conditional probability that it is raining, given that someone is carrying an umbrella? i.e P(Rain I Umbrella).
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Q.3 Attempt Any Two. **12**

a) List and briefly explain assumptions of linear regression analysis.

b) Compare between Supervised learning, Unsupervised learning, and Reinforcement learning.

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C5	250	1	60	No

SECTION – II

Q.4 Attempt Any Four. **16**

a) List & explain future trends of Machine Learning.

b) Explain the concept of clustering and Clustering Techniques.

c) Explain concept of Hierarchical Clustering.

d) Explain the steps of "Training a Model" for a given machine learning problem.

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a) What is model evaluation in ML? Why it is important in ML?

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Seat No.	

Set **S**

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Machine Learning (CSEMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the given options. 14

1) Which method randomly selects subsets of features and data samples?
a) Logistic Regression b) Random Forest
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   d) Complex learning

12) What is the purpose of the conditional probability in classification?
   a) It reduces computation
   b) It helps identify continuous variables
   c) It estimates the likelihood of an event given evidence
   d) It optimizes the cost function

13) Which algorithm is based on distance between data points?
   a) Decision Tree
   b) k-Nearest Neighbors (k-NN)
   c) Naïve Bayes
   d) Logistic Regression

14) What is entropy in the context of decision trees?
   a) Data inconsistency
   b) Information gain
   c) Measure of impurity
   d) Tree height

Seat No.	

Set **S**

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Machine Learning (CSEMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt Any Four. **16**

a) Describe the steps involved in building a classification model.

b) Explain Simple linear regression and multiple linear regression algorithm.

c) Discuss how we should improve accuracy of linear regression model.

d) Explain Logistic regression in details.

e) What is the conditional probability that it is raining, given that someone is carrying an umbrella? i.e P(Rain I Umbrella).
Suppose you observed 100 people over several days and noted whether it was raining and whether they carried an umbrella:

Situation	Count
Rain and Umbrella	30
Rain and No Umbrella	10
No Rain and Umbrella	10
No Rain and No Umbrella	50
Total	100

Q.3 Attempt Any Two. **12**

a) List and briefly explain assumptions of linear regression analysis.

b) Compare between Supervised learning, Unsupervised learning, and Reinforcement learning.

c) Predict whether a new customer will churn using KNN classification algorithm for following dataset.
New Customer to Classify: Call Minutes: 160, Support Tickets: 2, Monthly Charge: 45

Customer ID	Call Minutes	Support Tickets	Monthly Charge	Churn
C1	200	1	50	No
C2	300	0	70	No
C3	100	3	30	Yes
C4	150	2	40	Yes
C5	250	1	60	No

SECTION – II

Q.4 Attempt Any Four. **16**

a) List & explain future trends of Machine Learning.

b) Explain the concept of clustering and Clustering Techniques.

c) Explain concept of Hierarchical Clustering.

d) Explain the steps of "Training a Model" for a given machine learning problem.

e) Describe any four applications of unsupervised learning.

Q.5 Attempt Any Two. **12**

a) What is model evaluation in ML? Why it is important in ML?

b) Define cost function & explain its types in detail.

c) Explain following partitioning methods with example.

i) K-means

ii) K-medoids

SLR-QH-641

Seat No.		Set	P

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Machine Learning (CSEMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the given options. 14

1) A well-posed learning problem is defined by _____.
a) Unclear inputs
b) Random outputs
c) Defined inputs, outputs, and success criteria
d) Infinite possibilities

2) Which of the following is not a category of machine learning?
a) Supervised learning b) Unsupervised learning
c) Reinforcement learning d) Complex learning

3) What is the purpose of the conditional probability in classification?
a) It reduces computation
b) It helps identify continuous variables
c) It estimates the likelihood of an event given evidence
d) It optimizes the cost function

4) Which algorithm is based on distance between data points?
a) Decision Tree b) k-Nearest Neighbors (k-NN)
c) Naïve Bayes d) Logistic Regression

5) What is entropy in the context of decision trees?
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c) Measure of impurity d) Tree height

6) Which method randomly selects subsets of features and data samples?
a) Logistic Regression b) Random Forest
c) Decision Tree d) Naïve Bayes

7) In clustering, what does the “k” in k-means represent?
a) Number of data points
b) Number of clusters
c) Number of attributes
d) Number of iterations

8) Multiple linear regression has _____.
a) One independent variable
b) No dependent variable
c) Multiple dependent variables
d) Multiple independent variables

9) In association rules, A → B implies _____.
a) If A occurs, B never occurs
b) A and B are identical
c) If A occurs, B is likely to occur
d) A and B are unrelated

10) Which term describes a model performing well on training data but poorly on unseen data?
a) Underfitting
b) Overfitting
c) Regularization
d) Normalization

11) In Leave-One-Out Cross Validation (LOOCV), number of folds equals _____.
a) k
b) Size of dataset
c) Half of dataset
d) 10

12) What is hyperparameter tuning?
a) Adjusting test samples
b) Modifying model weights
c) Finding the best configuration settings for the model
d) Changing dataset

13) In reinforcement learning, the learning is driven by _____.
a) Labels
b) Direct instruction
c) Feedback in the form of rewards and punishments
d) Data clustering

14) Which model is generally easier to interpret?
a) Linear Regression
b) Deep Neural Networks
c) Random Forest
d) SVM

Seat No.	

Set P

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Machine Learning (CSEMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt Any Four. **16**

a) Describe the steps involved in building a classification model.

b) Explain Simple linear regression and multiple linear regression algorithm.

c) Discuss how we should improve accuracy of linear regression model.

d) Explain Logistic regression in details.

e) What is the conditional probability that it is raining, given that someone is carrying an umbrella? i.e P(Rain I Umbrella).
Suppose you observed 100 people over several days and noted whether it was raining and whether they carried an umbrella:

Situation	Count
Rain and Umbrella	30
Rain and No Umbrella	10
No Rain and Umbrella	10
No Rain and No Umbrella	50
Total	100

Q.3 Attempt Any Two. **12**

a) List and briefly explain assumptions of linear regression analysis.

b) Compare between Supervised learning, Unsupervised learning, and Reinforcement learning.

c) Predict whether a new customer will churn using KNN classification algorithm for following dataset.
New Customer to Classify: Call Minutes: 160, Support Tickets: 2, Monthly Charge: 45

Customer ID	Call Minutes	Support Tickets	Monthly Charge	Churn
C1	200	1	50	No
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C3	100	3	30	Yes
C4	150	2	40	Yes
C5	250	1	60	No

SECTION – II

Q.4 Attempt Any Four. **16**

a) List & explain future trends of Machine Learning.

b) Explain the concept of clustering and Clustering Techniques.

c) Explain concept of Hierarchical Clustering.

d) Explain the steps of "Training a Model" for a given machine learning problem.

e) Describe any four applications of unsupervised learning.

Q.5 Attempt Any Two. **12**

a) What is model evaluation in ML? Why it is important in ML?

b) Define cost function & explain its types in detail.

c) Explain following partitioning methods with example.

i) K-means

ii) K-medoids

Seat No.	

Set **Q**

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Machine Learning (CSEMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the given options. 14

1) Multiple linear regression has _____.
a) One independent variable
b) No dependent variable
c) Multiple dependent variables
d) Multiple independent variables

2) In association rules, A → B implies _____.
a) If A occurs, B never occurs
b) A and B are identical
c) If A occurs, B is likely to occur
d) A and B are unrelated

3) Which term describes a model performing well on training data but poorly on unseen data?
a) Underfitting b) Overfitting
c) Regularization d) Normalization

4) In Leave-One-Out Cross Validation (LOOCV), number of folds equals _____.
a) k b) Size of dataset
c) Half of dataset d) 10

5) What is hyperparameter tuning?
a) Adjusting test samples
b) Modifying model weights
c) Finding the best configuration settings for the model
d) Changing dataset

6) In reinforcement learning, the learning is driven by _____.
   a) Labels
   b) Direct instruction
   c) Feedback in the form of rewards and punishments
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7) Which model is generally easier to interpret?
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   c) Random Forest
   d) SVM

8) A well-posed learning problem is defined by _____.
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   b) Random outputs
   c) Defined inputs, outputs, and success criteria
   d) Infinite possibilities

9) Which of the following is not a category of machine learning?
   a) Supervised learning
   b) Unsupervised learning
   c) Reinforcement learning
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   a) It reduces computation
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   b) k-Nearest Neighbors (k-NN)
   c) Naïve Bayes
   d) Logistic Regression

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   b) Information gain
   c) Measure of impurity
   d) Tree height

13) Which method randomly selects subsets of features and data samples?
   a) Logistic Regression
   b) Random Forest
   c) Decision Tree
   d) Naïve Bayes

14) In clustering, what does the “k” in k-means represent?
   a) Number of data points
   b) Number of clusters
   c) Number of attributes
   d) Number of iterations

Seat No.	

Set **Q**

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Machine Learning (CSEMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt Any Four. **16**

a) Describe the steps involved in building a classification model.

b) Explain Simple linear regression and multiple linear regression algorithm.

c) Discuss how we should improve accuracy of linear regression model.

d) Explain Logistic regression in details.

e) What is the conditional probability that it is raining, given that someone is carrying an umbrella? i.e P(Rain I Umbrella).
Suppose you observed 100 people over several days and noted whether it was raining and whether they carried an umbrella:

Situation	Count
Rain and Umbrella	30
Rain and No Umbrella	10
No Rain and Umbrella	10
No Rain and No Umbrella	50
Total	100

Q.3 Attempt Any Two. **12**

a) List and briefly explain assumptions of linear regression analysis.

b) Compare between Supervised learning, Unsupervised learning, and Reinforcement learning.

c) Predict whether a new customer will churn using KNN classification algorithm for following dataset.
New Customer to Classify: Call Minutes: 160, Support Tickets: 2, Monthly Charge: 45

Customer ID	Call Minutes	Support Tickets	Monthly Charge	Churn
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C3	100	3	30	Yes
C4	150	2	40	Yes
C5	250	1	60	No

SECTION – II

Q.4 Attempt Any Four. **16**

a) List & explain future trends of Machine Learning.

b) Explain the concept of clustering and Clustering Techniques.

c) Explain concept of Hierarchical Clustering.

d) Explain the steps of "Training a Model" for a given machine learning problem.

e) Describe any four applications of unsupervised learning.

Q.5 Attempt Any Two. **12**

a) What is model evaluation in ML? Why it is important in ML?

b) Define cost function & explain its types in detail.

c) Explain following partitioning methods with example.

i) K-means

ii) K-medoids

SLR-QH-641

Seat No.	

Set R

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Machine Learning (CSEMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the given options. 14

1) In Leave-One-Out Cross Validation (LOOCV), number of folds equals _____.
a) k b) Size of dataset
c) Half of dataset d) 10

2) What is hyperparameter tuning?
a) Adjusting test samples
b) Modifying model weights
c) Finding the best configuration settings for the model
d) Changing dataset

3) In reinforcement learning, the learning is driven by _____.
a) Labels
b) Direct instruction
c) Feedback in the form of rewards and punishments
d) Data clustering

4) Which model is generally easier to interpret?
a) Linear Regression b) Deep Neural Networks
c) Random Forest d) SVM

5) A well-posed learning problem is defined by _____.
a) Unclear inputs
b) Random outputs
c) Defined inputs, outputs, and success criteria
d) Infinite possibilities

6) Which of the following is not a category of machine learning?
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7) What is the purpose of the conditional probability in classification?
   a) It reduces computation
   b) It helps identify continuous variables
   c) It estimates the likelihood of an event given evidence
   d) It optimizes the cost function

8) Which algorithm is based on distance between data points?
   a) Decision Tree
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   c) Naïve Bayes
   d) Logistic Regression

9) What is entropy in the context of decision trees?
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14) Which term describes a model performing well on training data but poorly on unseen data?
   a) Underfitting
   b) Overfitting
   c) Regularization
   d) Normalization

Seat No.	

Set R

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Machine Learning (CSEMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt Any Four. **16**

a) Describe the steps involved in building a classification model.

b) Explain Simple linear regression and multiple linear regression algorithm.

c) Discuss how we should improve accuracy of linear regression model.

d) Explain Logistic regression in details.

e) What is the conditional probability that it is raining, given that someone is carrying an umbrella? i.e P(Rain I Umbrella).
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No Rain and No Umbrella	50
Total	100

Q.3 Attempt Any Two. **12**

a) List and briefly explain assumptions of linear regression analysis.

b) Compare between Supervised learning, Unsupervised learning, and Reinforcement learning.

c) Predict whether a new customer will churn using KNN classification algorithm for following dataset.
New Customer to Classify: Call Minutes: 160, Support Tickets: 2, Monthly Charge: 45

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C5	250	1	60	No

SECTION – II

Q.4 Attempt Any Four. **16**

a) List & explain future trends of Machine Learning.

b) Explain the concept of clustering and Clustering Techniques.

c) Explain concept of Hierarchical Clustering.

d) Explain the steps of "Training a Model" for a given machine learning problem.

e) Describe any four applications of unsupervised learning.

Q.5 Attempt Any Two. **12**

a) What is model evaluation in ML? Why it is important in ML?

b) Define cost function & explain its types in detail.

c) Explain following partitioning methods with example.

i) K-means

ii) K-medoids

SLR-QH-641

Seat No.	

Set S

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Machine Learning (CSEMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the given options. 14

1) Which method randomly selects subsets of features and data samples?
a) Logistic Regression b) Random Forest
c) Decision Tree d) Naïve Bayes

2) In clustering, what does the "k" in k-means represent?
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6) In Leave-One-Out Cross Validation (LOOCV), number of folds equals _____.
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   d) Logistic Regression

14) What is entropy in the context of decision trees?
   a) Data inconsistency
   b) Information gain
   c) Measure of impurity
   d) Tree height

Seat No.	

Set **S**

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Machine Learning (CSEMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt Any Four. **16**

a) Describe the steps involved in building a classification model.

b) Explain Simple linear regression and multiple linear regression algorithm.

c) Discuss how we should improve accuracy of linear regression model.

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e) What is the conditional probability that it is raining, given that someone is carrying an umbrella? i.e P(Rain I Umbrella).
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No Rain and Umbrella	10
No Rain and No Umbrella	50
Total	100

Q.3 Attempt Any Two. **12**

a) List and briefly explain assumptions of linear regression analysis.

b) Compare between Supervised learning, Unsupervised learning, and Reinforcement learning.

c) Predict whether a new customer will churn using KNN classification algorithm for following dataset.
New Customer to Classify: Call Minutes: 160, Support Tickets: 2, Monthly Charge: 45

Customer ID	Call Minutes	Support Tickets	Monthly Charge	Churn
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C4	150	2	40	Yes
C5	250	1	60	No

SECTION – II

Q.4 Attempt Any Four. **16**

a) List & explain future trends of Machine Learning.

b) Explain the concept of clustering and Clustering Techniques.

c) Explain concept of Hierarchical Clustering.

d) Explain the steps of "Training a Model" for a given machine learning problem.

e) Describe any four applications of unsupervised learning.

Q.5 Attempt Any Two. **12**

a) What is model evaluation in ML? Why it is important in ML?

b) Define cost function & explain its types in detail.

c) Explain following partitioning methods with example.

i) K-means

ii) K-medoids

SLR-QH-642

Seat No.	

Set P

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April - 2026
Object Oriented Modeling and Design (CSEMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct option from the following. **14**

1) Modeling as a design technique helps in _____.
a) Coding
b) Abstraction and system understanding
c) Testing
d) Debugging

2) Evidence for usefulness of Object-Oriented Development includes _____.
a) Reduced code size and increased reusability
b) Longer development time
c) Increased redundancy
d) Lower abstraction

3) In Functional Modeling, the system is represented using _____.
a) Class Diagrams
b) Data Flow Diagrams (DFDs)
c) Sequence Diagrams
d) State Charts

4) In OMT, Objects are _____.
a) Abstract ideas only b) Instances of classes
c) Data tables d) Functions

5) Generalization in OMT refers to _____.
a) Combining classes
b) Deriving subclasses from base classes
c) Deleting attributes
d) Creating packages

6) Concurrency in Dynamic Modeling refers to _____.
   a) Sequential processes
   b) Multiple events occurring simultaneously
   c) Reusing code
   d) Class dependencies

7) Nested State Diagrams are used for _____.
   a) Representing hierarchical states
   b) Showing inheritance
   c) Database schema
   d) Packages

8) The main purpose of a Package in UML is _____.
   a) To execute code
   b) To group related classes and interfaces
   c) To store data
   d) To compile modules

9) A Sequence Diagram depicts _____.
   a) Structural relationships
   b) Order of messages between objects
   c) Static classes
   d) System deployment

10) In UML, an Object Diagram shows _____.
   a) Static structure
   b) Dynamic structure
   c) Snapshot of system objects at a time
   d) Deployment structure

11) Collaboration Diagrams show _____.
   a) Object interaction and message flow
   b) Static class structure
   c) Use case scenarios
   d) Process flow

12) A Component in UML can be _____.
   a) Hardware device
   b) Reusable software module
   c) Test case
   d) Class object

13) The Deployment Diagram shows which UML element?
   a) Software design
   b) Physical nodes and their connections
   c) User roles
   d) Object associations

14) Frameworks in UML are designed for _____.

a) One-time use
b) Reusability and domain-specific development
c) Hardware mapping
d) Testing functions

SLR-QH-642

Seat No.	

Set P

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April - 2026
Object Oriented Modeling and Design (CSEMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if required.

SECTION – I

Q.2 Attempt Any Three. **12**

a) Explain Object-Oriented Development themes.

b) What is modeling? Explain modeling as a design technique.

c) Describe events, states, and operations with suitable examples.

d) Write a short note on object-oriented style and features of OO languages.

Q.3 Attempt for Any One. **08**

a) Explain the Object Model, Dynamic Model, and Functional Model of OMT.

b) Explain object, class, link, and association in OMT with examples.

Q.4 Compulsory Question. **08**

Draw and explain a DFD for a library management system. (Level 0, Level 1, Level 2).

SECTION – II

Q.5 Attempt Any Three. **12**

a) Define interfaces, types, and roles in UML.

b) Explain the use of packages in UML.

c) Explain components and deployment in UML.

d) Write a short note on *state machines.*

Q.6 Attempt for Any One. **08**

a) What are interaction diagrams and activity diagrams? Explain with suitable examples.

b) Draw a Deployment Diagram for a *Hospital Management System.*

Q.7 Compulsory Question. **08**

Draw and explain a Component Diagram for an *Online Banking System.*

SLR-QH-642

Seat No.	

Set Q

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April - 2026
Object Oriented Modeling and Design (CSEMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct option from the following. **14**

1) The main purpose of a Package in UML is _____.
a) To execute code
b) To group related classes and interfaces
c) To store data
d) To compile modules

2) A Sequence Diagram depicts _____.
a) Structural relationships
b) Order of messages between objects
c) Static classes
d) System deployment

3) In UML, an Object Diagram shows _____.
a) Static structure
b) Dynamic structure
c) Snapshot of system objects at a time
d) Deployment structure

4) Collaboration Diagrams show _____.
a) Object interaction and message flow
b) Static class structure
c) Use case scenarios
d) Process flow

5) A Component in UML can be _____.
a) Hardware device
b) Reusable software module
c) Test case
d) Class object

6) The Deployment Diagram shows which UML element?
   a) Software design
   b) Physical nodes and their connections
   c) User roles
   d) Object associations

7) Frameworks in UML are designed for _____.
   a) One-time use
   b) Reusability and domain-specific development
   c) Hardware mapping
   d) Testing functions

8) Modeling as a design technique helps in _____.
   a) Coding
   b) Abstraction and system understanding
   c) Testing
   d) Debugging

9) Evidence for usefulness of Object-Oriented Development includes _____.
   a) Reduced code size and increased reusability
   b) Longer development time
   c) Increased redundancy
   d) Lower abstraction

10) In Functional Modeling, the system is represented using _____.
   a) Class Diagrams
   b) Data Flow Diagrams (DFDs)
   c) Sequence Diagrams
   d) State Charts

11) In OMT, Objects are _____.
   a) Abstract ideas only
   b) Instances of classes
   c) Data tables
   d) Functions

12) Generalization in OMT refers to _____.
   a) Combining classes
   b) Deriving subclasses from base classes
   c) Deleting attributes
   d) Creating packages

13) Concurrency in Dynamic Modeling refers to _____.
   a) Sequential processes
   b) Multiple events occurring simultaneously
   c) Reusing code
   d) Class dependencies

14) Nested State Diagrams are used for _____.

a) Representing hierarchical states
b) Showing inheritance
c) Database schema
d) Packages

SLR-QH-642

Seat No.	

Set Q

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April - 2026
Object Oriented Modeling and Design (CSEMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if required.

SECTION – I

Q.2 Attempt Any Three. **12**

a) Explain Object-Oriented Development themes.

b) What is modeling? Explain modeling as a design technique.

c) Describe events, states, and operations with suitable examples.

d) Write a short note on object-oriented style and features of OO languages.

Q.3 Attempt for Any One. **08**

a) Explain the Object Model, Dynamic Model, and Functional Model of OMT.

b) Explain object, class, link, and association in OMT with examples.

Q.4 Compulsory Question. **08**

Draw and explain a DFD for a library management system. (Level 0, Level 1, Level 2).

SECTION – II

Q.5 Attempt Any Three. **12**

a) Define interfaces, types, and roles in UML.

b) Explain the use of packages in UML.

c) Explain components and deployment in UML.

d) Write a short note on *state machines.*

Q.6 Attempt for Any One. **08**

a) What are interaction diagrams and activity diagrams? Explain with suitable examples.

b) Draw a Deployment Diagram for a *Hospital Management System.*

Q.7 Compulsory Question. **08**

Draw and explain a Component Diagram for an *Online Banking System.*

SLR-QH-642

Seat No.	

Set R

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April - 2026
Object Oriented Modeling and Design (CSEMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct option from the following. **14**

1) Collaboration Diagrams show _____.
a) Object interaction and message flow
b) Static class structure
c) Use case scenarios
d) Process flow

2) A Component in UML can be _____.
a) Hardware device
b) Reusable software module
c) Test case
d) Class object

3) The Deployment Diagram shows which UML element?
a) Software design
b) Physical nodes and their connections
c) User roles
d) Object associations

4) Frameworks in UML are designed for _____.
a) One-time use
b) Reusability and domain-specific development
c) Hardware mapping
d) Testing functions

5) Modeling as a design technique helps in _____.
a) Coding
b) Abstraction and system understanding
c) Testing
d) Debugging

6) Evidence for usefulness of Object-Oriented Development includes _____.
   a) Reduced code size and increased reusability
   b) Longer development time
   c) Increased redundancy
   d) Lower abstraction

7) In Functional Modeling, the system is represented using _____.
   a) Class Diagrams
   b) Data Flow Diagrams (DFDs)
   c) Sequence Diagrams
   d) State Charts

8) In OMT, Objects are _____.
   a) Abstract ideas only
   b) Instances of classes
   c) Data tables
   d) Functions

9) Generalization in OMT refers to _____.
   a) Combining classes
   b) Deriving subclasses from base classes
   c) Deleting attributes
   d) Creating packages

____

10) Concurrency in Dynamic Modeling refers to _____.
   a) Sequential processes
   b) Multiple events occurring simultaneously
   c) Reusing code
   d) Class dependencies

11) Nested State Diagrams are used for _____.
   a) Representing hierarchical states
   b) Showing inheritance
   c) Database schema
   d) Packages

12) The main purpose of a Package in UML is _____.
   a) To execute code
   b) To group related classes and interfaces
   c) To store data
   d) To compile modules

13) A Sequence Diagram depicts _____.
   a) Structural relationships
   b) Order of messages between objects
   c) Static classes
   d) System deployment

14) In UML, an Object Diagram shows _____.

a) Static structure
b) Dynamic structure
c) Snapshot of system objects at a time
d) Deployment structure

SLR-QH-642

Seat No.	

Set R

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April - 2026
Object Oriented Modeling and Design (CSEMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if required.

SECTION – I

Q.2 Attempt Any Three. **12**

a) Explain Object-Oriented Development themes.

b) What is modeling? Explain modeling as a design technique.

c) Describe events, states, and operations with suitable examples.

d) Write a short note on object-oriented style and features of OO languages.

Q.3 Attempt for Any One. **08**

a) Explain the Object Model, Dynamic Model, and Functional Model of OMT.

b) Explain object, class, link, and association in OMT with examples.

Q.4 Compulsory Question. **08**

Draw and explain a DFD for a library management system. (Level 0, Level 1, Level 2).

SECTION – II

Q.5 Attempt Any Three. **12**

a) Define interfaces, types, and roles in UML.

b) Explain the use of packages in UML.

c) Explain components and deployment in UML.

d) Write a short note on *state machines.*

Q.6 Attempt for Any One. **08**

a) What are interaction diagrams and activity diagrams? Explain with suitable examples.

b) Draw a Deployment Diagram for a *Hospital Management System.*

Q.7 Compulsory Question. **08**

Draw and explain a Component Diagram for an *Online Banking System.*

SLR-QH-642

Seat No.	

Set S

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April - 2026
Object Oriented Modeling and Design (CSEMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct option from the following. **14**

1) Concurrency in Dynamic Modeling refers to _____.
a) Sequential processes
b) Multiple events occurring simultaneously
c) Reusing code
d) Class dependencies

2) Nested State Diagrams are used for _____.
a) Representing hierarchical states
b) Showing inheritance
c) Database schema
d) Packages

3) The main purpose of a Package in UML is _____.
a) To execute code
b) To group related classes and interfaces
c) To store data
d) To compile modules

4) A Sequence Diagram depicts _____.
a) Structural relationships
b) Order of messages between objects
c) Static classes
d) System deployment

5) In UML, an Object Diagram shows _____.
a) Static structure
b) Dynamic structure
c) Snapshot of system objects at a time
d) Deployment structure

6) Collaboration Diagrams show _____.
   a) Object interaction and message flow
   b) Static class structure
   c) Use case scenarios
   d) Process flow

7) A Component in UML can be _____.
   a) Hardware device
   b) Reusable software module
   c) Test case
   d) Class object

8) The Deployment Diagram shows which UML element?
   a) Software design
   b) Physical nodes and their connections
   c) User roles
   d) Object associations

9) Frameworks in UML are designed for _____.
   a) One-time use
   b) Reusability and domain-specific development
   c) Hardware mapping
   d) Testing functions

10) Modeling as a design technique helps in _____.
   a) Coding
   b) Abstraction and system understanding
   c) Testing
   d) Debugging

11) Evidence for usefulness of Object-Oriented Development includes _____.
   a) Reduced code size and increased reusability
   b) Longer development time
   c) Increased redundancy
   d) Lower abstraction

12) In Functional Modeling, the system is represented using _____.
   a) Class Diagrams
   b) Data Flow Diagrams (DFDs)
   c) Sequence Diagrams
   d) State Charts

13) In OMT, Objects are _____.
   a) Abstract ideas only
   b) Instances of classes
   c) Data tables
   d) Functions

14) Generalization in OMT refers to _____.

a) Combining classes
b) Deriving subclasses from base classes
c) Deleting attributes
d) Creating packages

____

SLR-QH-642

Seat No.		Set	S

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April - 2026
Object Oriented Modeling and Design (CSEMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if required.

SECTION – I

Q.2 Attempt Any Three. **12**

a) Explain Object-Oriented Development themes.

b) What is modeling? Explain modeling as a design technique.

c) Describe events, states, and operations with suitable examples.

d) Write a short note on object-oriented style and features of OO languages.

Q.3 Attempt for Any One. **08**

a) Explain the Object Model, Dynamic Model, and Functional Model of OMT.

b) Explain object, class, link, and association in OMT with examples.

Q.4 Compulsory Question. **08**

Draw and explain a DFD for a library management system. (Level 0, Level 1, Level 2).

SECTION – II

Q.5 Attempt Any Three. **12**

a) Define interfaces, types, and roles in UML.

b) Explain the use of packages in UML.

c) Explain components and deployment in UML.

d) Write a short note on *state machines.*

Q.6 Attempt for Any One. **08**

a) What are interaction diagrams and activity diagrams? Explain with suitable examples.

b) Draw a Deployment Diagram for a *Hospital Management System.*

Q.7 Compulsory Question. **08**

Draw and explain a Component Diagram for an *Online Banking System.*

SLR-QH-642

Seat No.	

Set P

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Object Oriented Modeling and Design (CSEMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct option from the following. **14**

1) Modeling as a design technique helps in _____.
a) Coding
b) Abstraction and system understanding
c) Testing
d) Debugging

2) Evidence for usefulness of Object-Oriented Development includes _____.
a) Reduced code size and increased reusability
b) Longer development time
c) Increased redundancy
d) Lower abstraction

3) In Functional Modeling, the system is represented using _____.
a) Class Diagrams
b) Data Flow Diagrams (DFDs)
c) Sequence Diagrams
d) State Charts

4) In OMT, Objects are _____.
a) Abstract ideas only b) Instances of classes
c) Data tables d) Functions

5) Generalization in OMT refers to _____.
a) Combining classes
b) Deriving subclasses from base classes
c) Deleting attributes
d) Creating packages

6) Concurrency in Dynamic Modeling refers to _____.
   a) Sequential processes
   b) Multiple events occurring simultaneously
   c) Reusing code
   d) Class dependencies

7) Nested State Diagrams are used for _____.
   a) Representing hierarchical states
   b) Showing inheritance
   c) Database schema
   d) Packages

8) The main purpose of a Package in UML is _____.
   a) To execute code
   b) To group related classes and interfaces
   c) To store data
   d) To compile modules

9) A Sequence Diagram depicts _____.
   a) Structural relationships
   b) Order of messages between objects
   c) Static classes
   d) System deployment

10) In UML, an Object Diagram shows _____.
   a) Static structure
   b) Dynamic structure
   c) Snapshot of system objects at a time
   d) Deployment structure

11) Collaboration Diagrams show _____.
   a) Object interaction and message flow
   b) Static class structure
   c) Use case scenarios
   d) Process flow

12) A Component in UML can be _____.
   a) Hardware device
   b) Reusable software module
   c) Test case
   d) Class object

13) The Deployment Diagram shows which UML element?
   a) Software design
   b) Physical nodes and their connections
   c) User roles
   d) Object associations

14) Frameworks in UML are designed for _____.

a) One-time use
b) Reusability and domain-specific development
c) Hardware mapping
d) Testing functions

SLR-QH-642

Seat No.	

Set P

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Object Oriented Modeling and Design (CSEMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if required.

SECTION – I

Q.2 Attempt Any Three. **12**

a) Explain Object-Oriented Development themes.

b) What is modeling? Explain modeling as a design technique.

c) Describe events, states, and operations with suitable examples.

d) Write a short note on object-oriented style and features of OO languages.

Q.3 Attempt for Any One. **08**

a) Explain the Object Model, Dynamic Model, and Functional Model of OMT.

b) Explain object, class, link, and association in OMT with examples.

Q.4 Compulsory Question. **08**

Draw and explain a DFD for a library management system. (Level 0, Level 1, Level 2).

SECTION – II

Q.5 Attempt Any Three. **12**

a) Define interfaces, types, and roles in UML.

b) Explain the use of packages in UML.

c) Explain components and deployment in UML.

d) Write a short note on *state machines.*

Q.6 Attempt for Any One. **08**

a) What are interaction diagrams and activity diagrams? Explain with suitable examples.

b) Draw a Deployment Diagram for a *Hospital Management System.*

Q.7 Compulsory Question. **08**

Draw and explain a Component Diagram for an *Online Banking System.*

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Object Oriented Modeling and Design (CSEMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct option from the following. **14**

1) The main purpose of a Package in UML is _____.
a) To execute code
b) To group related classes and interfaces
c) To store data
d) To compile modules

2) A Sequence Diagram depicts _____.
a) Structural relationships
b) Order of messages between objects
c) Static classes
d) System deployment

3) In UML, an Object Diagram shows _____.
a) Static structure
b) Dynamic structure
c) Snapshot of system objects at a time
d) Deployment structure

4) Collaboration Diagrams show _____.
a) Object interaction and message flow
b) Static class structure
c) Use case scenarios
d) Process flow

5) A Component in UML can be _____.
a) Hardware device
b) Reusable software module
c) Test case
d) Class object

6) The Deployment Diagram shows which UML element?
   a) Software design
   b) Physical nodes and their connections
   c) User roles
   d) Object associations

7) Frameworks in UML are designed for _____.
   a) One-time use
   b) Reusability and domain-specific development
   c) Hardware mapping
   d) Testing functions

8) Modeling as a design technique helps in _____.
   a) Coding
   b) Abstraction and system understanding
   c) Testing
   d) Debugging

9) Evidence for usefulness of Object-Oriented Development includes _____.
   a) Reduced code size and increased reusability
   b) Longer development time
   c) Increased redundancy
   d) Lower abstraction

10) In Functional Modeling, the system is represented using _____.
   a) Class Diagrams
   b) Data Flow Diagrams (DFDs)
   c) Sequence Diagrams
   d) State Charts

11) In OMT, Objects are _____.
   a) Abstract ideas only
   b) Instances of classes
   c) Data tables
   d) Functions

12) Generalization in OMT refers to _____.
   a) Combining classes
   b) Deriving subclasses from base classes
   c) Deleting attributes
   d) Creating packages

13) Concurrency in Dynamic Modeling refers to _____.
   a) Sequential processes
   b) Multiple events occurring simultaneously
   c) Reusing code
   d) Class dependencies

14) Nested State Diagrams are used for _____.

a) Representing hierarchical states
b) Showing inheritance
c) Database schema
d) Packages

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Object Oriented Modeling and Design (CSEMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if required.

SECTION – I

Q.2 Attempt Any Three. **12**

a) Explain Object-Oriented Development themes.

b) What is modeling? Explain modeling as a design technique.

c) Describe events, states, and operations with suitable examples.

d) Write a short note on object-oriented style and features of OO languages.

Q.3 Attempt for Any One. **08**

a) Explain the Object Model, Dynamic Model, and Functional Model of OMT.

b) Explain object, class, link, and association in OMT with examples.

Q.4 Compulsory Question. **08**

Draw and explain a DFD for a library management system. (Level 0, Level 1, Level 2).

SECTION – II

Q.5 Attempt Any Three. **12**

a) Define interfaces, types, and roles in UML.

b) Explain the use of packages in UML.

c) Explain components and deployment in UML.

d) Write a short note on *state machines.*

Q.6 Attempt for Any One. **08**

a) What are interaction diagrams and activity diagrams? Explain with suitable examples.

b) Draw a Deployment Diagram for a *Hospital Management System.*

Q.7 Compulsory Question. **08**

Draw and explain a Component Diagram for an *Online Banking System.*

SLR-QH-642

Seat No.	

Set R

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Object Oriented Modeling and Design (CSEMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct option from the following. **14**

1) Collaboration Diagrams show _____.
a) Object interaction and message flow
b) Static class structure
c) Use case scenarios
d) Process flow

2) A Component in UML can be _____.
a) Hardware device
b) Reusable software module
c) Test case
d) Class object

3) The Deployment Diagram shows which UML element?
a) Software design
b) Physical nodes and their connections
c) User roles
d) Object associations

4) Frameworks in UML are designed for _____.
a) One-time use
b) Reusability and domain-specific development
c) Hardware mapping
d) Testing functions

5) Modeling as a design technique helps in _____.
a) Coding
b) Abstraction and system understanding
c) Testing
d) Debugging

6) Evidence for usefulness of Object-Oriented Development includes _____.
   a) Reduced code size and increased reusability
   b) Longer development time
   c) Increased redundancy
   d) Lower abstraction

7) In Functional Modeling, the system is represented using _____.
   a) Class Diagrams
   b) Data Flow Diagrams (DFDs)
   c) Sequence Diagrams
   d) State Charts

8) In OMT, Objects are _____.
   a) Abstract ideas only
   b) Instances of classes
   c) Data tables
   d) Functions

9) Generalization in OMT refers to _____.
   a) Combining classes
   b) Deriving subclasses from base classes
   c) Deleting attributes
   d) Creating packages

____

10) Concurrency in Dynamic Modeling refers to _____.
   a) Sequential processes
   b) Multiple events occurring simultaneously
   c) Reusing code
   d) Class dependencies

11) Nested State Diagrams are used for _____.
   a) Representing hierarchical states
   b) Showing inheritance
   c) Database schema
   d) Packages

12) The main purpose of a Package in UML is _____.
   a) To execute code
   b) To group related classes and interfaces
   c) To store data
   d) To compile modules

13) A Sequence Diagram depicts _____.
   a) Structural relationships
   b) Order of messages between objects
   c) Static classes
   d) System deployment

14) In UML, an Object Diagram shows _____.

a) Static structure
b) Dynamic structure
c) Snapshot of system objects at a time
d) Deployment structure

SLR-QH-642

Seat No.	

Set R

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Object Oriented Modeling and Design (CSEMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if required.

SECTION – I

Q.2 Attempt Any Three. **12**

a) Explain Object-Oriented Development themes.

b) What is modeling? Explain modeling as a design technique.

c) Describe events, states, and operations with suitable examples.

d) Write a short note on object-oriented style and features of OO languages.

Q.3 Attempt for Any One. **08**

a) Explain the Object Model, Dynamic Model, and Functional Model of OMT.

b) Explain object, class, link, and association in OMT with examples.

Q.4 Compulsory Question. **08**

Draw and explain a DFD for a library management system. (Level 0, Level 1, Level 2).

SECTION – II

Q.5 Attempt Any Three. **12**

a) Define interfaces, types, and roles in UML.

b) Explain the use of packages in UML.

c) Explain components and deployment in UML.

d) Write a short note on *state machines.*

Q.6 Attempt for Any One. **08**

a) What are interaction diagrams and activity diagrams? Explain with suitable examples.

b) Draw a Deployment Diagram for a *Hospital Management System.*

Q.7 Compulsory Question. **08**

Draw and explain a Component Diagram for an *Online Banking System.*

Seat No.	

Set **S**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Object Oriented Modeling and Design (CSEMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct option from the following. **14**

1) Concurrency in Dynamic Modeling refers to _____.
a) Sequential processes
b) Multiple events occurring simultaneously
c) Reusing code
d) Class dependencies

2) Nested State Diagrams are used for _____.
a) Representing hierarchical states
b) Showing inheritance
c) Database schema
d) Packages

3) The main purpose of a Package in UML is _____.
a) To execute code
b) To group related classes and interfaces
c) To store data
d) To compile modules

4) A Sequence Diagram depicts _____.
a) Structural relationships
b) Order of messages between objects
c) Static classes
d) System deployment

5) In UML, an Object Diagram shows _____.
a) Static structure
b) Dynamic structure
c) Snapshot of system objects at a time
d) Deployment structure

6) Collaboration Diagrams show _____.
   a) Object interaction and message flow
   b) Static class structure
   c) Use case scenarios
   d) Process flow

7) A Component in UML can be _____.
   a) Hardware device
   b) Reusable software module
   c) Test case
   d) Class object

8) The Deployment Diagram shows which UML element?
   a) Software design
   b) Physical nodes and their connections
   c) User roles
   d) Object associations

9) Frameworks in UML are designed for _____.
   a) One-time use
   b) Reusability and domain-specific development
   c) Hardware mapping
   d) Testing functions

10) Modeling as a design technique helps in _____.
   a) Coding
   b) Abstraction and system understanding
   c) Testing
   d) Debugging

11) Evidence for usefulness of Object-Oriented Development includes _____.
   a) Reduced code size and increased reusability
   b) Longer development time
   c) Increased redundancy
   d) Lower abstraction

12) In Functional Modeling, the system is represented using _____.
   a) Class Diagrams
   b) Data Flow Diagrams (DFDs)
   c) Sequence Diagrams
   d) State Charts

13) In OMT, Objects are _____.
   a) Abstract ideas only
   b) Instances of classes
   c) Data tables
   d) Functions

14) Generalization in OMT refers to _____.

a) Combining classes
b) Deriving subclasses from base classes
c) Deleting attributes
d) Creating packages

____

SLR-QH-642

Seat No.	

Set S

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Object Oriented Modeling and Design (CSEMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if required.

SECTION – I

Q.2 Attempt Any Three. **12**

a) Explain Object-Oriented Development themes.

b) What is modeling? Explain modeling as a design technique.

c) Describe events, states, and operations with suitable examples.

d) Write a short note on object-oriented style and features of OO languages.

Q.3 Attempt for Any One. **08**

a) Explain the Object Model, Dynamic Model, and Functional Model of OMT.

b) Explain object, class, link, and association in OMT with examples.

Q.4 Compulsory Question. **08**

Draw and explain a DFD for a library management system. (Level 0, Level 1, Level 2).

SECTION – II

Q.5 Attempt Any Three. **12**

a) Define interfaces, types, and roles in UML.

b) Explain the use of packages in UML.

c) Explain components and deployment in UML.

d) Write a short note on *state machines.*

Q.6 Attempt for Any One. **08**

a) What are interaction diagrams and activity diagrams? Explain with suitable examples.

b) Draw a Deployment Diagram for a *Hospital Management System.*

Q.7 Compulsory Question. **08**

Draw and explain a Component Diagram for an *Online Banking System.*

SLR-QH-642

Seat No.	

Set P

T.Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Object Oriented Modeling and Design (CSEMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct option from the following. **14**

1) Modeling as a design technique helps in _____.
a) Coding
b) Abstraction and system understanding
c) Testing
d) Debugging

2) Evidence for usefulness of Object-Oriented Development includes _____.
a) Reduced code size and increased reusability
b) Longer development time
c) Increased redundancy
d) Lower abstraction

3) In Functional Modeling, the system is represented using _____.
a) Class Diagrams
b) Data Flow Diagrams (DFDs)
c) Sequence Diagrams
d) State Charts

4) In OMT, Objects are _____.
a) Abstract ideas only b) Instances of classes
c) Data tables d) Functions

5) Generalization in OMT refers to _____.
a) Combining classes
b) Deriving subclasses from base classes
c) Deleting attributes
d) Creating packages

6) Concurrency in Dynamic Modeling refers to _____.
   a) Sequential processes
   b) Multiple events occurring simultaneously
   c) Reusing code
   d) Class dependencies

7) Nested State Diagrams are used for _____.
   a) Representing hierarchical states
   b) Showing inheritance
   c) Database schema
   d) Packages

8) The main purpose of a Package in UML is _____.
   a) To execute code
   b) To group related classes and interfaces
   c) To store data
   d) To compile modules

9) A Sequence Diagram depicts _____.
   a) Structural relationships
   b) Order of messages between objects
   c) Static classes
   d) System deployment

10) In UML, an Object Diagram shows _____.
   a) Static structure
   b) Dynamic structure
   c) Snapshot of system objects at a time
   d) Deployment structure

11) Collaboration Diagrams show _____.
   a) Object interaction and message flow
   b) Static class structure
   c) Use case scenarios
   d) Process flow

12) A Component in UML can be _____.
   a) Hardware device
   b) Reusable software module
   c) Test case
   d) Class object

13) The Deployment Diagram shows which UML element?
   a) Software design
   b) Physical nodes and their connections
   c) User roles
   d) Object associations

14) Frameworks in UML are designed for _____.

a) One-time use
b) Reusability and domain-specific development
c) Hardware mapping
d) Testing functions

SLR-QH-642

Seat No.		Set	P

T.Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Object Oriented Modeling and Design (CSEMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if required.

SECTION – I

Q.2 Attempt Any Three. **12**

a) Explain Object-Oriented Development themes.

b) What is modeling? Explain modeling as a design technique.

c) Describe events, states, and operations with suitable examples.

d) Write a short note on object-oriented style and features of OO languages.

Q.3 Attempt for Any One. **08**

a) Explain the Object Model, Dynamic Model, and Functional Model of OMT.

b) Explain object, class, link, and association in OMT with examples.

Q.4 Compulsory Question. **08**

Draw and explain a DFD for a library management system. (Level 0, Level 1, Level 2).

SECTION – II

Q.5 Attempt Any Three. **12**

a) Define interfaces, types, and roles in UML.

b) Explain the use of packages in UML.

c) Explain components and deployment in UML.

d) Write a short note on *state machines.*

Q.6 Attempt for Any One. **08**

a) What are interaction diagrams and activity diagrams? Explain with suitable examples.

b) Draw a Deployment Diagram for a *Hospital Management System.*

Q.7 Compulsory Question. **08**

Draw and explain a Component Diagram for an *Online Banking System.*

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Object Oriented Modeling and Design (CSEMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct option from the following. **14**

1) The main purpose of a Package in UML is _____.
a) To execute code
b) To group related classes and interfaces
c) To store data
d) To compile modules

2) A Sequence Diagram depicts _____.
a) Structural relationships
b) Order of messages between objects
c) Static classes
d) System deployment

3) In UML, an Object Diagram shows _____.
a) Static structure
b) Dynamic structure
c) Snapshot of system objects at a time
d) Deployment structure

4) Collaboration Diagrams show _____.
a) Object interaction and message flow
b) Static class structure
c) Use case scenarios
d) Process flow

5) A Component in UML can be _____.
a) Hardware device
b) Reusable software module
c) Test case
d) Class object

6) The Deployment Diagram shows which UML element?
   a) Software design
   b) Physical nodes and their connections
   c) User roles
   d) Object associations

7) Frameworks in UML are designed for _____.
   a) One-time use
   b) Reusability and domain-specific development
   c) Hardware mapping
   d) Testing functions

8) Modeling as a design technique helps in _____.
   a) Coding
   b) Abstraction and system understanding
   c) Testing
   d) Debugging

9) Evidence for usefulness of Object-Oriented Development includes _____.
   a) Reduced code size and increased reusability
   b) Longer development time
   c) Increased redundancy
   d) Lower abstraction

10) In Functional Modeling, the system is represented using _____.
   a) Class Diagrams
   b) Data Flow Diagrams (DFDs)
   c) Sequence Diagrams
   d) State Charts

11) In OMT, Objects are _____.
   a) Abstract ideas only
   b) Instances of classes
   c) Data tables
   d) Functions

12) Generalization in OMT refers to _____.
   a) Combining classes
   b) Deriving subclasses from base classes
   c) Deleting attributes
   d) Creating packages

13) Concurrency in Dynamic Modeling refers to _____.
   a) Sequential processes
   b) Multiple events occurring simultaneously
   c) Reusing code
   d) Class dependencies

14) Nested State Diagrams are used for _____.

a) Representing hierarchical states
b) Showing inheritance
c) Database schema
d) Packages

SLR-QH-642

Seat No.	

Set Q

T.Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Object Oriented Modeling and Design (CSEMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if required.

SECTION – I

Q.2 Attempt Any Three. **12**

a) Explain Object-Oriented Development themes.

b) What is modeling? Explain modeling as a design technique.

c) Describe events, states, and operations with suitable examples.

d) Write a short note on object-oriented style and features of OO languages.

Q.3 Attempt for Any One. **08**

a) Explain the Object Model, Dynamic Model, and Functional Model of OMT.

b) Explain object, class, link, and association in OMT with examples.

Q.4 Compulsory Question. **08**

Draw and explain a DFD for a library management system. (Level 0, Level 1, Level 2).

SECTION – II

Q.5 Attempt Any Three. **12**

a) Define interfaces, types, and roles in UML.

b) Explain the use of packages in UML.

c) Explain components and deployment in UML.

d) Write a short note on *state machines.*

Q.6 Attempt for Any One. **08**

a) What are interaction diagrams and activity diagrams? Explain with suitable examples.

b) Draw a Deployment Diagram for a *Hospital Management System.*

Q.7 Compulsory Question. **08**

Draw and explain a Component Diagram for an *Online Banking System.*

Seat No.	

Set **R**

T.Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Object Oriented Modeling and Design (CSEMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct option from the following. **14**

1) Collaboration Diagrams show _____.
a) Object interaction and message flow
b) Static class structure
c) Use case scenarios
d) Process flow

2) A Component in UML can be _____.
a) Hardware device
b) Reusable software module
c) Test case
d) Class object

3) The Deployment Diagram shows which UML element?
a) Software design
b) Physical nodes and their connections
c) User roles
d) Object associations

4) Frameworks in UML are designed for _____.
a) One-time use
b) Reusability and domain-specific development
c) Hardware mapping
d) Testing functions

5) Modeling as a design technique helps in _____.
a) Coding
b) Abstraction and system understanding
c) Testing
d) Debugging

6) Evidence for usefulness of Object-Oriented Development includes _____.
   a) Reduced code size and increased reusability
   b) Longer development time
   c) Increased redundancy
   d) Lower abstraction

7) In Functional Modeling, the system is represented using _____.
   a) Class Diagrams
   b) Data Flow Diagrams (DFDs)
   c) Sequence Diagrams
   d) State Charts

8) In OMT, Objects are _____.
   a) Abstract ideas only
   b) Instances of classes
   c) Data tables
   d) Functions

9) Generalization in OMT refers to _____.
   a) Combining classes
   b) Deriving subclasses from base classes
   c) Deleting attributes
   d) Creating packages

____

10) Concurrency in Dynamic Modeling refers to _____.
   a) Sequential processes
   b) Multiple events occurring simultaneously
   c) Reusing code
   d) Class dependencies

11) Nested State Diagrams are used for _____.
   a) Representing hierarchical states
   b) Showing inheritance
   c) Database schema
   d) Packages

12) The main purpose of a Package in UML is _____.
   a) To execute code
   b) To group related classes and interfaces
   c) To store data
   d) To compile modules

13) A Sequence Diagram depicts _____.
   a) Structural relationships
   b) Order of messages between objects
   c) Static classes
   d) System deployment

14) In UML, an Object Diagram shows _____.

a) Static structure
b) Dynamic structure
c) Snapshot of system objects at a time
d) Deployment structure

SLR-QH-642

Seat No.	

Set R

T.Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Object Oriented Modeling and Design (CSEMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if required.

SECTION – I

Q.2 Attempt Any Three. **12**

a) Explain Object-Oriented Development themes.

b) What is modeling? Explain modeling as a design technique.

c) Describe events, states, and operations with suitable examples.

d) Write a short note on object-oriented style and features of OO languages.

Q.3 Attempt for Any One. **08**

a) Explain the Object Model, Dynamic Model, and Functional Model of OMT.

b) Explain object, class, link, and association in OMT with examples.

Q.4 Compulsory Question. **08**

Draw and explain a DFD for a library management system. (Level 0, Level 1, Level 2).

SECTION – II

Q.5 Attempt Any Three. **12**

a) Define interfaces, types, and roles in UML.

b) Explain the use of packages in UML.

c) Explain components and deployment in UML.

d) Write a short note on *state machines.*

Q.6 Attempt for Any One. **08**

a) What are interaction diagrams and activity diagrams? Explain with suitable examples.

b) Draw a Deployment Diagram for a *Hospital Management System.*

Q.7 Compulsory Question. **08**

Draw and explain a Component Diagram for an *Online Banking System.*

Seat No.	

Set **S**

T.Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Object Oriented Modeling and Design (CSEMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct option from the following. **14**

1) Concurrency in Dynamic Modeling refers to _____.
a) Sequential processes
b) Multiple events occurring simultaneously
c) Reusing code
d) Class dependencies

2) Nested State Diagrams are used for _____.
a) Representing hierarchical states
b) Showing inheritance
c) Database schema
d) Packages

3) The main purpose of a Package in UML is _____.
a) To execute code
b) To group related classes and interfaces
c) To store data
d) To compile modules

4) A Sequence Diagram depicts _____.
a) Structural relationships
b) Order of messages between objects
c) Static classes
d) System deployment

5) In UML, an Object Diagram shows _____.
a) Static structure
b) Dynamic structure
c) Snapshot of system objects at a time
d) Deployment structure

6) Collaboration Diagrams show _____.
   a) Object interaction and message flow
   b) Static class structure
   c) Use case scenarios
   d) Process flow

7) A Component in UML can be _____.
   a) Hardware device
   b) Reusable software module
   c) Test case
   d) Class object

8) The Deployment Diagram shows which UML element?
   a) Software design
   b) Physical nodes and their connections
   c) User roles
   d) Object associations

9) Frameworks in UML are designed for _____.
   a) One-time use
   b) Reusability and domain-specific development
   c) Hardware mapping
   d) Testing functions

10) Modeling as a design technique helps in _____.
   a) Coding
   b) Abstraction and system understanding
   c) Testing
   d) Debugging

11) Evidence for usefulness of Object-Oriented Development includes _____.
   a) Reduced code size and increased reusability
   b) Longer development time
   c) Increased redundancy
   d) Lower abstraction

12) In Functional Modeling, the system is represented using _____.
   a) Class Diagrams
   b) Data Flow Diagrams (DFDs)
   c) Sequence Diagrams
   d) State Charts

13) In OMT, Objects are _____.
   a) Abstract ideas only
   b) Instances of classes
   c) Data tables
   d) Functions

14) Generalization in OMT refers to _____.

a) Combining classes
b) Deriving subclasses from base classes
c) Deleting attributes
d) Creating packages

____

SLR-QH-642

Seat No.		Set	S

T.Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Object Oriented Modeling and Design (CSEMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if required.

SECTION – I

Q.2 Attempt Any Three. **12**

a) Explain Object-Oriented Development themes.

b) What is modeling? Explain modeling as a design technique.

c) Describe events, states, and operations with suitable examples.

d) Write a short note on object-oriented style and features of OO languages.

Q.3 Attempt for Any One. **08**

a) Explain the Object Model, Dynamic Model, and Functional Model of OMT.

b) Explain object, class, link, and association in OMT with examples.

Q.4 Compulsory Question. **08**

Draw and explain a DFD for a library management system. (Level 0, Level 1, Level 2).

SECTION – II

Q.5 Attempt Any Three. **12**

a) Define interfaces, types, and roles in UML.

b) Explain the use of packages in UML.

c) Explain components and deployment in UML.

d) Write a short note on *state machines.*

Q.6 Attempt for Any One. **08**

a) What are interaction diagrams and activity diagrams? Explain with suitable examples.

b) Draw a Deployment Diagram for a *Hospital Management System.*

Q.7 Compulsory Question. **08**

Draw and explain a Component Diagram for an *Online Banking System.*

SLR-QH-642

Seat No.	

Set P

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Object Oriented Modeling and Design (CSEMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct option from the following. **14**

1) Modeling as a design technique helps in _____.
a) Coding
b) Abstraction and system understanding
c) Testing
d) Debugging

2) Evidence for usefulness of Object-Oriented Development includes _____.
a) Reduced code size and increased reusability
b) Longer development time
c) Increased redundancy
d) Lower abstraction

3) In Functional Modeling, the system is represented using _____.
a) Class Diagrams
b) Data Flow Diagrams (DFDs)
c) Sequence Diagrams
d) State Charts

4) In OMT, Objects are _____.
a) Abstract ideas only b) Instances of classes
c) Data tables d) Functions

5) Generalization in OMT refers to _____.
a) Combining classes
b) Deriving subclasses from base classes
c) Deleting attributes
d) Creating packages

6) Concurrency in Dynamic Modeling refers to _____.
   a) Sequential processes
   b) Multiple events occurring simultaneously
   c) Reusing code
   d) Class dependencies

7) Nested State Diagrams are used for _____.
   a) Representing hierarchical states
   b) Showing inheritance
   c) Database schema
   d) Packages

8) The main purpose of a Package in UML is _____.
   a) To execute code
   b) To group related classes and interfaces
   c) To store data
   d) To compile modules

9) A Sequence Diagram depicts _____.
   a) Structural relationships
   b) Order of messages between objects
   c) Static classes
   d) System deployment

10) In UML, an Object Diagram shows _____.
   a) Static structure
   b) Dynamic structure
   c) Snapshot of system objects at a time
   d) Deployment structure

11) Collaboration Diagrams show _____.
   a) Object interaction and message flow
   b) Static class structure
   c) Use case scenarios
   d) Process flow

12) A Component in UML can be _____.
   a) Hardware device
   b) Reusable software module
   c) Test case
   d) Class object

13) The Deployment Diagram shows which UML element?
   a) Software design
   b) Physical nodes and their connections
   c) User roles
   d) Object associations

14) Frameworks in UML are designed for _____.

a) One-time use
b) Reusability and domain-specific development
c) Hardware mapping
d) Testing functions

Seat No.	

Set **P**

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Object Oriented Modeling and Design (CSEMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if required.

SECTION – I

Q.2 Attempt Any Three. **12**

a) Explain Object-Oriented Development themes.

b) What is modeling? Explain modeling as a design technique.

c) Describe events, states, and operations with suitable examples.

d) Write a short note on object-oriented style and features of OO languages.

Q.3 Attempt for Any One. **08**

a) Explain the Object Model, Dynamic Model, and Functional Model of OMT.

b) Explain object, class, link, and association in OMT with examples.

Q.4 Compulsory Question. **08**

Draw and explain a DFD for a library management system. (Level 0, Level 1, Level 2).

SECTION – II

Q.5 Attempt Any Three. **12**

a) Define interfaces, types, and roles in UML.

b) Explain the use of packages in UML.

c) Explain components and deployment in UML.

d) Write a short note on *state machines.*

Q.6 Attempt for Any One. **08**

a) What are interaction diagrams and activity diagrams? Explain with suitable examples.

b) Draw a Deployment Diagram for a *Hospital Management System.*

Q.7 Compulsory Question. **08**

Draw and explain a Component Diagram for an *Online Banking System.*

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Object Oriented Modeling and Design (CSEMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct option from the following. **14**

1) The main purpose of a Package in UML is _____.
a) To execute code
b) To group related classes and interfaces
c) To store data
d) To compile modules

2) A Sequence Diagram depicts _____.
a) Structural relationships
b) Order of messages between objects
c) Static classes
d) System deployment

3) In UML, an Object Diagram shows _____.
a) Static structure
b) Dynamic structure
c) Snapshot of system objects at a time
d) Deployment structure

4) Collaboration Diagrams show _____.
a) Object interaction and message flow
b) Static class structure
c) Use case scenarios
d) Process flow

5) A Component in UML can be _____.
a) Hardware device
b) Reusable software module
c) Test case
d) Class object

6) The Deployment Diagram shows which UML element?
   a) Software design
   b) Physical nodes and their connections
   c) User roles
   d) Object associations

7) Frameworks in UML are designed for _____.
   a) One-time use
   b) Reusability and domain-specific development
   c) Hardware mapping
   d) Testing functions

8) Modeling as a design technique helps in _____.
   a) Coding
   b) Abstraction and system understanding
   c) Testing
   d) Debugging

9) Evidence for usefulness of Object-Oriented Development includes _____.
   a) Reduced code size and increased reusability
   b) Longer development time
   c) Increased redundancy
   d) Lower abstraction

10) In Functional Modeling, the system is represented using _____.
   a) Class Diagrams
   b) Data Flow Diagrams (DFDs)
   c) Sequence Diagrams
   d) State Charts

11) In OMT, Objects are _____.
   a) Abstract ideas only
   b) Instances of classes
   c) Data tables
   d) Functions

12) Generalization in OMT refers to _____.
   a) Combining classes
   b) Deriving subclasses from base classes
   c) Deleting attributes
   d) Creating packages

13) Concurrency in Dynamic Modeling refers to _____.
   a) Sequential processes
   b) Multiple events occurring simultaneously
   c) Reusing code
   d) Class dependencies

14) Nested State Diagrams are used for _____.

a) Representing hierarchical states
b) Showing inheritance
c) Database schema
d) Packages

SLR-QH-642

Seat No.	

Set Q

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Object Oriented Modeling and Design (CSEMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if required.

SECTION – I

Q.2 Attempt Any Three. **12**

a) Explain Object-Oriented Development themes.

b) What is modeling? Explain modeling as a design technique.

c) Describe events, states, and operations with suitable examples.

d) Write a short note on object-oriented style and features of OO languages.

Q.3 Attempt for Any One. **08**

a) Explain the Object Model, Dynamic Model, and Functional Model of OMT.

b) Explain object, class, link, and association in OMT with examples.

Q.4 Compulsory Question. **08**

Draw and explain a DFD for a library management system. (Level 0, Level 1, Level 2).

SECTION – II

Q.5 Attempt Any Three. **12**

a) Define interfaces, types, and roles in UML.

b) Explain the use of packages in UML.

c) Explain components and deployment in UML.

d) Write a short note on *state machines.*

Q.6 Attempt for Any One. **08**

a) What are interaction diagrams and activity diagrams? Explain with suitable examples.

b) Draw a Deployment Diagram for a *Hospital Management System.*

Q.7 Compulsory Question. **08**

Draw and explain a Component Diagram for an *Online Banking System.*

Seat No.	

Set **R**

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Object Oriented Modeling and Design (CSEMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct option from the following. **14**

1) Collaboration Diagrams show _____.
a) Object interaction and message flow
b) Static class structure
c) Use case scenarios
d) Process flow

2) A Component in UML can be _____.
a) Hardware device
b) Reusable software module
c) Test case
d) Class object

3) The Deployment Diagram shows which UML element?
a) Software design
b) Physical nodes and their connections
c) User roles
d) Object associations

4) Frameworks in UML are designed for _____.
a) One-time use
b) Reusability and domain-specific development
c) Hardware mapping
d) Testing functions

5) Modeling as a design technique helps in _____.
a) Coding
b) Abstraction and system understanding
c) Testing
d) Debugging

6) Evidence for usefulness of Object-Oriented Development includes _____.
   a) Reduced code size and increased reusability
   b) Longer development time
   c) Increased redundancy
   d) Lower abstraction

7) In Functional Modeling, the system is represented using _____.
   a) Class Diagrams
   b) Data Flow Diagrams (DFDs)
   c) Sequence Diagrams
   d) State Charts

8) In OMT, Objects are _____.
   a) Abstract ideas only
   b) Instances of classes
   c) Data tables
   d) Functions

9) Generalization in OMT refers to _____.
   a) Combining classes
   b) Deriving subclasses from base classes
   c) Deleting attributes
   d) Creating packages

____

10) Concurrency in Dynamic Modeling refers to _____.
   a) Sequential processes
   b) Multiple events occurring simultaneously
   c) Reusing code
   d) Class dependencies

11) Nested State Diagrams are used for _____.
   a) Representing hierarchical states
   b) Showing inheritance
   c) Database schema
   d) Packages

12) The main purpose of a Package in UML is _____.
   a) To execute code
   b) To group related classes and interfaces
   c) To store data
   d) To compile modules

13) A Sequence Diagram depicts _____.
   a) Structural relationships
   b) Order of messages between objects
   c) Static classes
   d) System deployment

14) In UML, an Object Diagram shows _____.

a) Static structure
b) Dynamic structure
c) Snapshot of system objects at a time
d) Deployment structure

SLR-QH-642

Seat No.	

Set R

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Object Oriented Modeling and Design (CSEMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if required.

SECTION – I

Q.2 Attempt Any Three. **12**

a) Explain Object-Oriented Development themes.

b) What is modeling? Explain modeling as a design technique.

c) Describe events, states, and operations with suitable examples.

d) Write a short note on object-oriented style and features of OO languages.

Q.3 Attempt for Any One. **08**

a) Explain the Object Model, Dynamic Model, and Functional Model of OMT.

b) Explain object, class, link, and association in OMT with examples.

Q.4 Compulsory Question. **08**

Draw and explain a DFD for a library management system. (Level 0, Level 1, Level 2).

SECTION – II

Q.5 Attempt Any Three. **12**

a) Define interfaces, types, and roles in UML.

b) Explain the use of packages in UML.

c) Explain components and deployment in UML.

d) Write a short note on *state machines.*

Q.6 Attempt for Any One. **08**

a) What are interaction diagrams and activity diagrams? Explain with suitable examples.

b) Draw a Deployment Diagram for a *Hospital Management System.*

Q.7 Compulsory Question. **08**

Draw and explain a Component Diagram for an *Online Banking System.*

Seat No.	

Set **S**

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Object Oriented Modeling and Design (CSEMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct option from the following. **14**

1) Concurrency in Dynamic Modeling refers to _____.
a) Sequential processes
b) Multiple events occurring simultaneously
c) Reusing code
d) Class dependencies

2) Nested State Diagrams are used for _____.
a) Representing hierarchical states
b) Showing inheritance
c) Database schema
d) Packages

3) The main purpose of a Package in UML is _____.
a) To execute code
b) To group related classes and interfaces
c) To store data
d) To compile modules

4) A Sequence Diagram depicts _____.
a) Structural relationships
b) Order of messages between objects
c) Static classes
d) System deployment

5) In UML, an Object Diagram shows _____.
a) Static structure
b) Dynamic structure
c) Snapshot of system objects at a time
d) Deployment structure

6) Collaboration Diagrams show _____.
   a) Object interaction and message flow
   b) Static class structure
   c) Use case scenarios
   d) Process flow

7) A Component in UML can be _____.
   a) Hardware device
   b) Reusable software module
   c) Test case
   d) Class object

8) The Deployment Diagram shows which UML element?
   a) Software design
   b) Physical nodes and their connections
   c) User roles
   d) Object associations

9) Frameworks in UML are designed for _____.
   a) One-time use
   b) Reusability and domain-specific development
   c) Hardware mapping
   d) Testing functions

10) Modeling as a design technique helps in _____.
   a) Coding
   b) Abstraction and system understanding
   c) Testing
   d) Debugging

11) Evidence for usefulness of Object-Oriented Development includes _____.
   a) Reduced code size and increased reusability
   b) Longer development time
   c) Increased redundancy
   d) Lower abstraction

12) In Functional Modeling, the system is represented using _____.
   a) Class Diagrams
   b) Data Flow Diagrams (DFDs)
   c) Sequence Diagrams
   d) State Charts

13) In OMT, Objects are _____.
   a) Abstract ideas only
   b) Instances of classes
   c) Data tables
   d) Functions

14) Generalization in OMT refers to _____.

a) Combining classes
b) Deriving subclasses from base classes
c) Deleting attributes
d) Creating packages

____

SLR-QH-642

Seat No.	

Set S

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Object Oriented Modeling and Design (CSEMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if required.

SECTION – I

Q.2 Attempt Any Three. **12**

a) Explain Object-Oriented Development themes.

b) What is modeling? Explain modeling as a design technique.

c) Describe events, states, and operations with suitable examples.

d) Write a short note on object-oriented style and features of OO languages.

Q.3 Attempt for Any One. **08**

a) Explain the Object Model, Dynamic Model, and Functional Model of OMT.

b) Explain object, class, link, and association in OMT with examples.

Q.4 Compulsory Question. **08**

Draw and explain a DFD for a library management system. (Level 0, Level 1, Level 2).

SECTION – II

Q.5 Attempt Any Three. **12**

a) Define interfaces, types, and roles in UML.

b) Explain the use of packages in UML.

c) Explain components and deployment in UML.

d) Write a short note on *state machines.*

Q.6 Attempt for Any One. **08**

a) What are interaction diagrams and activity diagrams? Explain with suitable examples.

b) Draw a Deployment Diagram for a *Hospital Management System.*

Q.7 Compulsory Question. **08**

Draw and explain a Component Diagram for an *Online Banking System.*

SLR-QH-642

Seat No.	

Set P

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Object Oriented Modeling and Design (CSEMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct option from the following. **14**

1) Modeling as a design technique helps in _____.
a) Coding
b) Abstraction and system understanding
c) Testing
d) Debugging

2) Evidence for usefulness of Object-Oriented Development includes _____.
a) Reduced code size and increased reusability
b) Longer development time
c) Increased redundancy
d) Lower abstraction

3) In Functional Modeling, the system is represented using _____.
a) Class Diagrams
b) Data Flow Diagrams (DFDs)
c) Sequence Diagrams
d) State Charts

4) In OMT, Objects are _____.
a) Abstract ideas only b) Instances of classes
c) Data tables d) Functions

5) Generalization in OMT refers to _____.
a) Combining classes
b) Deriving subclasses from base classes
c) Deleting attributes
d) Creating packages

6) Concurrency in Dynamic Modeling refers to _____.
   a) Sequential processes
   b) Multiple events occurring simultaneously
   c) Reusing code
   d) Class dependencies

7) Nested State Diagrams are used for _____.
   a) Representing hierarchical states
   b) Showing inheritance
   c) Database schema
   d) Packages

8) The main purpose of a Package in UML is _____.
   a) To execute code
   b) To group related classes and interfaces
   c) To store data
   d) To compile modules

9) A Sequence Diagram depicts _____.
   a) Structural relationships
   b) Order of messages between objects
   c) Static classes
   d) System deployment

10) In UML, an Object Diagram shows _____.
   a) Static structure
   b) Dynamic structure
   c) Snapshot of system objects at a time
   d) Deployment structure

11) Collaboration Diagrams show _____.
   a) Object interaction and message flow
   b) Static class structure
   c) Use case scenarios
   d) Process flow

12) A Component in UML can be _____.
   a) Hardware device
   b) Reusable software module
   c) Test case
   d) Class object

13) The Deployment Diagram shows which UML element?
   a) Software design
   b) Physical nodes and their connections
   c) User roles
   d) Object associations

14) Frameworks in UML are designed for _____.

a) One-time use
b) Reusability and domain-specific development
c) Hardware mapping
d) Testing functions

SLR-QH-642

Seat No.	

Set P

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS)
Examination: March/April - 2026
Object Oriented Modeling and Design (CSEMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if required.

SECTION – I

Q.2 Attempt Any Three. **12**

a) Explain Object-Oriented Development themes.

b) What is modeling? Explain modeling as a design technique.

c) Describe events, states, and operations with suitable examples.

d) Write a short note on object-oriented style and features of OO languages.

Q.3 Attempt for Any One. **08**

a) Explain the Object Model, Dynamic Model, and Functional Model of OMT.

b) Explain object, class, link, and association in OMT with examples.

Q.4 Compulsory Question. **08**

Draw and explain a DFD for a library management system. (Level 0, Level 1, Level 2).

SECTION – II

Q.5 Attempt Any Three. **12**

a) Define interfaces, types, and roles in UML.

b) Explain the use of packages in UML.

c) Explain components and deployment in UML.

d) Write a short note on *state machines.*

Q.6 Attempt for Any One. **08**

a) What are interaction diagrams and activity diagrams? Explain with suitable examples.

b) Draw a Deployment Diagram for a *Hospital Management System.*

Q.7 Compulsory Question. **08**

Draw and explain a Component Diagram for an *Online Banking System.*

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Object Oriented Modeling and Design (CSEMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct option from the following. **14**

1) The main purpose of a Package in UML is _____.
a) To execute code
b) To group related classes and interfaces
c) To store data
d) To compile modules

2) A Sequence Diagram depicts _____.
a) Structural relationships
b) Order of messages between objects
c) Static classes
d) System deployment

3) In UML, an Object Diagram shows _____.
a) Static structure
b) Dynamic structure
c) Snapshot of system objects at a time
d) Deployment structure

4) Collaboration Diagrams show _____.
a) Object interaction and message flow
b) Static class structure
c) Use case scenarios
d) Process flow

5) A Component in UML can be _____.
a) Hardware device
b) Reusable software module
c) Test case
d) Class object

6) The Deployment Diagram shows which UML element?
   a) Software design
   b) Physical nodes and their connections
   c) User roles
   d) Object associations

7) Frameworks in UML are designed for _____.
   a) One-time use
   b) Reusability and domain-specific development
   c) Hardware mapping
   d) Testing functions

8) Modeling as a design technique helps in _____.
   a) Coding
   b) Abstraction and system understanding
   c) Testing
   d) Debugging

9) Evidence for usefulness of Object-Oriented Development includes _____.
   a) Reduced code size and increased reusability
   b) Longer development time
   c) Increased redundancy
   d) Lower abstraction

10) In Functional Modeling, the system is represented using _____.
   a) Class Diagrams
   b) Data Flow Diagrams (DFDs)
   c) Sequence Diagrams
   d) State Charts

11) In OMT, Objects are _____.
   a) Abstract ideas only
   b) Instances of classes
   c) Data tables
   d) Functions

12) Generalization in OMT refers to _____.
   a) Combining classes
   b) Deriving subclasses from base classes
   c) Deleting attributes
   d) Creating packages

13) Concurrency in Dynamic Modeling refers to _____.
   a) Sequential processes
   b) Multiple events occurring simultaneously
   c) Reusing code
   d) Class dependencies

14) Nested State Diagrams are used for _____.

a) Representing hierarchical states
b) Showing inheritance
c) Database schema
d) Packages

SLR-QH-642

Seat No.	

Set Q

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS)
Examination: March/April - 2026
Object Oriented Modeling and Design (CSEMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if required.

SECTION – I

Q.2 Attempt Any Three. **12**

a) Explain Object-Oriented Development themes.

b) What is modeling? Explain modeling as a design technique.

c) Describe events, states, and operations with suitable examples.

d) Write a short note on object-oriented style and features of OO languages.

Q.3 Attempt for Any One. **08**

a) Explain the Object Model, Dynamic Model, and Functional Model of OMT.

b) Explain object, class, link, and association in OMT with examples.

Q.4 Compulsory Question. **08**

Draw and explain a DFD for a library management system. (Level 0, Level 1, Level 2).

SECTION – II

Q.5 Attempt Any Three. **12**

a) Define interfaces, types, and roles in UML.

b) Explain the use of packages in UML.

c) Explain components and deployment in UML.

d) Write a short note on *state machines.*

Q.6 Attempt for Any One. **08**

a) What are interaction diagrams and activity diagrams? Explain with suitable examples.

b) Draw a Deployment Diagram for a *Hospital Management System.*

Q.7 Compulsory Question. **08**

Draw and explain a Component Diagram for an *Online Banking System.*

Seat No.	

Set R

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Object Oriented Modeling and Design (CSEMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct option from the following. **14**

1) Collaboration Diagrams show _____.
a) Object interaction and message flow
b) Static class structure
c) Use case scenarios
d) Process flow

2) A Component in UML can be _____.
a) Hardware device
b) Reusable software module
c) Test case
d) Class object

3) The Deployment Diagram shows which UML element?
a) Software design
b) Physical nodes and their connections
c) User roles
d) Object associations

4) Frameworks in UML are designed for _____.
a) One-time use
b) Reusability and domain-specific development
c) Hardware mapping
d) Testing functions

5) Modeling as a design technique helps in _____.
a) Coding
b) Abstraction and system understanding
c) Testing
d) Debugging

6) Evidence for usefulness of Object-Oriented Development includes _____.
   a) Reduced code size and increased reusability
   b) Longer development time
   c) Increased redundancy
   d) Lower abstraction

7) In Functional Modeling, the system is represented using _____.
   a) Class Diagrams
   b) Data Flow Diagrams (DFDs)
   c) Sequence Diagrams
   d) State Charts

8) In OMT, Objects are _____.
   a) Abstract ideas only
   b) Instances of classes
   c) Data tables
   d) Functions

9) Generalization in OMT refers to _____.
   a) Combining classes
   b) Deriving subclasses from base classes
   c) Deleting attributes
   d) Creating packages

____

10) Concurrency in Dynamic Modeling refers to _____.
   a) Sequential processes
   b) Multiple events occurring simultaneously
   c) Reusing code
   d) Class dependencies

11) Nested State Diagrams are used for _____.
   a) Representing hierarchical states
   b) Showing inheritance
   c) Database schema
   d) Packages

12) The main purpose of a Package in UML is _____.
   a) To execute code
   b) To group related classes and interfaces
   c) To store data
   d) To compile modules

13) A Sequence Diagram depicts _____.
   a) Structural relationships
   b) Order of messages between objects
   c) Static classes
   d) System deployment

14) In UML, an Object Diagram shows _____.

a) Static structure
b) Dynamic structure
c) Snapshot of system objects at a time
d) Deployment structure

SLR-QH-642

Seat No.	

Set R

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS)
Examination: March/April - 2026
Object Oriented Modeling and Design (CSEMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if required.

SECTION – I

Q.2 Attempt Any Three. **12**

a) Explain Object-Oriented Development themes.

b) What is modeling? Explain modeling as a design technique.

c) Describe events, states, and operations with suitable examples.

d) Write a short note on object-oriented style and features of OO languages.

Q.3 Attempt for Any One. **08**

a) Explain the Object Model, Dynamic Model, and Functional Model of OMT.

b) Explain object, class, link, and association in OMT with examples.

Q.4 Compulsory Question. **08**

Draw and explain a DFD for a library management system. (Level 0, Level 1, Level 2).

SECTION – II

Q.5 Attempt Any Three. **12**

a) Define interfaces, types, and roles in UML.

b) Explain the use of packages in UML.

c) Explain components and deployment in UML.

d) Write a short note on *state machines.*

Q.6 Attempt for Any One. **08**

a) What are interaction diagrams and activity diagrams? Explain with suitable examples.

b) Draw a Deployment Diagram for a *Hospital Management System.*

Q.7 Compulsory Question. **08**

Draw and explain a Component Diagram for an *Online Banking System.*

Seat No.	

Set **S**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Object Oriented Modeling and Design (CSEMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct option from the following. **14**

1) Concurrency in Dynamic Modeling refers to _____.
a) Sequential processes
b) Multiple events occurring simultaneously
c) Reusing code
d) Class dependencies

2) Nested State Diagrams are used for _____.
a) Representing hierarchical states
b) Showing inheritance
c) Database schema
d) Packages

3) The main purpose of a Package in UML is _____.
a) To execute code
b) To group related classes and interfaces
c) To store data
d) To compile modules

4) A Sequence Diagram depicts _____.
a) Structural relationships
b) Order of messages between objects
c) Static classes
d) System deployment

5) In UML, an Object Diagram shows _____.
a) Static structure
b) Dynamic structure
c) Snapshot of system objects at a time
d) Deployment structure

6) Collaboration Diagrams show _____.
   a) Object interaction and message flow
   b) Static class structure
   c) Use case scenarios
   d) Process flow

7) A Component in UML can be _____.
   a) Hardware device
   b) Reusable software module
   c) Test case
   d) Class object

8) The Deployment Diagram shows which UML element?
   a) Software design
   b) Physical nodes and their connections
   c) User roles
   d) Object associations

9) Frameworks in UML are designed for _____.
   a) One-time use
   b) Reusability and domain-specific development
   c) Hardware mapping
   d) Testing functions

10) Modeling as a design technique helps in _____.
   a) Coding
   b) Abstraction and system understanding
   c) Testing
   d) Debugging

11) Evidence for usefulness of Object-Oriented Development includes _____.
   a) Reduced code size and increased reusability
   b) Longer development time
   c) Increased redundancy
   d) Lower abstraction

12) In Functional Modeling, the system is represented using _____.
   a) Class Diagrams
   b) Data Flow Diagrams (DFDs)
   c) Sequence Diagrams
   d) State Charts

13) In OMT, Objects are _____.
   a) Abstract ideas only
   b) Instances of classes
   c) Data tables
   d) Functions

14) Generalization in OMT refers to _____.

a) Combining classes
b) Deriving subclasses from base classes
c) Deleting attributes
d) Creating packages

____

SLR-QH-642

Seat No.	

Set S

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS)
Examination: March/April - 2026
Object Oriented Modeling and Design (CSEMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if required.

SECTION – I

Q.2 Attempt Any Three. **12**

a) Explain Object-Oriented Development themes.

b) What is modeling? Explain modeling as a design technique.

c) Describe events, states, and operations with suitable examples.

d) Write a short note on object-oriented style and features of OO languages.

Q.3 Attempt for Any One. **08**

a) Explain the Object Model, Dynamic Model, and Functional Model of OMT.

b) Explain object, class, link, and association in OMT with examples.

Q.4 Compulsory Question. **08**

Draw and explain a DFD for a library management system. (Level 0, Level 1, Level 2).

SECTION – II

Q.5 Attempt Any Three. **12**

a) Define interfaces, types, and roles in UML.

b) Explain the use of packages in UML.

c) Explain components and deployment in UML.

d) Write a short note on *state machines.*

Q.6 Attempt for Any One. **08**

a) What are interaction diagrams and activity diagrams? Explain with suitable examples.

b) Draw a Deployment Diagram for a *Hospital Management System.*

Q.7 Compulsory Question. **08**

Draw and explain a Component Diagram for an *Online Banking System.*

SLR-QH-643

Seat No.	

Set P

T. Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Electrical Installation and Utilization (EEMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) The term "hazard" refers to _____.
a) A potential source of harm b) An unexpected event
c) A rescue method d) A type of accident

2) Which of the following defines "safety"?
a) Elimination of all risks
b) Freedom from danger, risk, or injury
c) Absence of accidents
d) Working without supervision

3) Responsibility in safety means _____.
a) The power to take decisions
b) The right to punish
c) The duty to perform assigned tasks safely
d) Authority without work

4) I.E. Act stands for _____.
a) Indian Electricity Act b) Indian Engineering Act
c) Industrial Energy Act d) Internal Electrical Act

5) The main purpose of a machine foundation is to _____.
a) Increase machine speed
b) Support and absorb vibrations of the machine
c) Reduce current flow
d) Supply cooling water

6) Which factor is *most important* in designing a machine foundation?
a) Color of the floor
b) Type of soil and machine load
c) Lighting arrangement
d) Size of building

7) The foundation of a rotating machine should be _____.
a) Weak and flexible
b) Made of wood
c) Rigid and vibration-free
d) Above ground level

8) Static machines require foundation mainly for _____.
a) Reducing speed
b) Stability and load support
c) Increasing vibration
d) Decoration

9) Electric heating converts _____.
a) Mechanical energy into heat energy
b) Electrical energy into heat energy
c) Chemical energy into light energy
d) Heat energy into electrical energy

10) The most commonly used principle for electric heating is _____.
a) Faraday's law
b) Joule's law of heating
c) Lenz's law
d) Fleming's rule

11) Which of the following is not a type of electric heating?
a) Resistance heating
b) Induction heating
c) Arc heating
d) Conduction heating

12) The unit of luminous intensity is _____.
a) Lumen
b) Lux
c) Candela
d) Watt

13) The law which states that illumination is inversely proportional to the square of the distance is _____.
a) Lambert's Cosine Law
b) Ohm's Law
c) Inverse Square Law
d) Faraday's Law

14) The unit of illumination (E) is _____.
a) Lumen
b) Watt/m^2
c) Candela
d) Lux (Lumen/m^2)

Seat No.	

Set **P**

T. Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Electrical Installation and Utilization (EEMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Solve Any Four. **16**

a) Definition of terminology used in safety; safety, hazard, accident.

b) Explain I. E. Act & statutory regulations for safety of persons & equipment working with electrical installation.

c) Explain Procedure for rescuing the person who has received an electric shock.

d) Explain Factors involved in designing the machine foundation.

e) Explain procedure for leveling & alignment of two shafts of directly & indirectly coupled drives.

Q.3 Solve Any Two. **12**

a) Installation of rotating machines as per I.S.900-1992.

b) Explain Meaning & causes of electrical accidents factors on which severity of shock depends.

c) Explain methods of providing artificial respiration.

SECTION – II

Q.4 Solve Any Four. **16**

a) Explain laws of illumination.

b) Explain construction & Working mercury vapour lamp.

c) Comparison between tungsten filament lamps and fluorescent tubes.

d) Explain basic principles of light control.

e) Explain CFL & LED Lamps.

Q.5 Solve Any Two. **12**

a) Explain advantages, disadvantages of electrical heating.

b) Explain street lighting.

c) Explain Flood lighting.

SLR-QH-643

Seat No.	

Set Q

T. Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Electrical Installation and Utilization (EEMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) Static machines require foundation mainly for _____.
a) Reducing speed b) Stability and load support
c) Increasing vibration d) Decoration

2) Electric heating converts _____.
a) Mechanical energy into heat energy
b) Electrical energy into heat energy
c) Chemical energy into light energy
d) Heat energy into electrical energy

3) The most commonly used principle for electric heating is _____.
a) Faraday's law b) Joule's law of heating
c) Lenz's law d) Fleming's rule

4) Which of the following is not a type of electric heating?
a) Resistance heating b) Induction heating
c) Arc heating d) Conduction heating

5) The unit of luminous intensity is _____.
a) Lumen b) Lux
c) Candela d) Watt

6) The law which states that illumination is inversely proportional to the square of the distance is _____.
a) Lambert's Cosine Law b) Ohm's Law
c) Inverse Square Law d) Faraday's Law

7) The unit of illumination (E) is _____.
a) Lumen b) Watt/m^2
c) Candela d) Lux (Lumen/m^2)

8) The term “hazard” refers to _____.
a) A potential source of harm b) An unexpected event
c) A rescue method d) A type of accident

9) Which of the following defines “safety”?
a) Elimination of all risks
b) Freedom from danger, risk, or injury
c) Absence of accidents
d) Working without supervision

10) Responsibility in safety means _____.
a) The power to take decisions
b) The right to punish
c) The duty to perform assigned tasks safely
d) Authority without work

11) I.E. Act stands for _____.
a) Indian Electricity Act b) Indian Engineering Act
c) Industrial Energy Act d) Internal Electrical Act

12) The main purpose of a machine foundation is to _____.
a) Increase machine speed
b) Support and absorb vibrations of the machine
c) Reduce current flow
d) Supply cooling water

13) Which factor is *most important* in designing a machine foundation?
a) Color of the floor
b) Type of soil and machine load
c) Lighting arrangement
d) Size of building

14) The foundation of a rotating machine should be _____.
a) Weak and flexible b) Made of wood
c) Rigid and vibration-free d) Above ground level

Seat No.	

Set **Q**

T. Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Electrical Installation and Utilization (EEMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Solve Any Four. **16**

a) Definition of terminology used in safety; safety, hazard, accident.

b) Explain I. E. Act & statutory regulations for safety of persons & equipment working with electrical installation.

c) Explain Procedure for rescuing the person who has received an electric shock.

d) Explain Factors involved in designing the machine foundation.

e) Explain procedure for leveling & alignment of two shafts of directly & indirectly coupled drives.

Q.3 Solve Any Two. **12**

a) Installation of rotating machines as per I.S.900-1992.

b) Explain Meaning & causes of electrical accidents factors on which severity of shock depends.

c) Explain methods of providing artificial respiration.

SECTION – II

Q.4 Solve Any Four. **16**

a) Explain laws of illumination.

b) Explain construction & Working mercury vapour lamp.

c) Comparison between tungsten filament lamps and fluorescent tubes.

d) Explain basic principles of light control.

e) Explain CFL & LED Lamps.

Q.5 Solve Any Two. **12**

a) Explain advantages, disadvantages of electrical heating.

b) Explain street lighting.

c) Explain Flood lighting.

SLR-QH-643

Seat No.	

Set R

T. Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Electrical Installation and Utilization (EEMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) Which of the following is not a type of electric heating?
a) Resistance heating b) Induction heating
c) Arc heating d) Conduction heating

2) The unit of luminous intensity is _____.
a) Lumen b) Lux
c) Candela d) Watt

3) The law which states that illumination is inversely proportional to the square of the distance is _____.
a) Lambert's Cosine Law b) Ohm's Law
c) Inverse Square Law d) Faraday's Law

4) The unit of illumination (E) is _____.
a) Lumen b) Watt/m^2
c) Candela d) Lux (Lumen/m^2)

5) The term "hazard" refers to _____.
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c) Reduce current flow
d) Supply cooling water

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a) Color of the floor
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c) Lighting arrangement
d) Size of building

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a) Weak and flexible
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c) Rigid and vibration-free
d) Above ground level

12) Static machines require foundation mainly for _____.
a) Reducing speed
b) Stability and load support
c) Increasing vibration
d) Decoration

13) Electric heating converts _____.
a) Mechanical energy into heat energy
b) Electrical energy into heat energy
c) Chemical energy into light energy
d) Heat energy into electrical energy

14) The most commonly used principle for electric heating is _____.
a) Faraday's law
b) Joule's law of heating
c) Lenz's law
d) Fleming's rule

Seat No.	

Set **R**

T. Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Electrical Installation and Utilization (EEMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Solve Any Four. **16**

a) Definition of terminology used in safety; safety, hazard, accident.

b) Explain I. E. Act & statutory regulations for safety of persons & equipment working with electrical installation.

c) Explain Procedure for rescuing the person who has received an electric shock.

d) Explain Factors involved in designing the machine foundation.

e) Explain procedure for leveling & alignment of two shafts of directly & indirectly coupled drives.

Q.3 Solve Any Two. **12**

a) Installation of rotating machines as per I.S.900-1992.

b) Explain Meaning & causes of electrical accidents factors on which severity of shock depends.

c) Explain methods of providing artificial respiration.

SECTION – II

Q.4 Solve Any Four. **16**

a) Explain laws of illumination.

b) Explain construction & Working mercury vapour lamp.

c) Comparison between tungsten filament lamps and fluorescent tubes.

d) Explain basic principles of light control.

e) Explain CFL & LED Lamps.

Q.5 Solve Any Two. **12**

a) Explain advantages, disadvantages of electrical heating.

b) Explain street lighting.

c) Explain Flood lighting.

SLR-QH-643

Seat No.	

Set S

T. Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Electrical Installation and Utilization (EEMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) Which factor is *most important* in designing a machine foundation?
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c) The duty to perform assigned tasks safely
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13) I.E. Act stands for _____.
a) Indian Electricity Act b) Indian Engineering Act
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14) The main purpose of a machine foundation is to _____.
a) Increase machine speed
b) Support and absorb vibrations of the machine
c) Reduce current flow
d) Supply cooling water

SLR-QH-643

Seat No.	

Set S

T. Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Electrical Installation and Utilization (EEMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Solve Any Four. **16**

a) Definition of terminology used in safety; safety, hazard, accident.

b) Explain I. E. Act & statutory regulations for safety of persons & equipment working with electrical installation.

c) Explain Procedure for rescuing the person who has received an electric shock.

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e) Explain procedure for leveling & alignment of two shafts of directly & indirectly coupled drives.

Q.3 Solve Any Two. **12**

a) Installation of rotating machines as per I.S.900-1992.

b) Explain Meaning & causes of electrical accidents factors on which severity of shock depends.

c) Explain methods of providing artificial respiration.

SECTION – II

Q.4 Solve Any Four. **16**

a) Explain laws of illumination.

b) Explain construction & Working mercury vapour lamp.

c) Comparison between tungsten filament lamps and fluorescent tubes.

d) Explain basic principles of light control.

e) Explain CFL & LED Lamps.

Q.5 Solve Any Two. **12**

a) Explain advantages, disadvantages of electrical heating.

b) Explain street lighting.

c) Explain Flood lighting.

SLR-QH-643

Seat No.	

Set P

T. Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Electrical Installation and Utilization (EEMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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c) Lighting arrangement
d) Size of building

7) The foundation of a rotating machine should be _____.
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d) Above ground level

8) Static machines require foundation mainly for _____.
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c) Lenz's law
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a) Lumen
b) Lux
c) Candela
d) Watt

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a) Lambert's Cosine Law
b) Ohm's Law
c) Inverse Square Law
d) Faraday's Law

14) The unit of illumination (E) is _____.
a) Lumen
b) Watt/m^2
c) Candela
d) Lux (Lumen/m^2)

SLR-QH-643

Seat No.	

Set P

T. Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Electrical Installation and Utilization (EEMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Solve Any Four. **16**

a) Definition of terminology used in safety; safety, hazard, accident.

b) Explain I. E. Act & statutory regulations for safety of persons & equipment working with electrical installation.

c) Explain Procedure for rescuing the person who has received an electric shock.

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Q.3 Solve Any Two. **12**

a) Installation of rotating machines as per I.S.900-1992.

b) Explain Meaning & causes of electrical accidents factors on which severity of shock depends.

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SECTION – II

Q.4 Solve Any Four. **16**

a) Explain laws of illumination.

b) Explain construction & Working mercury vapour lamp.

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d) Explain basic principles of light control.

e) Explain CFL & LED Lamps.

Q.5 Solve Any Two. **12**

a) Explain advantages, disadvantages of electrical heating.

b) Explain street lighting.

c) Explain Flood lighting.

SLR-QH-643

Seat No.	

Set Q

T. Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Electrical Installation and Utilization (EEMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) Static machines require foundation mainly for _____.
a) Reducing speed b) Stability and load support
c) Increasing vibration d) Decoration

2) Electric heating converts _____.
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b) Electrical energy into heat energy
c) Chemical energy into light energy
d) Heat energy into electrical energy

3) The most commonly used principle for electric heating is _____.
a) Faraday's law b) Joule's law of heating
c) Lenz's law d) Fleming's rule

4) Which of the following is not a type of electric heating?
a) Resistance heating b) Induction heating
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d) Supply cooling water

13) Which factor is *most important* in designing a machine foundation?
a) Color of the floor
b) Type of soil and machine load
c) Lighting arrangement
d) Size of building

14) The foundation of a rotating machine should be _____.
a) Weak and flexible b) Made of wood
c) Rigid and vibration-free d) Above ground level

SLR-QH-643

Seat No.	

Set Q

T. Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Electrical Installation and Utilization (EEMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Solve Any Four. **16**

a) Definition of terminology used in safety; safety, hazard, accident.

b) Explain I. E. Act & statutory regulations for safety of persons & equipment working with electrical installation.

c) Explain Procedure for rescuing the person who has received an electric shock.

d) Explain Factors involved in designing the machine foundation.

e) Explain procedure for leveling & alignment of two shafts of directly & indirectly coupled drives.

Q.3 Solve Any Two. **12**

a) Installation of rotating machines as per I.S.900-1992.

b) Explain Meaning & causes of electrical accidents factors on which severity of shock depends.

c) Explain methods of providing artificial respiration.

SECTION – II

Q.4 Solve Any Four. **16**

a) Explain laws of illumination.

b) Explain construction & Working mercury vapour lamp.

c) Comparison between tungsten filament lamps and fluorescent tubes.

d) Explain basic principles of light control.

e) Explain CFL & LED Lamps.

Q.5 Solve Any Two. **12**

a) Explain advantages, disadvantages of electrical heating.

b) Explain street lighting.

c) Explain Flood lighting.

SLR-QH-643

Seat No.	

Set R

T. Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Electrical Installation and Utilization (EEMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) Which of the following is not a type of electric heating?
a) Resistance heating b) Induction heating
c) Arc heating d) Conduction heating

2) The unit of luminous intensity is _____.
a) Lumen b) Lux
c) Candela d) Watt

3) The law which states that illumination is inversely proportional to the square of the distance is _____.
a) Lambert's Cosine Law b) Ohm's Law
c) Inverse Square Law d) Faraday's Law

4) The unit of illumination (E) is _____.
a) Lumen b) Watt/m^2
c) Candela d) Lux (Lumen/m^2)

5) The term "hazard" refers to _____.
a) A potential source of harm b) An unexpected event
c) A rescue method d) A type of accident

6) Which of the following defines "safety"?
a) Elimination of all risks
b) Freedom from danger, risk, or injury
c) Absence of accidents
d) Working without supervision

7) Responsibility in safety means _____.
a) The power to take decisions
b) The right to punish
c) The duty to perform assigned tasks safely
d) Authority without work

8) I.E. Act stands for _____.
a) Indian Electricity Act
b) Indian Engineering Act
c) Industrial Energy Act
d) Internal Electrical Act

9) The main purpose of a machine foundation is to _____.
a) Increase machine speed
b) Support and absorb vibrations of the machine
c) Reduce current flow
d) Supply cooling water

10) Which factor is *most important* in designing a machine foundation?
a) Color of the floor
b) Type of soil and machine load
c) Lighting arrangement
d) Size of building

11) The foundation of a rotating machine should be _____.
a) Weak and flexible
b) Made of wood
c) Rigid and vibration-free
d) Above ground level

12) Static machines require foundation mainly for _____.
a) Reducing speed
b) Stability and load support
c) Increasing vibration
d) Decoration

13) Electric heating converts _____.
a) Mechanical energy into heat energy
b) Electrical energy into heat energy
c) Chemical energy into light energy
d) Heat energy into electrical energy

14) The most commonly used principle for electric heating is _____.
a) Faraday's law
b) Joule's law of heating
c) Lenz's law
d) Fleming's rule

SLR-QH-643

Seat No.	

Set R

T. Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Electrical Installation and Utilization (EEMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Solve Any Four. **16**

a) Definition of terminology used in safety; safety, hazard, accident.

b) Explain I. E. Act & statutory regulations for safety of persons & equipment working with electrical installation.

c) Explain Procedure for rescuing the person who has received an electric shock.

d) Explain Factors involved in designing the machine foundation.

e) Explain procedure for leveling & alignment of two shafts of directly & indirectly coupled drives.

Q.3 Solve Any Two. **12**

a) Installation of rotating machines as per I.S.900-1992.

b) Explain Meaning & causes of electrical accidents factors on which severity of shock depends.

c) Explain methods of providing artificial respiration.

SECTION – II

Q.4 Solve Any Four. **16**

a) Explain laws of illumination.

b) Explain construction & Working mercury vapour lamp.

c) Comparison between tungsten filament lamps and fluorescent tubes.

d) Explain basic principles of light control.

e) Explain CFL & LED Lamps.

Q.5 Solve Any Two. **12**

a) Explain advantages, disadvantages of electrical heating.

b) Explain street lighting.

c) Explain Flood lighting.

SLR-QH-643

Seat No.	

Set S

T. Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Electrical Installation and Utilization (EEMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) Which factor is *most important* in designing a machine foundation?
a) Color of the floor
b) Type of soil and machine load
c) Lighting arrangement
d) Size of building

2) The foundation of a rotating machine should be _____.
a) Weak and flexible b) Made of wood
c) Rigid and vibration-free d) Above ground level

3) Static machines require foundation mainly for _____.
a) Reducing speed b) Stability and load support
c) Increasing vibration d) Decoration

4) Electric heating converts _____.
a) Mechanical energy into heat energy
b) Electrical energy into heat energy
c) Chemical energy into light energy
d) Heat energy into electrical energy

5) The most commonly used principle for electric heating is _____.
a) Faraday's law b) Joule's law of heating
c) Lenz's law d) Fleming's rule

6) Which of the following is not a type of electric heating?
a) Resistance heating b) Induction heating
c) Arc heating d) Conduction heating

7) The unit of luminous intensity is _____.
a) Lumen b) Lux
c) Candela d) Watt

8) The law which states that illumination is inversely proportional to the square of the distance is _____.
a) Lambert's Cosine Law b) Ohm's Law
c) Inverse Square Law d) Faraday's Law

9) The unit of illumination (E) is _____.
a) Lumen b) Watt/m^2
c) Candela d) Lux (Lumen/m^2)

10) The term "hazard" refers to _____.
a) A potential source of harm b) An unexpected event
c) A rescue method d) A type of accident

11) Which of the following defines "safety"?
a) Elimination of all risks
b) Freedom from danger, risk, or injury
c) Absence of accidents
d) Working without supervision

12) Responsibility in safety means _____.
a) The power to take decisions
b) The right to punish
c) The duty to perform assigned tasks safely
d) Authority without work

13) I.E. Act stands for _____.
a) Indian Electricity Act b) Indian Engineering Act
c) Industrial Energy Act d) Internal Electrical Act

14) The main purpose of a machine foundation is to _____.
a) Increase machine speed
b) Support and absorb vibrations of the machine
c) Reduce current flow
d) Supply cooling water

SLR-QH-643

Seat No.		Set	S

T. Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Electrical Installation and Utilization (EEMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Solve Any Four. **16**

a) Definition of terminology used in safety; safety, hazard, accident.

b) Explain I. E. Act & statutory regulations for safety of persons & equipment working with electrical installation.

c) Explain Procedure for rescuing the person who has received an electric shock.

d) Explain Factors involved in designing the machine foundation.

e) Explain procedure for leveling & alignment of two shafts of directly & indirectly coupled drives.

Q.3 Solve Any Two. **12**

a) Installation of rotating machines as per I.S.900-1992.

b) Explain Meaning & causes of electrical accidents factors on which severity of shock depends.

c) Explain methods of providing artificial respiration.

SECTION – II

Q.4 Solve Any Four. **16**

a) Explain laws of illumination.

b) Explain construction & Working mercury vapour lamp.

c) Comparison between tungsten filament lamps and fluorescent tubes.

d) Explain basic principles of light control.

e) Explain CFL & LED Lamps.

Q.5 Solve Any Two. **12**

a) Explain advantages, disadvantages of electrical heating.

b) Explain street lighting.

c) Explain Flood lighting.

SLR-QH-643

Seat No.	

Set P

T. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Electrical Installation and Utilization (EEMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) The term "hazard" refers to _____.
a) A potential source of harm b) An unexpected event
c) A rescue method d) A type of accident

2) Which of the following defines "safety"?
a) Elimination of all risks
b) Freedom from danger, risk, or injury
c) Absence of accidents
d) Working without supervision

3) Responsibility in safety means _____.
a) The power to take decisions
b) The right to punish
c) The duty to perform assigned tasks safely
d) Authority without work

4) I.E. Act stands for _____.
a) Indian Electricity Act b) Indian Engineering Act
c) Industrial Energy Act d) Internal Electrical Act

5) The main purpose of a machine foundation is to _____.
a) Increase machine speed
b) Support and absorb vibrations of the machine
c) Reduce current flow
d) Supply cooling water

6) Which factor is *most important* in designing a machine foundation?
a) Color of the floor
b) Type of soil and machine load
c) Lighting arrangement
d) Size of building

7) The foundation of a rotating machine should be _____.
a) Weak and flexible
b) Made of wood
c) Rigid and vibration-free
d) Above ground level

8) Static machines require foundation mainly for _____.
a) Reducing speed
b) Stability and load support
c) Increasing vibration
d) Decoration

9) Electric heating converts _____.
a) Mechanical energy into heat energy
b) Electrical energy into heat energy
c) Chemical energy into light energy
d) Heat energy into electrical energy

10) The most commonly used principle for electric heating is _____.
a) Faraday's law
b) Joule's law of heating
c) Lenz's law
d) Fleming's rule

11) Which of the following is not a type of electric heating?
a) Resistance heating
b) Induction heating
c) Arc heating
d) Conduction heating

12) The unit of luminous intensity is _____.
a) Lumen
b) Lux
c) Candela
d) Watt

13) The law which states that illumination is inversely proportional to the square of the distance is _____.
a) Lambert's Cosine Law
b) Ohm's Law
c) Inverse Square Law
d) Faraday's Law

14) The unit of illumination (E) is _____.
a) Lumen
b) Watt/m^2
c) Candela
d) Lux (Lumen/m^2)

Seat No.	

Set **P**

T. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Electrical Installation and Utilization (EEMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Solve Any Four. **16**

a) Definition of terminology used in safety; safety, hazard, accident.

b) Explain I. E. Act & statutory regulations for safety of persons & equipment working with electrical installation.

c) Explain Procedure for rescuing the person who has received an electric shock.

d) Explain Factors involved in designing the machine foundation.

e) Explain procedure for leveling & alignment of two shafts of directly & indirectly coupled drives.

Q.3 Solve Any Two. **12**

a) Installation of rotating machines as per I.S.900-1992.

b) Explain Meaning & causes of electrical accidents factors on which severity of shock depends.

c) Explain methods of providing artificial respiration.

SECTION – II

Q.4 Solve Any Four. **16**

a) Explain laws of illumination.

b) Explain construction & Working mercury vapour lamp.

c) Comparison between tungsten filament lamps and fluorescent tubes.

d) Explain basic principles of light control.

e) Explain CFL & LED Lamps.

Q.5 Solve Any Two. **12**

a) Explain advantages, disadvantages of electrical heating.

b) Explain street lighting.

c) Explain Flood lighting.

SLR-QH-643

Seat No.	

Set Q

T. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Electrical Installation and Utilization (EEMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) Static machines require foundation mainly for _____.
a) Reducing speed b) Stability and load support
c) Increasing vibration d) Decoration

2) Electric heating converts _____.
a) Mechanical energy into heat energy
b) Electrical energy into heat energy
c) Chemical energy into light energy
d) Heat energy into electrical energy

3) The most commonly used principle for electric heating is _____.
a) Faraday's law b) Joule's law of heating
c) Lenz's law d) Fleming's rule

4) Which of the following is not a type of electric heating?
a) Resistance heating b) Induction heating
c) Arc heating d) Conduction heating

5) The unit of luminous intensity is _____.
a) Lumen b) Lux
c) Candela d) Watt

6) The law which states that illumination is inversely proportional to the square of the distance is _____.
a) Lambert's Cosine Law b) Ohm's Law
c) Inverse Square Law d) Faraday's Law

7) The unit of illumination (E) is _____.
a) Lumen b) Watt/m^2
c) Candela d) Lux (Lumen/m^2)

8) The term “hazard” refers to _____.
a) A potential source of harm b) An unexpected event
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9) Which of the following defines “safety”?
a) Elimination of all risks
b) Freedom from danger, risk, or injury
c) Absence of accidents
d) Working without supervision

10) Responsibility in safety means _____.
a) The power to take decisions
b) The right to punish
c) The duty to perform assigned tasks safely
d) Authority without work

11) I.E. Act stands for _____.
a) Indian Electricity Act b) Indian Engineering Act
c) Industrial Energy Act d) Internal Electrical Act

12) The main purpose of a machine foundation is to _____.
a) Increase machine speed
b) Support and absorb vibrations of the machine
c) Reduce current flow
d) Supply cooling water

13) Which factor is *most important* in designing a machine foundation?
a) Color of the floor
b) Type of soil and machine load
c) Lighting arrangement
d) Size of building

14) The foundation of a rotating machine should be _____.
a) Weak and flexible b) Made of wood
c) Rigid and vibration-free d) Above ground level

Seat No.	

Set **Q**

T. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Electrical Installation and Utilization (EEMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Solve Any Four. **16**

a) Definition of terminology used in safety; safety, hazard, accident.

b) Explain I. E. Act & statutory regulations for safety of persons & equipment working with electrical installation.

c) Explain Procedure for rescuing the person who has received an electric shock.

d) Explain Factors involved in designing the machine foundation.

e) Explain procedure for leveling & alignment of two shafts of directly & indirectly coupled drives.

Q.3 Solve Any Two. **12**

a) Installation of rotating machines as per I.S.900-1992.

b) Explain Meaning & causes of electrical accidents factors on which severity of shock depends.

c) Explain methods of providing artificial respiration.

SECTION – II

Q.4 Solve Any Four. **16**

a) Explain laws of illumination.

b) Explain construction & Working mercury vapour lamp.

c) Comparison between tungsten filament lamps and fluorescent tubes.

d) Explain basic principles of light control.

e) Explain CFL & LED Lamps.

Q.5 Solve Any Two. **12**

a) Explain advantages, disadvantages of electrical heating.

b) Explain street lighting.

c) Explain Flood lighting.

SLR-QH-643

Seat No.	

Set R

T. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Electrical Installation and Utilization (EEMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) Which of the following is not a type of electric heating?
a) Resistance heating b) Induction heating
c) Arc heating d) Conduction heating

2) The unit of luminous intensity is _____.
a) Lumen b) Lux
c) Candela d) Watt

3) The law which states that illumination is inversely proportional to the square of the distance is _____.
a) Lambert's Cosine Law b) Ohm's Law
c) Inverse Square Law d) Faraday's Law

4) The unit of illumination (E) is _____.
a) Lumen b) Watt/m^2
c) Candela d) Lux (Lumen/m^2)

5) The term "hazard" refers to _____.
a) A potential source of harm b) An unexpected event
c) A rescue method d) A type of accident

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a) The power to take decisions
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c) The duty to perform assigned tasks safely
d) Authority without work

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a) Indian Electricity Act
b) Indian Engineering Act
c) Industrial Energy Act
d) Internal Electrical Act

9) The main purpose of a machine foundation is to _____.
a) Increase machine speed
b) Support and absorb vibrations of the machine
c) Reduce current flow
d) Supply cooling water

10) Which factor is *most important* in designing a machine foundation?
a) Color of the floor
b) Type of soil and machine load
c) Lighting arrangement
d) Size of building

11) The foundation of a rotating machine should be _____.
a) Weak and flexible
b) Made of wood
c) Rigid and vibration-free
d) Above ground level

12) Static machines require foundation mainly for _____.
a) Reducing speed
b) Stability and load support
c) Increasing vibration
d) Decoration

13) Electric heating converts _____.
a) Mechanical energy into heat energy
b) Electrical energy into heat energy
c) Chemical energy into light energy
d) Heat energy into electrical energy

14) The most commonly used principle for electric heating is _____.
a) Faraday's law
b) Joule's law of heating
c) Lenz's law
d) Fleming's rule

Seat No.	

Set **R**

T. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Electrical Installation and Utilization (EEMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Solve Any Four. **16**

a) Definition of terminology used in safety; safety, hazard, accident.

b) Explain I. E. Act & statutory regulations for safety of persons & equipment working with electrical installation.

c) Explain Procedure for rescuing the person who has received an electric shock.

d) Explain Factors involved in designing the machine foundation.

e) Explain procedure for leveling & alignment of two shafts of directly & indirectly coupled drives.

Q.3 Solve Any Two. **12**

a) Installation of rotating machines as per I.S.900-1992.

b) Explain Meaning & causes of electrical accidents factors on which severity of shock depends.

c) Explain methods of providing artificial respiration.

SECTION – II

Q.4 Solve Any Four. **16**

a) Explain laws of illumination.

b) Explain construction & Working mercury vapour lamp.

c) Comparison between tungsten filament lamps and fluorescent tubes.

d) Explain basic principles of light control.

e) Explain CFL & LED Lamps.

Q.5 Solve Any Two. **12**

a) Explain advantages, disadvantages of electrical heating.

b) Explain street lighting.

c) Explain Flood lighting.

SLR-QH-643

Seat No.	

Set S

T. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Electrical Installation and Utilization (EEMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) Which factor is *most important* in designing a machine foundation?
a) Color of the floor
b) Type of soil and machine load
c) Lighting arrangement
d) Size of building

2) The foundation of a rotating machine should be _____.
a) Weak and flexible b) Made of wood
c) Rigid and vibration-free d) Above ground level

3) Static machines require foundation mainly for _____.
a) Reducing speed b) Stability and load support
c) Increasing vibration d) Decoration

4) Electric heating converts _____.
a) Mechanical energy into heat energy
b) Electrical energy into heat energy
c) Chemical energy into light energy
d) Heat energy into electrical energy

5) The most commonly used principle for electric heating is _____.
a) Faraday's law b) Joule's law of heating
c) Lenz's law d) Fleming's rule

6) Which of the following is not a type of electric heating?
a) Resistance heating b) Induction heating
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7) The unit of luminous intensity is _____.
a) Lumen b) Lux
c) Candela d) Watt

8) The law which states that illumination is inversely proportional to the square of the distance is _____.
a) Lambert's Cosine Law b) Ohm's Law
c) Inverse Square Law d) Faraday's Law

9) The unit of illumination (E) is _____.
a) Lumen b) Watt/m^2
c) Candela d) Lux (Lumen/m^2)

10) The term "hazard" refers to _____.
a) A potential source of harm b) An unexpected event
c) A rescue method d) A type of accident

11) Which of the following defines "safety"?
a) Elimination of all risks
b) Freedom from danger, risk, or injury
c) Absence of accidents
d) Working without supervision

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a) The power to take decisions
b) The right to punish
c) The duty to perform assigned tasks safely
d) Authority without work

13) I.E. Act stands for _____.
a) Indian Electricity Act b) Indian Engineering Act
c) Industrial Energy Act d) Internal Electrical Act

14) The main purpose of a machine foundation is to _____.
a) Increase machine speed
b) Support and absorb vibrations of the machine
c) Reduce current flow
d) Supply cooling water

SLR-QH-643

Seat No.	

Set S

T. Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Electrical Installation and Utilization (EEMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Solve Any Four. **16**

a) Definition of terminology used in safety; safety, hazard, accident.

b) Explain I. E. Act & statutory regulations for safety of persons & equipment working with electrical installation.

c) Explain Procedure for rescuing the person who has received an electric shock.

d) Explain Factors involved in designing the machine foundation.

e) Explain procedure for leveling & alignment of two shafts of directly & indirectly coupled drives.

Q.3 Solve Any Two. **12**

a) Installation of rotating machines as per I.S.900-1992.

b) Explain Meaning & causes of electrical accidents factors on which severity of shock depends.

c) Explain methods of providing artificial respiration.

SECTION – II

Q.4 Solve Any Four. **16**

a) Explain laws of illumination.

b) Explain construction & Working mercury vapour lamp.

c) Comparison between tungsten filament lamps and fluorescent tubes.

d) Explain basic principles of light control.

e) Explain CFL & LED Lamps.

Q.5 Solve Any Two. **12**

a) Explain advantages, disadvantages of electrical heating.

b) Explain street lighting.

c) Explain Flood lighting.

SLR-QH-643

Seat No.	

Set P

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Electrical Installation and Utilization (EEMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) The term "hazard" refers to _____.
a) A potential source of harm b) An unexpected event
c) A rescue method d) A type of accident

2) Which of the following defines "safety"?
a) Elimination of all risks
b) Freedom from danger, risk, or injury
c) Absence of accidents
d) Working without supervision

3) Responsibility in safety means _____.
a) The power to take decisions
b) The right to punish
c) The duty to perform assigned tasks safely
d) Authority without work

4) I.E. Act stands for _____.
a) Indian Electricity Act b) Indian Engineering Act
c) Industrial Energy Act d) Internal Electrical Act

5) The main purpose of a machine foundation is to _____.
a) Increase machine speed
b) Support and absorb vibrations of the machine
c) Reduce current flow
d) Supply cooling water

6) Which factor is *most important* in designing a machine foundation?
a) Color of the floor
b) Type of soil and machine load
c) Lighting arrangement
d) Size of building

7) The foundation of a rotating machine should be _____.
a) Weak and flexible
b) Made of wood
c) Rigid and vibration-free
d) Above ground level

8) Static machines require foundation mainly for _____.
a) Reducing speed
b) Stability and load support
c) Increasing vibration
d) Decoration

9) Electric heating converts _____.
a) Mechanical energy into heat energy
b) Electrical energy into heat energy
c) Chemical energy into light energy
d) Heat energy into electrical energy

10) The most commonly used principle for electric heating is _____.
a) Faraday's law
b) Joule's law of heating
c) Lenz's law
d) Fleming's rule

11) Which of the following is not a type of electric heating?
a) Resistance heating
b) Induction heating
c) Arc heating
d) Conduction heating

12) The unit of luminous intensity is _____.
a) Lumen
b) Lux
c) Candela
d) Watt

13) The law which states that illumination is inversely proportional to the square of the distance is _____.
a) Lambert's Cosine Law
b) Ohm's Law
c) Inverse Square Law
d) Faraday's Law

14) The unit of illumination (E) is _____.
a) Lumen
b) Watt/m^2
c) Candela
d) Lux (Lumen/m^2)

SLR-QH-643

Seat No.	

Set P

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Electrical Installation and Utilization (EEMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Solve Any Four. **16**

a) Definition of terminology used in safety; safety, hazard, accident.

b) Explain I. E. Act & statutory regulations for safety of persons & equipment working with electrical installation.

c) Explain Procedure for rescuing the person who has received an electric shock.

d) Explain Factors involved in designing the machine foundation.

e) Explain procedure for leveling & alignment of two shafts of directly & indirectly coupled drives.

Q.3 Solve Any Two. **12**

a) Installation of rotating machines as per I.S.900-1992.

b) Explain Meaning & causes of electrical accidents factors on which severity of shock depends.

c) Explain methods of providing artificial respiration.

SECTION – II

Q.4 Solve Any Four. **16**

a) Explain laws of illumination.

b) Explain construction & Working mercury vapour lamp.

c) Comparison between tungsten filament lamps and fluorescent tubes.

d) Explain basic principles of light control.

e) Explain CFL & LED Lamps.

Q.5 Solve Any Two. **12**

a) Explain advantages, disadvantages of electrical heating.

b) Explain street lighting.

c) Explain Flood lighting.

SLR-QH-643

Seat No.	

Set Q

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Electrical Installation and Utilization (EEMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) Static machines require foundation mainly for _____.
a) Reducing speed b) Stability and load support
c) Increasing vibration d) Decoration

2) Electric heating converts _____.
a) Mechanical energy into heat energy
b) Electrical energy into heat energy
c) Chemical energy into light energy
d) Heat energy into electrical energy

3) The most commonly used principle for electric heating is _____.
a) Faraday's law b) Joule's law of heating
c) Lenz's law d) Fleming's rule

4) Which of the following is not a type of electric heating?
a) Resistance heating b) Induction heating
c) Arc heating d) Conduction heating

5) The unit of luminous intensity is _____.
a) Lumen b) Lux
c) Candela d) Watt

6) The law which states that illumination is inversely proportional to the square of the distance is _____.
a) Lambert's Cosine Law b) Ohm's Law
c) Inverse Square Law d) Faraday's Law

7) The unit of illumination (E) is _____.
a) Lumen b) Watt/m^2
c) Candela d) Lux (Lumen/m^2)

8) The term “hazard” refers to _____.
a) A potential source of harm b) An unexpected event
c) A rescue method d) A type of accident

9) Which of the following defines “safety”?
a) Elimination of all risks
b) Freedom from danger, risk, or injury
c) Absence of accidents
d) Working without supervision

10) Responsibility in safety means _____.
a) The power to take decisions
b) The right to punish
c) The duty to perform assigned tasks safely
d) Authority without work

11) I.E. Act stands for _____.
a) Indian Electricity Act b) Indian Engineering Act
c) Industrial Energy Act d) Internal Electrical Act

12) The main purpose of a machine foundation is to _____.
a) Increase machine speed
b) Support and absorb vibrations of the machine
c) Reduce current flow
d) Supply cooling water

13) Which factor is *most important* in designing a machine foundation?
a) Color of the floor
b) Type of soil and machine load
c) Lighting arrangement
d) Size of building

14) The foundation of a rotating machine should be _____.
a) Weak and flexible b) Made of wood
c) Rigid and vibration-free d) Above ground level

SLR-QH-643

Seat No.	

Set Q

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Electrical Installation and Utilization (EEMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Solve Any Four. **16**

a) Definition of terminology used in safety; safety, hazard, accident.

b) Explain I. E. Act & statutory regulations for safety of persons & equipment working with electrical installation.

c) Explain Procedure for rescuing the person who has received an electric shock.

d) Explain Factors involved in designing the machine foundation.

e) Explain procedure for leveling & alignment of two shafts of directly & indirectly coupled drives.

Q.3 Solve Any Two. **12**

a) Installation of rotating machines as per I.S.900-1992.

b) Explain Meaning & causes of electrical accidents factors on which severity of shock depends.

c) Explain methods of providing artificial respiration.

SECTION – II

Q.4 Solve Any Four. **16**

a) Explain laws of illumination.

b) Explain construction & Working mercury vapour lamp.

c) Comparison between tungsten filament lamps and fluorescent tubes.

d) Explain basic principles of light control.

e) Explain CFL & LED Lamps.

Q.5 Solve Any Two. **12**

a) Explain advantages, disadvantages of electrical heating.

b) Explain street lighting.

c) Explain Flood lighting.

SLR-QH-643

Seat No.	

Set R

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Electrical Installation and Utilization (EEMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) Which of the following is not a type of electric heating?
a) Resistance heating b) Induction heating
c) Arc heating d) Conduction heating

2) The unit of luminous intensity is _____.
a) Lumen b) Lux
c) Candela d) Watt

3) The law which states that illumination is inversely proportional to the square of the distance is _____.
a) Lambert's Cosine Law b) Ohm's Law
c) Inverse Square Law d) Faraday's Law

4) The unit of illumination (E) is _____.
a) Lumen b) Watt/m^2
c) Candela d) Lux (Lumen/m^2)

5) The term "hazard" refers to _____.
a) A potential source of harm b) An unexpected event
c) A rescue method d) A type of accident

6) Which of the following defines "safety"?
a) Elimination of all risks
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7) Responsibility in safety means _____.
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b) The right to punish
c) The duty to perform assigned tasks safely
d) Authority without work

8) I.E. Act stands for _____.
a) Indian Electricity Act
b) Indian Engineering Act
c) Industrial Energy Act
d) Internal Electrical Act

9) The main purpose of a machine foundation is to _____.
a) Increase machine speed
b) Support and absorb vibrations of the machine
c) Reduce current flow
d) Supply cooling water

10) Which factor is *most important* in designing a machine foundation?
a) Color of the floor
b) Type of soil and machine load
c) Lighting arrangement
d) Size of building

11) The foundation of a rotating machine should be _____.
a) Weak and flexible
b) Made of wood
c) Rigid and vibration-free
d) Above ground level

12) Static machines require foundation mainly for _____.
a) Reducing speed
b) Stability and load support
c) Increasing vibration
d) Decoration

13) Electric heating converts _____.
a) Mechanical energy into heat energy
b) Electrical energy into heat energy
c) Chemical energy into light energy
d) Heat energy into electrical energy

14) The most commonly used principle for electric heating is _____.
a) Faraday's law
b) Joule's law of heating
c) Lenz's law
d) Fleming's rule

SLR-QH-643

Seat No.	

Set R

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Electrical Installation and Utilization (EEMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Solve Any Four. **16**

a) Definition of terminology used in safety; safety, hazard, accident.

b) Explain I. E. Act & statutory regulations for safety of persons & equipment working with electrical installation.

c) Explain Procedure for rescuing the person who has received an electric shock.

d) Explain Factors involved in designing the machine foundation.

e) Explain procedure for leveling & alignment of two shafts of directly & indirectly coupled drives.

Q.3 Solve Any Two. **12**

a) Installation of rotating machines as per I.S.900-1992.

b) Explain Meaning & causes of electrical accidents factors on which severity of shock depends.

c) Explain methods of providing artificial respiration.

SECTION – II

Q.4 Solve Any Four. **16**

a) Explain laws of illumination.

b) Explain construction & Working mercury vapour lamp.

c) Comparison between tungsten filament lamps and fluorescent tubes.

d) Explain basic principles of light control.

e) Explain CFL & LED Lamps.

Q.5 Solve Any Two. **12**

a) Explain advantages, disadvantages of electrical heating.

b) Explain street lighting.

c) Explain Flood lighting.

SLR-QH-643

Seat No.	

Set S

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Electrical Installation and Utilization (EEMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) Which factor is *most important* in designing a machine foundation?
a) Color of the floor
b) Type of soil and machine load
c) Lighting arrangement
d) Size of building

2) The foundation of a rotating machine should be _____.
a) Weak and flexible b) Made of wood
c) Rigid and vibration-free d) Above ground level

3) Static machines require foundation mainly for _____.
a) Reducing speed b) Stability and load support
c) Increasing vibration d) Decoration

4) Electric heating converts _____.
a) Mechanical energy into heat energy
b) Electrical energy into heat energy
c) Chemical energy into light energy
d) Heat energy into electrical energy

5) The most commonly used principle for electric heating is _____.
a) Faraday's law b) Joule's law of heating
c) Lenz's law d) Fleming's rule

6) Which of the following is not a type of electric heating?
a) Resistance heating b) Induction heating
c) Arc heating d) Conduction heating

7) The unit of luminous intensity is _____.
a) Lumen b) Lux
c) Candela d) Watt

8) The law which states that illumination is inversely proportional to the square of the distance is _____.
a) Lambert's Cosine Law b) Ohm's Law
c) Inverse Square Law d) Faraday's Law

9) The unit of illumination (E) is _____.
a) Lumen b) Watt/m^2
c) Candela d) Lux (Lumen/m^2)

10) The term "hazard" refers to _____.
a) A potential source of harm b) An unexpected event
c) A rescue method d) A type of accident

11) Which of the following defines "safety"?
a) Elimination of all risks
b) Freedom from danger, risk, or injury
c) Absence of accidents
d) Working without supervision

12) Responsibility in safety means _____.
a) The power to take decisions
b) The right to punish
c) The duty to perform assigned tasks safely
d) Authority without work

13) I.E. Act stands for _____.
a) Indian Electricity Act b) Indian Engineering Act
c) Industrial Energy Act d) Internal Electrical Act

14) The main purpose of a machine foundation is to _____.
a) Increase machine speed
b) Support and absorb vibrations of the machine
c) Reduce current flow
d) Supply cooling water

SLR-QH-643

Seat No.	

Set S

T. Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Electrical Installation and Utilization (EEMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Solve Any Four. **16**

a) Definition of terminology used in safety; safety, hazard, accident.

b) Explain I. E. Act & statutory regulations for safety of persons & equipment working with electrical installation.

c) Explain Procedure for rescuing the person who has received an electric shock.

d) Explain Factors involved in designing the machine foundation.

e) Explain procedure for leveling & alignment of two shafts of directly & indirectly coupled drives.

Q.3 Solve Any Two. **12**

a) Installation of rotating machines as per I.S.900-1992.

b) Explain Meaning & causes of electrical accidents factors on which severity of shock depends.

c) Explain methods of providing artificial respiration.

SECTION – II

Q.4 Solve Any Four. **16**

a) Explain laws of illumination.

b) Explain construction & Working mercury vapour lamp.

c) Comparison between tungsten filament lamps and fluorescent tubes.

d) Explain basic principles of light control.

e) Explain CFL & LED Lamps.

Q.5 Solve Any Two. **12**

a) Explain advantages, disadvantages of electrical heating.

b) Explain street lighting.

c) Explain Flood lighting.

SLR-QH-643

Seat No.	

Set P

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Electrical Installation and Utilization (EEMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) The term "hazard" refers to _____.
a) A potential source of harm b) An unexpected event
c) A rescue method d) A type of accident

2) Which of the following defines "safety"?
a) Elimination of all risks
b) Freedom from danger, risk, or injury
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d) Working without supervision

3) Responsibility in safety means _____.
a) The power to take decisions
b) The right to punish
c) The duty to perform assigned tasks safely
d) Authority without work

4) I.E. Act stands for _____.
a) Indian Electricity Act b) Indian Engineering Act
c) Industrial Energy Act d) Internal Electrical Act

5) The main purpose of a machine foundation is to _____.
a) Increase machine speed
b) Support and absorb vibrations of the machine
c) Reduce current flow
d) Supply cooling water

6) Which factor is *most important* in designing a machine foundation?
a) Color of the floor
b) Type of soil and machine load
c) Lighting arrangement
d) Size of building

7) The foundation of a rotating machine should be _____.
a) Weak and flexible
b) Made of wood
c) Rigid and vibration-free
d) Above ground level

8) Static machines require foundation mainly for _____.
a) Reducing speed
b) Stability and load support
c) Increasing vibration
d) Decoration

9) Electric heating converts _____.
a) Mechanical energy into heat energy
b) Electrical energy into heat energy
c) Chemical energy into light energy
d) Heat energy into electrical energy

10) The most commonly used principle for electric heating is _____.
a) Faraday's law
b) Joule's law of heating
c) Lenz's law
d) Fleming's rule

11) Which of the following is not a type of electric heating?
a) Resistance heating
b) Induction heating
c) Arc heating
d) Conduction heating

12) The unit of luminous intensity is _____.
a) Lumen
b) Lux
c) Candela
d) Watt

13) The law which states that illumination is inversely proportional to the square of the distance is _____.
a) Lambert's Cosine Law
b) Ohm's Law
c) Inverse Square Law
d) Faraday's Law

14) The unit of illumination (E) is _____.
a) Lumen
b) Watt/m^2
c) Candela
d) Lux (Lumen/m^2)

SLR-QH-643

Seat No.	

Set P

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Electrical Installation and Utilization (EEMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Solve Any Four. **16**

a) Definition of terminology used in safety; safety, hazard, accident.

b) Explain I. E. Act & statutory regulations for safety of persons & equipment working with electrical installation.

c) Explain Procedure for rescuing the person who has received an electric shock.

d) Explain Factors involved in designing the machine foundation.

e) Explain procedure for leveling & alignment of two shafts of directly & indirectly coupled drives.

Q.3 Solve Any Two. **12**

a) Installation of rotating machines as per I.S.900-1992.

b) Explain Meaning & causes of electrical accidents factors on which severity of shock depends.

c) Explain methods of providing artificial respiration.

SECTION – II

Q.4 Solve Any Four. **16**

a) Explain laws of illumination.

b) Explain construction & Working mercury vapour lamp.

c) Comparison between tungsten filament lamps and fluorescent tubes.

d) Explain basic principles of light control.

e) Explain CFL & LED Lamps.

Q.5 Solve Any Two. **12**

a) Explain advantages, disadvantages of electrical heating.

b) Explain street lighting.

c) Explain Flood lighting.

SLR-QH-643

Seat No.	

Set Q

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Electrical Installation and Utilization (EEMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) Static machines require foundation mainly for _____.
a) Reducing speed b) Stability and load support
c) Increasing vibration d) Decoration

2) Electric heating converts _____.
a) Mechanical energy into heat energy
b) Electrical energy into heat energy
c) Chemical energy into light energy
d) Heat energy into electrical energy

3) The most commonly used principle for electric heating is _____.
a) Faraday's law b) Joule's law of heating
c) Lenz's law d) Fleming's rule

4) Which of the following is not a type of electric heating?
a) Resistance heating b) Induction heating
c) Arc heating d) Conduction heating

5) The unit of luminous intensity is _____.
a) Lumen b) Lux
c) Candela d) Watt

6) The law which states that illumination is inversely proportional to the square of the distance is _____.
a) Lambert's Cosine Law b) Ohm's Law
c) Inverse Square Law d) Faraday's Law

7) The unit of illumination (E) is _____.
a) Lumen b) Watt/m^2
c) Candela d) Lux (Lumen/m^2)

8) The term “hazard” refers to _____.
a) A potential source of harm b) An unexpected event
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9) Which of the following defines “safety”?
a) Elimination of all risks
b) Freedom from danger, risk, or injury
c) Absence of accidents
d) Working without supervision

10) Responsibility in safety means _____.
a) The power to take decisions
b) The right to punish
c) The duty to perform assigned tasks safely
d) Authority without work

11) I.E. Act stands for _____.
a) Indian Electricity Act b) Indian Engineering Act
c) Industrial Energy Act d) Internal Electrical Act

12) The main purpose of a machine foundation is to _____.
a) Increase machine speed
b) Support and absorb vibrations of the machine
c) Reduce current flow
d) Supply cooling water

13) Which factor is *most important* in designing a machine foundation?
a) Color of the floor
b) Type of soil and machine load
c) Lighting arrangement
d) Size of building

14) The foundation of a rotating machine should be _____.
a) Weak and flexible b) Made of wood
c) Rigid and vibration-free d) Above ground level

Seat No.	

Set **Q**

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Electrical Installation and Utilization (EEMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Solve Any Four. **16**

a) Definition of terminology used in safety; safety, hazard, accident.

b) Explain I. E. Act & statutory regulations for safety of persons & equipment working with electrical installation.

c) Explain Procedure for rescuing the person who has received an electric shock.

d) Explain Factors involved in designing the machine foundation.

e) Explain procedure for leveling & alignment of two shafts of directly & indirectly coupled drives.

Q.3 Solve Any Two. **12**

a) Installation of rotating machines as per I.S.900-1992.

b) Explain Meaning & causes of electrical accidents factors on which severity of shock depends.

c) Explain methods of providing artificial respiration.

SECTION – II

Q.4 Solve Any Four. **16**

a) Explain laws of illumination.

b) Explain construction & Working mercury vapour lamp.

c) Comparison between tungsten filament lamps and fluorescent tubes.

d) Explain basic principles of light control.

e) Explain CFL & LED Lamps.

Q.5 Solve Any Two. **12**

a) Explain advantages, disadvantages of electrical heating.

b) Explain street lighting.

c) Explain Flood lighting.

SLR-QH-643

Seat No.	

Set R

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Electrical Installation and Utilization (EEMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) Which of the following is not a type of electric heating?
a) Resistance heating b) Induction heating
c) Arc heating d) Conduction heating

2) The unit of luminous intensity is _____.
a) Lumen b) Lux
c) Candela d) Watt

3) The law which states that illumination is inversely proportional to the square of the distance is _____.
a) Lambert's Cosine Law b) Ohm's Law
c) Inverse Square Law d) Faraday's Law

4) The unit of illumination (E) is _____.
a) Lumen b) Watt/m^2
c) Candela d) Lux (Lumen/m^2)

5) The term "hazard" refers to _____.
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a) The power to take decisions
b) The right to punish
c) The duty to perform assigned tasks safely
d) Authority without work

8) I.E. Act stands for _____.
a) Indian Electricity Act
b) Indian Engineering Act
c) Industrial Energy Act
d) Internal Electrical Act

9) The main purpose of a machine foundation is to _____.
a) Increase machine speed
b) Support and absorb vibrations of the machine
c) Reduce current flow
d) Supply cooling water

10) Which factor is *most important* in designing a machine foundation?
a) Color of the floor
b) Type of soil and machine load
c) Lighting arrangement
d) Size of building

11) The foundation of a rotating machine should be _____.
a) Weak and flexible
b) Made of wood
c) Rigid and vibration-free
d) Above ground level

12) Static machines require foundation mainly for _____.
a) Reducing speed
b) Stability and load support
c) Increasing vibration
d) Decoration

13) Electric heating converts _____.
a) Mechanical energy into heat energy
b) Electrical energy into heat energy
c) Chemical energy into light energy
d) Heat energy into electrical energy

14) The most commonly used principle for electric heating is _____.
a) Faraday's law
b) Joule's law of heating
c) Lenz's law
d) Fleming's rule

SLR-QH-643

Seat No.	

Set R

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Electrical Installation and Utilization (EEMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Solve Any Four. **16**

a) Definition of terminology used in safety; safety, hazard, accident.

b) Explain I. E. Act & statutory regulations for safety of persons & equipment working with electrical installation.

c) Explain Procedure for rescuing the person who has received an electric shock.

d) Explain Factors involved in designing the machine foundation.

e) Explain procedure for leveling & alignment of two shafts of directly & indirectly coupled drives.

Q.3 Solve Any Two. **12**

a) Installation of rotating machines as per I.S.900-1992.

b) Explain Meaning & causes of electrical accidents factors on which severity of shock depends.

c) Explain methods of providing artificial respiration.

SECTION – II

Q.4 Solve Any Four. **16**

a) Explain laws of illumination.

b) Explain construction & Working mercury vapour lamp.

c) Comparison between tungsten filament lamps and fluorescent tubes.

d) Explain basic principles of light control.

e) Explain CFL & LED Lamps.

Q.5 Solve Any Two. **12**

a) Explain advantages, disadvantages of electrical heating.

b) Explain street lighting.

c) Explain Flood lighting.

SLR-QH-643

Seat No.	

Set S

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Electrical Installation and Utilization (EEMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) Which factor is *most important* in designing a machine foundation?
a) Color of the floor
b) Type of soil and machine load
c) Lighting arrangement
d) Size of building

2) The foundation of a rotating machine should be _____.
a) Weak and flexible b) Made of wood
c) Rigid and vibration-free d) Above ground level

3) Static machines require foundation mainly for _____.
a) Reducing speed b) Stability and load support
c) Increasing vibration d) Decoration

4) Electric heating converts _____.
a) Mechanical energy into heat energy
b) Electrical energy into heat energy
c) Chemical energy into light energy
d) Heat energy into electrical energy

5) The most commonly used principle for electric heating is _____.
a) Faraday's law b) Joule's law of heating
c) Lenz's law d) Fleming's rule

6) Which of the following is not a type of electric heating?
a) Resistance heating b) Induction heating
c) Arc heating d) Conduction heating

7) The unit of luminous intensity is _____.
a) Lumen b) Lux
c) Candela d) Watt

8) The law which states that illumination is inversely proportional to the square of the distance is _____.
a) Lambert's Cosine Law b) Ohm's Law
c) Inverse Square Law d) Faraday's Law

9) The unit of illumination (E) is _____.
a) Lumen b) Watt/m^2
c) Candela d) Lux (Lumen/m^2)

10) The term "hazard" refers to _____.
a) A potential source of harm b) An unexpected event
c) A rescue method d) A type of accident

11) Which of the following defines "safety"?
a) Elimination of all risks
b) Freedom from danger, risk, or injury
c) Absence of accidents
d) Working without supervision

12) Responsibility in safety means _____.
a) The power to take decisions
b) The right to punish
c) The duty to perform assigned tasks safely
d) Authority without work

13) I.E. Act stands for _____.
a) Indian Electricity Act b) Indian Engineering Act
c) Industrial Energy Act d) Internal Electrical Act

14) The main purpose of a machine foundation is to _____.
a) Increase machine speed
b) Support and absorb vibrations of the machine
c) Reduce current flow
d) Supply cooling water

SLR-QH-643

Seat No.	

Set S

T. Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Electrical Installation and Utilization (EEMDM-03A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Solve Any Four. **16**

a) Definition of terminology used in safety; safety, hazard, accident.

b) Explain I. E. Act & statutory regulations for safety of persons & equipment working with electrical installation.

c) Explain Procedure for rescuing the person who has received an electric shock.

d) Explain Factors involved in designing the machine foundation.

e) Explain procedure for leveling & alignment of two shafts of directly & indirectly coupled drives.

Q.3 Solve Any Two. **12**

a) Installation of rotating machines as per I.S.900-1992.

b) Explain Meaning & causes of electrical accidents factors on which severity of shock depends.

c) Explain methods of providing artificial respiration.

SECTION – II

Q.4 Solve Any Four. **16**

a) Explain laws of illumination.

b) Explain construction & Working mercury vapour lamp.

c) Comparison between tungsten filament lamps and fluorescent tubes.

d) Explain basic principles of light control.

e) Explain CFL & LED Lamps.

Q.5 Solve Any Two. **12**

a) Explain advantages, disadvantages of electrical heating.

b) Explain street lighting.

c) Explain Flood lighting.

SLR-QH-644

Seat No.	

Set P

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Electric Vehicle Controls (EEMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) In a full converter, how many thyristors are needed?
a) 1 b) 2
c) 3 d) 4

2) A full converter provides how many quadrant operations (voltage & current considered)?
a) One b) Two
c) Three d) Four

3) Dual converters enable how many quadrants operation?
a) One b) Two
c) Three d) Four

4) Choppers are what type of converters?
a) AC→DC b) DC→AC
c) DC→DC d) AC→AC

5) In V/f control, to maintain constant stator flux, the stator voltage must be varied proportionally with frequency.
a) True b) False

6) Closed-loop V/f control adjusts which parameter based on speed error?
a) Voltage amplitude b) Slip frequency
c) Stator resistance d) Rotor speed

7) CSI stands for _____.
a) Current Source Inverter b) Constant Slip Inverter
c) Common Source Inverter d) Cyclo-source inverter

8) Closed-loop VSI control adjusts voltage and frequency to track _____.
a) Torque b) Speed
c) Slip d) Current

9) FOC makes an induction motor behave like a DC motor by decoupling _____.
a) Voltage & current b) Flux & torque
c) Speed & torque d) Frequency & flux

10) In FOC, the d-axis current (Ids) controls _____.
a) Torque b) Flux
c) Speed d) Voltage

11) Direct vector control estimates flux using _____.
a) Rotor position sensor b) Flux estimator (feedback)
c) Pre-defined model d) Open-loop flux

12) The angle δ in the torque expression refers to the slip angle between stator and rotor flux vectors _____.
a) True b) False

13) DTC uses hysteresis controllers to maintain torque and flux within two separate bands _____.
a) True b) False

14) Optimal switching vector selection ensures torque and flux errors are driven back into hysteresis bands each cycle.
a) True b) False

Seat No.	

Set | P

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Electric Vehicle Controls (EEMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Solve Any Four. **16**

a) Draw and explain the operation of single-phase half-controlled converter fed DC series motor drive.

b) Describe the working principle of single-phase dual converter with neat diagram and waveforms.

c) Describe class B chopper drive with neat circuit diagram.

d) Explain stator voltage control method of an induction motor.

e) Explain the slip power recovery theory of an induction motor with neat diagram.

f) Explain variable frequency control method of an induction motor.

Q.3 Solve Any Two. **12**

a) Draw and explain the operation of three phase fully controlled converter fed DC motor drive. Also draw the related voltage and current waveforms.

b) Explain four quadrant operation of class E chopper drive with neat diagram.

c) Compare CSI and VSI fed induction motor drives.

SECTION – II

Q.4 Solve Any Four. **16**

a) Explain direct field-oriented control scheme with neat diagram.

b) Explain the working principle of Field Oriented Control (FOC) of induction machine.

c) Describe indirect field-oriented control method of induction motor with neat diagram.

d) Explain the principle of Space Vector Modulation control technique used in FOC.

e) Explain the DTC strategy to control the torque and flux of an Induction Machine.

f) Describe optimum switching vector selection in direct torque control.

Q.5 Solve Any Two. **12**

a) Explain the working principle of Field Oriented Control (FOC) of induction machine. Also state its advantages over standard control methods.

b) Discuss the torque ripple reduction methods in Induction motor drives.

c) Derive the torque expression with stator and rotor fluxes in DTC.

SLR-QH-644

Seat No.		Set	Q

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Electric Vehicle Controls (EEMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. 14

1) Closed-loop VSI control adjusts voltage and frequency to track _____.
a) Torque b) Speed
c) Slip d) Current

2) FOC makes an induction motor behave like a DC motor by decoupling _____.
a) Voltage & current b) Flux & torque
c) Speed & torque d) Frequency & flux

3) In FOC, the d-axis current (Ids) controls _____.
a) Torque b) Flux
c) Speed d) Voltage

4) Direct vector control estimates flux using _____.
a) Rotor position sensor b) Flux estimator (feedback)
c) Pre-defined model d) Open-loop flux

5) The angle δ in the torque expression refers to the slip angle between stator and rotor flux vectors _____.
a) True b) False

6) DTC uses hysteresis controllers to maintain torque and flux within two separate bands _____.
a) True b) False

7) Optimal switching vector selection ensures torque and flux errors are driven back into hysteresis bands each cycle.
a) True b) False

8) In a full converter, how many thyristors are needed?
a) 1 b) 2
c) 3 d) 4

9) A full converter provides how many quadrant operations (voltage & current considered)?
a) One b) Two
c) Three d) Four

10) Dual converters enable how many quadrants operation?
a) One b) Two
c) Three d) Four

11) Choppers are what type of converters?
a) AC→DC b) DC→AC
c) DC→DC d) AC→AC

12) In V/f control, to maintain constant stator flux, the stator voltage must be varied proportionally with frequency.
a) True b) False

13) Closed-loop V/f control adjusts which parameter based on speed error?
a) Voltage amplitude b) Slip frequency
c) Stator resistance d) Rotor speed

14) CSI stands for _____.
a) Current Source Inverter b) Constant Slip Inverter
c) Common Source Inverter d) Cyclo-source inverter

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Electric Vehicle Controls (EEMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Solve Any Four. **16**

a) Draw and explain the operation of single-phase half-controlled converter fed DC series motor drive.

b) Describe the working principle of single-phase dual converter with neat diagram and waveforms.

c) Describe class B chopper drive with neat circuit diagram.

d) Explain stator voltage control method of an induction motor.

e) Explain the slip power recovery theory of an induction motor with neat diagram.

f) Explain variable frequency control method of an induction motor.

Q.3 Solve Any Two. **12**

a) Draw and explain the operation of three phase fully controlled converter fed DC motor drive. Also draw the related voltage and current waveforms.

b) Explain four quadrant operation of class E chopper drive with neat diagram.

c) Compare CSI and VSI fed induction motor drives.

SECTION – II

Q.4 Solve Any Four. **16**

a) Explain direct field-oriented control scheme with neat diagram.

b) Explain the working principle of Field Oriented Control (FOC) of induction machine.

c) Describe indirect field-oriented control method of induction motor with neat diagram.

d) Explain the principle of Space Vector Modulation control technique used in FOC.

e) Explain the DTC strategy to control the torque and flux of an Induction Machine.

f) Describe optimum switching vector selection in direct torque control.

Q.5 Solve Any Two. **12**

a) Explain the working principle of Field Oriented Control (FOC) of induction machine. Also state its advantages over standard control methods.

b) Discuss the torque ripple reduction methods in Induction motor drives.

c) Derive the torque expression with stator and rotor fluxes in DTC.

SLR-QH-644

Seat No.	

Set R

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Electric Vehicle Controls (EEMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) Direct vector control estimates flux using _____.
a) Rotor position sensor b) Flux estimator (feedback)
c) Pre-defined model d) Open-loop flux

2) The angle δ in the torque expression refers to the slip angle between stator and rotor flux vectors _____.
a) True b) False

3) DTC uses hysteresis controllers to maintain torque and flux within two separate bands _____.
a) True b) False

4) Optimal switching vector selection ensures torque and flux errors are driven back into hysteresis bands each cycle.
a) True b) False

5) In a full converter, how many thyristors are needed?
a) 1 b) 2
c) 3 d) 4

6) A full converter provides how many quadrant operations (voltage & current considered)?
a) One b) Two
c) Three d) Four

7) Dual converters enable how many quadrants operation?
a) One b) Two
c) Three d) Four

8) Choppers are what type of converters?
a) AC→DC b) DC→AC
c) DC→DC d) AC→AC

9) In V/f control, to maintain constant stator flux, the stator voltage must be varied proportionally with frequency.
a) True b) False

10) Closed-loop V/f control adjusts which parameter based on speed error?
a) Voltage amplitude b) Slip frequency
c) Stator resistance d) Rotor speed

11) CSI stands for _____.
a) Current Source Inverter b) Constant Slip Inverter
c) Common Source Inverter d) Cyclo-source inverter

12) Closed-loop VSI control adjusts voltage and frequency to track _____.
a) Torque b) Speed
c) Slip d) Current

13) FOC makes an induction motor behave like a DC motor by decoupling _____.
a) Voltage & current b) Flux & torque
c) Speed & torque d) Frequency & flux

14) In FOC, the d-axis current (Ids) controls _____.
a) Torque b) Flux
c) Speed d) Voltage

SLR-QH-644

Seat No.	

Set R

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Electric Vehicle Controls (EEMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Solve Any Four. **16**

a) Draw and explain the operation of single-phase half-controlled converter fed DC series motor drive.

b) Describe the working principle of single-phase dual converter with neat diagram and waveforms.

c) Describe class B chopper drive with neat circuit diagram.

d) Explain stator voltage control method of an induction motor.

e) Explain the slip power recovery theory of an induction motor with neat diagram.

f) Explain variable frequency control method of an induction motor.

Q.3 Solve Any Two. **12**

a) Draw and explain the operation of three phase fully controlled converter fed DC motor drive. Also draw the related voltage and current waveforms.

b) Explain four quadrant operation of class E chopper drive with neat diagram.

c) Compare CSI and VSI fed induction motor drives.

SECTION – II

Q.4 Solve Any Four. **16**

a) Explain direct field-oriented control scheme with neat diagram.

b) Explain the working principle of Field Oriented Control (FOC) of induction machine.

c) Describe indirect field-oriented control method of induction motor with neat diagram.

d) Explain the principle of Space Vector Modulation control technique used in FOC.

e) Explain the DTC strategy to control the torque and flux of an Induction Machine.

f) Describe optimum switching vector selection in direct torque control.

Q.5 Solve Any Two. **12**

a) Explain the working principle of Field Oriented Control (FOC) of induction machine. Also state its advantages over standard control methods.

b) Discuss the torque ripple reduction methods in Induction motor drives.

c) Derive the torque expression with stator and rotor fluxes in DTC.

SLR-QH-644

Seat No.		Set	S

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Electric Vehicle Controls (EEMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) Closed-loop V/f control adjusts which parameter based on speed error?
a) Voltage amplitude b) Slip frequency
c) Stator resistance d) Rotor speed

2) CSI stands for _____.
a) Current Source Inverter b) Constant Slip Inverter
c) Common Source Inverter d) Cyclo-source inverter

3) Closed-loop VSI control adjusts voltage and frequency to track _____.
a) Torque b) Speed
c) Slip d) Current

4) FOC makes an induction motor behave like a DC motor by decoupling _____.
a) Voltage & current b) Flux & torque
c) Speed & torque d) Frequency & flux

5) In FOC, the d-axis current (Ids) controls _____.
a) Torque b) Flux
c) Speed d) Voltage

6) Direct vector control estimates flux using _____.
a) Rotor position sensor b) Flux estimator (feedback)
c) Pre-defined model d) Open-loop flux

7) The angle δ in the torque expression refers to the slip angle between stator and rotor flux vectors _____.
a) True b) False

8) DTC uses hysteresis controllers to maintain torque and flux within two separate bands _____.

a) True b) False

9) Optimal switching vector selection ensures torque and flux errors are driven back into hysteresis bands each cycle.

a) True b) False

10) In a full converter, how many thyristors are needed?

a) 1 b) 2
c) 3 d) 4

11) A full converter provides how many quadrant operations (voltage & current considered)?

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c) Three d) Four

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13) Choppers are what type of converters?

a) AC→DC b) DC→AC
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a) True b) False

SLR-QH-644

Seat No.		Set	S

T.Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (CBCS)
Examination: March/April – 2026
Electric Vehicle Controls (EEMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Solve Any Four. **16**

a) Draw and explain the operation of single-phase half-controlled converter fed DC series motor drive.

b) Describe the working principle of single-phase dual converter with neat diagram and waveforms.

c) Describe class B chopper drive with neat circuit diagram.

d) Explain stator voltage control method of an induction motor.

e) Explain the slip power recovery theory of an induction motor with neat diagram.

f) Explain variable frequency control method of an induction motor.

Q.3 Solve Any Two. **12**

a) Draw and explain the operation of three phase fully controlled converter fed DC motor drive. Also draw the related voltage and current waveforms.

b) Explain four quadrant operation of class E chopper drive with neat diagram.

c) Compare CSI and VSI fed induction motor drives.

SECTION – II

Q.4 Solve Any Four. **16**

a) Explain direct field-oriented control scheme with neat diagram.

b) Explain the working principle of Field Oriented Control (FOC) of induction machine.

c) Describe indirect field-oriented control method of induction motor with neat diagram.

d) Explain the principle of Space Vector Modulation control technique used in FOC.

e) Explain the DTC strategy to control the torque and flux of an Induction Machine.

f) Describe optimum switching vector selection in direct torque control.

Q.5 Solve Any Two. **12**

a) Explain the working principle of Field Oriented Control (FOC) of induction machine. Also state its advantages over standard control methods.

b) Discuss the torque ripple reduction methods in Induction motor drives.

c) Derive the torque expression with stator and rotor fluxes in DTC.

SLR-QH-644

Seat No.	

Set P

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Electric Vehicle Controls (EEMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) In a full converter, how many thyristors are needed?
a) 1 b) 2
c) 3 d) 4

2) A full converter provides how many quadrant operations (voltage & current considered)?
a) One b) Two
c) Three d) Four

3) Dual converters enable how many quadrants operation?
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a) Voltage amplitude b) Slip frequency
c) Stator resistance d) Rotor speed

7) CSI stands for _____.
a) Current Source Inverter b) Constant Slip Inverter
c) Common Source Inverter d) Cyclo-source inverter

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a) Torque b) Speed
c) Slip d) Current

9) FOC makes an induction motor behave like a DC motor by decoupling _____.
a) Voltage & current b) Flux & torque
c) Speed & torque d) Frequency & flux

10) In FOC, the d-axis current (Ids) controls _____.
a) Torque b) Flux
c) Speed d) Voltage

11) Direct vector control estimates flux using _____.
a) Rotor position sensor b) Flux estimator (feedback)
c) Pre-defined model d) Open-loop flux

12) The angle δ in the torque expression refers to the slip angle between stator and rotor flux vectors _____.
a) True b) False

13) DTC uses hysteresis controllers to maintain torque and flux within two separate bands _____.
a) True b) False

14) Optimal switching vector selection ensures torque and flux errors are driven back into hysteresis bands each cycle.
a) True b) False

SLR-QH-644

Seat No.	

Set P

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Electric Vehicle Controls (EEMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Solve Any Four. **16**

a) Draw and explain the operation of single-phase half-controlled converter fed DC series motor drive.

b) Describe the working principle of single-phase dual converter with neat diagram and waveforms.

c) Describe class B chopper drive with neat circuit diagram.

d) Explain stator voltage control method of an induction motor.

e) Explain the slip power recovery theory of an induction motor with neat diagram.

f) Explain variable frequency control method of an induction motor.

Q.3 Solve Any Two. **12**

a) Draw and explain the operation of three phase fully controlled converter fed DC motor drive. Also draw the related voltage and current waveforms.

b) Explain four quadrant operation of class E chopper drive with neat diagram.

c) Compare CSI and VSI fed induction motor drives.

SECTION – II

Q.4 Solve Any Four. **16**

a) Explain direct field-oriented control scheme with neat diagram.

b) Explain the working principle of Field Oriented Control (FOC) of induction machine.

c) Describe indirect field-oriented control method of induction motor with neat diagram.

d) Explain the principle of Space Vector Modulation control technique used in FOC.

e) Explain the DTC strategy to control the torque and flux of an Induction Machine.

f) Describe optimum switching vector selection in direct torque control.

Q.5 Solve Any Two. **12**

a) Explain the working principle of Field Oriented Control (FOC) of induction machine. Also state its advantages over standard control methods.

b) Discuss the torque ripple reduction methods in Induction motor drives.

c) Derive the torque expression with stator and rotor fluxes in DTC.

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Electric Vehicle Controls (EEMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) Closed-loop VSI control adjusts voltage and frequency to track _____.
a) Torque b) Speed
c) Slip d) Current

2) FOC makes an induction motor behave like a DC motor by decoupling _____.
a) Voltage & current b) Flux & torque
c) Speed & torque d) Frequency & flux

3) In FOC, the d-axis current (Ids) controls _____.
a) Torque b) Flux
c) Speed d) Voltage

4) Direct vector control estimates flux using _____.
a) Rotor position sensor b) Flux estimator (feedback)
c) Pre-defined model d) Open-loop flux

5) The angle δ in the torque expression refers to the slip angle between stator and rotor flux vectors _____.
a) True b) False

6) DTC uses hysteresis controllers to maintain torque and flux within two separate bands _____.
a) True b) False

7) Optimal switching vector selection ensures torque and flux errors are driven back into hysteresis bands each cycle.
a) True b) False

8) In a full converter, how many thyristors are needed?
a) 1 b) 2
c) 3 d) 4

9) A full converter provides how many quadrant operations (voltage & current considered)?
a) One b) Two
c) Three d) Four

10) Dual converters enable how many quadrants operation?
a) One b) Two
c) Three d) Four

11) Choppers are what type of converters?
a) AC→DC b) DC→AC
c) DC→DC d) AC→AC

12) In V/f control, to maintain constant stator flux, the stator voltage must be varied proportionally with frequency.
a) True b) False

13) Closed-loop V/f control adjusts which parameter based on speed error?
a) Voltage amplitude b) Slip frequency
c) Stator resistance d) Rotor speed

14) CSI stands for _____.
a) Current Source Inverter b) Constant Slip Inverter
c) Common Source Inverter d) Cyclo-source inverter

SLR-QH-644

Seat No.	

Set Q

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Electric Vehicle Controls (EEMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Solve Any Four. **16**

a) Draw and explain the operation of single-phase half-controlled converter fed DC series motor drive.

b) Describe the working principle of single-phase dual converter with neat diagram and waveforms.

c) Describe class B chopper drive with neat circuit diagram.

d) Explain stator voltage control method of an induction motor.

e) Explain the slip power recovery theory of an induction motor with neat diagram.

f) Explain variable frequency control method of an induction motor.

Q.3 Solve Any Two. **12**

a) Draw and explain the operation of three phase fully controlled converter fed DC motor drive. Also draw the related voltage and current waveforms.

b) Explain four quadrant operation of class E chopper drive with neat diagram.

c) Compare CSI and VSI fed induction motor drives.

SECTION – II

Q.4 Solve Any Four. **16**

a) Explain direct field-oriented control scheme with neat diagram.

b) Explain the working principle of Field Oriented Control (FOC) of induction machine.

c) Describe indirect field-oriented control method of induction motor with neat diagram.

d) Explain the principle of Space Vector Modulation control technique used in FOC.

e) Explain the DTC strategy to control the torque and flux of an Induction Machine.

f) Describe optimum switching vector selection in direct torque control.

Q.5 Solve Any Two. **12**

a) Explain the working principle of Field Oriented Control (FOC) of induction machine. Also state its advantages over standard control methods.

b) Discuss the torque ripple reduction methods in Induction motor drives.

c) Derive the torque expression with stator and rotor fluxes in DTC.

SLR-QH-644

Seat No.	

Set R

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Electric Vehicle Controls (EEMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) Direct vector control estimates flux using _____.
a) Rotor position sensor b) Flux estimator (feedback)
c) Pre-defined model d) Open-loop flux

2) The angle δ in the torque expression refers to the slip angle between stator and rotor flux vectors _____.
a) True b) False

3) DTC uses hysteresis controllers to maintain torque and flux within two separate bands _____.
a) True b) False

4) Optimal switching vector selection ensures torque and flux errors are driven back into hysteresis bands each cycle.
a) True b) False

5) In a full converter, how many thyristors are needed?
a) 1 b) 2
c) 3 d) 4

6) A full converter provides how many quadrant operations (voltage & current considered)?
a) One b) Two
c) Three d) Four

7) Dual converters enable how many quadrants operation?
a) One b) Two
c) Three d) Four

8) Choppers are what type of converters?
a) AC→DC b) DC→AC
c) DC→DC d) AC→AC

9) In V/f control, to maintain constant stator flux, the stator voltage must be varied proportionally with frequency.
a) True b) False

10) Closed-loop V/f control adjusts which parameter based on speed error?
a) Voltage amplitude b) Slip frequency
c) Stator resistance d) Rotor speed

11) CSI stands for _____.
a) Current Source Inverter b) Constant Slip Inverter
c) Common Source Inverter d) Cyclo-source inverter

12) Closed-loop VSI control adjusts voltage and frequency to track _____.
a) Torque b) Speed
c) Slip d) Current

13) FOC makes an induction motor behave like a DC motor by decoupling _____.
a) Voltage & current b) Flux & torque
c) Speed & torque d) Frequency & flux

14) In FOC, the d-axis current (Ids) controls _____.
a) Torque b) Flux
c) Speed d) Voltage

Seat No.	

Set **R**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Electric Vehicle Controls (EEMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Solve Any Four. **16**

a) Draw and explain the operation of single-phase half-controlled converter fed DC series motor drive.

b) Describe the working principle of single-phase dual converter with neat diagram and waveforms.

c) Describe class B chopper drive with neat circuit diagram.

d) Explain stator voltage control method of an induction motor.

e) Explain the slip power recovery theory of an induction motor with neat diagram.

f) Explain variable frequency control method of an induction motor.

Q.3 Solve Any Two. **12**

a) Draw and explain the operation of three phase fully controlled converter fed DC motor drive. Also draw the related voltage and current waveforms.

b) Explain four quadrant operation of class E chopper drive with neat diagram.

c) Compare CSI and VSI fed induction motor drives.

SECTION – II

Q.4 Solve Any Four. **16**

a) Explain direct field-oriented control scheme with neat diagram.

b) Explain the working principle of Field Oriented Control (FOC) of induction machine.

c) Describe indirect field-oriented control method of induction motor with neat diagram.

d) Explain the principle of Space Vector Modulation control technique used in FOC.

e) Explain the DTC strategy to control the torque and flux of an Induction Machine.

f) Describe optimum switching vector selection in direct torque control.

Q.5 Solve Any Two. **12**

a) Explain the working principle of Field Oriented Control (FOC) of induction machine. Also state its advantages over standard control methods.

b) Discuss the torque ripple reduction methods in Induction motor drives.

c) Derive the torque expression with stator and rotor fluxes in DTC.

Seat No.	

Set | S

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Electric Vehicle Controls (EEMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) Closed-loop V/f control adjusts which parameter based on speed error?
a) Voltage amplitude b) Slip frequency
c) Stator resistance d) Rotor speed

2) CSI stands for _____.
a) Current Source Inverter b) Constant Slip Inverter
c) Common Source Inverter d) Cyclo-source inverter

3) Closed-loop VSI control adjusts voltage and frequency to track _____.
a) Torque b) Speed
c) Slip d) Current

4) FOC makes an induction motor behave like a DC motor by decoupling _____.
a) Voltage & current b) Flux & torque
c) Speed & torque d) Frequency & flux

5) In FOC, the d-axis current (Ids) controls _____.
a) Torque b) Flux
c) Speed d) Voltage

6) Direct vector control estimates flux using _____.
a) Rotor position sensor b) Flux estimator (feedback)
c) Pre-defined model d) Open-loop flux

7) The angle δ in the torque expression refers to the slip angle between stator and rotor flux vectors _____.
a) True b) False

8) DTC uses hysteresis controllers to maintain torque and flux within two separate bands _____.

a) True b) False

9) Optimal switching vector selection ensures torque and flux errors are driven back into hysteresis bands each cycle.

a) True b) False

10) In a full converter, how many thyristors are needed?

a) 1 b) 2
c) 3 d) 4

11) A full converter provides how many quadrant operations (voltage & current considered)?

a) One b) Two
c) Three d) Four

12) Dual converters enable how many quadrants operation?

a) One b) Two
c) Three d) Four

13) Choppers are what type of converters?

a) AC→DC b) DC→AC
c) DC→DC d) AC→AC

14) In V/f control, to maintain constant stator flux, the stator voltage must be varied proportionally with frequency.

a) True b) False

SLR-QH-644

Seat No.		Set	S

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Electric Vehicle Controls (EEMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Solve Any Four. **16**

a) Draw and explain the operation of single-phase half-controlled converter fed DC series motor drive.

b) Describe the working principle of single-phase dual converter with neat diagram and waveforms.

c) Describe class B chopper drive with neat circuit diagram.

d) Explain stator voltage control method of an induction motor.

e) Explain the slip power recovery theory of an induction motor with neat diagram.

f) Explain variable frequency control method of an induction motor.

Q.3 Solve Any Two. **12**

a) Draw and explain the operation of three phase fully controlled converter fed DC motor drive. Also draw the related voltage and current waveforms.

b) Explain four quadrant operation of class E chopper drive with neat diagram.

c) Compare CSI and VSI fed induction motor drives.

SECTION – II

Q.4 Solve Any Four. **16**

a) Explain direct field-oriented control scheme with neat diagram.

b) Explain the working principle of Field Oriented Control (FOC) of induction machine.

c) Describe indirect field-oriented control method of induction motor with neat diagram.

d) Explain the principle of Space Vector Modulation control technique used in FOC.

e) Explain the DTC strategy to control the torque and flux of an Induction Machine.

f) Describe optimum switching vector selection in direct torque control.

Q.5 Solve Any Two. **12**

a) Explain the working principle of Field Oriented Control (FOC) of induction machine. Also state its advantages over standard control methods.

b) Discuss the torque ripple reduction methods in Induction motor drives.

c) Derive the torque expression with stator and rotor fluxes in DTC.

SLR-QH-644

Seat No.		Set	P

T.Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Electric Vehicle Controls (EEMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) In a full converter, how many thyristors are needed?
a) 1 b) 2
c) 3 d) 4

2) A full converter provides how many quadrant operations (voltage & current considered)?
a) One b) Two
c) Three d) Four

3) Dual converters enable how many quadrants operation?
a) One b) Two
c) Three d) Four

4) Choppers are what type of converters?
a) AC→DC b) DC→AC
c) DC→DC d) AC→AC

5) In V/f control, to maintain constant stator flux, the stator voltage must be varied proportionally with frequency.
a) True b) False

6) Closed-loop V/f control adjusts which parameter based on speed error?
a) Voltage amplitude b) Slip frequency
c) Stator resistance d) Rotor speed

7) CSI stands for _____.
a) Current Source Inverter b) Constant Slip Inverter
c) Common Source Inverter d) Cyclo-source inverter

8) Closed-loop VSI control adjusts voltage and frequency to track _____.
a) Torque b) Speed
c) Slip d) Current

9) FOC makes an induction motor behave like a DC motor by decoupling _____.
a) Voltage & current b) Flux & torque
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10) In FOC, the d-axis current (Ids) controls _____.
a) Torque b) Flux
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11) Direct vector control estimates flux using _____.
a) Rotor position sensor b) Flux estimator (feedback)
c) Pre-defined model d) Open-loop flux

12) The angle δ in the torque expression refers to the slip angle between stator and rotor flux vectors _____.
a) True b) False

13) DTC uses hysteresis controllers to maintain torque and flux within two separate bands _____.
a) True b) False

14) Optimal switching vector selection ensures torque and flux errors are driven back into hysteresis bands each cycle.
a) True b) False

Seat No.	

Set | P

T.Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Electric Vehicle Controls (EEMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Solve Any Four. **16**

a) Draw and explain the operation of single-phase half-controlled converter fed DC series motor drive.

b) Describe the working principle of single-phase dual converter with neat diagram and waveforms.

c) Describe class B chopper drive with neat circuit diagram.

d) Explain stator voltage control method of an induction motor.

e) Explain the slip power recovery theory of an induction motor with neat diagram.

f) Explain variable frequency control method of an induction motor.

Q.3 Solve Any Two. **12**

a) Draw and explain the operation of three phase fully controlled converter fed DC motor drive. Also draw the related voltage and current waveforms.

b) Explain four quadrant operation of class E chopper drive with neat diagram.

c) Compare CSI and VSI fed induction motor drives.

SECTION – II

Q.4 Solve Any Four. **16**

a) Explain direct field-oriented control scheme with neat diagram.

b) Explain the working principle of Field Oriented Control (FOC) of induction machine.

c) Describe indirect field-oriented control method of induction motor with neat diagram.

d) Explain the principle of Space Vector Modulation control technique used in FOC.

e) Explain the DTC strategy to control the torque and flux of an Induction Machine.

f) Describe optimum switching vector selection in direct torque control.

Q.5 Solve Any Two. **12**

a) Explain the working principle of Field Oriented Control (FOC) of induction machine. Also state its advantages over standard control methods.

b) Discuss the torque ripple reduction methods in Induction motor drives.

c) Derive the torque expression with stator and rotor fluxes in DTC.

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Electric Vehicle Controls (EEMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) Closed-loop VSI control adjusts voltage and frequency to track _____.
a) Torque b) Speed
c) Slip d) Current

2) FOC makes an induction motor behave like a DC motor by decoupling _____.
a) Voltage & current b) Flux & torque
c) Speed & torque d) Frequency & flux

3) In FOC, the d-axis current (Ids) controls _____.
a) Torque b) Flux
c) Speed d) Voltage

4) Direct vector control estimates flux using _____.
a) Rotor position sensor b) Flux estimator (feedback)
c) Pre-defined model d) Open-loop flux

5) The angle δ in the torque expression refers to the slip angle between stator and rotor flux vectors _____.
a) True b) False

6) DTC uses hysteresis controllers to maintain torque and flux within two separate bands _____.
a) True b) False

7) Optimal switching vector selection ensures torque and flux errors are driven back into hysteresis bands each cycle.
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8) In a full converter, how many thyristors are needed?
a) 1 b) 2
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c) DC→DC d) AC→AC

12) In V/f control, to maintain constant stator flux, the stator voltage must be varied proportionally with frequency.
a) True b) False

13) Closed-loop V/f control adjusts which parameter based on speed error?
a) Voltage amplitude b) Slip frequency
c) Stator resistance d) Rotor speed

14) CSI stands for _____.
a) Current Source Inverter b) Constant Slip Inverter
c) Common Source Inverter d) Cyclo-source inverter

SLR-QH-644

Seat No.	

Set Q

T.Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Electric Vehicle Controls (EEMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Solve Any Four. **16**

a) Draw and explain the operation of single-phase half-controlled converter fed DC series motor drive.

b) Describe the working principle of single-phase dual converter with neat diagram and waveforms.

c) Describe class B chopper drive with neat circuit diagram.

d) Explain stator voltage control method of an induction motor.

e) Explain the slip power recovery theory of an induction motor with neat diagram.

f) Explain variable frequency control method of an induction motor.

Q.3 Solve Any Two. **12**

a) Draw and explain the operation of three phase fully controlled converter fed DC motor drive. Also draw the related voltage and current waveforms.

b) Explain four quadrant operation of class E chopper drive with neat diagram.

c) Compare CSI and VSI fed induction motor drives.

SECTION – II

Q.4 Solve Any Four. **16**

a) Explain direct field-oriented control scheme with neat diagram.

b) Explain the working principle of Field Oriented Control (FOC) of induction machine.

c) Describe indirect field-oriented control method of induction motor with neat diagram.

d) Explain the principle of Space Vector Modulation control technique used in FOC.

e) Explain the DTC strategy to control the torque and flux of an Induction Machine.

f) Describe optimum switching vector selection in direct torque control.

Q.5 Solve Any Two. **12**

a) Explain the working principle of Field Oriented Control (FOC) of induction machine. Also state its advantages over standard control methods.

b) Discuss the torque ripple reduction methods in Induction motor drives.

c) Derive the torque expression with stator and rotor fluxes in DTC.

Seat No.	

Set | **R**

T.Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Electric Vehicle Controls (EEMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) Direct vector control estimates flux using _____.
a) Rotor position sensor b) Flux estimator (feedback)
c) Pre-defined model d) Open-loop flux

2) The angle δ in the torque expression refers to the slip angle between stator and rotor flux vectors _____.
a) True b) False

3) DTC uses hysteresis controllers to maintain torque and flux within two separate bands _____.
a) True b) False

4) Optimal switching vector selection ensures torque and flux errors are driven back into hysteresis bands each cycle.
a) True b) False

5) In a full converter, how many thyristors are needed?
a) 1 b) 2
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a) AC→DC b) DC→AC
c) DC→DC d) AC→AC

9) In V/f control, to maintain constant stator flux, the stator voltage must be varied proportionally with frequency.
a) True b) False

10) Closed-loop V/f control adjusts which parameter based on speed error?
a) Voltage amplitude b) Slip frequency
c) Stator resistance d) Rotor speed

11) CSI stands for _____.
a) Current Source Inverter b) Constant Slip Inverter
c) Common Source Inverter d) Cyclo-source inverter

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a) Torque b) Speed
c) Slip d) Current

13) FOC makes an induction motor behave like a DC motor by decoupling _____.
a) Voltage & current b) Flux & torque
c) Speed & torque d) Frequency & flux

14) In FOC, the d-axis current (Ids) controls _____.
a) Torque b) Flux
c) Speed d) Voltage

Seat No.	

Set **R**

T.Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Electric Vehicle Controls (EEMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Solve Any Four. **16**

a) Draw and explain the operation of single-phase half-controlled converter fed DC series motor drive.

b) Describe the working principle of single-phase dual converter with neat diagram and waveforms.

c) Describe class B chopper drive with neat circuit diagram.

d) Explain stator voltage control method of an induction motor.

e) Explain the slip power recovery theory of an induction motor with neat diagram.

f) Explain variable frequency control method of an induction motor.

Q.3 Solve Any Two. **12**

a) Draw and explain the operation of three phase fully controlled converter fed DC motor drive. Also draw the related voltage and current waveforms.

b) Explain four quadrant operation of class E chopper drive with neat diagram.

c) Compare CSI and VSI fed induction motor drives.

SECTION – II

Q.4 Solve Any Four. **16**

a) Explain direct field-oriented control scheme with neat diagram.

b) Explain the working principle of Field Oriented Control (FOC) of induction machine.

c) Describe indirect field-oriented control method of induction motor with neat diagram.

d) Explain the principle of Space Vector Modulation control technique used in FOC.

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f) Describe optimum switching vector selection in direct torque control.

Q.5 Solve Any Two. **12**

a) Explain the working principle of Field Oriented Control (FOC) of induction machine. Also state its advantages over standard control methods.

b) Discuss the torque ripple reduction methods in Induction motor drives.

c) Derive the torque expression with stator and rotor fluxes in DTC.

SLR-QH-644

Seat No.		Set	S

T.Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Electric Vehicle Controls (EEMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) Closed-loop V/f control adjusts which parameter based on speed error?
a) Voltage amplitude b) Slip frequency
c) Stator resistance d) Rotor speed

2) CSI stands for _____.
a) Current Source Inverter b) Constant Slip Inverter
c) Common Source Inverter d) Cyclo-source inverter

3) Closed-loop VSI control adjusts voltage and frequency to track _____.
a) Torque b) Speed
c) Slip d) Current

4) FOC makes an induction motor behave like a DC motor by decoupling _____.
a) Voltage & current b) Flux & torque
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5) In FOC, the d-axis current (Ids) controls _____.
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c) Speed d) Voltage

6) Direct vector control estimates flux using _____.
a) Rotor position sensor b) Flux estimator (feedback)
c) Pre-defined model d) Open-loop flux

7) The angle δ in the torque expression refers to the slip angle between stator and rotor flux vectors _____.
a) True b) False

8) DTC uses hysteresis controllers to maintain torque and flux within two separate bands _____.

a) True b) False

9) Optimal switching vector selection ensures torque and flux errors are driven back into hysteresis bands each cycle.

a) True b) False

10) In a full converter, how many thyristors are needed?

a) 1 b) 2
c) 3 d) 4

11) A full converter provides how many quadrant operations (voltage & current considered)?

a) One b) Two
c) Three d) Four

12) Dual converters enable how many quadrants operation?

a) One b) Two
c) Three d) Four

13) Choppers are what type of converters?

a) AC→DC b) DC→AC
c) DC→DC d) AC→AC

14) In V/f control, to maintain constant stator flux, the stator voltage must be varied proportionally with frequency.

a) True b) False

SLR-QH-644

Seat No.		Set	S

T.Y. (B.Tech.) (Electrical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Electric Vehicle Controls (EEMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Solve Any Four. **16**

a) Draw and explain the operation of single-phase half-controlled converter fed DC series motor drive.

b) Describe the working principle of single-phase dual converter with neat diagram and waveforms.

c) Describe class B chopper drive with neat circuit diagram.

d) Explain stator voltage control method of an induction motor.

e) Explain the slip power recovery theory of an induction motor with neat diagram.

f) Explain variable frequency control method of an induction motor.

Q.3 Solve Any Two. **12**

a) Draw and explain the operation of three phase fully controlled converter fed DC motor drive. Also draw the related voltage and current waveforms.

b) Explain four quadrant operation of class E chopper drive with neat diagram.

c) Compare CSI and VSI fed induction motor drives.

SECTION – II

Q.4 Solve Any Four. **16**

a) Explain direct field-oriented control scheme with neat diagram.

b) Explain the working principle of Field Oriented Control (FOC) of induction machine.

c) Describe indirect field-oriented control method of induction motor with neat diagram.

d) Explain the principle of Space Vector Modulation control technique used in FOC.

e) Explain the DTC strategy to control the torque and flux of an Induction Machine.

f) Describe optimum switching vector selection in direct torque control.

Q.5 Solve Any Two. **12**

a) Explain the working principle of Field Oriented Control (FOC) of induction machine. Also state its advantages over standard control methods.

b) Discuss the torque ripple reduction methods in Induction motor drives.

c) Derive the torque expression with stator and rotor fluxes in DTC.

SLR-QH-644

Seat No.	

Set P

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Electric Vehicle Controls (EEMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) In a full converter, how many thyristors are needed?
a) 1 b) 2
c) 3 d) 4

2) A full converter provides how many quadrant operations (voltage & current considered)?
a) One b) Two
c) Three d) Four

3) Dual converters enable how many quadrants operation?
a) One b) Two
c) Three d) Four

4) Choppers are what type of converters?
a) AC→DC b) DC→AC
c) DC→DC d) AC→AC

5) In V/f control, to maintain constant stator flux, the stator voltage must be varied proportionally with frequency.
a) True b) False

6) Closed-loop V/f control adjusts which parameter based on speed error?
a) Voltage amplitude b) Slip frequency
c) Stator resistance d) Rotor speed

7) CSI stands for _____.
a) Current Source Inverter b) Constant Slip Inverter
c) Common Source Inverter d) Cyclo-source inverter

8) Closed-loop VSI control adjusts voltage and frequency to track _____.
a) Torque b) Speed
c) Slip d) Current

9) FOC makes an induction motor behave like a DC motor by decoupling _____.
a) Voltage & current b) Flux & torque
c) Speed & torque d) Frequency & flux

10) In FOC, the d-axis current (Ids) controls _____.
a) Torque b) Flux
c) Speed d) Voltage

11) Direct vector control estimates flux using _____.
a) Rotor position sensor b) Flux estimator (feedback)
c) Pre-defined model d) Open-loop flux

12) The angle δ in the torque expression refers to the slip angle between stator and rotor flux vectors _____.
a) True b) False

13) DTC uses hysteresis controllers to maintain torque and flux within two separate bands _____.
a) True b) False

14) Optimal switching vector selection ensures torque and flux errors are driven back into hysteresis bands each cycle.
a) True b) False

Seat No.	

Set | P

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Electric Vehicle Controls (EEMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Solve Any Four. **16**

a) Draw and explain the operation of single-phase half-controlled converter fed DC series motor drive.

b) Describe the working principle of single-phase dual converter with neat diagram and waveforms.

c) Describe class B chopper drive with neat circuit diagram.

d) Explain stator voltage control method of an induction motor.

e) Explain the slip power recovery theory of an induction motor with neat diagram.

f) Explain variable frequency control method of an induction motor.

Q.3 Solve Any Two. **12**

a) Draw and explain the operation of three phase fully controlled converter fed DC motor drive. Also draw the related voltage and current waveforms.

b) Explain four quadrant operation of class E chopper drive with neat diagram.

c) Compare CSI and VSI fed induction motor drives.

SECTION – II

Q.4 Solve Any Four. **16**

a) Explain direct field-oriented control scheme with neat diagram.

b) Explain the working principle of Field Oriented Control (FOC) of induction machine.

c) Describe indirect field-oriented control method of induction motor with neat diagram.

d) Explain the principle of Space Vector Modulation control technique used in FOC.

e) Explain the DTC strategy to control the torque and flux of an Induction Machine.

f) Describe optimum switching vector selection in direct torque control.

Q.5 Solve Any Two. **12**

a) Explain the working principle of Field Oriented Control (FOC) of induction machine. Also state its advantages over standard control methods.

b) Discuss the torque ripple reduction methods in Induction motor drives.

c) Derive the torque expression with stator and rotor fluxes in DTC.

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Electric Vehicle Controls (EEMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) Closed-loop VSI control adjusts voltage and frequency to track _____.
a) Torque b) Speed
c) Slip d) Current

2) FOC makes an induction motor behave like a DC motor by decoupling _____.
a) Voltage & current b) Flux & torque
c) Speed & torque d) Frequency & flux

3) In FOC, the d-axis current (Ids) controls _____.
a) Torque b) Flux
c) Speed d) Voltage

4) Direct vector control estimates flux using _____.
a) Rotor position sensor b) Flux estimator (feedback)
c) Pre-defined model d) Open-loop flux

5) The angle δ in the torque expression refers to the slip angle between stator and rotor flux vectors _____.
a) True b) False

6) DTC uses hysteresis controllers to maintain torque and flux within two separate bands _____.
a) True b) False

7) Optimal switching vector selection ensures torque and flux errors are driven back into hysteresis bands each cycle.
a) True b) False

8) In a full converter, how many thyristors are needed?
a) 1 b) 2
c) 3 d) 4

9) A full converter provides how many quadrant operations (voltage & current considered)?
a) One b) Two
c) Three d) Four

10) Dual converters enable how many quadrants operation?
a) One b) Two
c) Three d) Four

11) Choppers are what type of converters?
a) AC→DC b) DC→AC
c) DC→DC d) AC→AC

12) In V/f control, to maintain constant stator flux, the stator voltage must be varied proportionally with frequency.
a) True b) False

13) Closed-loop V/f control adjusts which parameter based on speed error?
a) Voltage amplitude b) Slip frequency
c) Stator resistance d) Rotor speed

14) CSI stands for _____.
a) Current Source Inverter b) Constant Slip Inverter
c) Common Source Inverter d) Cyclo-source inverter

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Electric Vehicle Controls (EEMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Solve Any Four. **16**

a) Draw and explain the operation of single-phase half-controlled converter fed DC series motor drive.

b) Describe the working principle of single-phase dual converter with neat diagram and waveforms.

c) Describe class B chopper drive with neat circuit diagram.

d) Explain stator voltage control method of an induction motor.

e) Explain the slip power recovery theory of an induction motor with neat diagram.

f) Explain variable frequency control method of an induction motor.

Q.3 Solve Any Two. **12**

a) Draw and explain the operation of three phase fully controlled converter fed DC motor drive. Also draw the related voltage and current waveforms.

b) Explain four quadrant operation of class E chopper drive with neat diagram.

c) Compare CSI and VSI fed induction motor drives.

SECTION – II

Q.4 Solve Any Four. **16**

a) Explain direct field-oriented control scheme with neat diagram.

b) Explain the working principle of Field Oriented Control (FOC) of induction machine.

c) Describe indirect field-oriented control method of induction motor with neat diagram.

d) Explain the principle of Space Vector Modulation control technique used in FOC.

e) Explain the DTC strategy to control the torque and flux of an Induction Machine.

f) Describe optimum switching vector selection in direct torque control.

Q.5 Solve Any Two. **12**

a) Explain the working principle of Field Oriented Control (FOC) of induction machine. Also state its advantages over standard control methods.

b) Discuss the torque ripple reduction methods in Induction motor drives.

c) Derive the torque expression with stator and rotor fluxes in DTC.

SLR-QH-644

Seat No.	

Set R

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Electric Vehicle Controls (EEMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) Direct vector control estimates flux using _____.
a) Rotor position sensor b) Flux estimator (feedback)
c) Pre-defined model d) Open-loop flux

2) The angle δ in the torque expression refers to the slip angle between stator and rotor flux vectors _____.
a) True b) False

3) DTC uses hysteresis controllers to maintain torque and flux within two separate bands _____.
a) True b) False

4) Optimal switching vector selection ensures torque and flux errors are driven back into hysteresis bands each cycle.
a) True b) False

5) In a full converter, how many thyristors are needed?
a) 1 b) 2
c) 3 d) 4

6) A full converter provides how many quadrant operations (voltage & current considered)?
a) One b) Two
c) Three d) Four

7) Dual converters enable how many quadrants operation?
a) One b) Two
c) Three d) Four

8) Choppers are what type of converters?
a) AC→DC b) DC→AC
c) DC→DC d) AC→AC

9) In V/f control, to maintain constant stator flux, the stator voltage must be varied proportionally with frequency.
a) True b) False

10) Closed-loop V/f control adjusts which parameter based on speed error?
a) Voltage amplitude b) Slip frequency
c) Stator resistance d) Rotor speed

11) CSI stands for _____.
a) Current Source Inverter b) Constant Slip Inverter
c) Common Source Inverter d) Cyclo-source inverter

12) Closed-loop VSI control adjusts voltage and frequency to track _____.
a) Torque b) Speed
c) Slip d) Current

13) FOC makes an induction motor behave like a DC motor by decoupling _____.
a) Voltage & current b) Flux & torque
c) Speed & torque d) Frequency & flux

14) In FOC, the d-axis current (Ids) controls _____.
a) Torque b) Flux
c) Speed d) Voltage

Seat No.	

Set **R**

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Electric Vehicle Controls (EEMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Solve Any Four. **16**

a) Draw and explain the operation of single-phase half-controlled converter fed DC series motor drive.

b) Describe the working principle of single-phase dual converter with neat diagram and waveforms.

c) Describe class B chopper drive with neat circuit diagram.

d) Explain stator voltage control method of an induction motor.

e) Explain the slip power recovery theory of an induction motor with neat diagram.

f) Explain variable frequency control method of an induction motor.

Q.3 Solve Any Two. **12**

a) Draw and explain the operation of three phase fully controlled converter fed DC motor drive. Also draw the related voltage and current waveforms.

b) Explain four quadrant operation of class E chopper drive with neat diagram.

c) Compare CSI and VSI fed induction motor drives.

SECTION – II

Q.4 Solve Any Four. **16**

a) Explain direct field-oriented control scheme with neat diagram.

b) Explain the working principle of Field Oriented Control (FOC) of induction machine.

c) Describe indirect field-oriented control method of induction motor with neat diagram.

d) Explain the principle of Space Vector Modulation control technique used in FOC.

e) Explain the DTC strategy to control the torque and flux of an Induction Machine.

f) Describe optimum switching vector selection in direct torque control.

Q.5 Solve Any Two. **12**

a) Explain the working principle of Field Oriented Control (FOC) of induction machine. Also state its advantages over standard control methods.

b) Discuss the torque ripple reduction methods in Induction motor drives.

c) Derive the torque expression with stator and rotor fluxes in DTC.

Seat No.	

Set | S

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Electric Vehicle Controls (EEMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) Closed-loop V/f control adjusts which parameter based on speed error?
a) Voltage amplitude b) Slip frequency
c) Stator resistance d) Rotor speed

2) CSI stands for _____.
a) Current Source Inverter b) Constant Slip Inverter
c) Common Source Inverter d) Cyclo-source inverter

3) Closed-loop VSI control adjusts voltage and frequency to track _____.
a) Torque b) Speed
c) Slip d) Current

4) FOC makes an induction motor behave like a DC motor by decoupling _____.
a) Voltage & current b) Flux & torque
c) Speed & torque d) Frequency & flux

5) In FOC, the d-axis current (Ids) controls _____.
a) Torque b) Flux
c) Speed d) Voltage

6) Direct vector control estimates flux using _____.
a) Rotor position sensor b) Flux estimator (feedback)
c) Pre-defined model d) Open-loop flux

7) The angle δ in the torque expression refers to the slip angle between stator and rotor flux vectors _____.
a) True b) False

8) DTC uses hysteresis controllers to maintain torque and flux within two separate bands _____.

a) True b) False

9) Optimal switching vector selection ensures torque and flux errors are driven back into hysteresis bands each cycle.

a) True b) False

10) In a full converter, how many thyristors are needed?

a) 1 b) 2
c) 3 d) 4

11) A full converter provides how many quadrant operations (voltage & current considered)?

a) One b) Two
c) Three d) Four

12) Dual converters enable how many quadrants operation?

a) One b) Two
c) Three d) Four

13) Choppers are what type of converters?

a) AC→DC b) DC→AC
c) DC→DC d) AC→AC

14) In V/f control, to maintain constant stator flux, the stator voltage must be varied proportionally with frequency.

a) True b) False

SLR-QH-644

Seat No.		Set	S

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Electric Vehicle Controls (EEMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Solve Any Four. **16**

a) Draw and explain the operation of single-phase half-controlled converter fed DC series motor drive.

b) Describe the working principle of single-phase dual converter with neat diagram and waveforms.

c) Describe class B chopper drive with neat circuit diagram.

d) Explain stator voltage control method of an induction motor.

e) Explain the slip power recovery theory of an induction motor with neat diagram.

f) Explain variable frequency control method of an induction motor.

Q.3 Solve Any Two. **12**

a) Draw and explain the operation of three phase fully controlled converter fed DC motor drive. Also draw the related voltage and current waveforms.

b) Explain four quadrant operation of class E chopper drive with neat diagram.

c) Compare CSI and VSI fed induction motor drives.

SECTION – II

Q.4 Solve Any Four. **16**

a) Explain direct field-oriented control scheme with neat diagram.

b) Explain the working principle of Field Oriented Control (FOC) of induction machine.

c) Describe indirect field-oriented control method of induction motor with neat diagram.

d) Explain the principle of Space Vector Modulation control technique used in FOC.

e) Explain the DTC strategy to control the torque and flux of an Induction Machine.

f) Describe optimum switching vector selection in direct torque control.

Q.5 Solve Any Two. **12**

a) Explain the working principle of Field Oriented Control (FOC) of induction machine. Also state its advantages over standard control methods.

b) Discuss the torque ripple reduction methods in Induction motor drives.

c) Derive the torque expression with stator and rotor fluxes in DTC.

SLR-QH-644

Seat No.		Set	P

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Electric Vehicle Controls (EEMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) In a full converter, how many thyristors are needed?
a) 1 b) 2
c) 3 d) 4

2) A full converter provides how many quadrant operations (voltage & current considered)?
a) One b) Two
c) Three d) Four

3) Dual converters enable how many quadrants operation?
a) One b) Two
c) Three d) Four

4) Choppers are what type of converters?
a) AC→DC b) DC→AC
c) DC→DC d) AC→AC

5) In V/f control, to maintain constant stator flux, the stator voltage must be varied proportionally with frequency.
a) True b) False

6) Closed-loop V/f control adjusts which parameter based on speed error?
a) Voltage amplitude b) Slip frequency
c) Stator resistance d) Rotor speed

7) CSI stands for _____.
a) Current Source Inverter b) Constant Slip Inverter
c) Common Source Inverter d) Cyclo-source inverter

8) Closed-loop VSI control adjusts voltage and frequency to track _____.
a) Torque b) Speed
c) Slip d) Current

9) FOC makes an induction motor behave like a DC motor by decoupling _____.
a) Voltage & current b) Flux & torque
c) Speed & torque d) Frequency & flux

10) In FOC, the d-axis current (Ids) controls _____.
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c) Speed d) Voltage

11) Direct vector control estimates flux using _____.
a) Rotor position sensor b) Flux estimator (feedback)
c) Pre-defined model d) Open-loop flux

12) The angle δ in the torque expression refers to the slip angle between stator and rotor flux vectors _____.
a) True b) False

13) DTC uses hysteresis controllers to maintain torque and flux within two separate bands _____.
a) True b) False

14) Optimal switching vector selection ensures torque and flux errors are driven back into hysteresis bands each cycle.
a) True b) False

Seat No.	

Set | P

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Electric Vehicle Controls (EEMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Solve Any Four. **16**

a) Draw and explain the operation of single-phase half-controlled converter fed DC series motor drive.

b) Describe the working principle of single-phase dual converter with neat diagram and waveforms.

c) Describe class B chopper drive with neat circuit diagram.

d) Explain stator voltage control method of an induction motor.

e) Explain the slip power recovery theory of an induction motor with neat diagram.

f) Explain variable frequency control method of an induction motor.

Q.3 Solve Any Two. **12**

a) Draw and explain the operation of three phase fully controlled converter fed DC motor drive. Also draw the related voltage and current waveforms.

b) Explain four quadrant operation of class E chopper drive with neat diagram.

c) Compare CSI and VSI fed induction motor drives.

SECTION – II

Q.4 Solve Any Four. **16**

a) Explain direct field-oriented control scheme with neat diagram.

b) Explain the working principle of Field Oriented Control (FOC) of induction machine.

c) Describe indirect field-oriented control method of induction motor with neat diagram.

d) Explain the principle of Space Vector Modulation control technique used in FOC.

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f) Describe optimum switching vector selection in direct torque control.

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b) Discuss the torque ripple reduction methods in Induction motor drives.

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SLR-QH-644

Seat No.		Set	Q

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Electric Vehicle Controls (EEMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. 14

1) Closed-loop VSI control adjusts voltage and frequency to track _____.
a) Torque b) Speed
c) Slip d) Current

2) FOC makes an induction motor behave like a DC motor by decoupling _____.
a) Voltage & current b) Flux & torque
c) Speed & torque d) Frequency & flux

3) In FOC, the d-axis current (Ids) controls _____.
a) Torque b) Flux
c) Speed d) Voltage

4) Direct vector control estimates flux using _____.
a) Rotor position sensor b) Flux estimator (feedback)
c) Pre-defined model d) Open-loop flux

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a) True b) False

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7) Optimal switching vector selection ensures torque and flux errors are driven back into hysteresis bands each cycle.
a) True b) False

8) In a full converter, how many thyristors are needed?
a) 1 b) 2
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a) True b) False

13) Closed-loop V/f control adjusts which parameter based on speed error?
a) Voltage amplitude b) Slip frequency
c) Stator resistance d) Rotor speed

14) CSI stands for _____.
a) Current Source Inverter b) Constant Slip Inverter
c) Common Source Inverter d) Cyclo-source inverter

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Electric Vehicle Controls (EEMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Solve Any Four. **16**

a) Draw and explain the operation of single-phase half-controlled converter fed DC series motor drive.

b) Describe the working principle of single-phase dual converter with neat diagram and waveforms.

c) Describe class B chopper drive with neat circuit diagram.

d) Explain stator voltage control method of an induction motor.

e) Explain the slip power recovery theory of an induction motor with neat diagram.

f) Explain variable frequency control method of an induction motor.

Q.3 Solve Any Two. **12**

a) Draw and explain the operation of three phase fully controlled converter fed DC motor drive. Also draw the related voltage and current waveforms.

b) Explain four quadrant operation of class E chopper drive with neat diagram.

c) Compare CSI and VSI fed induction motor drives.

SECTION – II

Q.4 Solve Any Four. **16**

a) Explain direct field-oriented control scheme with neat diagram.

b) Explain the working principle of Field Oriented Control (FOC) of induction machine.

c) Describe indirect field-oriented control method of induction motor with neat diagram.

d) Explain the principle of Space Vector Modulation control technique used in FOC.

e) Explain the DTC strategy to control the torque and flux of an Induction Machine.

f) Describe optimum switching vector selection in direct torque control.

Q.5 Solve Any Two. **12**

a) Explain the working principle of Field Oriented Control (FOC) of induction machine. Also state its advantages over standard control methods.

b) Discuss the torque ripple reduction methods in Induction motor drives.

c) Derive the torque expression with stator and rotor fluxes in DTC.

Seat No.	

Set **R**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Electric Vehicle Controls (EEMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) Direct vector control estimates flux using _____.
a) Rotor position sensor b) Flux estimator (feedback)
c) Pre-defined model d) Open-loop flux

2) The angle δ in the torque expression refers to the slip angle between stator and rotor flux vectors _____.
a) True b) False

3) DTC uses hysteresis controllers to maintain torque and flux within two separate bands _____.
a) True b) False

4) Optimal switching vector selection ensures torque and flux errors are driven back into hysteresis bands each cycle.
a) True b) False

5) In a full converter, how many thyristors are needed?
a) 1 b) 2
c) 3 d) 4

6) A full converter provides how many quadrant operations (voltage & current considered)?
a) One b) Two
c) Three d) Four

7) Dual converters enable how many quadrants operation?
a) One b) Two
c) Three d) Four

8) Choppers are what type of converters?
a) AC→DC b) DC→AC
c) DC→DC d) AC→AC

9) In V/f control, to maintain constant stator flux, the stator voltage must be varied proportionally with frequency.
a) True b) False

10) Closed-loop V/f control adjusts which parameter based on speed error?
a) Voltage amplitude b) Slip frequency
c) Stator resistance d) Rotor speed

11) CSI stands for _____.
a) Current Source Inverter b) Constant Slip Inverter
c) Common Source Inverter d) Cyclo-source inverter

12) Closed-loop VSI control adjusts voltage and frequency to track _____.
a) Torque b) Speed
c) Slip d) Current

13) FOC makes an induction motor behave like a DC motor by decoupling _____.
a) Voltage & current b) Flux & torque
c) Speed & torque d) Frequency & flux

14) In FOC, the d-axis current (Ids) controls _____.
a) Torque b) Flux
c) Speed d) Voltage

SLR-QH-644

Seat No.	

Set R

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Electric Vehicle Controls (EEMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Solve Any Four. **16**

a) Draw and explain the operation of single-phase half-controlled converter fed DC series motor drive.

b) Describe the working principle of single-phase dual converter with neat diagram and waveforms.

c) Describe class B chopper drive with neat circuit diagram.

d) Explain stator voltage control method of an induction motor.

e) Explain the slip power recovery theory of an induction motor with neat diagram.

f) Explain variable frequency control method of an induction motor.

Q.3 Solve Any Two. **12**

a) Draw and explain the operation of three phase fully controlled converter fed DC motor drive. Also draw the related voltage and current waveforms.

b) Explain four quadrant operation of class E chopper drive with neat diagram.

c) Compare CSI and VSI fed induction motor drives.

SECTION – II

Q.4 Solve Any Four. **16**

a) Explain direct field-oriented control scheme with neat diagram.

b) Explain the working principle of Field Oriented Control (FOC) of induction machine.

c) Describe indirect field-oriented control method of induction motor with neat diagram.

d) Explain the principle of Space Vector Modulation control technique used in FOC.

e) Explain the DTC strategy to control the torque and flux of an Induction Machine.

f) Describe optimum switching vector selection in direct torque control.

Q.5 Solve Any Two. **12**

a) Explain the working principle of Field Oriented Control (FOC) of induction machine. Also state its advantages over standard control methods.

b) Discuss the torque ripple reduction methods in Induction motor drives.

c) Derive the torque expression with stator and rotor fluxes in DTC.

SLR-QH-644

Seat No.		Set	S

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Electric Vehicle Controls (EEMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) Closed-loop V/f control adjusts which parameter based on speed error?
a) Voltage amplitude b) Slip frequency
c) Stator resistance d) Rotor speed

2) CSI stands for _____.
a) Current Source Inverter b) Constant Slip Inverter
c) Common Source Inverter d) Cyclo-source inverter

3) Closed-loop VSI control adjusts voltage and frequency to track _____.
a) Torque b) Speed
c) Slip d) Current

4) FOC makes an induction motor behave like a DC motor by decoupling _____.
a) Voltage & current b) Flux & torque
c) Speed & torque d) Frequency & flux

5) In FOC, the d-axis current (Ids) controls _____.
a) Torque b) Flux
c) Speed d) Voltage

6) Direct vector control estimates flux using _____.
a) Rotor position sensor b) Flux estimator (feedback)
c) Pre-defined model d) Open-loop flux

7) The angle δ in the torque expression refers to the slip angle between stator and rotor flux vectors _____.
a) True b) False

8) DTC uses hysteresis controllers to maintain torque and flux within two separate bands _____.

a) True b) False

9) Optimal switching vector selection ensures torque and flux errors are driven back into hysteresis bands each cycle.

a) True b) False

10) In a full converter, how many thyristors are needed?

a) 1 b) 2
c) 3 d) 4

11) A full converter provides how many quadrant operations (voltage & current considered)?

a) One b) Two
c) Three d) Four

12) Dual converters enable how many quadrants operation?

a) One b) Two
c) Three d) Four

13) Choppers are what type of converters?

a) AC→DC b) DC→AC
c) DC→DC d) AC→AC

14) In V/f control, to maintain constant stator flux, the stator voltage must be varied proportionally with frequency.

a) True b) False

SLR-QH-644

Seat No.		Set	S

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (CBCS) Examination: March/April – 2026
Electric Vehicle Controls (EEMDM-03B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Solve Any Four. **16**

a) Draw and explain the operation of single-phase half-controlled converter fed DC series motor drive.

b) Describe the working principle of single-phase dual converter with neat diagram and waveforms.

c) Describe class B chopper drive with neat circuit diagram.

d) Explain stator voltage control method of an induction motor.

e) Explain the slip power recovery theory of an induction motor with neat diagram.

f) Explain variable frequency control method of an induction motor.

Q.3 Solve Any Two. **12**

a) Draw and explain the operation of three phase fully controlled converter fed DC motor drive. Also draw the related voltage and current waveforms.

b) Explain four quadrant operation of class E chopper drive with neat diagram.

c) Compare CSI and VSI fed induction motor drives.

SECTION – II

Q.4 Solve Any Four. **16**

a) Explain direct field-oriented control scheme with neat diagram.

b) Explain the working principle of Field Oriented Control (FOC) of induction machine.

c) Describe indirect field-oriented control method of induction motor with neat diagram.

d) Explain the principle of Space Vector Modulation control technique used in FOC.

e) Explain the DTC strategy to control the torque and flux of an Induction Machine.

f) Describe optimum switching vector selection in direct torque control.

Q.5 Solve Any Two. **12**

a) Explain the working principle of Field Oriented Control (FOC) of induction machine. Also state its advantages over standard control methods.

b) Discuss the torque ripple reduction methods in Induction motor drives.

c) Derive the torque expression with stator and rotor fluxes in DTC.

SLR-QH-645

Seat No.	

Set P

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
New Product Development (CIVMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the given options. 14

1) Product development mainly focuses on _____.
a) Product disposal
b) Creating and improving products
c) Advertising only
d) Cost reduction only

2) Product lifecycle includes _____.
a) Introduction b) Growth
c) Decline d) All of the above

3) Market segmentation helps in _____.
a) Reducing product quality b) Identifying target customers
c) Increasing production waste d) Eliminating testing

4) Voice of Customer (VOC) is used to _____.
a) Estimate profit
b) Understand customer expectations
c) Reduce manufacturing cost
d) Manage inventory

5) Quality Function Deployment (QFD) primarily converts _____.
a) Customer needs into engineering characteristics
b) Cost into profit
c) Ideas into patents
d) Materials into products

6) House of Quality (HoQ) is associated with _____.
a) Marketing b) Product costing
c) QFD methodology d) Testing methods

7) TRIZ methodology is used for _____.
a) Financial analysis b) Creative problem solving
c) Market research d) Product packaging

8) Morphological methods are useful for _____.
a) Material testing
b) Generating design alternatives
c) Product branding
d) Cost reduction

9) Pugh Matrix is used for _____.
a) Product testing b) Concept selection
c) Reliability analysis d) Cost estimation

10) Modular product architecture provides _____.
a) Increased complexity
b) Ease of maintenance and flexibility
c) Higher production waste
d) Lower usability

11) Human-centered design emphasizes _____.
a) Machine convenience only b) User needs and usability
c) Cost reduction only d) Industrial safety only

12) Activity-based costing helps in _____.
a) Product packaging
b) Accurate allocation of overhead costs
c) Product branding
d) Market segmentation

13) Rapid prototyping is mainly used for _____.
a) Product visualization and testing
b) Final packaging
c) Advertising
d) Sales forecasting

14) Intellectual Property Rights (IPR) protect _____.
a) Customer complaints
b) Innovative ideas and inventions
c) Product waste
d) Raw materials

SLR-QH-645

Seat No.		Set	P

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
New Product Development (CIVMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculators is allowed.

SECTION – I

Q.2 Answer the following questions. **10**

a) Explain phases of product development with suitable examples.

b) Describe Quality Function Deployment (QFD) and House of Quality (HoQ).

Q.3 Answer the following questions. (Any Three) **18**

a) Discuss the importance of engineering design in product development.

b) Explain market segmentation and market research techniques.

c) Describe methods used for identifying customer needs.

d) Explain TRIZ methodology and its applications in product design.

e) Discuss creative thinking methods used in concept generation.

SECTION – II

Q.4 Answer the following questions. **10**

a) Explain concept selection methods using Pugh Matrix and Weighted Decision Matrix.

b) Discuss design for manufacturing and sustainability.

Q.5 Answer the following questions. (Any Three) **18**

a) Explain utility theory and decision trees in product design decision-making.

b) Describe modularity and product architecture development steps.

c) Discuss methods of cost estimation and value analysis in product costing.

d) Explain rapid prototyping techniques and reliability testing.

e) Discuss IPR, patenting, and branding strategies in product commercialization.

SLR-QH-645

Seat No.	

Set Q

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
New Product Development (CIVMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the given options. 14

1) Morphological methods are useful for _____.
a) Material testing
b) Generating design alternatives
c) Product branding
d) Cost reduction

2) Pugh Matrix is used for _____.
a) Product testing b) Concept selection
c) Reliability analysis d) Cost estimation

3) Modular product architecture provides _____.
a) Increased complexity
b) Ease of maintenance and flexibility
c) Higher production waste
d) Lower usability

4) Human-centered design emphasizes _____.
a) Machine convenience only b) User needs and usability
c) Cost reduction only d) Industrial safety only

5) Activity-based costing helps in _____.
a) Product packaging
b) Accurate allocation of overhead costs
c) Product branding
d) Market segmentation

6) Rapid prototyping is mainly used for _____.
a) Product visualization and testing
b) Final packaging
c) Advertising
d) Sales forecasting

7) Intellectual Property Rights (IPR) protect _____.
a) Customer complaints
b) Innovative ideas and inventions
c) Product waste
d) Raw materials

8) Product development mainly focuses on _____.
a) Product disposal
b) Creating and improving products
c) Advertising only
d) Cost reduction only

9) Product lifecycle includes _____.
a) Introduction b) Growth
c) Decline d) All of the above

10) Market segmentation helps in _____.
a) Reducing product quality b) Identifying target customers
c) Increasing production waste d) Eliminating testing

11) Voice of Customer (VOC) is used to _____.
a) Estimate profit
b) Understand customer expectations
c) Reduce manufacturing cost
d) Manage inventory

12) Quality Function Deployment (QFD) primarily converts _____.
a) Customer needs into engineering characteristics
b) Cost into profit
c) Ideas into patents
d) Materials into products

13) House of Quality (HoQ) is associated with _____.
a) Marketing b) Product costing
c) QFD methodology d) Testing methods

14) TRIZ methodology is used for _____.
a) Financial analysis b) Creative problem solving
c) Market research d) Product packaging

SLR-QH-645

Seat No.	

Set Q

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
New Product Development (CIVMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculators is allowed.

SECTION – I

Q.2 Answer the following questions. **10**

a) Explain phases of product development with suitable examples.

b) Describe Quality Function Deployment (QFD) and House of Quality (HoQ).

Q.3 Answer the following questions. (Any Three) **18**

a) Discuss the importance of engineering design in product development.

b) Explain market segmentation and market research techniques.

c) Describe methods used for identifying customer needs.

d) Explain TRIZ methodology and its applications in product design.

e) Discuss creative thinking methods used in concept generation.

SECTION – II

Q.4 Answer the following questions. **10**

a) Explain concept selection methods using Pugh Matrix and Weighted Decision Matrix.

b) Discuss design for manufacturing and sustainability.

Q.5 Answer the following questions. (Any Three) **18**

a) Explain utility theory and decision trees in product design decision-making.

b) Describe modularity and product architecture development steps.

c) Discuss methods of cost estimation and value analysis in product costing.

d) Explain rapid prototyping techniques and reliability testing.

e) Discuss IPR, patenting, and branding strategies in product commercialization.

Seat No.	

Set **R**

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
New Product Development (CIVMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the given options. 14

1) Human-centered design emphasizes _____.
a) Machine convenience only b) User needs and usability
c) Cost reduction only d) Industrial safety only

2) Activity-based costing helps in _____.
a) Product packaging
b) Accurate allocation of overhead costs
c) Product branding
d) Market segmentation

3) Rapid prototyping is mainly used for _____.
a) Product visualization and testing
b) Final packaging
c) Advertising
d) Sales forecasting

4) Intellectual Property Rights (IPR) protect _____.
a) Customer complaints
b) Innovative ideas and inventions
c) Product waste
d) Raw materials

5) Product development mainly focuses on _____.
a) Product disposal
b) Creating and improving products
c) Advertising only
d) Cost reduction only

6) Product lifecycle includes _____.
a) Introduction b) Growth
c) Decline d) All of the above

7) Market segmentation helps in _____.
a) Reducing product quality b) Identifying target customers
c) Increasing production waste d) Eliminating testing

8) Voice of Customer (VOC) is used to _____.
a) Estimate profit
b) Understand customer expectations
c) Reduce manufacturing cost
d) Manage inventory

9) Quality Function Deployment (QFD) primarily converts _____.
a) Customer needs into engineering characteristics
b) Cost into profit
c) Ideas into patents
d) Materials into products

10) House of Quality (HoQ) is associated with _____.
a) Marketing b) Product costing
c) QFD methodology d) Testing methods

11) TRIZ methodology is used for _____.
a) Financial analysis b) Creative problem solving
c) Market research d) Product packaging

12) Morphological methods are useful for _____.
a) Material testing
b) Generating design alternatives
c) Product branding
d) Cost reduction

13) Pugh Matrix is used for _____.
a) Product testing b) Concept selection
c) Reliability analysis d) Cost estimation

14) Modular product architecture provides _____.
a) Increased complexity
b) Ease of maintenance and flexibility
c) Higher production waste
d) Lower usability

SLR-QH-645

Seat No.	

Set R

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
New Product Development (CIVMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculators is allowed.

SECTION – I

Q.2 Answer the following questions. **10**

a) Explain phases of product development with suitable examples.

b) Describe Quality Function Deployment (QFD) and House of Quality (HoQ).

Q.3 Answer the following questions. (Any Three) **18**

a) Discuss the importance of engineering design in product development.

b) Explain market segmentation and market research techniques.

c) Describe methods used for identifying customer needs.

d) Explain TRIZ methodology and its applications in product design.

e) Discuss creative thinking methods used in concept generation.

SECTION – II

Q.4 Answer the following questions. **10**

a) Explain concept selection methods using Pugh Matrix and Weighted Decision Matrix.

b) Discuss design for manufacturing and sustainability.

Q.5 Answer the following questions. (Any Three) **18**

a) Explain utility theory and decision trees in product design decision-making.

b) Describe modularity and product architecture development steps.

c) Discuss methods of cost estimation and value analysis in product costing.

d) Explain rapid prototyping techniques and reliability testing.

e) Discuss IPR, patenting, and branding strategies in product commercialization.

SLR-QH-645

Seat No.	

Set S

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
New Product Development (CIVMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the given options. 14

1) House of Quality (HoQ) is associated with _____.
a) Marketing b) Product costing
c) QFD methodology d) Testing methods

2) TRIZ methodology is used for _____.
a) Financial analysis b) Creative problem solving
c) Market research d) Product packaging

3) Morphological methods are useful for _____.
a) Material testing
b) Generating design alternatives
c) Product branding
d) Cost reduction

4) Pugh Matrix is used for _____.
a) Product testing b) Concept selection
c) Reliability analysis d) Cost estimation

5) Modular product architecture provides _____.
a) Increased complexity
b) Ease of maintenance and flexibility
c) Higher production waste
d) Lower usability

6) Human-centered design emphasizes _____.
a) Machine convenience only b) User needs and usability
c) Cost reduction only d) Industrial safety only

7) Activity-based costing helps in _____.
a) Product packaging
b) Accurate allocation of overhead costs
c) Product branding
d) Market segmentation

8) Rapid prototyping is mainly used for _____.
a) Product visualization and testing
b) Final packaging
c) Advertising
d) Sales forecasting

9) Intellectual Property Rights (IPR) protect _____.
a) Customer complaints
b) Innovative ideas and inventions
c) Product waste
d) Raw materials

10) Product development mainly focuses on _____.
a) Product disposal
b) Creating and improving products
c) Advertising only
d) Cost reduction only

11) Product lifecycle includes _____.
a) Introduction b) Growth
c) Decline d) All of the above

12) Market segmentation helps in _____.
a) Reducing product quality b) Identifying target customers
c) Increasing production waste d) Eliminating testing

13) Voice of Customer (VOC) is used to _____.
a) Estimate profit
b) Understand customer expectations
c) Reduce manufacturing cost
d) Manage inventory

14) Quality Function Deployment (QFD) primarily converts _____.
a) Customer needs into engineering characteristics
b) Cost into profit
c) Ideas into patents
d) Materials into products

SLR-QH-645

Seat No.		Set	S

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
New Product Development (CIVMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculators is allowed.

SECTION – I

Q.2 Answer the following questions. **10**

a) Explain phases of product development with suitable examples.

b) Describe Quality Function Deployment (QFD) and House of Quality (HoQ).

Q.3 Answer the following questions. (Any Three) **18**

a) Discuss the importance of engineering design in product development.

b) Explain market segmentation and market research techniques.

c) Describe methods used for identifying customer needs.

d) Explain TRIZ methodology and its applications in product design.

e) Discuss creative thinking methods used in concept generation.

SECTION – II

Q.4 Answer the following questions. **10**

a) Explain concept selection methods using Pugh Matrix and Weighted Decision Matrix.

b) Discuss design for manufacturing and sustainability.

Q.5 Answer the following questions. (Any Three) **18**

a) Explain utility theory and decision trees in product design decision-making.

b) Describe modularity and product architecture development steps.

c) Discuss methods of cost estimation and value analysis in product costing.

d) Explain rapid prototyping techniques and reliability testing.

e) Discuss IPR, patenting, and branding strategies in product commercialization.

SLR-QH-645

Seat No.	

Set P

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
New Product Development (CIVMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the given options. 14

1) Product development mainly focuses on _____.
a) Product disposal
b) Creating and improving products
c) Advertising only
d) Cost reduction only

2) Product lifecycle includes _____.
a) Introduction b) Growth
c) Decline d) All of the above

3) Market segmentation helps in _____.
a) Reducing product quality b) Identifying target customers
c) Increasing production waste d) Eliminating testing

4) Voice of Customer (VOC) is used to _____.
a) Estimate profit
b) Understand customer expectations
c) Reduce manufacturing cost
d) Manage inventory

5) Quality Function Deployment (QFD) primarily converts _____.
a) Customer needs into engineering characteristics
b) Cost into profit
c) Ideas into patents
d) Materials into products

6) House of Quality (HoQ) is associated with _____.
a) Marketing b) Product costing
c) QFD methodology d) Testing methods

7) TRIZ methodology is used for _____.
a) Financial analysis b) Creative problem solving
c) Market research d) Product packaging

8) Morphological methods are useful for _____.
a) Material testing
b) Generating design alternatives
c) Product branding
d) Cost reduction

9) Pugh Matrix is used for _____.
a) Product testing b) Concept selection
c) Reliability analysis d) Cost estimation

10) Modular product architecture provides _____.
a) Increased complexity
b) Ease of maintenance and flexibility
c) Higher production waste
d) Lower usability

11) Human-centered design emphasizes _____.
a) Machine convenience only b) User needs and usability
c) Cost reduction only d) Industrial safety only

12) Activity-based costing helps in _____.
a) Product packaging
b) Accurate allocation of overhead costs
c) Product branding
d) Market segmentation

13) Rapid prototyping is mainly used for _____.
a) Product visualization and testing
b) Final packaging
c) Advertising
d) Sales forecasting

14) Intellectual Property Rights (IPR) protect _____.
a) Customer complaints
b) Innovative ideas and inventions
c) Product waste
d) Raw materials

SLR-QH-645

Seat No.		Set	P

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
New Product Development (CIVMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculators is allowed.

SECTION – I

Q.2 Answer the following questions. **10**

a) Explain phases of product development with suitable examples.

b) Describe Quality Function Deployment (QFD) and House of Quality (HoQ).

Q.3 Answer the following questions. (Any Three) **18**

a) Discuss the importance of engineering design in product development.

b) Explain market segmentation and market research techniques.

c) Describe methods used for identifying customer needs.

d) Explain TRIZ methodology and its applications in product design.

e) Discuss creative thinking methods used in concept generation.

SECTION – II

Q.4 Answer the following questions. **10**

a) Explain concept selection methods using Pugh Matrix and Weighted Decision Matrix.

b) Discuss design for manufacturing and sustainability.

Q.5 Answer the following questions. (Any Three) **18**

a) Explain utility theory and decision trees in product design decision-making.

b) Describe modularity and product architecture development steps.

c) Discuss methods of cost estimation and value analysis in product costing.

d) Explain rapid prototyping techniques and reliability testing.

e) Discuss IPR, patenting, and branding strategies in product commercialization.

SLR-QH-645

Seat No.	

Set Q

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
New Product Development (CIVMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the given options. 14

1) Morphological methods are useful for _____.
a) Material testing
b) Generating design alternatives
c) Product branding
d) Cost reduction

2) Pugh Matrix is used for _____.
a) Product testing b) Concept selection
c) Reliability analysis d) Cost estimation

3) Modular product architecture provides _____.
a) Increased complexity
b) Ease of maintenance and flexibility
c) Higher production waste
d) Lower usability

4) Human-centered design emphasizes _____.
a) Machine convenience only b) User needs and usability
c) Cost reduction only d) Industrial safety only

5) Activity-based costing helps in _____.
a) Product packaging
b) Accurate allocation of overhead costs
c) Product branding
d) Market segmentation

6) Rapid prototyping is mainly used for _____.
a) Product visualization and testing
b) Final packaging
c) Advertising
d) Sales forecasting

7) Intellectual Property Rights (IPR) protect _____.
a) Customer complaints
b) Innovative ideas and inventions
c) Product waste
d) Raw materials

8) Product development mainly focuses on _____.
a) Product disposal
b) Creating and improving products
c) Advertising only
d) Cost reduction only

9) Product lifecycle includes _____.
a) Introduction b) Growth
c) Decline d) All of the above

10) Market segmentation helps in _____.
a) Reducing product quality b) Identifying target customers
c) Increasing production waste d) Eliminating testing

11) Voice of Customer (VOC) is used to _____.
a) Estimate profit
b) Understand customer expectations
c) Reduce manufacturing cost
d) Manage inventory

12) Quality Function Deployment (QFD) primarily converts _____.
a) Customer needs into engineering characteristics
b) Cost into profit
c) Ideas into patents
d) Materials into products

13) House of Quality (HoQ) is associated with _____.
a) Marketing b) Product costing
c) QFD methodology d) Testing methods

14) TRIZ methodology is used for _____.
a) Financial analysis b) Creative problem solving
c) Market research d) Product packaging

SLR-QH-645

Seat No.	

Set Q

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
New Product Development (CIVMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculators is allowed.

SECTION – I

Q.2 Answer the following questions. **10**

a) Explain phases of product development with suitable examples.

b) Describe Quality Function Deployment (QFD) and House of Quality (HoQ).

Q.3 Answer the following questions. (Any Three) **18**

a) Discuss the importance of engineering design in product development.

b) Explain market segmentation and market research techniques.

c) Describe methods used for identifying customer needs.

d) Explain TRIZ methodology and its applications in product design.

e) Discuss creative thinking methods used in concept generation.

SECTION – II

Q.4 Answer the following questions. **10**

a) Explain concept selection methods using Pugh Matrix and Weighted Decision Matrix.

b) Discuss design for manufacturing and sustainability.

Q.5 Answer the following questions. (Any Three) **18**

a) Explain utility theory and decision trees in product design decision-making.

b) Describe modularity and product architecture development steps.

c) Discuss methods of cost estimation and value analysis in product costing.

d) Explain rapid prototyping techniques and reliability testing.

e) Discuss IPR, patenting, and branding strategies in product commercialization.

Seat No.	

Set **R**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
New Product Development (CIVMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the given options. 14

1) Human-centered design emphasizes _____.
a) Machine convenience only b) User needs and usability
c) Cost reduction only d) Industrial safety only

2) Activity-based costing helps in _____.
a) Product packaging
b) Accurate allocation of overhead costs
c) Product branding
d) Market segmentation

3) Rapid prototyping is mainly used for _____.
a) Product visualization and testing
b) Final packaging
c) Advertising
d) Sales forecasting

4) Intellectual Property Rights (IPR) protect _____.
a) Customer complaints
b) Innovative ideas and inventions
c) Product waste
d) Raw materials

5) Product development mainly focuses on _____.
a) Product disposal
b) Creating and improving products
c) Advertising only
d) Cost reduction only

6) Product lifecycle includes _____.
a) Introduction b) Growth
c) Decline d) All of the above

7) Market segmentation helps in _____.
a) Reducing product quality b) Identifying target customers
c) Increasing production waste d) Eliminating testing

8) Voice of Customer (VOC) is used to _____.
a) Estimate profit
b) Understand customer expectations
c) Reduce manufacturing cost
d) Manage inventory

9) Quality Function Deployment (QFD) primarily converts _____.
a) Customer needs into engineering characteristics
b) Cost into profit
c) Ideas into patents
d) Materials into products

10) House of Quality (HoQ) is associated with _____.
a) Marketing b) Product costing
c) QFD methodology d) Testing methods

11) TRIZ methodology is used for _____.
a) Financial analysis b) Creative problem solving
c) Market research d) Product packaging

12) Morphological methods are useful for _____.
a) Material testing
b) Generating design alternatives
c) Product branding
d) Cost reduction

13) Pugh Matrix is used for _____.
a) Product testing b) Concept selection
c) Reliability analysis d) Cost estimation

14) Modular product architecture provides _____.
a) Increased complexity
b) Ease of maintenance and flexibility
c) Higher production waste
d) Lower usability

SLR-QH-645

Seat No.	

Set R

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
New Product Development (CIVMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculators is allowed.

SECTION – I

Q.2 Answer the following questions. **10**

a) Explain phases of product development with suitable examples.

b) Describe Quality Function Deployment (QFD) and House of Quality (HoQ).

Q.3 Answer the following questions. (Any Three) **18**

a) Discuss the importance of engineering design in product development.

b) Explain market segmentation and market research techniques.

c) Describe methods used for identifying customer needs.

d) Explain TRIZ methodology and its applications in product design.

e) Discuss creative thinking methods used in concept generation.

SECTION – II

Q.4 Answer the following questions. **10**

a) Explain concept selection methods using Pugh Matrix and Weighted Decision Matrix.

b) Discuss design for manufacturing and sustainability.

Q.5 Answer the following questions. (Any Three) **18**

a) Explain utility theory and decision trees in product design decision-making.

b) Describe modularity and product architecture development steps.

c) Discuss methods of cost estimation and value analysis in product costing.

d) Explain rapid prototyping techniques and reliability testing.

e) Discuss IPR, patenting, and branding strategies in product commercialization.

SLR-QH-645

Seat No.	

Set S

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
New Product Development (CIVMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the given options. 14

1) House of Quality (HoQ) is associated with _____.
a) Marketing b) Product costing
c) QFD methodology d) Testing methods

2) TRIZ methodology is used for _____.
a) Financial analysis b) Creative problem solving
c) Market research d) Product packaging

3) Morphological methods are useful for _____.
a) Material testing
b) Generating design alternatives
c) Product branding
d) Cost reduction

4) Pugh Matrix is used for _____.
a) Product testing b) Concept selection
c) Reliability analysis d) Cost estimation

5) Modular product architecture provides _____.
a) Increased complexity
b) Ease of maintenance and flexibility
c) Higher production waste
d) Lower usability

6) Human-centered design emphasizes _____.
a) Machine convenience only b) User needs and usability
c) Cost reduction only d) Industrial safety only

7) Activity-based costing helps in _____.
a) Product packaging
b) Accurate allocation of overhead costs
c) Product branding
d) Market segmentation

8) Rapid prototyping is mainly used for _____.
a) Product visualization and testing
b) Final packaging
c) Advertising
d) Sales forecasting

9) Intellectual Property Rights (IPR) protect _____.
a) Customer complaints
b) Innovative ideas and inventions
c) Product waste
d) Raw materials

10) Product development mainly focuses on _____.
a) Product disposal
b) Creating and improving products
c) Advertising only
d) Cost reduction only

11) Product lifecycle includes _____.
a) Introduction b) Growth
c) Decline d) All of the above

12) Market segmentation helps in _____.
a) Reducing product quality b) Identifying target customers
c) Increasing production waste d) Eliminating testing

13) Voice of Customer (VOC) is used to _____.
a) Estimate profit
b) Understand customer expectations
c) Reduce manufacturing cost
d) Manage inventory

14) Quality Function Deployment (QFD) primarily converts _____.
a) Customer needs into engineering characteristics
b) Cost into profit
c) Ideas into patents
d) Materials into products

SLR-QH-645

Seat No.		Set	S

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
New Product Development (CIVMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculators is allowed.

SECTION – I

Q.2 Answer the following questions. **10**

a) Explain phases of product development with suitable examples.

b) Describe Quality Function Deployment (QFD) and House of Quality (HoQ).

Q.3 Answer the following questions. (Any Three) **18**

a) Discuss the importance of engineering design in product development.

b) Explain market segmentation and market research techniques.

c) Describe methods used for identifying customer needs.

d) Explain TRIZ methodology and its applications in product design.

e) Discuss creative thinking methods used in concept generation.

SECTION – II

Q.4 Answer the following questions. **10**

a) Explain concept selection methods using Pugh Matrix and Weighted Decision Matrix.

b) Discuss design for manufacturing and sustainability.

Q.5 Answer the following questions. (Any Three) **18**

a) Explain utility theory and decision trees in product design decision-making.

b) Describe modularity and product architecture development steps.

c) Discuss methods of cost estimation and value analysis in product costing.

d) Explain rapid prototyping techniques and reliability testing.

e) Discuss IPR, patenting, and branding strategies in product commercialization.

SLR-QH-645

Seat No.	

Set P

T.Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
New Product Development (CIVMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
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MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the given options. 14

1) Product development mainly focuses on _____.
a) Product disposal
b) Creating and improving products
c) Advertising only
d) Cost reduction only

2) Product lifecycle includes _____.
a) Introduction b) Growth
c) Decline d) All of the above

3) Market segmentation helps in _____.
a) Reducing product quality b) Identifying target customers
c) Increasing production waste d) Eliminating testing

4) Voice of Customer (VOC) is used to _____.
a) Estimate profit
b) Understand customer expectations
c) Reduce manufacturing cost
d) Manage inventory

5) Quality Function Deployment (QFD) primarily converts _____.
a) Customer needs into engineering characteristics
b) Cost into profit
c) Ideas into patents
d) Materials into products

6) House of Quality (HoQ) is associated with _____.
a) Marketing b) Product costing
c) QFD methodology d) Testing methods

7) TRIZ methodology is used for _____.
a) Financial analysis b) Creative problem solving
c) Market research d) Product packaging

8) Morphological methods are useful for _____.
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b) Generating design alternatives
c) Product branding
d) Cost reduction

9) Pugh Matrix is used for _____.
a) Product testing b) Concept selection
c) Reliability analysis d) Cost estimation

10) Modular product architecture provides _____.
a) Increased complexity
b) Ease of maintenance and flexibility
c) Higher production waste
d) Lower usability

11) Human-centered design emphasizes _____.
a) Machine convenience only b) User needs and usability
c) Cost reduction only d) Industrial safety only

12) Activity-based costing helps in _____.
a) Product packaging
b) Accurate allocation of overhead costs
c) Product branding
d) Market segmentation

13) Rapid prototyping is mainly used for _____.
a) Product visualization and testing
b) Final packaging
c) Advertising
d) Sales forecasting

14) Intellectual Property Rights (IPR) protect _____.
a) Customer complaints
b) Innovative ideas and inventions
c) Product waste
d) Raw materials

Seat No.		Set	P

T.Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
New Product Development (CIVMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculators is allowed.

SECTION – I

Q.2 Answer the following questions. **10**

a) Explain phases of product development with suitable examples.

b) Describe Quality Function Deployment (QFD) and House of Quality (HoQ).

Q.3 Answer the following questions. (Any Three) **18**

a) Discuss the importance of engineering design in product development.

b) Explain market segmentation and market research techniques.

c) Describe methods used for identifying customer needs.

d) Explain TRIZ methodology and its applications in product design.

e) Discuss creative thinking methods used in concept generation.

SECTION – II

Q.4 Answer the following questions. **10**

a) Explain concept selection methods using Pugh Matrix and Weighted Decision Matrix.

b) Discuss design for manufacturing and sustainability.

Q.5 Answer the following questions. (Any Three) **18**

a) Explain utility theory and decision trees in product design decision-making.

b) Describe modularity and product architecture development steps.

c) Discuss methods of cost estimation and value analysis in product costing.

d) Explain rapid prototyping techniques and reliability testing.

e) Discuss IPR, patenting, and branding strategies in product commercialization.

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
New Product Development (CIVMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the given options. 14

1) Morphological methods are useful for _____.
a) Material testing
b) Generating design alternatives
c) Product branding
d) Cost reduction

2) Pugh Matrix is used for _____.
a) Product testing b) Concept selection
c) Reliability analysis d) Cost estimation

3) Modular product architecture provides _____.
a) Increased complexity
b) Ease of maintenance and flexibility
c) Higher production waste
d) Lower usability

4) Human-centered design emphasizes _____.
a) Machine convenience only b) User needs and usability
c) Cost reduction only d) Industrial safety only

5) Activity-based costing helps in _____.
a) Product packaging
b) Accurate allocation of overhead costs
c) Product branding
d) Market segmentation

6) Rapid prototyping is mainly used for _____.
a) Product visualization and testing
b) Final packaging
c) Advertising
d) Sales forecasting

7) Intellectual Property Rights (IPR) protect _____.
a) Customer complaints
b) Innovative ideas and inventions
c) Product waste
d) Raw materials

8) Product development mainly focuses on _____.
a) Product disposal
b) Creating and improving products
c) Advertising only
d) Cost reduction only

9) Product lifecycle includes _____.
a) Introduction b) Growth
c) Decline d) All of the above

10) Market segmentation helps in _____.
a) Reducing product quality b) Identifying target customers
c) Increasing production waste d) Eliminating testing

11) Voice of Customer (VOC) is used to _____.
a) Estimate profit
b) Understand customer expectations
c) Reduce manufacturing cost
d) Manage inventory

12) Quality Function Deployment (QFD) primarily converts _____.
a) Customer needs into engineering characteristics
b) Cost into profit
c) Ideas into patents
d) Materials into products

13) House of Quality (HoQ) is associated with _____.
a) Marketing b) Product costing
c) QFD methodology d) Testing methods

14) TRIZ methodology is used for _____.
a) Financial analysis b) Creative problem solving
c) Market research d) Product packaging

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
New Product Development (CIVMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculators is allowed.

SECTION – I

Q.2 Answer the following questions. **10**

a) Explain phases of product development with suitable examples.

b) Describe Quality Function Deployment (QFD) and House of Quality (HoQ).

Q.3 Answer the following questions. (Any Three) **18**

a) Discuss the importance of engineering design in product development.

b) Explain market segmentation and market research techniques.

c) Describe methods used for identifying customer needs.

d) Explain TRIZ methodology and its applications in product design.

e) Discuss creative thinking methods used in concept generation.

SECTION – II

Q.4 Answer the following questions. **10**

a) Explain concept selection methods using Pugh Matrix and Weighted Decision Matrix.

b) Discuss design for manufacturing and sustainability.

Q.5 Answer the following questions. (Any Three) **18**

a) Explain utility theory and decision trees in product design decision-making.

b) Describe modularity and product architecture development steps.

c) Discuss methods of cost estimation and value analysis in product costing.

d) Explain rapid prototyping techniques and reliability testing.

e) Discuss IPR, patenting, and branding strategies in product commercialization.

Seat No.	

Set **R**

T.Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
New Product Development (CIVMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the given options. 14

1) Human-centered design emphasizes _____.
a) Machine convenience only b) User needs and usability
c) Cost reduction only d) Industrial safety only

2) Activity-based costing helps in _____.
a) Product packaging
b) Accurate allocation of overhead costs
c) Product branding
d) Market segmentation

3) Rapid prototyping is mainly used for _____.
a) Product visualization and testing
b) Final packaging
c) Advertising
d) Sales forecasting

4) Intellectual Property Rights (IPR) protect _____.
a) Customer complaints
b) Innovative ideas and inventions
c) Product waste
d) Raw materials

5) Product development mainly focuses on _____.
a) Product disposal
b) Creating and improving products
c) Advertising only
d) Cost reduction only

6) Product lifecycle includes _____.
a) Introduction b) Growth
c) Decline d) All of the above

7) Market segmentation helps in _____.
a) Reducing product quality b) Identifying target customers
c) Increasing production waste d) Eliminating testing

8) Voice of Customer (VOC) is used to _____.
a) Estimate profit
b) Understand customer expectations
c) Reduce manufacturing cost
d) Manage inventory

9) Quality Function Deployment (QFD) primarily converts _____.
a) Customer needs into engineering characteristics
b) Cost into profit
c) Ideas into patents
d) Materials into products

10) House of Quality (HoQ) is associated with _____.
a) Marketing b) Product costing
c) QFD methodology d) Testing methods

11) TRIZ methodology is used for _____.
a) Financial analysis b) Creative problem solving
c) Market research d) Product packaging

12) Morphological methods are useful for _____.
a) Material testing
b) Generating design alternatives
c) Product branding
d) Cost reduction

13) Pugh Matrix is used for _____.
a) Product testing b) Concept selection
c) Reliability analysis d) Cost estimation

14) Modular product architecture provides _____.
a) Increased complexity
b) Ease of maintenance and flexibility
c) Higher production waste
d) Lower usability

SLR-QH-645

Seat No.		Set	R

T.Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
New Product Development (CIVMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculators is allowed.

SECTION – I

Q.2 Answer the following questions. **10**

a) Explain phases of product development with suitable examples.

b) Describe Quality Function Deployment (QFD) and House of Quality (HoQ).

Q.3 Answer the following questions. (Any Three) **18**

a) Discuss the importance of engineering design in product development.

b) Explain market segmentation and market research techniques.

c) Describe methods used for identifying customer needs.

d) Explain TRIZ methodology and its applications in product design.

e) Discuss creative thinking methods used in concept generation.

SECTION – II

Q.4 Answer the following questions. **10**

a) Explain concept selection methods using Pugh Matrix and Weighted Decision Matrix.

b) Discuss design for manufacturing and sustainability.

Q.5 Answer the following questions. (Any Three) **18**

a) Explain utility theory and decision trees in product design decision-making.

b) Describe modularity and product architecture development steps.

c) Discuss methods of cost estimation and value analysis in product costing.

d) Explain rapid prototyping techniques and reliability testing.

e) Discuss IPR, patenting, and branding strategies in product commercialization.

SLR-QH-645

Seat No.	

Set S

T.Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
New Product Development (CIVMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the given options. 14

1) House of Quality (HoQ) is associated with _____.
a) Marketing b) Product costing
c) QFD methodology d) Testing methods

2) TRIZ methodology is used for _____.
a) Financial analysis b) Creative problem solving
c) Market research d) Product packaging

3) Morphological methods are useful for _____.
a) Material testing
b) Generating design alternatives
c) Product branding
d) Cost reduction

4) Pugh Matrix is used for _____.
a) Product testing b) Concept selection
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5) Modular product architecture provides _____.
a) Increased complexity
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c) Higher production waste
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6) Human-centered design emphasizes _____.
a) Machine convenience only b) User needs and usability
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7) Activity-based costing helps in _____.
a) Product packaging
b) Accurate allocation of overhead costs
c) Product branding
d) Market segmentation

8) Rapid prototyping is mainly used for _____.
a) Product visualization and testing
b) Final packaging
c) Advertising
d) Sales forecasting

9) Intellectual Property Rights (IPR) protect _____.
a) Customer complaints
b) Innovative ideas and inventions
c) Product waste
d) Raw materials

10) Product development mainly focuses on _____.
a) Product disposal
b) Creating and improving products
c) Advertising only
d) Cost reduction only

11) Product lifecycle includes _____.
a) Introduction b) Growth
c) Decline d) All of the above

12) Market segmentation helps in _____.
a) Reducing product quality b) Identifying target customers
c) Increasing production waste d) Eliminating testing

13) Voice of Customer (VOC) is used to _____.
a) Estimate profit
b) Understand customer expectations
c) Reduce manufacturing cost
d) Manage inventory

14) Quality Function Deployment (QFD) primarily converts _____.
a) Customer needs into engineering characteristics
b) Cost into profit
c) Ideas into patents
d) Materials into products

SLR-QH-645

Seat No.		Set	S

T.Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
New Product Development (CIVMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculators is allowed.

SECTION – I

Q.2 Answer the following questions. **10**

a) Explain phases of product development with suitable examples.

b) Describe Quality Function Deployment (QFD) and House of Quality (HoQ).

Q.3 Answer the following questions. (Any Three) **18**

a) Discuss the importance of engineering design in product development.

b) Explain market segmentation and market research techniques.

c) Describe methods used for identifying customer needs.

d) Explain TRIZ methodology and its applications in product design.

e) Discuss creative thinking methods used in concept generation.

SECTION – II

Q.4 Answer the following questions. **10**

a) Explain concept selection methods using Pugh Matrix and Weighted Decision Matrix.

b) Discuss design for manufacturing and sustainability.

Q.5 Answer the following questions. (Any Three) **18**

a) Explain utility theory and decision trees in product design decision-making.

b) Describe modularity and product architecture development steps.

c) Discuss methods of cost estimation and value analysis in product costing.

d) Explain rapid prototyping techniques and reliability testing.

e) Discuss IPR, patenting, and branding strategies in product commercialization.

SLR-QH-645

Seat No.	

Set P

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
New Product Development (CIVMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the given options. 14

1) Product development mainly focuses on _____.
a) Product disposal
b) Creating and improving products
c) Advertising only
d) Cost reduction only

2) Product lifecycle includes _____.
a) Introduction b) Growth
c) Decline d) All of the above

3) Market segmentation helps in _____.
a) Reducing product quality b) Identifying target customers
c) Increasing production waste d) Eliminating testing

4) Voice of Customer (VOC) is used to _____.
a) Estimate profit
b) Understand customer expectations
c) Reduce manufacturing cost
d) Manage inventory

5) Quality Function Deployment (QFD) primarily converts _____.
a) Customer needs into engineering characteristics
b) Cost into profit
c) Ideas into patents
d) Materials into products

6) House of Quality (HoQ) is associated with _____.
a) Marketing b) Product costing
c) QFD methodology d) Testing methods

7) TRIZ methodology is used for _____.
a) Financial analysis b) Creative problem solving
c) Market research d) Product packaging

8) Morphological methods are useful for _____.
a) Material testing
b) Generating design alternatives
c) Product branding
d) Cost reduction

9) Pugh Matrix is used for _____.
a) Product testing b) Concept selection
c) Reliability analysis d) Cost estimation

10) Modular product architecture provides _____.
a) Increased complexity
b) Ease of maintenance and flexibility
c) Higher production waste
d) Lower usability

11) Human-centered design emphasizes _____.
a) Machine convenience only b) User needs and usability
c) Cost reduction only d) Industrial safety only

12) Activity-based costing helps in _____.
a) Product packaging
b) Accurate allocation of overhead costs
c) Product branding
d) Market segmentation

13) Rapid prototyping is mainly used for _____.
a) Product visualization and testing
b) Final packaging
c) Advertising
d) Sales forecasting

14) Intellectual Property Rights (IPR) protect _____.
a) Customer complaints
b) Innovative ideas and inventions
c) Product waste
d) Raw materials

SLR-QH-645

Seat No.		Set	P

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
New Product Development (CIVMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculators is allowed.

SECTION – I

Q.2 Answer the following questions. **10**

a) Explain phases of product development with suitable examples.

b) Describe Quality Function Deployment (QFD) and House of Quality (HoQ).

Q.3 Answer the following questions. (Any Three) **18**

a) Discuss the importance of engineering design in product development.

b) Explain market segmentation and market research techniques.

c) Describe methods used for identifying customer needs.

d) Explain TRIZ methodology and its applications in product design.

e) Discuss creative thinking methods used in concept generation.

SECTION – II

Q.4 Answer the following questions. **10**

a) Explain concept selection methods using Pugh Matrix and Weighted Decision Matrix.

b) Discuss design for manufacturing and sustainability.

Q.5 Answer the following questions. (Any Three) **18**

a) Explain utility theory and decision trees in product design decision-making.

b) Describe modularity and product architecture development steps.

c) Discuss methods of cost estimation and value analysis in product costing.

d) Explain rapid prototyping techniques and reliability testing.

e) Discuss IPR, patenting, and branding strategies in product commercialization.

SLR-QH-645

Seat No.	

Set Q

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
New Product Development (CIVMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the given options. 14

1) Morphological methods are useful for _____.
a) Material testing
b) Generating design alternatives
c) Product branding
d) Cost reduction

2) Pugh Matrix is used for _____.
a) Product testing b) Concept selection
c) Reliability analysis d) Cost estimation

3) Modular product architecture provides _____.
a) Increased complexity
b) Ease of maintenance and flexibility
c) Higher production waste
d) Lower usability

4) Human-centered design emphasizes _____.
a) Machine convenience only b) User needs and usability
c) Cost reduction only d) Industrial safety only

5) Activity-based costing helps in _____.
a) Product packaging
b) Accurate allocation of overhead costs
c) Product branding
d) Market segmentation

6) Rapid prototyping is mainly used for _____.
a) Product visualization and testing
b) Final packaging
c) Advertising
d) Sales forecasting

7) Intellectual Property Rights (IPR) protect _____.
a) Customer complaints
b) Innovative ideas and inventions
c) Product waste
d) Raw materials

8) Product development mainly focuses on _____.
a) Product disposal
b) Creating and improving products
c) Advertising only
d) Cost reduction only

9) Product lifecycle includes _____.
a) Introduction b) Growth
c) Decline d) All of the above

10) Market segmentation helps in _____.
a) Reducing product quality b) Identifying target customers
c) Increasing production waste d) Eliminating testing

11) Voice of Customer (VOC) is used to _____.
a) Estimate profit
b) Understand customer expectations
c) Reduce manufacturing cost
d) Manage inventory

12) Quality Function Deployment (QFD) primarily converts _____.
a) Customer needs into engineering characteristics
b) Cost into profit
c) Ideas into patents
d) Materials into products

13) House of Quality (HoQ) is associated with _____.
a) Marketing b) Product costing
c) QFD methodology d) Testing methods

14) TRIZ methodology is used for _____.
a) Financial analysis b) Creative problem solving
c) Market research d) Product packaging

SLR-QH-645

Seat No.	

Set Q

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
New Product Development (CIVMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculators is allowed.

SECTION – I

Q.2 Answer the following questions. **10**

a) Explain phases of product development with suitable examples.

b) Describe Quality Function Deployment (QFD) and House of Quality (HoQ).

Q.3 Answer the following questions. (Any Three) **18**

a) Discuss the importance of engineering design in product development.

b) Explain market segmentation and market research techniques.

c) Describe methods used for identifying customer needs.

d) Explain TRIZ methodology and its applications in product design.

e) Discuss creative thinking methods used in concept generation.

SECTION – II

Q.4 Answer the following questions. **10**

a) Explain concept selection methods using Pugh Matrix and Weighted Decision Matrix.

b) Discuss design for manufacturing and sustainability.

Q.5 Answer the following questions. (Any Three) **18**

a) Explain utility theory and decision trees in product design decision-making.

b) Describe modularity and product architecture development steps.

c) Discuss methods of cost estimation and value analysis in product costing.

d) Explain rapid prototyping techniques and reliability testing.

e) Discuss IPR, patenting, and branding strategies in product commercialization.

Seat No.	

Set R

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
New Product Development (CIVMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the given options. 14

1) Human-centered design emphasizes _____.
a) Machine convenience only b) User needs and usability
c) Cost reduction only d) Industrial safety only

2) Activity-based costing helps in _____.
a) Product packaging
b) Accurate allocation of overhead costs
c) Product branding
d) Market segmentation

3) Rapid prototyping is mainly used for _____.
a) Product visualization and testing
b) Final packaging
c) Advertising
d) Sales forecasting

4) Intellectual Property Rights (IPR) protect _____.
a) Customer complaints
b) Innovative ideas and inventions
c) Product waste
d) Raw materials

5) Product development mainly focuses on _____.
a) Product disposal
b) Creating and improving products
c) Advertising only
d) Cost reduction only

6) Product lifecycle includes _____.
a) Introduction b) Growth
c) Decline d) All of the above

7) Market segmentation helps in _____.
a) Reducing product quality b) Identifying target customers
c) Increasing production waste d) Eliminating testing

8) Voice of Customer (VOC) is used to _____.
a) Estimate profit
b) Understand customer expectations
c) Reduce manufacturing cost
d) Manage inventory

9) Quality Function Deployment (QFD) primarily converts _____.
a) Customer needs into engineering characteristics
b) Cost into profit
c) Ideas into patents
d) Materials into products

10) House of Quality (HoQ) is associated with _____.
a) Marketing b) Product costing
c) QFD methodology d) Testing methods

11) TRIZ methodology is used for _____.
a) Financial analysis b) Creative problem solving
c) Market research d) Product packaging

12) Morphological methods are useful for _____.
a) Material testing
b) Generating design alternatives
c) Product branding
d) Cost reduction

13) Pugh Matrix is used for _____.
a) Product testing b) Concept selection
c) Reliability analysis d) Cost estimation

14) Modular product architecture provides _____.
a) Increased complexity
b) Ease of maintenance and flexibility
c) Higher production waste
d) Lower usability

SLR-QH-645

Seat No.		Set	R

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
New Product Development (CIVMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculators is allowed.

SECTION – I

Q.2 Answer the following questions. **10**

a) Explain phases of product development with suitable examples.

b) Describe Quality Function Deployment (QFD) and House of Quality (HoQ).

Q.3 Answer the following questions. (Any Three) **18**

a) Discuss the importance of engineering design in product development.

b) Explain market segmentation and market research techniques.

c) Describe methods used for identifying customer needs.

d) Explain TRIZ methodology and its applications in product design.

e) Discuss creative thinking methods used in concept generation.

SECTION – II

Q.4 Answer the following questions. **10**

a) Explain concept selection methods using Pugh Matrix and Weighted Decision Matrix.

b) Discuss design for manufacturing and sustainability.

Q.5 Answer the following questions. (Any Three) **18**

a) Explain utility theory and decision trees in product design decision-making.

b) Describe modularity and product architecture development steps.

c) Discuss methods of cost estimation and value analysis in product costing.

d) Explain rapid prototyping techniques and reliability testing.

e) Discuss IPR, patenting, and branding strategies in product commercialization.

SLR-QH-645

Seat No.	

Set S

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
New Product Development (CIVMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the given options. 14

1) House of Quality (HoQ) is associated with _____.
a) Marketing b) Product costing
c) QFD methodology d) Testing methods

2) TRIZ methodology is used for _____.
a) Financial analysis b) Creative problem solving
c) Market research d) Product packaging

3) Morphological methods are useful for _____.
a) Material testing
b) Generating design alternatives
c) Product branding
d) Cost reduction

4) Pugh Matrix is used for _____.
a) Product testing b) Concept selection
c) Reliability analysis d) Cost estimation

5) Modular product architecture provides _____.
a) Increased complexity
b) Ease of maintenance and flexibility
c) Higher production waste
d) Lower usability

6) Human-centered design emphasizes _____.
a) Machine convenience only b) User needs and usability
c) Cost reduction only d) Industrial safety only

7) Activity-based costing helps in _____.
a) Product packaging
b) Accurate allocation of overhead costs
c) Product branding
d) Market segmentation

8) Rapid prototyping is mainly used for _____.
a) Product visualization and testing
b) Final packaging
c) Advertising
d) Sales forecasting

9) Intellectual Property Rights (IPR) protect _____.
a) Customer complaints
b) Innovative ideas and inventions
c) Product waste
d) Raw materials

10) Product development mainly focuses on _____.
a) Product disposal
b) Creating and improving products
c) Advertising only
d) Cost reduction only

11) Product lifecycle includes _____.
a) Introduction b) Growth
c) Decline d) All of the above

12) Market segmentation helps in _____.
a) Reducing product quality b) Identifying target customers
c) Increasing production waste d) Eliminating testing

13) Voice of Customer (VOC) is used to _____.
a) Estimate profit
b) Understand customer expectations
c) Reduce manufacturing cost
d) Manage inventory

14) Quality Function Deployment (QFD) primarily converts _____.
a) Customer needs into engineering characteristics
b) Cost into profit
c) Ideas into patents
d) Materials into products

SLR-QH-645

Seat No.		Set	S

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
New Product Development (CIVMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculators is allowed.

SECTION – I

Q.2 Answer the following questions. **10**

a) Explain phases of product development with suitable examples.

b) Describe Quality Function Deployment (QFD) and House of Quality (HoQ).

Q.3 Answer the following questions. (Any Three) **18**

a) Discuss the importance of engineering design in product development.

b) Explain market segmentation and market research techniques.

c) Describe methods used for identifying customer needs.

d) Explain TRIZ methodology and its applications in product design.

e) Discuss creative thinking methods used in concept generation.

SECTION – II

Q.4 Answer the following questions. **10**

a) Explain concept selection methods using Pugh Matrix and Weighted Decision Matrix.

b) Discuss design for manufacturing and sustainability.

Q.5 Answer the following questions. (Any Three) **18**

a) Explain utility theory and decision trees in product design decision-making.

b) Describe modularity and product architecture development steps.

c) Discuss methods of cost estimation and value analysis in product costing.

d) Explain rapid prototyping techniques and reliability testing.

e) Discuss IPR, patenting, and branding strategies in product commercialization.

SLR-QH-645

Seat No.	

Set P

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
New Product Development (CIVMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the given options. 14

1) Product development mainly focuses on _____.
a) Product disposal
b) Creating and improving products
c) Advertising only
d) Cost reduction only

2) Product lifecycle includes _____.
a) Introduction b) Growth
c) Decline d) All of the above

3) Market segmentation helps in _____.
a) Reducing product quality b) Identifying target customers
c) Increasing production waste d) Eliminating testing

4) Voice of Customer (VOC) is used to _____.
a) Estimate profit
b) Understand customer expectations
c) Reduce manufacturing cost
d) Manage inventory

5) Quality Function Deployment (QFD) primarily converts _____.
a) Customer needs into engineering characteristics
b) Cost into profit
c) Ideas into patents
d) Materials into products

6) House of Quality (HoQ) is associated with _____.
a) Marketing b) Product costing
c) QFD methodology d) Testing methods

7) TRIZ methodology is used for _____.
a) Financial analysis b) Creative problem solving
c) Market research d) Product packaging

8) Morphological methods are useful for _____.
a) Material testing
b) Generating design alternatives
c) Product branding
d) Cost reduction

9) Pugh Matrix is used for _____.
a) Product testing b) Concept selection
c) Reliability analysis d) Cost estimation

10) Modular product architecture provides _____.
a) Increased complexity
b) Ease of maintenance and flexibility
c) Higher production waste
d) Lower usability

11) Human-centered design emphasizes _____.
a) Machine convenience only b) User needs and usability
c) Cost reduction only d) Industrial safety only

12) Activity-based costing helps in _____.
a) Product packaging
b) Accurate allocation of overhead costs
c) Product branding
d) Market segmentation

13) Rapid prototyping is mainly used for _____.
a) Product visualization and testing
b) Final packaging
c) Advertising
d) Sales forecasting

14) Intellectual Property Rights (IPR) protect _____.
a) Customer complaints
b) Innovative ideas and inventions
c) Product waste
d) Raw materials

Seat No.	

Set **P**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
New Product Development (CIVMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculators is allowed.

SECTION – I

Q.2 Answer the following questions. **10**

a) Explain phases of product development with suitable examples.

b) Describe Quality Function Deployment (QFD) and House of Quality (HoQ).

Q.3 Answer the following questions. (Any Three) **18**

a) Discuss the importance of engineering design in product development.

b) Explain market segmentation and market research techniques.

c) Describe methods used for identifying customer needs.

d) Explain TRIZ methodology and its applications in product design.

e) Discuss creative thinking methods used in concept generation.

SECTION – II

Q.4 Answer the following questions. **10**

a) Explain concept selection methods using Pugh Matrix and Weighted Decision Matrix.

b) Discuss design for manufacturing and sustainability.

Q.5 Answer the following questions. (Any Three) **18**

a) Explain utility theory and decision trees in product design decision-making.

b) Describe modularity and product architecture development steps.

c) Discuss methods of cost estimation and value analysis in product costing.

d) Explain rapid prototyping techniques and reliability testing.

e) Discuss IPR, patenting, and branding strategies in product commercialization.

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
New Product Development (CIVMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the given options. 14

1) Morphological methods are useful for _____.
a) Material testing
b) Generating design alternatives
c) Product branding
d) Cost reduction

2) Pugh Matrix is used for _____.
a) Product testing b) Concept selection
c) Reliability analysis d) Cost estimation

3) Modular product architecture provides _____.
a) Increased complexity
b) Ease of maintenance and flexibility
c) Higher production waste
d) Lower usability

4) Human-centered design emphasizes _____.
a) Machine convenience only b) User needs and usability
c) Cost reduction only d) Industrial safety only

5) Activity-based costing helps in _____.
a) Product packaging
b) Accurate allocation of overhead costs
c) Product branding
d) Market segmentation

6) Rapid prototyping is mainly used for _____.
a) Product visualization and testing
b) Final packaging
c) Advertising
d) Sales forecasting

7) Intellectual Property Rights (IPR) protect _____.
a) Customer complaints
b) Innovative ideas and inventions
c) Product waste
d) Raw materials

8) Product development mainly focuses on _____.
a) Product disposal
b) Creating and improving products
c) Advertising only
d) Cost reduction only

9) Product lifecycle includes _____.
a) Introduction b) Growth
c) Decline d) All of the above

10) Market segmentation helps in _____.
a) Reducing product quality b) Identifying target customers
c) Increasing production waste d) Eliminating testing

11) Voice of Customer (VOC) is used to _____.
a) Estimate profit
b) Understand customer expectations
c) Reduce manufacturing cost
d) Manage inventory

12) Quality Function Deployment (QFD) primarily converts _____.
a) Customer needs into engineering characteristics
b) Cost into profit
c) Ideas into patents
d) Materials into products

13) House of Quality (HoQ) is associated with _____.
a) Marketing b) Product costing
c) QFD methodology d) Testing methods

14) TRIZ methodology is used for _____.
a) Financial analysis b) Creative problem solving
c) Market research d) Product packaging

SLR-QH-645

Seat No.		Set	Q

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
New Product Development (CIVMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculators is allowed.

SECTION – I

Q.2 Answer the following questions. **10**

a) Explain phases of product development with suitable examples.

b) Describe Quality Function Deployment (QFD) and House of Quality (HoQ).

Q.3 Answer the following questions. (Any Three) **18**

a) Discuss the importance of engineering design in product development.

b) Explain market segmentation and market research techniques.

c) Describe methods used for identifying customer needs.

d) Explain TRIZ methodology and its applications in product design.

e) Discuss creative thinking methods used in concept generation.

SECTION – II

Q.4 Answer the following questions. **10**

a) Explain concept selection methods using Pugh Matrix and Weighted Decision Matrix.

b) Discuss design for manufacturing and sustainability.

Q.5 Answer the following questions. (Any Three) **18**

a) Explain utility theory and decision trees in product design decision-making.

b) Describe modularity and product architecture development steps.

c) Discuss methods of cost estimation and value analysis in product costing.

d) Explain rapid prototyping techniques and reliability testing.

e) Discuss IPR, patenting, and branding strategies in product commercialization.

Seat No.	

Set **R**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
New Product Development (CIVMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the given options. 14

1) Human-centered design emphasizes _____.
a) Machine convenience only b) User needs and usability
c) Cost reduction only d) Industrial safety only

2) Activity-based costing helps in _____.
a) Product packaging
b) Accurate allocation of overhead costs
c) Product branding
d) Market segmentation

3) Rapid prototyping is mainly used for _____.
a) Product visualization and testing
b) Final packaging
c) Advertising
d) Sales forecasting

4) Intellectual Property Rights (IPR) protect _____.
a) Customer complaints
b) Innovative ideas and inventions
c) Product waste
d) Raw materials

5) Product development mainly focuses on _____.
a) Product disposal
b) Creating and improving products
c) Advertising only
d) Cost reduction only

6) Product lifecycle includes _____.
a) Introduction b) Growth
c) Decline d) All of the above

7) Market segmentation helps in _____.
a) Reducing product quality b) Identifying target customers
c) Increasing production waste d) Eliminating testing

8) Voice of Customer (VOC) is used to _____.
a) Estimate profit
b) Understand customer expectations
c) Reduce manufacturing cost
d) Manage inventory

9) Quality Function Deployment (QFD) primarily converts _____.
a) Customer needs into engineering characteristics
b) Cost into profit
c) Ideas into patents
d) Materials into products

10) House of Quality (HoQ) is associated with _____.
a) Marketing b) Product costing
c) QFD methodology d) Testing methods

11) TRIZ methodology is used for _____.
a) Financial analysis b) Creative problem solving
c) Market research d) Product packaging

12) Morphological methods are useful for _____.
a) Material testing
b) Generating design alternatives
c) Product branding
d) Cost reduction

13) Pugh Matrix is used for _____.
a) Product testing b) Concept selection
c) Reliability analysis d) Cost estimation

14) Modular product architecture provides _____.
a) Increased complexity
b) Ease of maintenance and flexibility
c) Higher production waste
d) Lower usability

SLR-QH-645

Seat No.		Set	R

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
New Product Development (CIVMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculators is allowed.

SECTION – I

Q.2 Answer the following questions. **10**

a) Explain phases of product development with suitable examples.

b) Describe Quality Function Deployment (QFD) and House of Quality (HoQ).

Q.3 Answer the following questions. (Any Three) **18**

a) Discuss the importance of engineering design in product development.

b) Explain market segmentation and market research techniques.

c) Describe methods used for identifying customer needs.

d) Explain TRIZ methodology and its applications in product design.

e) Discuss creative thinking methods used in concept generation.

SECTION – II

Q.4 Answer the following questions. **10**

a) Explain concept selection methods using Pugh Matrix and Weighted Decision Matrix.

b) Discuss design for manufacturing and sustainability.

Q.5 Answer the following questions. (Any Three) **18**

a) Explain utility theory and decision trees in product design decision-making.

b) Describe modularity and product architecture development steps.

c) Discuss methods of cost estimation and value analysis in product costing.

d) Explain rapid prototyping techniques and reliability testing.

e) Discuss IPR, patenting, and branding strategies in product commercialization.

SLR-QH-645

Seat No.	

Set S

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
New Product Development (CIVMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the given options. 14

1) House of Quality (HoQ) is associated with _____.
a) Marketing b) Product costing
c) QFD methodology d) Testing methods

2) TRIZ methodology is used for _____.
a) Financial analysis b) Creative problem solving
c) Market research d) Product packaging

3) Morphological methods are useful for _____.
a) Material testing
b) Generating design alternatives
c) Product branding
d) Cost reduction

4) Pugh Matrix is used for _____.
a) Product testing b) Concept selection
c) Reliability analysis d) Cost estimation

5) Modular product architecture provides _____.
a) Increased complexity
b) Ease of maintenance and flexibility
c) Higher production waste
d) Lower usability

6) Human-centered design emphasizes _____.
a) Machine convenience only b) User needs and usability
c) Cost reduction only d) Industrial safety only

7) Activity-based costing helps in _____.
a) Product packaging
b) Accurate allocation of overhead costs
c) Product branding
d) Market segmentation

8) Rapid prototyping is mainly used for _____.
a) Product visualization and testing
b) Final packaging
c) Advertising
d) Sales forecasting

9) Intellectual Property Rights (IPR) protect _____.
a) Customer complaints
b) Innovative ideas and inventions
c) Product waste
d) Raw materials

10) Product development mainly focuses on _____.
a) Product disposal
b) Creating and improving products
c) Advertising only
d) Cost reduction only

11) Product lifecycle includes _____.
a) Introduction b) Growth
c) Decline d) All of the above

12) Market segmentation helps in _____.
a) Reducing product quality b) Identifying target customers
c) Increasing production waste d) Eliminating testing

13) Voice of Customer (VOC) is used to _____.
a) Estimate profit
b) Understand customer expectations
c) Reduce manufacturing cost
d) Manage inventory

14) Quality Function Deployment (QFD) primarily converts _____.
a) Customer needs into engineering characteristics
b) Cost into profit
c) Ideas into patents
d) Materials into products

SLR-QH-645

Seat No.		Set	S

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
New Product Development (CIVMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculators is allowed.

SECTION – I

Q.2 Answer the following questions. **10**

a) Explain phases of product development with suitable examples.

b) Describe Quality Function Deployment (QFD) and House of Quality (HoQ).

Q.3 Answer the following questions. (Any Three) **18**

a) Discuss the importance of engineering design in product development.

b) Explain market segmentation and market research techniques.

c) Describe methods used for identifying customer needs.

d) Explain TRIZ methodology and its applications in product design.

e) Discuss creative thinking methods used in concept generation.

SECTION – II

Q.4 Answer the following questions. **10**

a) Explain concept selection methods using Pugh Matrix and Weighted Decision Matrix.

b) Discuss design for manufacturing and sustainability.

Q.5 Answer the following questions. (Any Three) **18**

a) Explain utility theory and decision trees in product design decision-making.

b) Describe modularity and product architecture development steps.

c) Discuss methods of cost estimation and value analysis in product costing.

d) Explain rapid prototyping techniques and reliability testing.

e) Discuss IPR, patenting, and branding strategies in product commercialization.

SLR-QH-646

Seat No.	

Set P

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Disaster Management and Mitigation (CIVMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) In technical terms, 'Risk' is often mathematically expressed as ____.
a) Risk = Hazard + Vulnerability
b) Risk = Hazard × Vulnerability × Exposure
c) Risk = Disaster / Mitigation
d) Risk = Capacity − Vulnerability

2) Land-use zoning is a form of _____ mitigation.
a) Structural b) Non-structural
c) Financial d) Immediate

3) A system used to alert people before a hazard strike is _____.
a) NDMA b) EWS
c) GIS d) GPS

4) Which sphere of the Earth is associated with earthquakes?
a) Hydrosphere b) Atmosphere
c) Lithosphere d) Biosphere

5) Biological disasters are mainly caused by _____.
a) Geological processes b) Microorganisms
c) Mechanical failure d) Climate change

6) Major cause of road accidents in India is _____.
a) Flood b) Over-speeding
c) Earthquake d) Landslide

7) Mount Vesuvius is located in _____.
a) India b) Italy
c) Japan d) USA

8) Indian Ocean tsunami (2004) was primarily triggered by _____.
a) Cyclone b) Earthquake
c) Fire d) Landslide

9) Which factors heavily influence the habitation pattern and damage during a disaster?
a) Social status and climate b) Global trade
c) Stock market d) Export volume

10) What primarily dictates the selection of mitigation and preparation measures in a region?
a) Area and accessibility b) Space data
c) Currency rates d) Export volumes

11) Effective dissemination of information during a crisis relies on ____.
a) Withholding data b) Mass media and DMIS
c) Individual secrets d) Rumors

12) What is the primary purpose of 'feedback' in a disaster information system?
a) Blaming victims
b) To improve future information accuracy and flow
c) Revenue generation
d) Blocking channels

13) Which technology is reliable when standard networks fail?
a) HAM Radio b) Optical fiber
c) Home Wi-Fi d) Postal mail

14) GIS and Remote Sensing are applied in Disaster Management for _____.
a) Entertainment
b) Spatial hazard mapping and tracking
c) Interior design
d) Weather control

SLR-QH-646

Seat No.	

Set P

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Disaster Management and Mitigation (CIVMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Answer Any Four. **20**

a) What are different types of disasters?

b) Write a short note on 'Flood.'

c) Elaborate 'Tsunami' as a natural disaster.

d) Explain the concept of biological disasters. Discuss their causes, modes of transmission, and preventive measures with suitable examples.

e) Discuss the major causes of road accidents in India. Suggest effective engineering, enforcement, and awareness-based measures to reduce road accident risks.

f) Is Pollution a manmade disaster? and explain its sources, effects on human health and environment, and control measures.

g) Describe the Indian Ocean Earthquake (2004) and resulting tsunami. Explain its causes, impacts, and the disaster management measures taken at national and international levels.

Q.3 Answer Any Two. **08**

a) What is Disaster? Explain along with Hazard & Vulnerability.

b) Explain the Disaster Management Cycle in details.

c) Explain 'Earthquake' as a geological disaster.

SECTION – II

Q.4 Answer Any Four. **20**

a) Explain the importance of Early Warning Systems (EWS). Describe the working mechanism of the Tsunami or Cyclone warning system in India.

b) Write a detailed note on Community Based Disaster Management (CBDM). Why is the community considered the first responder?

c) Explain the application of Geographic Information Systems (GIS) and Remote Sensing in Disaster Management (Hazard Zonation mapping).

d) Discuss the role of modern technologies like Drones (UAVs) and Artificial Intelligence (Al) in disaster damage assessment.

e) Write a note on the Sendai Framework for Disaster Risk Reduction (2015-2030). What are its four priorities for action?

f) Discuss the Psycho-social impacts of disasters on victims (PTSD). Why is mental health care crucial during the recovery phase?

g) Differentiate between Relief, Rehabilitation, and Reconstruction phases of disaster recovery.

Q.5 Answer Any Two. **08**

a) Differentiate between Structural and Non-Structural mitigation measures with three examples of each.

b) Explain the concept of the "Golden Hour". Discuss the role of the National Disaster Response Force (NDRF) in search and rescue operations.

c) Discuss the relationship between Climate Change and the increasing frequency of natural disasters. How can sustainable development reduce this risk?

SLR-QH-646

Seat No.	

Set Q

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Disaster Management and Mitigation (CIVMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) Indian Ocean tsunami (2004) was primarily triggered by _____.
a) Cyclone b) Earthquake
c) Fire d) Landslide

2) Which factors heavily influence the habitation pattern and damage during a disaster?
a) Social status and climate b) Global trade
c) Stock market d) Export volume

3) What primarily dictates the selection of mitigation and preparation measures in a region?
a) Area and accessibility b) Space data
c) Currency rates d) Export volumes

4) Effective dissemination of information during a crisis relies on ____.
a) Withholding data b) Mass media and DMIS
c) Individual secrets d) Rumors

5) What is the primary purpose of 'feedback' in a disaster information system?
a) Blaming victims
b) To improve future information accuracy and flow
c) Revenue generation
d) Blocking channels

6) Which technology is reliable when standard networks fail?
a) HAM Radio b) Optical fiber
c) Home Wi-Fi d) Postal mail

7) GIS and Remote Sensing are applied in Disaster Management for _____.
   a) Entertainment
   b) Spatial hazard mapping and tracking
   c) Interior design
   d) Weather control

8) In technical terms, 'Risk' is often mathematically expressed as ____.
   a) Risk = Hazard + Vulnerability
   b) Risk = Hazard × Vulnerability × Exposure
   c) Risk = Disaster / Mitigation
   d) Risk = Capacity − Vulnerability

9) Land-use zoning is a form of _____ mitigation.
   a) Structural
   b) Non-structural
   c) Financial
   d) Immediate

10) A system used to alert people before a hazard strike is _____.
   a) NDMA
   b) EWS
   c) GIS
   d) GPS

11) Which sphere of the Earth is associated with earthquakes?
   a) Hydrosphere
   b) Atmosphere
   c) Lithosphere
   d) Biosphere

12) Biological disasters are mainly caused by _____.
   a) Geological processes
   b) Microorganisms
   c) Mechanical failure
   d) Climate change

13) Major cause of road accidents in India is _____.
   a) Flood
   b) Over-speeding
   c) Earthquake
   d) Landslide

14) Mount Vesuvius is located in _____.
   a) India
   b) Italy
   c) Japan
   d) USA

SLR-QH-646

Seat No.	

Set Q

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Disaster Management and Mitigation (CIVMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Answer Any Four. **20**

a) What are different types of disasters?

b) Write a short note on 'Flood.'

c) Elaborate 'Tsunami' as a natural disaster.

d) Explain the concept of biological disasters. Discuss their causes, modes of transmission, and preventive measures with suitable examples.

e) Discuss the major causes of road accidents in India. Suggest effective engineering, enforcement, and awareness-based measures to reduce road accident risks.

f) Is Pollution a manmade disaster? and explain its sources, effects on human health and environment, and control measures.

g) Describe the Indian Ocean Earthquake (2004) and resulting tsunami. Explain its causes, impacts, and the disaster management measures taken at national and international levels.

Q.3 Answer Any Two. **08**

a) What is Disaster? Explain along with Hazard & Vulnerability.

b) Explain the Disaster Management Cycle in details.

c) Explain 'Earthquake' as a geological disaster.

SECTION – II

Q.4 Answer Any Four. **20**

a) Explain the importance of Early Warning Systems (EWS). Describe the working mechanism of the Tsunami or Cyclone warning system in India.

b) Write a detailed note on Community Based Disaster Management (CBDM). Why is the community considered the first responder?

c) Explain the application of Geographic Information Systems (GIS) and Remote Sensing in Disaster Management (Hazard Zonation mapping).

d) Discuss the role of modern technologies like Drones (UAVs) and Artificial Intelligence (Al) in disaster damage assessment.

e) Write a note on the Sendai Framework for Disaster Risk Reduction (2015-2030). What are its four priorities for action?

f) Discuss the Psycho-social impacts of disasters on victims (PTSD). Why is mental health care crucial during the recovery phase?

g) Differentiate between Relief, Rehabilitation, and Reconstruction phases of disaster recovery.

Q.5 Answer Any Two. **08**

a) Differentiate between Structural and Non-Structural mitigation measures with three examples of each.

b) Explain the concept of the "Golden Hour". Discuss the role of the National Disaster Response Force (NDRF) in search and rescue operations.

c) Discuss the relationship between Climate Change and the increasing frequency of natural disasters. How can sustainable development reduce this risk?

Seat No.	

Set R

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Disaster Management and Mitigation (CIVMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) Effective dissemination of information during a crisis relies on ____.
a) Withholding data b) Mass media and DMIS
c) Individual secrets d) Rumors

2) What is the primary purpose of 'feedback' in a disaster information system?
a) Blaming victims
b) To improve future information accuracy and flow
c) Revenue generation
d) Blocking channels

3) Which technology is reliable when standard networks fail?
a) HAM Radio b) Optical fiber
c) Home Wi-Fi d) Postal mail

4) GIS and Remote Sensing are applied in Disaster Management for _____.
a) Entertainment
b) Spatial hazard mapping and tracking
c) Interior design
d) Weather control

5) In technical terms, 'Risk' is often mathematically expressed as ____.
a) Risk = Hazard + Vulnerability
b) Risk = Hazard × Vulnerability × Exposure
c) Risk = Disaster / Mitigation
d) Risk = Capacity − Vulnerability

6) Land-use zoning is a form of _____ mitigation.
a) Structural b) Non-structural
c) Financial d) Immediate

7) A system used to alert people before a hazard strike is _____.
a) NDMA b) EWS
c) GIS d) GPS

8) Which sphere of the Earth is associated with earthquakes?
a) Hydrosphere b) Atmosphere
c) Lithosphere d) Biosphere

9) Biological disasters are mainly caused by _____.
a) Geological processes b) Microorganisms
c) Mechanical failure d) Climate change

10) Major cause of road accidents in India is _____.
a) Flood b) Over-speeding
c) Earthquake d) Landslide

11) Mount Vesuvius is located in _____.
a) India b) Italy
c) Japan d) USA

12) Indian Ocean tsunami (2004) was primarily triggered by _____.
a) Cyclone b) Earthquake
c) Fire d) Landslide

13) Which factors heavily influence the habitation pattern and damage during a disaster?
a) Social status and climate b) Global trade
c) Stock market d) Export volume

14) What primarily dictates the selection of mitigation and preparation measures in a region?
a) Area and accessibility b) Space data
c) Currency rates d) Export volumes

SLR-QH-646

Seat No.	

Set R

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Disaster Management and Mitigation (CIVMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Answer Any Four. **20**

a) What are different types of disasters?

b) Write a short note on 'Flood.'

c) Elaborate 'Tsunami' as a natural disaster.

d) Explain the concept of biological disasters. Discuss their causes, modes of transmission, and preventive measures with suitable examples.

e) Discuss the major causes of road accidents in India. Suggest effective engineering, enforcement, and awareness-based measures to reduce road accident risks.

f) Is Pollution a manmade disaster? and explain its sources, effects on human health and environment, and control measures.

g) Describe the Indian Ocean Earthquake (2004) and resulting tsunami. Explain its causes, impacts, and the disaster management measures taken at national and international levels.

Q.3 Answer Any Two. **08**

a) What is Disaster? Explain along with Hazard & Vulnerability.

b) Explain the Disaster Management Cycle in details.

c) Explain 'Earthquake' as a geological disaster.

SECTION – II

Q.4 Answer Any Four. **20**

a) Explain the importance of Early Warning Systems (EWS). Describe the working mechanism of the Tsunami or Cyclone warning system in India.

b) Write a detailed note on Community Based Disaster Management (CBDM). Why is the community considered the first responder?

c) Explain the application of Geographic Information Systems (GIS) and Remote Sensing in Disaster Management (Hazard Zonation mapping).

d) Discuss the role of modern technologies like Drones (UAVs) and Artificial Intelligence (Al) in disaster damage assessment.

e) Write a note on the Sendai Framework for Disaster Risk Reduction (2015-2030). What are its four priorities for action?

f) Discuss the Psycho-social impacts of disasters on victims (PTSD). Why is mental health care crucial during the recovery phase?

g) Differentiate between Relief, Rehabilitation, and Reconstruction phases of disaster recovery.

Q.5 Answer Any Two. **08**

a) Differentiate between Structural and Non-Structural mitigation measures with three examples of each.

b) Explain the concept of the "Golden Hour". Discuss the role of the National Disaster Response Force (NDRF) in search and rescue operations.

c) Discuss the relationship between Climate Change and the increasing frequency of natural disasters. How can sustainable development reduce this risk?

SLR-QH-646

Seat No.	

Set S

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Disaster Management and Mitigation (CIVMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. **14**

1) Major cause of road accidents in India is _____.
a) Flood b) Over-speeding
c) Earthquake d) Landslide

2) Mount Vesuvius is located in _____.
a) India b) Italy
c) Japan d) USA

3) Indian Ocean tsunami (2004) was primarily triggered by _____.
a) Cyclone b) Earthquake
c) Fire d) Landslide

4) Which factors heavily influence the habitation pattern and damage during a disaster?
a) Social status and climate b) Global trade
c) Stock market d) Export volume

5) What primarily dictates the selection of mitigation and preparation measures in a region?
a) Area and accessibility b) Space data
c) Currency rates d) Export volumes

6) Effective dissemination of information during a crisis relies on ____.
a) Withholding data b) Mass media and DMIS
c) Individual secrets d) Rumors

7) What is the primary purpose of 'feedback' in a disaster information system?
   a) Blaming victims
   b) To improve future information accuracy and flow
   c) Revenue generation
   d) Blocking channels

8) Which technology is reliable when standard networks fail?
   a) HAM Radio
   b) Optical fiber
   c) Home Wi-Fi
   d) Postal mail

9) GIS and Remote Sensing are applied in Disaster Management for _____.
   a) Entertainment
   b) Spatial hazard mapping and tracking
   c) Interior design
   d) Weather control

10) In technical terms, 'Risk' is often mathematically expressed as ____.
   a) Risk = Hazard + Vulnerability
   b) Risk = Hazard × Vulnerability × Exposure
   c) Risk = Disaster / Mitigation
   d) Risk = Capacity − Vulnerability

11) Land-use zoning is a form of _____ mitigation.
   a) Structural
   b) Non-structural
   c) Financial
   d) Immediate

12) A system used to alert people before a hazard strike is _____.
   a) NDMA
   b) EWS
   c) GIS
   d) GPS

13) Which sphere of the Earth is associated with earthquakes?
   a) Hydrosphere
   b) Atmosphere
   c) Lithosphere
   d) Biosphere

14) Biological disasters are mainly caused by _____.
   a) Geological processes
   b) Microorganisms
   c) Mechanical failure
   d) Climate change

SLR-QH-646

Seat No.	

Set S

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Disaster Management and Mitigation (CIVMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Answer Any Four. **20**

a) What are different types of disasters?

b) Write a short note on 'Flood.'

c) Elaborate 'Tsunami' as a natural disaster.

d) Explain the concept of biological disasters. Discuss their causes, modes of transmission, and preventive measures with suitable examples.

e) Discuss the major causes of road accidents in India. Suggest effective engineering, enforcement, and awareness-based measures to reduce road accident risks.

f) Is Pollution a manmade disaster? and explain its sources, effects on human health and environment, and control measures.

g) Describe the Indian Ocean Earthquake (2004) and resulting tsunami. Explain its causes, impacts, and the disaster management measures taken at national and international levels.

Q.3 Answer Any Two. **08**

a) What is Disaster? Explain along with Hazard & Vulnerability.

b) Explain the Disaster Management Cycle in details.

c) Explain 'Earthquake' as a geological disaster.

SECTION – II

Q.4 Answer Any Four. **20**

a) Explain the importance of Early Warning Systems (EWS). Describe the working mechanism of the Tsunami or Cyclone warning system in India.

b) Write a detailed note on Community Based Disaster Management (CBDM). Why is the community considered the first responder?

c) Explain the application of Geographic Information Systems (GIS) and Remote Sensing in Disaster Management (Hazard Zonation mapping).

d) Discuss the role of modern technologies like Drones (UAVs) and Artificial Intelligence (Al) in disaster damage assessment.

e) Write a note on the Sendai Framework for Disaster Risk Reduction (2015-2030). What are its four priorities for action?

f) Discuss the Psycho-social impacts of disasters on victims (PTSD). Why is mental health care crucial during the recovery phase?

g) Differentiate between Relief, Rehabilitation, and Reconstruction phases of disaster recovery.

Q.5 Answer Any Two. **08**

a) Differentiate between Structural and Non-Structural mitigation measures with three examples of each.

b) Explain the concept of the "Golden Hour". Discuss the role of the National Disaster Response Force (NDRF) in search and rescue operations.

c) Discuss the relationship between Climate Change and the increasing frequency of natural disasters. How can sustainable development reduce this risk?

SLR-QH-646

Seat No.	

Set P

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Disaster Management and Mitigation (CIVMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) In technical terms, 'Risk' is often mathematically expressed as ____.
a) Risk = Hazard + Vulnerability
b) Risk = Hazard × Vulnerability × Exposure
c) Risk = Disaster / Mitigation
d) Risk = Capacity − Vulnerability

2) Land-use zoning is a form of _____ mitigation.
a) Structural b) Non-structural
c) Financial d) Immediate

3) A system used to alert people before a hazard strike is _____.
a) NDMA b) EWS
c) GIS d) GPS

4) Which sphere of the Earth is associated with earthquakes?
a) Hydrosphere b) Atmosphere
c) Lithosphere d) Biosphere

5) Biological disasters are mainly caused by _____.
a) Geological processes b) Microorganisms
c) Mechanical failure d) Climate change

6) Major cause of road accidents in India is _____.
a) Flood b) Over-speeding
c) Earthquake d) Landslide

7) Mount Vesuvius is located in _____.
a) India b) Italy
c) Japan d) USA

8) Indian Ocean tsunami (2004) was primarily triggered by _____.
a) Cyclone b) Earthquake
c) Fire d) Landslide

9) Which factors heavily influence the habitation pattern and damage during a disaster?
a) Social status and climate b) Global trade
c) Stock market d) Export volume

10) What primarily dictates the selection of mitigation and preparation measures in a region?
a) Area and accessibility b) Space data
c) Currency rates d) Export volumes

11) Effective dissemination of information during a crisis relies on ____.
a) Withholding data b) Mass media and DMIS
c) Individual secrets d) Rumors

12) What is the primary purpose of 'feedback' in a disaster information system?
a) Blaming victims
b) To improve future information accuracy and flow
c) Revenue generation
d) Blocking channels

13) Which technology is reliable when standard networks fail?
a) HAM Radio b) Optical fiber
c) Home Wi-Fi d) Postal mail

14) GIS and Remote Sensing are applied in Disaster Management for _____.
a) Entertainment
b) Spatial hazard mapping and tracking
c) Interior design
d) Weather control

SLR-QH-646

Seat No.	

Set P

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Disaster Management and Mitigation (CIVMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Answer Any Four. **20**

a) What are different types of disasters?

b) Write a short note on 'Flood.'

c) Elaborate 'Tsunami' as a natural disaster.

d) Explain the concept of biological disasters. Discuss their causes, modes of transmission, and preventive measures with suitable examples.

e) Discuss the major causes of road accidents in India. Suggest effective engineering, enforcement, and awareness-based measures to reduce road accident risks.

f) Is Pollution a manmade disaster? and explain its sources, effects on human health and environment, and control measures.

g) Describe the Indian Ocean Earthquake (2004) and resulting tsunami. Explain its causes, impacts, and the disaster management measures taken at national and international levels.

Q.3 Answer Any Two. **08**

a) What is Disaster? Explain along with Hazard & Vulnerability.

b) Explain the Disaster Management Cycle in details.

c) Explain 'Earthquake' as a geological disaster.

SECTION – II

Q.4 Answer Any Four. **20**

a) Explain the importance of Early Warning Systems (EWS). Describe the working mechanism of the Tsunami or Cyclone warning system in India.

b) Write a detailed note on Community Based Disaster Management (CBDM). Why is the community considered the first responder?

c) Explain the application of Geographic Information Systems (GIS) and Remote Sensing in Disaster Management (Hazard Zonation mapping).

d) Discuss the role of modern technologies like Drones (UAVs) and Artificial Intelligence (Al) in disaster damage assessment.

e) Write a note on the Sendai Framework for Disaster Risk Reduction (2015-2030). What are its four priorities for action?

f) Discuss the Psycho-social impacts of disasters on victims (PTSD). Why is mental health care crucial during the recovery phase?

g) Differentiate between Relief, Rehabilitation, and Reconstruction phases of disaster recovery.

Q.5 Answer Any Two. **08**

a) Differentiate between Structural and Non-Structural mitigation measures with three examples of each.

b) Explain the concept of the "Golden Hour". Discuss the role of the National Disaster Response Force (NDRF) in search and rescue operations.

c) Discuss the relationship between Climate Change and the increasing frequency of natural disasters. How can sustainable development reduce this risk?

SLR-QH-646

Seat No.	

Set Q

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Disaster Management and Mitigation (CIVMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) Indian Ocean tsunami (2004) was primarily triggered by _____.
a) Cyclone b) Earthquake
c) Fire d) Landslide

2) Which factors heavily influence the habitation pattern and damage during a disaster?
a) Social status and climate b) Global trade
c) Stock market d) Export volume

3) What primarily dictates the selection of mitigation and preparation measures in a region?
a) Area and accessibility b) Space data
c) Currency rates d) Export volumes

4) Effective dissemination of information during a crisis relies on ____.
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c) Individual secrets d) Rumors

5) What is the primary purpose of 'feedback' in a disaster information system?
a) Blaming victims
b) To improve future information accuracy and flow
c) Revenue generation
d) Blocking channels

6) Which technology is reliable when standard networks fail?
a) HAM Radio b) Optical fiber
c) Home Wi-Fi d) Postal mail

7) GIS and Remote Sensing are applied in Disaster Management for _____.
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   b) Spatial hazard mapping and tracking
   c) Interior design
   d) Weather control

8) In technical terms, 'Risk' is often mathematically expressed as ____.
   a) Risk = Hazard + Vulnerability
   b) Risk = Hazard × Vulnerability × Exposure
   c) Risk = Disaster / Mitigation
   d) Risk = Capacity − Vulnerability

9) Land-use zoning is a form of _____ mitigation.
   a) Structural
   b) Non-structural
   c) Financial
   d) Immediate

10) A system used to alert people before a hazard strike is _____.
   a) NDMA
   b) EWS
   c) GIS
   d) GPS

11) Which sphere of the Earth is associated with earthquakes?
   a) Hydrosphere
   b) Atmosphere
   c) Lithosphere
   d) Biosphere

12) Biological disasters are mainly caused by _____.
   a) Geological processes
   b) Microorganisms
   c) Mechanical failure
   d) Climate change

13) Major cause of road accidents in India is _____.
   a) Flood
   b) Over-speeding
   c) Earthquake
   d) Landslide

14) Mount Vesuvius is located in _____.
   a) India
   b) Italy
   c) Japan
   d) USA

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Disaster Management and Mitigation (CIVMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Answer Any Four. **20**

a) What are different types of disasters?

b) Write a short note on 'Flood.'

c) Elaborate 'Tsunami' as a natural disaster.

d) Explain the concept of biological disasters. Discuss their causes, modes of transmission, and preventive measures with suitable examples.

e) Discuss the major causes of road accidents in India. Suggest effective engineering, enforcement, and awareness-based measures to reduce road accident risks.

f) Is Pollution a manmade disaster? and explain its sources, effects on human health and environment, and control measures.

g) Describe the Indian Ocean Earthquake (2004) and resulting tsunami. Explain its causes, impacts, and the disaster management measures taken at national and international levels.

Q.3 Answer Any Two. **08**

a) What is Disaster? Explain along with Hazard & Vulnerability.

b) Explain the Disaster Management Cycle in details.

c) Explain 'Earthquake' as a geological disaster.

SECTION – II

Q.4 Answer Any Four. **20**

a) Explain the importance of Early Warning Systems (EWS). Describe the working mechanism of the Tsunami or Cyclone warning system in India.

b) Write a detailed note on Community Based Disaster Management (CBDM). Why is the community considered the first responder?

c) Explain the application of Geographic Information Systems (GIS) and Remote Sensing in Disaster Management (Hazard Zonation mapping).

d) Discuss the role of modern technologies like Drones (UAVs) and Artificial Intelligence (Al) in disaster damage assessment.

e) Write a note on the Sendai Framework for Disaster Risk Reduction (2015-2030). What are its four priorities for action?

f) Discuss the Psycho-social impacts of disasters on victims (PTSD). Why is mental health care crucial during the recovery phase?

g) Differentiate between Relief, Rehabilitation, and Reconstruction phases of disaster recovery.

Q.5 Answer Any Two. **08**

a) Differentiate between Structural and Non-Structural mitigation measures with three examples of each.

b) Explain the concept of the "Golden Hour". Discuss the role of the National Disaster Response Force (NDRF) in search and rescue operations.

c) Discuss the relationship between Climate Change and the increasing frequency of natural disasters. How can sustainable development reduce this risk?

SLR-QH-646

Seat No.	

Set R

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Disaster Management and Mitigation (CIVMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) Effective dissemination of information during a crisis relies on ____.
a) Withholding data b) Mass media and DMIS
c) Individual secrets d) Rumors

2) What is the primary purpose of 'feedback' in a disaster information system?
a) Blaming victims
b) To improve future information accuracy and flow
c) Revenue generation
d) Blocking channels

3) Which technology is reliable when standard networks fail?
a) HAM Radio b) Optical fiber
c) Home Wi-Fi d) Postal mail

4) GIS and Remote Sensing are applied in Disaster Management for _____.
a) Entertainment
b) Spatial hazard mapping and tracking
c) Interior design
d) Weather control

5) In technical terms, 'Risk' is often mathematically expressed as ____.
a) Risk = Hazard + Vulnerability
b) Risk = Hazard × Vulnerability × Exposure
c) Risk = Disaster / Mitigation
d) Risk = Capacity − Vulnerability

6) Land-use zoning is a form of _____ mitigation.
a) Structural b) Non-structural
c) Financial d) Immediate

7) A system used to alert people before a hazard strike is _____.
a) NDMA b) EWS
c) GIS d) GPS

8) Which sphere of the Earth is associated with earthquakes?
a) Hydrosphere b) Atmosphere
c) Lithosphere d) Biosphere

9) Biological disasters are mainly caused by _____.
a) Geological processes b) Microorganisms
c) Mechanical failure d) Climate change

10) Major cause of road accidents in India is _____.
a) Flood b) Over-speeding
c) Earthquake d) Landslide

11) Mount Vesuvius is located in _____.
a) India b) Italy
c) Japan d) USA

12) Indian Ocean tsunami (2004) was primarily triggered by _____.
a) Cyclone b) Earthquake
c) Fire d) Landslide

13) Which factors heavily influence the habitation pattern and damage during a disaster?
a) Social status and climate b) Global trade
c) Stock market d) Export volume

14) What primarily dictates the selection of mitigation and preparation measures in a region?
a) Area and accessibility b) Space data
c) Currency rates d) Export volumes

Seat No.	

Set **R**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Disaster Management and Mitigation (CIVMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Answer Any Four. **20**

a) What are different types of disasters?

b) Write a short note on 'Flood.'

c) Elaborate 'Tsunami' as a natural disaster.

d) Explain the concept of biological disasters. Discuss their causes, modes of transmission, and preventive measures with suitable examples.

e) Discuss the major causes of road accidents in India. Suggest effective engineering, enforcement, and awareness-based measures to reduce road accident risks.

f) Is Pollution a manmade disaster? and explain its sources, effects on human health and environment, and control measures.

g) Describe the Indian Ocean Earthquake (2004) and resulting tsunami. Explain its causes, impacts, and the disaster management measures taken at national and international levels.

Q.3 Answer Any Two. **08**

a) What is Disaster? Explain along with Hazard & Vulnerability.

b) Explain the Disaster Management Cycle in details.

c) Explain 'Earthquake' as a geological disaster.

SECTION – II

Q.4 Answer Any Four. **20**

a) Explain the importance of Early Warning Systems (EWS). Describe the working mechanism of the Tsunami or Cyclone warning system in India.

b) Write a detailed note on Community Based Disaster Management (CBDM). Why is the community considered the first responder?

c) Explain the application of Geographic Information Systems (GIS) and Remote Sensing in Disaster Management (Hazard Zonation mapping).

d) Discuss the role of modern technologies like Drones (UAVs) and Artificial Intelligence (Al) in disaster damage assessment.

e) Write a note on the Sendai Framework for Disaster Risk Reduction (2015-2030). What are its four priorities for action?

f) Discuss the Psycho-social impacts of disasters on victims (PTSD). Why is mental health care crucial during the recovery phase?

g) Differentiate between Relief, Rehabilitation, and Reconstruction phases of disaster recovery.

Q.5 Answer Any Two. **08**

a) Differentiate between Structural and Non-Structural mitigation measures with three examples of each.

b) Explain the concept of the "Golden Hour". Discuss the role of the National Disaster Response Force (NDRF) in search and rescue operations.

c) Discuss the relationship between Climate Change and the increasing frequency of natural disasters. How can sustainable development reduce this risk?

SLR-QH-646

Seat No.	

Set S

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Disaster Management and Mitigation (CIVMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. **14**

1) Major cause of road accidents in India is _____.
a) Flood b) Over-speeding
c) Earthquake d) Landslide

2) Mount Vesuvius is located in _____.
a) India b) Italy
c) Japan d) USA

3) Indian Ocean tsunami (2004) was primarily triggered by _____.
a) Cyclone b) Earthquake
c) Fire d) Landslide

4) Which factors heavily influence the habitation pattern and damage during a disaster?
a) Social status and climate b) Global trade
c) Stock market d) Export volume

5) What primarily dictates the selection of mitigation and preparation measures in a region?
a) Area and accessibility b) Space data
c) Currency rates d) Export volumes

6) Effective dissemination of information during a crisis relies on ____.
a) Withholding data b) Mass media and DMIS
c) Individual secrets d) Rumors

7) What is the primary purpose of 'feedback' in a disaster information system?
   a) Blaming victims
   b) To improve future information accuracy and flow
   c) Revenue generation
   d) Blocking channels

8) Which technology is reliable when standard networks fail?
   a) HAM Radio
   b) Optical fiber
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   d) Postal mail

9) GIS and Remote Sensing are applied in Disaster Management for _____.
   a) Entertainment
   b) Spatial hazard mapping and tracking
   c) Interior design
   d) Weather control

10) In technical terms, 'Risk' is often mathematically expressed as ____.
   a) Risk = Hazard + Vulnerability
   b) Risk = Hazard × Vulnerability × Exposure
   c) Risk = Disaster / Mitigation
   d) Risk = Capacity − Vulnerability

11) Land-use zoning is a form of _____ mitigation.
   a) Structural
   b) Non-structural
   c) Financial
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12) A system used to alert people before a hazard strike is _____.
   a) NDMA
   b) EWS
   c) GIS
   d) GPS

13) Which sphere of the Earth is associated with earthquakes?
   a) Hydrosphere
   b) Atmosphere
   c) Lithosphere
   d) Biosphere

14) Biological disasters are mainly caused by _____.
   a) Geological processes
   b) Microorganisms
   c) Mechanical failure
   d) Climate change

SLR-QH-646

Seat No.	

Set S

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Disaster Management and Mitigation (CIVMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Answer Any Four. **20**

a) What are different types of disasters?

b) Write a short note on 'Flood.'

c) Elaborate 'Tsunami' as a natural disaster.

d) Explain the concept of biological disasters. Discuss their causes, modes of transmission, and preventive measures with suitable examples.

e) Discuss the major causes of road accidents in India. Suggest effective engineering, enforcement, and awareness-based measures to reduce road accident risks.

f) Is Pollution a manmade disaster? and explain its sources, effects on human health and environment, and control measures.

g) Describe the Indian Ocean Earthquake (2004) and resulting tsunami. Explain its causes, impacts, and the disaster management measures taken at national and international levels.

Q.3 Answer Any Two. **08**

a) What is Disaster? Explain along with Hazard & Vulnerability.

b) Explain the Disaster Management Cycle in details.

c) Explain 'Earthquake' as a geological disaster.

SECTION – II

Q.4 Answer Any Four. **20**

a) Explain the importance of Early Warning Systems (EWS). Describe the working mechanism of the Tsunami or Cyclone warning system in India.

b) Write a detailed note on Community Based Disaster Management (CBDM). Why is the community considered the first responder?

c) Explain the application of Geographic Information Systems (GIS) and Remote Sensing in Disaster Management (Hazard Zonation mapping).

d) Discuss the role of modern technologies like Drones (UAVs) and Artificial Intelligence (Al) in disaster damage assessment.

e) Write a note on the Sendai Framework for Disaster Risk Reduction (2015-2030). What are its four priorities for action?

f) Discuss the Psycho-social impacts of disasters on victims (PTSD). Why is mental health care crucial during the recovery phase?

g) Differentiate between Relief, Rehabilitation, and Reconstruction phases of disaster recovery.

Q.5 Answer Any Two. **08**

a) Differentiate between Structural and Non-Structural mitigation measures with three examples of each.

b) Explain the concept of the "Golden Hour". Discuss the role of the National Disaster Response Force (NDRF) in search and rescue operations.

c) Discuss the relationship between Climate Change and the increasing frequency of natural disasters. How can sustainable development reduce this risk?

SLR-QH-646

Seat No.	

Set P

T.Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Disaster Management and Mitigation (CIVMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) In technical terms, 'Risk' is often mathematically expressed as ____.
a) Risk = Hazard + Vulnerability
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2) Land-use zoning is a form of _____ mitigation.
a) Structural b) Non-structural
c) Financial d) Immediate

3) A system used to alert people before a hazard strike is _____.
a) NDMA b) EWS
c) GIS d) GPS

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c) Lithosphere d) Biosphere

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6) Major cause of road accidents in India is _____.
a) Flood b) Over-speeding
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7) Mount Vesuvius is located in _____.
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8) Indian Ocean tsunami (2004) was primarily triggered by _____.
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11) Effective dissemination of information during a crisis relies on ____.
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Seat No.	

Set | P

T.Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Disaster Management and Mitigation (CIVMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
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SECTION – I

Q.2 Answer Any Four. **20**

a) What are different types of disasters?

b) Write a short note on 'Flood.'

c) Elaborate 'Tsunami' as a natural disaster.

d) Explain the concept of biological disasters. Discuss their causes, modes of transmission, and preventive measures with suitable examples.

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g) Describe the Indian Ocean Earthquake (2004) and resulting tsunami. Explain its causes, impacts, and the disaster management measures taken at national and international levels.

Q.3 Answer Any Two. **08**

a) What is Disaster? Explain along with Hazard & Vulnerability.

b) Explain the Disaster Management Cycle in details.

c) Explain 'Earthquake' as a geological disaster.

SECTION – II

Q.4 Answer Any Four. **20**

a) Explain the importance of Early Warning Systems (EWS). Describe the working mechanism of the Tsunami or Cyclone warning system in India.

b) Write a detailed note on Community Based Disaster Management (CBDM). Why is the community considered the first responder?

c) Explain the application of Geographic Information Systems (GIS) and Remote Sensing in Disaster Management (Hazard Zonation mapping).

d) Discuss the role of modern technologies like Drones (UAVs) and Artificial Intelligence (Al) in disaster damage assessment.

e) Write a note on the Sendai Framework for Disaster Risk Reduction (2015-2030). What are its four priorities for action?

f) Discuss the Psycho-social impacts of disasters on victims (PTSD). Why is mental health care crucial during the recovery phase?

g) Differentiate between Relief, Rehabilitation, and Reconstruction phases of disaster recovery.

Q.5 Answer Any Two. **08**

a) Differentiate between Structural and Non-Structural mitigation measures with three examples of each.

b) Explain the concept of the "Golden Hour". Discuss the role of the National Disaster Response Force (NDRF) in search and rescue operations.

c) Discuss the relationship between Climate Change and the increasing frequency of natural disasters. How can sustainable development reduce this risk?

SLR-QH-646

Seat No.	

Set Q

T.Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Disaster Management and Mitigation (CIVMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) Indian Ocean tsunami (2004) was primarily triggered by _____.
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   c) Mechanical failure
   d) Climate change

13) Major cause of road accidents in India is _____.
   a) Flood
   b) Over-speeding
   c) Earthquake
   d) Landslide

14) Mount Vesuvius is located in _____.
   a) India
   b) Italy
   c) Japan
   d) USA

SLR-QH-646

Seat No.	

Set Q

T.Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Disaster Management and Mitigation (CIVMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Answer Any Four. **20**

a) What are different types of disasters?

b) Write a short note on 'Flood.'

c) Elaborate 'Tsunami' as a natural disaster.

d) Explain the concept of biological disasters. Discuss their causes, modes of transmission, and preventive measures with suitable examples.

e) Discuss the major causes of road accidents in India. Suggest effective engineering, enforcement, and awareness-based measures to reduce road accident risks.

f) Is Pollution a manmade disaster? and explain its sources, effects on human health and environment, and control measures.

g) Describe the Indian Ocean Earthquake (2004) and resulting tsunami. Explain its causes, impacts, and the disaster management measures taken at national and international levels.

Q.3 Answer Any Two. **08**

a) What is Disaster? Explain along with Hazard & Vulnerability.

b) Explain the Disaster Management Cycle in details.

c) Explain 'Earthquake' as a geological disaster.

SECTION – II

Q.4 Answer Any Four. **20**

a) Explain the importance of Early Warning Systems (EWS). Describe the working mechanism of the Tsunami or Cyclone warning system in India.

b) Write a detailed note on Community Based Disaster Management (CBDM). Why is the community considered the first responder?

c) Explain the application of Geographic Information Systems (GIS) and Remote Sensing in Disaster Management (Hazard Zonation mapping).

d) Discuss the role of modern technologies like Drones (UAVs) and Artificial Intelligence (Al) in disaster damage assessment.

e) Write a note on the Sendai Framework for Disaster Risk Reduction (2015-2030). What are its four priorities for action?

f) Discuss the Psycho-social impacts of disasters on victims (PTSD). Why is mental health care crucial during the recovery phase?

g) Differentiate between Relief, Rehabilitation, and Reconstruction phases of disaster recovery.

Q.5 Answer Any Two. **08**

a) Differentiate between Structural and Non-Structural mitigation measures with three examples of each.

b) Explain the concept of the "Golden Hour". Discuss the role of the National Disaster Response Force (NDRF) in search and rescue operations.

c) Discuss the relationship between Climate Change and the increasing frequency of natural disasters. How can sustainable development reduce this risk?

SLR-QH-646

Seat No.	

Set R

T.Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Disaster Management and Mitigation (CIVMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) Effective dissemination of information during a crisis relies on ____.
a) Withholding data b) Mass media and DMIS
c) Individual secrets d) Rumors

2) What is the primary purpose of 'feedback' in a disaster information system?
a) Blaming victims
b) To improve future information accuracy and flow
c) Revenue generation
d) Blocking channels

3) Which technology is reliable when standard networks fail?
a) HAM Radio b) Optical fiber
c) Home Wi-Fi d) Postal mail

4) GIS and Remote Sensing are applied in Disaster Management for _____.
a) Entertainment
b) Spatial hazard mapping and tracking
c) Interior design
d) Weather control

5) In technical terms, 'Risk' is often mathematically expressed as ____.
a) Risk = Hazard + Vulnerability
b) Risk = Hazard × Vulnerability × Exposure
c) Risk = Disaster / Mitigation
d) Risk = Capacity − Vulnerability

6) Land-use zoning is a form of _____ mitigation.
a) Structural b) Non-structural
c) Financial d) Immediate

7) A system used to alert people before a hazard strike is _____.
a) NDMA b) EWS
c) GIS d) GPS

8) Which sphere of the Earth is associated with earthquakes?
a) Hydrosphere b) Atmosphere
c) Lithosphere d) Biosphere

9) Biological disasters are mainly caused by _____.
a) Geological processes b) Microorganisms
c) Mechanical failure d) Climate change

10) Major cause of road accidents in India is _____.
a) Flood b) Over-speeding
c) Earthquake d) Landslide

11) Mount Vesuvius is located in _____.
a) India b) Italy
c) Japan d) USA

12) Indian Ocean tsunami (2004) was primarily triggered by _____.
a) Cyclone b) Earthquake
c) Fire d) Landslide

13) Which factors heavily influence the habitation pattern and damage during a disaster?
a) Social status and climate b) Global trade
c) Stock market d) Export volume

14) What primarily dictates the selection of mitigation and preparation measures in a region?
a) Area and accessibility b) Space data
c) Currency rates d) Export volumes

Seat No.	

Set **R**

T.Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Disaster Management and Mitigation (CIVMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Answer Any Four. **20**

a) What are different types of disasters?

b) Write a short note on 'Flood.'

c) Elaborate 'Tsunami' as a natural disaster.

d) Explain the concept of biological disasters. Discuss their causes, modes of transmission, and preventive measures with suitable examples.

e) Discuss the major causes of road accidents in India. Suggest effective engineering, enforcement, and awareness-based measures to reduce road accident risks.

f) Is Pollution a manmade disaster? and explain its sources, effects on human health and environment, and control measures.

g) Describe the Indian Ocean Earthquake (2004) and resulting tsunami. Explain its causes, impacts, and the disaster management measures taken at national and international levels.

Q.3 Answer Any Two. **08**

a) What is Disaster? Explain along with Hazard & Vulnerability.

b) Explain the Disaster Management Cycle in details.

c) Explain 'Earthquake' as a geological disaster.

SECTION – II

Q.4 Answer Any Four. **20**

a) Explain the importance of Early Warning Systems (EWS). Describe the working mechanism of the Tsunami or Cyclone warning system in India.

b) Write a detailed note on Community Based Disaster Management (CBDM). Why is the community considered the first responder?

c) Explain the application of Geographic Information Systems (GIS) and Remote Sensing in Disaster Management (Hazard Zonation mapping).

d) Discuss the role of modern technologies like Drones (UAVs) and Artificial Intelligence (Al) in disaster damage assessment.

e) Write a note on the Sendai Framework for Disaster Risk Reduction (2015-2030). What are its four priorities for action?

f) Discuss the Psycho-social impacts of disasters on victims (PTSD). Why is mental health care crucial during the recovery phase?

g) Differentiate between Relief, Rehabilitation, and Reconstruction phases of disaster recovery.

Q.5 Answer Any Two. **08**

a) Differentiate between Structural and Non-Structural mitigation measures with three examples of each.

b) Explain the concept of the "Golden Hour". Discuss the role of the National Disaster Response Force (NDRF) in search and rescue operations.

c) Discuss the relationship between Climate Change and the increasing frequency of natural disasters. How can sustainable development reduce this risk?

Seat No.	

Set **S**

T.Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Disaster Management and Mitigation (CIVMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. **14**

1) Major cause of road accidents in India is _____.
a) Flood b) Over-speeding
c) Earthquake d) Landslide

2) Mount Vesuvius is located in _____.
a) India b) Italy
c) Japan d) USA

3) Indian Ocean tsunami (2004) was primarily triggered by _____.
a) Cyclone b) Earthquake
c) Fire d) Landslide

4) Which factors heavily influence the habitation pattern and damage during a disaster?
a) Social status and climate b) Global trade
c) Stock market d) Export volume

5) What primarily dictates the selection of mitigation and preparation measures in a region?
a) Area and accessibility b) Space data
c) Currency rates d) Export volumes

6) Effective dissemination of information during a crisis relies on ____.
a) Withholding data b) Mass media and DMIS
c) Individual secrets d) Rumors

7) What is the primary purpose of 'feedback' in a disaster information system?
   a) Blaming victims
   b) To improve future information accuracy and flow
   c) Revenue generation
   d) Blocking channels

8) Which technology is reliable when standard networks fail?
   a) HAM Radio
   b) Optical fiber
   c) Home Wi-Fi
   d) Postal mail

9) GIS and Remote Sensing are applied in Disaster Management for _____.
   a) Entertainment
   b) Spatial hazard mapping and tracking
   c) Interior design
   d) Weather control

10) In technical terms, 'Risk' is often mathematically expressed as ____.
   a) Risk = Hazard + Vulnerability
   b) Risk = Hazard × Vulnerability × Exposure
   c) Risk = Disaster / Mitigation
   d) Risk = Capacity − Vulnerability

11) Land-use zoning is a form of _____ mitigation.
   a) Structural
   b) Non-structural
   c) Financial
   d) Immediate

12) A system used to alert people before a hazard strike is _____.
   a) NDMA
   b) EWS
   c) GIS
   d) GPS

13) Which sphere of the Earth is associated with earthquakes?
   a) Hydrosphere
   b) Atmosphere
   c) Lithosphere
   d) Biosphere

14) Biological disasters are mainly caused by _____.
   a) Geological processes
   b) Microorganisms
   c) Mechanical failure
   d) Climate change

SLR-QH-646

Seat No.	

Set S

T.Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Disaster Management and Mitigation (CIVMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Answer Any Four. **20**

a) What are different types of disasters?

b) Write a short note on 'Flood.'

c) Elaborate 'Tsunami' as a natural disaster.

d) Explain the concept of biological disasters. Discuss their causes, modes of transmission, and preventive measures with suitable examples.

e) Discuss the major causes of road accidents in India. Suggest effective engineering, enforcement, and awareness-based measures to reduce road accident risks.

f) Is Pollution a manmade disaster? and explain its sources, effects on human health and environment, and control measures.

g) Describe the Indian Ocean Earthquake (2004) and resulting tsunami. Explain its causes, impacts, and the disaster management measures taken at national and international levels.

Q.3 Answer Any Two. **08**

a) What is Disaster? Explain along with Hazard & Vulnerability.

b) Explain the Disaster Management Cycle in details.

c) Explain 'Earthquake' as a geological disaster.

SECTION – II

Q.4 Answer Any Four. **20**

a) Explain the importance of Early Warning Systems (EWS). Describe the working mechanism of the Tsunami or Cyclone warning system in India.

b) Write a detailed note on Community Based Disaster Management (CBDM). Why is the community considered the first responder?

c) Explain the application of Geographic Information Systems (GIS) and Remote Sensing in Disaster Management (Hazard Zonation mapping).

d) Discuss the role of modern technologies like Drones (UAVs) and Artificial Intelligence (Al) in disaster damage assessment.

e) Write a note on the Sendai Framework for Disaster Risk Reduction (2015-2030). What are its four priorities for action?

f) Discuss the Psycho-social impacts of disasters on victims (PTSD). Why is mental health care crucial during the recovery phase?

g) Differentiate between Relief, Rehabilitation, and Reconstruction phases of disaster recovery.

Q.5 Answer Any Two. **08**

a) Differentiate between Structural and Non-Structural mitigation measures with three examples of each.

b) Explain the concept of the "Golden Hour". Discuss the role of the National Disaster Response Force (NDRF) in search and rescue operations.

c) Discuss the relationship between Climate Change and the increasing frequency of natural disasters. How can sustainable development reduce this risk?

SLR-QH-646

Seat No.	

Set P

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Disaster Management and Mitigation (CIVMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) In technical terms, 'Risk' is often mathematically expressed as ____.
a) Risk = Hazard + Vulnerability
b) Risk = Hazard × Vulnerability × Exposure
c) Risk = Disaster / Mitigation
d) Risk = Capacity − Vulnerability

2) Land-use zoning is a form of _____ mitigation.
a) Structural b) Non-structural
c) Financial d) Immediate

3) A system used to alert people before a hazard strike is _____.
a) NDMA b) EWS
c) GIS d) GPS

4) Which sphere of the Earth is associated with earthquakes?
a) Hydrosphere b) Atmosphere
c) Lithosphere d) Biosphere

5) Biological disasters are mainly caused by _____.
a) Geological processes b) Microorganisms
c) Mechanical failure d) Climate change

6) Major cause of road accidents in India is _____.
a) Flood b) Over-speeding
c) Earthquake d) Landslide

7) Mount Vesuvius is located in _____.
a) India b) Italy
c) Japan d) USA

8) Indian Ocean tsunami (2004) was primarily triggered by _____.
a) Cyclone b) Earthquake
c) Fire d) Landslide

9) Which factors heavily influence the habitation pattern and damage during a disaster?
a) Social status and climate b) Global trade
c) Stock market d) Export volume

10) What primarily dictates the selection of mitigation and preparation measures in a region?
a) Area and accessibility b) Space data
c) Currency rates d) Export volumes

11) Effective dissemination of information during a crisis relies on ____.
a) Withholding data b) Mass media and DMIS
c) Individual secrets d) Rumors

12) What is the primary purpose of 'feedback' in a disaster information system?
a) Blaming victims
b) To improve future information accuracy and flow
c) Revenue generation
d) Blocking channels

13) Which technology is reliable when standard networks fail?
a) HAM Radio b) Optical fiber
c) Home Wi-Fi d) Postal mail

14) GIS and Remote Sensing are applied in Disaster Management for _____.
a) Entertainment
b) Spatial hazard mapping and tracking
c) Interior design
d) Weather control

SLR-QH-646

Seat No.	

Set P

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Disaster Management and Mitigation (CIVMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Answer Any Four. **20**

a) What are different types of disasters?

b) Write a short note on 'Flood.'

c) Elaborate 'Tsunami' as a natural disaster.

d) Explain the concept of biological disasters. Discuss their causes, modes of transmission, and preventive measures with suitable examples.

e) Discuss the major causes of road accidents in India. Suggest effective engineering, enforcement, and awareness-based measures to reduce road accident risks.

f) Is Pollution a manmade disaster? and explain its sources, effects on human health and environment, and control measures.

g) Describe the Indian Ocean Earthquake (2004) and resulting tsunami. Explain its causes, impacts, and the disaster management measures taken at national and international levels.

Q.3 Answer Any Two. **08**

a) What is Disaster? Explain along with Hazard & Vulnerability.

b) Explain the Disaster Management Cycle in details.

c) Explain 'Earthquake' as a geological disaster.

SECTION – II

Q.4 Answer Any Four. **20**

a) Explain the importance of Early Warning Systems (EWS). Describe the working mechanism of the Tsunami or Cyclone warning system in India.

b) Write a detailed note on Community Based Disaster Management (CBDM). Why is the community considered the first responder?

c) Explain the application of Geographic Information Systems (GIS) and Remote Sensing in Disaster Management (Hazard Zonation mapping).

d) Discuss the role of modern technologies like Drones (UAVs) and Artificial Intelligence (Al) in disaster damage assessment.

e) Write a note on the Sendai Framework for Disaster Risk Reduction (2015-2030). What are its four priorities for action?

f) Discuss the Psycho-social impacts of disasters on victims (PTSD). Why is mental health care crucial during the recovery phase?

g) Differentiate between Relief, Rehabilitation, and Reconstruction phases of disaster recovery.

Q.5 Answer Any Two. **08**

a) Differentiate between Structural and Non-Structural mitigation measures with three examples of each.

b) Explain the concept of the "Golden Hour". Discuss the role of the National Disaster Response Force (NDRF) in search and rescue operations.

c) Discuss the relationship between Climate Change and the increasing frequency of natural disasters. How can sustainable development reduce this risk?

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Disaster Management and Mitigation (CIVMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. **14**

1) Indian Ocean tsunami (2004) was primarily triggered by _____.
a) Cyclone b) Earthquake
c) Fire d) Landslide

2) Which factors heavily influence the habitation pattern and damage during a disaster?
a) Social status and climate b) Global trade
c) Stock market d) Export volume

3) What primarily dictates the selection of mitigation and preparation measures in a region?
a) Area and accessibility b) Space data
c) Currency rates d) Export volumes

4) Effective dissemination of information during a crisis relies on ____.
a) Withholding data b) Mass media and DMIS
c) Individual secrets d) Rumors

5) What is the primary purpose of 'feedback' in a disaster information system?
a) Blaming victims
b) To improve future information accuracy and flow
c) Revenue generation
d) Blocking channels

6) Which technology is reliable when standard networks fail?
a) HAM Radio b) Optical fiber
c) Home Wi-Fi d) Postal mail

7) GIS and Remote Sensing are applied in Disaster Management for _____.
   a) Entertainment
   b) Spatial hazard mapping and tracking
   c) Interior design
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8) In technical terms, 'Risk' is often mathematically expressed as ____.
   a) Risk = Hazard + Vulnerability
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   c) Risk = Disaster / Mitigation
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9) Land-use zoning is a form of _____ mitigation.
   a) Structural
   b) Non-structural
   c) Financial
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10) A system used to alert people before a hazard strike is _____.
   a) NDMA
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11) Which sphere of the Earth is associated with earthquakes?
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12) Biological disasters are mainly caused by _____.
   a) Geological processes
   b) Microorganisms
   c) Mechanical failure
   d) Climate change

13) Major cause of road accidents in India is _____.
   a) Flood
   b) Over-speeding
   c) Earthquake
   d) Landslide

14) Mount Vesuvius is located in _____.
   a) India
   b) Italy
   c) Japan
   d) USA

SLR-QH-646

Seat No.	

Set Q

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Disaster Management and Mitigation (CIVMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Answer Any Four. **20**

a) What are different types of disasters?

b) Write a short note on 'Flood.'

c) Elaborate 'Tsunami' as a natural disaster.

d) Explain the concept of biological disasters. Discuss their causes, modes of transmission, and preventive measures with suitable examples.

e) Discuss the major causes of road accidents in India. Suggest effective engineering, enforcement, and awareness-based measures to reduce road accident risks.

f) Is Pollution a manmade disaster? and explain its sources, effects on human health and environment, and control measures.

g) Describe the Indian Ocean Earthquake (2004) and resulting tsunami. Explain its causes, impacts, and the disaster management measures taken at national and international levels.

Q.3 Answer Any Two. **08**

a) What is Disaster? Explain along with Hazard & Vulnerability.

b) Explain the Disaster Management Cycle in details.

c) Explain 'Earthquake' as a geological disaster.

SECTION – II

Q.4 Answer Any Four. **20**

a) Explain the importance of Early Warning Systems (EWS). Describe the working mechanism of the Tsunami or Cyclone warning system in India.

b) Write a detailed note on Community Based Disaster Management (CBDM). Why is the community considered the first responder?

c) Explain the application of Geographic Information Systems (GIS) and Remote Sensing in Disaster Management (Hazard Zonation mapping).

d) Discuss the role of modern technologies like Drones (UAVs) and Artificial Intelligence (Al) in disaster damage assessment.

e) Write a note on the Sendai Framework for Disaster Risk Reduction (2015-2030). What are its four priorities for action?

f) Discuss the Psycho-social impacts of disasters on victims (PTSD). Why is mental health care crucial during the recovery phase?

g) Differentiate between Relief, Rehabilitation, and Reconstruction phases of disaster recovery.

Q.5 Answer Any Two. **08**

a) Differentiate between Structural and Non-Structural mitigation measures with three examples of each.

b) Explain the concept of the "Golden Hour". Discuss the role of the National Disaster Response Force (NDRF) in search and rescue operations.

c) Discuss the relationship between Climate Change and the increasing frequency of natural disasters. How can sustainable development reduce this risk?

SLR-QH-646

Seat No.	

Set R

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Disaster Management and Mitigation (CIVMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) Effective dissemination of information during a crisis relies on ____.
a) Withholding data b) Mass media and DMIS
c) Individual secrets d) Rumors

2) What is the primary purpose of 'feedback' in a disaster information system?
a) Blaming victims
b) To improve future information accuracy and flow
c) Revenue generation
d) Blocking channels

3) Which technology is reliable when standard networks fail?
a) HAM Radio b) Optical fiber
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4) GIS and Remote Sensing are applied in Disaster Management for _____.
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b) Spatial hazard mapping and tracking
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5) In technical terms, 'Risk' is often mathematically expressed as ____.
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6) Land-use zoning is a form of _____ mitigation.
a) Structural b) Non-structural
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7) A system used to alert people before a hazard strike is _____.
a) NDMA b) EWS
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8) Which sphere of the Earth is associated with earthquakes?
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9) Biological disasters are mainly caused by _____.
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a) Flood b) Over-speeding
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11) Mount Vesuvius is located in _____.
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12) Indian Ocean tsunami (2004) was primarily triggered by _____.
a) Cyclone b) Earthquake
c) Fire d) Landslide

13) Which factors heavily influence the habitation pattern and damage during a disaster?
a) Social status and climate b) Global trade
c) Stock market d) Export volume

14) What primarily dictates the selection of mitigation and preparation measures in a region?
a) Area and accessibility b) Space data
c) Currency rates d) Export volumes

SLR-QH-646

Seat No.	

Set R

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Disaster Management and Mitigation (CIVMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Answer Any Four. **20**

a) What are different types of disasters?

b) Write a short note on 'Flood.'

c) Elaborate 'Tsunami' as a natural disaster.

d) Explain the concept of biological disasters. Discuss their causes, modes of transmission, and preventive measures with suitable examples.

e) Discuss the major causes of road accidents in India. Suggest effective engineering, enforcement, and awareness-based measures to reduce road accident risks.

f) Is Pollution a manmade disaster? and explain its sources, effects on human health and environment, and control measures.

g) Describe the Indian Ocean Earthquake (2004) and resulting tsunami. Explain its causes, impacts, and the disaster management measures taken at national and international levels.

Q.3 Answer Any Two. **08**

a) What is Disaster? Explain along with Hazard & Vulnerability.

b) Explain the Disaster Management Cycle in details.

c) Explain 'Earthquake' as a geological disaster.

SECTION – II

Q.4 Answer Any Four. **20**

a) Explain the importance of Early Warning Systems (EWS). Describe the working mechanism of the Tsunami or Cyclone warning system in India.

b) Write a detailed note on Community Based Disaster Management (CBDM). Why is the community considered the first responder?

c) Explain the application of Geographic Information Systems (GIS) and Remote Sensing in Disaster Management (Hazard Zonation mapping).

d) Discuss the role of modern technologies like Drones (UAVs) and Artificial Intelligence (Al) in disaster damage assessment.

e) Write a note on the Sendai Framework for Disaster Risk Reduction (2015-2030). What are its four priorities for action?

f) Discuss the Psycho-social impacts of disasters on victims (PTSD). Why is mental health care crucial during the recovery phase?

g) Differentiate between Relief, Rehabilitation, and Reconstruction phases of disaster recovery.

Q.5 Answer Any Two. **08**

a) Differentiate between Structural and Non-Structural mitigation measures with three examples of each.

b) Explain the concept of the "Golden Hour". Discuss the role of the National Disaster Response Force (NDRF) in search and rescue operations.

c) Discuss the relationship between Climate Change and the increasing frequency of natural disasters. How can sustainable development reduce this risk?

Seat No.	

Set **S**

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Disaster Management and Mitigation (CIVMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. **14**

1) Major cause of road accidents in India is _____.
a) Flood b) Over-speeding
c) Earthquake d) Landslide

2) Mount Vesuvius is located in _____.
a) India b) Italy
c) Japan d) USA

3) Indian Ocean tsunami (2004) was primarily triggered by _____.
a) Cyclone b) Earthquake
c) Fire d) Landslide

4) Which factors heavily influence the habitation pattern and damage during a disaster?
a) Social status and climate b) Global trade
c) Stock market d) Export volume

5) What primarily dictates the selection of mitigation and preparation measures in a region?
a) Area and accessibility b) Space data
c) Currency rates d) Export volumes

6) Effective dissemination of information during a crisis relies on ____.
a) Withholding data b) Mass media and DMIS
c) Individual secrets d) Rumors

7) What is the primary purpose of 'feedback' in a disaster information system?
   a) Blaming victims
   b) To improve future information accuracy and flow
   c) Revenue generation
   d) Blocking channels

8) Which technology is reliable when standard networks fail?
   a) HAM Radio
   b) Optical fiber
   c) Home Wi-Fi
   d) Postal mail

9) GIS and Remote Sensing are applied in Disaster Management for _____.
   a) Entertainment
   b) Spatial hazard mapping and tracking
   c) Interior design
   d) Weather control

10) In technical terms, 'Risk' is often mathematically expressed as ____.
   a) Risk = Hazard + Vulnerability
   b) Risk = Hazard × Vulnerability × Exposure
   c) Risk = Disaster / Mitigation
   d) Risk = Capacity − Vulnerability

11) Land-use zoning is a form of _____ mitigation.
   a) Structural
   b) Non-structural
   c) Financial
   d) Immediate

12) A system used to alert people before a hazard strike is _____.
   a) NDMA
   b) EWS
   c) GIS
   d) GPS

13) Which sphere of the Earth is associated with earthquakes?
   a) Hydrosphere
   b) Atmosphere
   c) Lithosphere
   d) Biosphere

14) Biological disasters are mainly caused by _____.
   a) Geological processes
   b) Microorganisms
   c) Mechanical failure
   d) Climate change

SLR-QH-646

Seat No.	

Set S

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Disaster Management and Mitigation (CIVMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Answer Any Four. **20**

a) What are different types of disasters?

b) Write a short note on 'Flood.'

c) Elaborate 'Tsunami' as a natural disaster.

d) Explain the concept of biological disasters. Discuss their causes, modes of transmission, and preventive measures with suitable examples.

e) Discuss the major causes of road accidents in India. Suggest effective engineering, enforcement, and awareness-based measures to reduce road accident risks.

f) Is Pollution a manmade disaster? and explain its sources, effects on human health and environment, and control measures.

g) Describe the Indian Ocean Earthquake (2004) and resulting tsunami. Explain its causes, impacts, and the disaster management measures taken at national and international levels.

Q.3 Answer Any Two. **08**

a) What is Disaster? Explain along with Hazard & Vulnerability.

b) Explain the Disaster Management Cycle in details.

c) Explain 'Earthquake' as a geological disaster.

SECTION – II

Q.4 Answer Any Four. **20**

a) Explain the importance of Early Warning Systems (EWS). Describe the working mechanism of the Tsunami or Cyclone warning system in India.

b) Write a detailed note on Community Based Disaster Management (CBDM). Why is the community considered the first responder?

c) Explain the application of Geographic Information Systems (GIS) and Remote Sensing in Disaster Management (Hazard Zonation mapping).

d) Discuss the role of modern technologies like Drones (UAVs) and Artificial Intelligence (Al) in disaster damage assessment.

e) Write a note on the Sendai Framework for Disaster Risk Reduction (2015-2030). What are its four priorities for action?

f) Discuss the Psycho-social impacts of disasters on victims (PTSD). Why is mental health care crucial during the recovery phase?

g) Differentiate between Relief, Rehabilitation, and Reconstruction phases of disaster recovery.

Q.5 Answer Any Two. **08**

a) Differentiate between Structural and Non-Structural mitigation measures with three examples of each.

b) Explain the concept of the "Golden Hour". Discuss the role of the National Disaster Response Force (NDRF) in search and rescue operations.

c) Discuss the relationship between Climate Change and the increasing frequency of natural disasters. How can sustainable development reduce this risk?

SLR-QH-646

Seat No.	

Set P

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Disaster Management and Mitigation (CIVMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) In technical terms, 'Risk' is often mathematically expressed as ____.
a) Risk = Hazard + Vulnerability
b) Risk = Hazard × Vulnerability × Exposure
c) Risk = Disaster / Mitigation
d) Risk = Capacity − Vulnerability

2) Land-use zoning is a form of _____ mitigation.
a) Structural b) Non-structural
c) Financial d) Immediate

3) A system used to alert people before a hazard strike is _____.
a) NDMA b) EWS
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4) Which sphere of the Earth is associated with earthquakes?
a) Hydrosphere b) Atmosphere
c) Lithosphere d) Biosphere

5) Biological disasters are mainly caused by _____.
a) Geological processes b) Microorganisms
c) Mechanical failure d) Climate change

6) Major cause of road accidents in India is _____.
a) Flood b) Over-speeding
c) Earthquake d) Landslide

7) Mount Vesuvius is located in _____.
a) India b) Italy
c) Japan d) USA

8) Indian Ocean tsunami (2004) was primarily triggered by _____.
a) Cyclone b) Earthquake
c) Fire d) Landslide

9) Which factors heavily influence the habitation pattern and damage during a disaster?
a) Social status and climate b) Global trade
c) Stock market d) Export volume

10) What primarily dictates the selection of mitigation and preparation measures in a region?
a) Area and accessibility b) Space data
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11) Effective dissemination of information during a crisis relies on ____.
a) Withholding data b) Mass media and DMIS
c) Individual secrets d) Rumors

12) What is the primary purpose of 'feedback' in a disaster information system?
a) Blaming victims
b) To improve future information accuracy and flow
c) Revenue generation
d) Blocking channels

13) Which technology is reliable when standard networks fail?
a) HAM Radio b) Optical fiber
c) Home Wi-Fi d) Postal mail

14) GIS and Remote Sensing are applied in Disaster Management for _____.
a) Entertainment
b) Spatial hazard mapping and tracking
c) Interior design
d) Weather control

SLR-QH-646

Seat No.	

Set P

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Disaster Management and Mitigation (CIVMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Answer Any Four. **20**

a) What are different types of disasters?

b) Write a short note on 'Flood.'

c) Elaborate 'Tsunami' as a natural disaster.

d) Explain the concept of biological disasters. Discuss their causes, modes of transmission, and preventive measures with suitable examples.

e) Discuss the major causes of road accidents in India. Suggest effective engineering, enforcement, and awareness-based measures to reduce road accident risks.

f) Is Pollution a manmade disaster? and explain its sources, effects on human health and environment, and control measures.

g) Describe the Indian Ocean Earthquake (2004) and resulting tsunami. Explain its causes, impacts, and the disaster management measures taken at national and international levels.

Q.3 Answer Any Two. **08**

a) What is Disaster? Explain along with Hazard & Vulnerability.

b) Explain the Disaster Management Cycle in details.

c) Explain 'Earthquake' as a geological disaster.

SECTION – II

Q.4 Answer Any Four. **20**

a) Explain the importance of Early Warning Systems (EWS). Describe the working mechanism of the Tsunami or Cyclone warning system in India.

b) Write a detailed note on Community Based Disaster Management (CBDM). Why is the community considered the first responder?

c) Explain the application of Geographic Information Systems (GIS) and Remote Sensing in Disaster Management (Hazard Zonation mapping).

d) Discuss the role of modern technologies like Drones (UAVs) and Artificial Intelligence (Al) in disaster damage assessment.

e) Write a note on the Sendai Framework for Disaster Risk Reduction (2015-2030). What are its four priorities for action?

f) Discuss the Psycho-social impacts of disasters on victims (PTSD). Why is mental health care crucial during the recovery phase?

g) Differentiate between Relief, Rehabilitation, and Reconstruction phases of disaster recovery.

Q.5 Answer Any Two. **08**

a) Differentiate between Structural and Non-Structural mitigation measures with three examples of each.

b) Explain the concept of the "Golden Hour". Discuss the role of the National Disaster Response Force (NDRF) in search and rescue operations.

c) Discuss the relationship between Climate Change and the increasing frequency of natural disasters. How can sustainable development reduce this risk?

SLR-QH-646

Seat No.	

Set Q

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Disaster Management and Mitigation (CIVMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) Indian Ocean tsunami (2004) was primarily triggered by _____.
a) Cyclone b) Earthquake
c) Fire d) Landslide

2) Which factors heavily influence the habitation pattern and damage during a disaster?
a) Social status and climate b) Global trade
c) Stock market d) Export volume

3) What primarily dictates the selection of mitigation and preparation measures in a region?
a) Area and accessibility b) Space data
c) Currency rates d) Export volumes

4) Effective dissemination of information during a crisis relies on ____.
a) Withholding data b) Mass media and DMIS
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5) What is the primary purpose of 'feedback' in a disaster information system?
a) Blaming victims
b) To improve future information accuracy and flow
c) Revenue generation
d) Blocking channels

6) Which technology is reliable when standard networks fail?
a) HAM Radio b) Optical fiber
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7) GIS and Remote Sensing are applied in Disaster Management for _____.
   a) Entertainment
   b) Spatial hazard mapping and tracking
   c) Interior design
   d) Weather control

8) In technical terms, 'Risk' is often mathematically expressed as ____.
   a) Risk = Hazard + Vulnerability
   b) Risk = Hazard × Vulnerability × Exposure
   c) Risk = Disaster / Mitigation
   d) Risk = Capacity − Vulnerability

9) Land-use zoning is a form of _____ mitigation.
   a) Structural
   b) Non-structural
   c) Financial
   d) Immediate

10) A system used to alert people before a hazard strike is _____.
   a) NDMA
   b) EWS
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   d) GPS

11) Which sphere of the Earth is associated with earthquakes?
   a) Hydrosphere
   b) Atmosphere
   c) Lithosphere
   d) Biosphere

12) Biological disasters are mainly caused by _____.
   a) Geological processes
   b) Microorganisms
   c) Mechanical failure
   d) Climate change

13) Major cause of road accidents in India is _____.
   a) Flood
   b) Over-speeding
   c) Earthquake
   d) Landslide

14) Mount Vesuvius is located in _____.
   a) India
   b) Italy
   c) Japan
   d) USA

SLR-QH-646

Seat No.	

Set Q

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Disaster Management and Mitigation (CIVMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Answer Any Four. **20**

a) What are different types of disasters?

b) Write a short note on 'Flood.'

c) Elaborate 'Tsunami' as a natural disaster.

d) Explain the concept of biological disasters. Discuss their causes, modes of transmission, and preventive measures with suitable examples.

e) Discuss the major causes of road accidents in India. Suggest effective engineering, enforcement, and awareness-based measures to reduce road accident risks.

f) Is Pollution a manmade disaster? and explain its sources, effects on human health and environment, and control measures.

g) Describe the Indian Ocean Earthquake (2004) and resulting tsunami. Explain its causes, impacts, and the disaster management measures taken at national and international levels.

Q.3 Answer Any Two. **08**

a) What is Disaster? Explain along with Hazard & Vulnerability.

b) Explain the Disaster Management Cycle in details.

c) Explain 'Earthquake' as a geological disaster.

SECTION – II

Q.4 Answer Any Four. **20**

a) Explain the importance of Early Warning Systems (EWS). Describe the working mechanism of the Tsunami or Cyclone warning system in India.

b) Write a detailed note on Community Based Disaster Management (CBDM). Why is the community considered the first responder?

c) Explain the application of Geographic Information Systems (GIS) and Remote Sensing in Disaster Management (Hazard Zonation mapping).

d) Discuss the role of modern technologies like Drones (UAVs) and Artificial Intelligence (Al) in disaster damage assessment.

e) Write a note on the Sendai Framework for Disaster Risk Reduction (2015-2030). What are its four priorities for action?

f) Discuss the Psycho-social impacts of disasters on victims (PTSD). Why is mental health care crucial during the recovery phase?

g) Differentiate between Relief, Rehabilitation, and Reconstruction phases of disaster recovery.

Q.5 Answer Any Two. **08**

a) Differentiate between Structural and Non-Structural mitigation measures with three examples of each.

b) Explain the concept of the "Golden Hour". Discuss the role of the National Disaster Response Force (NDRF) in search and rescue operations.

c) Discuss the relationship between Climate Change and the increasing frequency of natural disasters. How can sustainable development reduce this risk?

SLR-QH-646

Seat No.	

Set R

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Disaster Management and Mitigation (CIVMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) Effective dissemination of information during a crisis relies on ____.
a) Withholding data b) Mass media and DMIS
c) Individual secrets d) Rumors

2) What is the primary purpose of 'feedback' in a disaster information system?
a) Blaming victims
b) To improve future information accuracy and flow
c) Revenue generation
d) Blocking channels

3) Which technology is reliable when standard networks fail?
a) HAM Radio b) Optical fiber
c) Home Wi-Fi d) Postal mail

4) GIS and Remote Sensing are applied in Disaster Management for _____.
a) Entertainment
b) Spatial hazard mapping and tracking
c) Interior design
d) Weather control

5) In technical terms, 'Risk' is often mathematically expressed as ____.
a) Risk = Hazard + Vulnerability
b) Risk = Hazard × Vulnerability × Exposure
c) Risk = Disaster / Mitigation
d) Risk = Capacity − Vulnerability

6) Land-use zoning is a form of _____ mitigation.
a) Structural b) Non-structural
c) Financial d) Immediate

7) A system used to alert people before a hazard strike is _____.
a) NDMA b) EWS
c) GIS d) GPS

8) Which sphere of the Earth is associated with earthquakes?
a) Hydrosphere b) Atmosphere
c) Lithosphere d) Biosphere

9) Biological disasters are mainly caused by _____.
a) Geological processes b) Microorganisms
c) Mechanical failure d) Climate change

10) Major cause of road accidents in India is _____.
a) Flood b) Over-speeding
c) Earthquake d) Landslide

11) Mount Vesuvius is located in _____.
a) India b) Italy
c) Japan d) USA

12) Indian Ocean tsunami (2004) was primarily triggered by _____.
a) Cyclone b) Earthquake
c) Fire d) Landslide

13) Which factors heavily influence the habitation pattern and damage during a disaster?
a) Social status and climate b) Global trade
c) Stock market d) Export volume

14) What primarily dictates the selection of mitigation and preparation measures in a region?
a) Area and accessibility b) Space data
c) Currency rates d) Export volumes

SLR-QH-646

Seat No.	

Set R

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Disaster Management and Mitigation (CIVMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Answer Any Four. **20**

a) What are different types of disasters?

b) Write a short note on 'Flood.'

c) Elaborate 'Tsunami' as a natural disaster.

d) Explain the concept of biological disasters. Discuss their causes, modes of transmission, and preventive measures with suitable examples.

e) Discuss the major causes of road accidents in India. Suggest effective engineering, enforcement, and awareness-based measures to reduce road accident risks.

f) Is Pollution a manmade disaster? and explain its sources, effects on human health and environment, and control measures.

g) Describe the Indian Ocean Earthquake (2004) and resulting tsunami. Explain its causes, impacts, and the disaster management measures taken at national and international levels.

Q.3 Answer Any Two. **08**

a) What is Disaster? Explain along with Hazard & Vulnerability.

b) Explain the Disaster Management Cycle in details.

c) Explain 'Earthquake' as a geological disaster.

SECTION – II

Q.4 Answer Any Four. **20**

a) Explain the importance of Early Warning Systems (EWS). Describe the working mechanism of the Tsunami or Cyclone warning system in India.

b) Write a detailed note on Community Based Disaster Management (CBDM). Why is the community considered the first responder?

c) Explain the application of Geographic Information Systems (GIS) and Remote Sensing in Disaster Management (Hazard Zonation mapping).

d) Discuss the role of modern technologies like Drones (UAVs) and Artificial Intelligence (Al) in disaster damage assessment.

e) Write a note on the Sendai Framework for Disaster Risk Reduction (2015-2030). What are its four priorities for action?

f) Discuss the Psycho-social impacts of disasters on victims (PTSD). Why is mental health care crucial during the recovery phase?

g) Differentiate between Relief, Rehabilitation, and Reconstruction phases of disaster recovery.

Q.5 Answer Any Two. **08**

a) Differentiate between Structural and Non-Structural mitigation measures with three examples of each.

b) Explain the concept of the "Golden Hour". Discuss the role of the National Disaster Response Force (NDRF) in search and rescue operations.

c) Discuss the relationship between Climate Change and the increasing frequency of natural disasters. How can sustainable development reduce this risk?

Seat No.	

Set **S**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Disaster Management and Mitigation (CIVMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. **14**

1) Major cause of road accidents in India is _____.
a) Flood b) Over-speeding
c) Earthquake d) Landslide

2) Mount Vesuvius is located in _____.
a) India b) Italy
c) Japan d) USA

3) Indian Ocean tsunami (2004) was primarily triggered by _____.
a) Cyclone b) Earthquake
c) Fire d) Landslide

4) Which factors heavily influence the habitation pattern and damage during a disaster?
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13) Which sphere of the Earth is associated with earthquakes?
   a) Hydrosphere
   b) Atmosphere
   c) Lithosphere
   d) Biosphere

14) Biological disasters are mainly caused by _____.
   a) Geological processes
   b) Microorganisms
   c) Mechanical failure
   d) Climate change

SLR-QH-646

Seat No.	

Set S

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Disaster Management and Mitigation (CIVMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Answer Any Four. **20**

a) What are different types of disasters?

b) Write a short note on 'Flood.'

c) Elaborate 'Tsunami' as a natural disaster.

d) Explain the concept of biological disasters. Discuss their causes, modes of transmission, and preventive measures with suitable examples.

e) Discuss the major causes of road accidents in India. Suggest effective engineering, enforcement, and awareness-based measures to reduce road accident risks.

f) Is Pollution a manmade disaster? and explain its sources, effects on human health and environment, and control measures.

g) Describe the Indian Ocean Earthquake (2004) and resulting tsunami. Explain its causes, impacts, and the disaster management measures taken at national and international levels.

Q.3 Answer Any Two. **08**

a) What is Disaster? Explain along with Hazard & Vulnerability.

b) Explain the Disaster Management Cycle in details.

c) Explain 'Earthquake' as a geological disaster.

SECTION – II

Q.4 Answer Any Four. **20**

a) Explain the importance of Early Warning Systems (EWS). Describe the working mechanism of the Tsunami or Cyclone warning system in India.

b) Write a detailed note on Community Based Disaster Management (CBDM). Why is the community considered the first responder?

c) Explain the application of Geographic Information Systems (GIS) and Remote Sensing in Disaster Management (Hazard Zonation mapping).

d) Discuss the role of modern technologies like Drones (UAVs) and Artificial Intelligence (Al) in disaster damage assessment.

e) Write a note on the Sendai Framework for Disaster Risk Reduction (2015-2030). What are its four priorities for action?

f) Discuss the Psycho-social impacts of disasters on victims (PTSD). Why is mental health care crucial during the recovery phase?

g) Differentiate between Relief, Rehabilitation, and Reconstruction phases of disaster recovery.

Q.5 Answer Any Two. **08**

a) Differentiate between Structural and Non-Structural mitigation measures with three examples of each.

b) Explain the concept of the "Golden Hour". Discuss the role of the National Disaster Response Force (NDRF) in search and rescue operations.

c) Discuss the relationship between Climate Change and the increasing frequency of natural disasters. How can sustainable development reduce this risk?

SLR-QH-647

Seat No.	

Set P

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Renewable Energy Resources (MECHMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.
4) Assume suitable data if required & state it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) What is the main environmental benefit of using renewable energy?
a) Increased deforestation
b) Increased air pollution
c) Decreased greenhouse gas emissions
d) Depletion of natural resources

2) Which of the following is not a type of primary resource?
a) Crude Oil b) Coal
c) Sunlight d) Hydrogen Energy

3) Which country is the largest producer of wind energy?
a) India b) United States
c) China d) Germany

4) _____ is produced by blending of vegetable oil.
a) CNG b) Methane gas
c) Biogas d) Biodiesel

5) Availability of Solar energy on the earth surface is _____ MW.
a) 190 billion b) 178 billion
c) 150 billion d) 250 billion

6) In wind turbine gear box is used to _____.
a) Step up the speed b) Reduce the speed
c) shut down d) None of these

7) OTEC stands for _____.
a) Ocean thermal energy conversion
b) Ocean thermal energy Component
c) Ocean thermal energy contact
d) Ocean thermodynamic energy conversion

8) What is the primary need for designing a battery pack in electric vehicles?
a) To reduce weight
b) To increase the speed
c) To store and manage electrical energy safely and efficiently
d) To reduce emissions

9) Which of the following instruments is used to measure global solar radiation?
a) Pyrheliometer
b) Pyranometer
c) Pyrometer
d) Sunshine Recorder

10) What is the primary cause of wind formation?
a) Earth's rotation
b) Uneven heating of the Earth's surface by the sun
c) Gravitational pull of the moon
d) Ocean currents

11) Which energy storage method is best suited for stabilizing short-term fluctuations in power supply?
a) Pumped hydroelectric storage
b) Flywheel energy storage
c) Biomass storage
d) Compressed air storage

12) Which turbine is best suited for high-head hydroelectric plants?
a) Kaplan turbine
b) Francis turbine
c) Pelton wheel turbine
d) Cross-flow turbine

13) What is the efficiency range of tidal power plants?
a) 20-30%
b) 35-45%
c) 70-80%
d) 85-90%

14) Which component of a fuel cell allows only specific ions to pass through?
a) Electrolyte
b) Anode
c) Cathode
d) Separator

SLR-QH-647

Seat No.	

Set P

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Renewable Energy Resources (MECHMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Solve any two questions from each Section.
2) Use of nonprogrammable calculators is allowed.
3) Figures to the right indicate full marks.
4) Assume additional suitable data if necessary and state it clearly.

SECTION – I

Q.2 Attempt the following.

a) What are the renewable energy sources? Write its advantages and obstacles to implement these sources. **05**

b) Explain construction and working of Horizontal axis wind mill. **05**

c) How renewable energy is different from Conventional one? Discus Indian and global energy scenario. **04**

Q.3 Attempt the following.

a) Explain Construction and Working of Flat Plate Collector. **05**

b) Explain the construction and working of Solar distillation (Solar Still) with the help of neat sketch. **05**

c) Explain in brief Biomass Gasification. **04**

Q.4 Attempt the following.

a) Explain the working of Pyrometer with the help of neat sketch. **05**

b) Describe with neat sketch working of wind energy system with main components. **05**

c) Write a short note on: **04**
i) Internet of Energy
ii) Photosynthesis process

SECTION – II

Q.5 Attempt the following.

a) Explain with neat sketch working of pumped hydroelectric storage system. **05**

b) Explain working of lead acid battery. **05**

c) Discuss the need of energy storage devices. **04**

Q.6 Attempt the following.

a) Describe with a schematic diagram medium head hydro power plant. **05**

b) Explain compressed air energy storage with neat sketch and describe its working principle. **05**

c) Explain the factors to be considered for the selection of site for a hydroelectric power plant. **04**

Q.7 Attempt the following.

a) Describe construction & working of single basin Tidal Power plant. **05**

b) Describe construction & working of close cycle Ocean Thermal power plant. **05**

c) Write a short note on: **04**

i) Tidal barrage power system

ii) Flywheel energy storage

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Renewable Energy Resources (MECHMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.
4) Assume suitable data if required & state it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. **14**

1) What is the primary need for designing a battery pack in electric vehicles?
a) To reduce weight
b) To increase the speed
c) To store and manage electrical energy safely and efficiently
d) To reduce emissions

2) Which of the following instruments is used to measure global solar radiation?
a) Pyrheliometer b) Pyranometer
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3) What is the primary cause of wind formation?
a) Earth's rotation
b) Uneven heating of the Earth's surface by the sun
c) Gravitational pull of the moon
d) Ocean currents

4) Which energy storage method is best suited for stabilizing short-term fluctuations in power supply?
a) Pumped hydroelectric storage b) Flywheel energy storage
c) Biomass storage d) Compressed air storage

5) Which turbine is best suited for high-head hydroelectric plants?
a) Kaplan turbine b) Francis turbine
c) Pelton wheel turbine d) Cross-flow turbine

6) What is the efficiency range of tidal power plants?
a) 20-30% b) 35-45%
c) 70-80% d) 85-90%

7) Which component of a fuel cell allows only specific ions to pass through?
a) Electrolyte b) Anode
c) Cathode d) Separator

8) What is the main environmental benefit of using renewable energy?
a) Increased deforestation
b) Increased air pollution
c) Decreased greenhouse gas emissions
d) Depletion of natural resources

9) Which of the following is not a type of primary resource?
a) Crude Oil b) Coal
c) Sunlight d) Hydrogen Energy

10) Which country is the largest producer of wind energy?
a) India b) United States
c) China d) Germany

11) _____ is produced by blending of vegetable oil.
a) CNG b) Methane gas
c) Biogas d) Biodiesel

12) Availability of Solar energy on the earth surface is _____ MW.
a) 190 billion b) 178 billion
c) 150 billion d) 250 billion

13) In wind turbine gear box is used to _____.
a) Step up the speed b) Reduce the speed
c) shut down d) None of these

14) OTEC stands for _____.
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b) Ocean thermal energy Component
c) Ocean thermal energy contact
d) Ocean thermodynamic energy conversion

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Renewable Energy Resources (MECHMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Solve any two questions from each Section.
2) Use of nonprogrammable calculators is allowed.
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4) Assume additional suitable data if necessary and state it clearly.

SECTION – I

Q.2 Attempt the following.

a) What are the renewable energy sources? Write its advantages and obstacles to implement these sources. **05**

b) Explain construction and working of Horizontal axis wind mill. **05**

c) How renewable energy is different from Conventional one? Discus Indian and global energy scenario. **04**

Q.3 Attempt the following.

a) Explain Construction and Working of Flat Plate Collector. **05**

b) Explain the construction and working of Solar distillation (Solar Still) with the help of neat sketch. **05**

c) Explain in brief Biomass Gasification. **04**

Q.4 Attempt the following.

a) Explain the working of Pyrometer with the help of neat sketch. **05**

b) Describe with neat sketch working of wind energy system with main components. **05**

c) Write a short note on: **04**
i) Internet of Energy
ii) Photosynthesis process

SECTION – II

Q.5 Attempt the following.

a) Explain with neat sketch working of pumped hydroelectric storage system. **05**

b) Explain working of lead acid battery. **05**

c) Discuss the need of energy storage devices. **04**

Q.6 Attempt the following.

a) Describe with a schematic diagram medium head hydro power plant. **05**

b) Explain compressed air energy storage with neat sketch and describe its working principle. **05**

c) Explain the factors to be considered for the selection of site for a hydroelectric power plant. **04**

Q.7 Attempt the following.

a) Describe construction & working of single basin Tidal Power plant. **05**

b) Describe construction & working of close cycle Ocean Thermal power plant. **05**

c) Write a short note on: **04**

i) Tidal barrage power system

ii) Flywheel energy storage

Seat No.	

Set **R**

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Renewable Energy Resources (MECHMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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3) Figures to the right indicate full marks.
4) Assume suitable data if required & state it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) Which energy storage method is best suited for stabilizing short-term fluctuations in power supply?
a) Pumped hydroelectric storage b) Flywheel energy storage
c) Biomass storage d) Compressed air storage

2) Which turbine is best suited for high-head hydroelectric plants?
a) Kaplan turbine b) Francis turbine
c) Pelton wheel turbine d) Cross-flow turbine

3) What is the efficiency range of tidal power plants?
a) 20-30% b) 35-45%
c) 70-80% d) 85-90%

4) Which component of a fuel cell allows only specific ions to pass through?
a) Electrolyte b) Anode
c) Cathode d) Separator

5) What is the main environmental benefit of using renewable energy?
a) Increased deforestation
b) Increased air pollution
c) Decreased greenhouse gas emissions
d) Depletion of natural resources

6) Which of the following is not a type of primary resource?
a) Crude Oil b) Coal
c) Sunlight d) Hydrogen Energy

7) Which country is the largest producer of wind energy?
a) India b) United States
c) China d) Germany

8) _____ is produced by blending of vegetable oil.
a) CNG b) Methane gas
c) Biogas d) Biodiesel

9) Availability of Solar energy on the earth surface is _____ MW.
a) 190 billion b) 178 billion
c) 150 billion d) 250 billion

10) In wind turbine gear box is used to _____.
a) Step up the speed b) Reduce the speed
c) shut down d) None of these

11) OTEC stands for _____.
a) Ocean thermal energy conversion
b) Ocean thermal energy Component
c) Ocean thermal energy contact
d) Ocean thermodynamic energy conversion

12) What is the primary need for designing a battery pack in electric vehicles?
a) To reduce weight
b) To increase the speed
c) To store and manage electrical energy safely and efficiently
d) To reduce emissions

13) Which of the following instruments is used to measure global solar radiation?
a) Pyrheliometer b) Pyranometer
c) Pyrometer d) Sunshine Recorder

14) What is the primary cause of wind formation?
a) Earth's rotation
b) Uneven heating of the Earth's surface by the sun
c) Gravitational pull of the moon
d) Ocean currents

Seat No.	

Set **R**

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Renewable Energy Resources (MECHMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Solve any two questions from each Section.
2) Use of nonprogrammable calculators is allowed.
3) Figures to the right indicate full marks.
4) Assume additional suitable data if necessary and state it clearly.

SECTION – I

Q.2 Attempt the following.

a) What are the renewable energy sources? Write its advantages and obstacles to implement these sources. **05**

b) Explain construction and working of Horizontal axis wind mill. **05**

c) How renewable energy is different from Conventional one? Discus Indian and global energy scenario. **04**

Q.3 Attempt the following.

a) Explain Construction and Working of Flat Plate Collector. **05**

b) Explain the construction and working of Solar distillation (Solar Still) with the help of neat sketch. **05**

c) Explain in brief Biomass Gasification. **04**

Q.4 Attempt the following.

a) Explain the working of Pyrometer with the help of neat sketch. **05**

b) Describe with neat sketch working of wind energy system with main components. **05**

c) Write a short note on: **04**
i) Internet of Energy
ii) Photosynthesis process

SECTION – II

Q.5 Attempt the following.

a) Explain with neat sketch working of pumped hydroelectric storage system. **05**

b) Explain working of lead acid battery. **05**

c) Discuss the need of energy storage devices. **04**

Q.6 Attempt the following.

a) Describe with a schematic diagram medium head hydro power plant. **05**

b) Explain compressed air energy storage with neat sketch and describe its working principle. **05**

c) Explain the factors to be considered for the selection of site for a hydroelectric power plant. **04**

Q.7 Attempt the following.

a) Describe construction & working of single basin Tidal Power plant. **05**

b) Describe construction & working of close cycle Ocean Thermal power plant. **05**

c) Write a short note on: **04**

i) Tidal barrage power system

ii) Flywheel energy storage

SLR-QH-647

Seat No.		Set	S

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Renewable Energy Resources (MECHMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.
4) Assume suitable data if required & state it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. **14**

1) In wind turbine gear box is used to _____.
a) Step up the speed b) Reduce the speed
c) shut down d) None of these

2) OTEC stands for _____.
a) Ocean thermal energy conversion
b) Ocean thermal energy Component
c) Ocean thermal energy contact
d) Ocean thermodynamic energy conversion

3) What is the primary need for designing a battery pack in electric vehicles?
a) To reduce weight
b) To increase the speed
c) To store and manage electrical energy safely and efficiently
d) To reduce emissions

4) Which of the following instruments is used to measure global solar radiation?
a) Pyrheliometer b) Pyranometer
c) Pyrometer d) Sunshine Recorder

5) What is the primary cause of wind formation?
a) Earth's rotation
b) Uneven heating of the Earth's surface by the sun
c) Gravitational pull of the moon
d) Ocean currents

6) Which energy storage method is best suited for stabilizing short-term fluctuations in power supply?
a) Pumped hydroelectric storage b) Flywheel energy storage
c) Biomass storage d) Compressed air storage

7) Which turbine is best suited for high-head hydroelectric plants?
a) Kaplan turbine b) Francis turbine
c) Pelton wheel turbine d) Cross-flow turbine

8) What is the efficiency range of tidal power plants?
a) 20-30% b) 35-45%
c) 70-80% d) 85-90%

9) Which component of a fuel cell allows only specific ions to pass through?
a) Electrolyte b) Anode
c) Cathode d) Separator

10) What is the main environmental benefit of using renewable energy?
a) Increased deforestation
b) Increased air pollution
c) Decreased greenhouse gas emissions
d) Depletion of natural resources

11) Which of the following is not a type of primary resource?
a) Crude Oil b) Coal
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12) Which country is the largest producer of wind energy?
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13) _____ is produced by blending of vegetable oil.
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14) Availability of Solar energy on the earth surface is _____ MW.
a) 190 billion b) 178 billion
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SLR-QH-647

Seat No.	

Set S

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Renewable Energy Resources (MECHMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Solve any two questions from each Section.
2) Use of nonprogrammable calculators is allowed.
3) Figures to the right indicate full marks.
4) Assume additional suitable data if necessary and state it clearly.

SECTION – I

Q.2 Attempt the following.

a) What are the renewable energy sources? Write its advantages and obstacles to implement these sources. **05**

b) Explain construction and working of Horizontal axis wind mill. **05**

c) How renewable energy is different from Conventional one? Discus Indian and global energy scenario. **04**

Q.3 Attempt the following.

a) Explain Construction and Working of Flat Plate Collector. **05**

b) Explain the construction and working of Solar distillation (Solar Still) with the help of neat sketch. **05**

c) Explain in brief Biomass Gasification. **04**

Q.4 Attempt the following.

a) Explain the working of Pyrometer with the help of neat sketch. **05**

b) Describe with neat sketch working of wind energy system with main components. **05**

c) Write a short note on: **04**
i) Internet of Energy
ii) Photosynthesis process

SECTION – II

Q.5 Attempt the following.

a) Explain with neat sketch working of pumped hydroelectric storage system. **05**

b) Explain working of lead acid battery. **05**

c) Discuss the need of energy storage devices. **04**

Q.6 Attempt the following.

a) Describe with a schematic diagram medium head hydro power plant. **05**

b) Explain compressed air energy storage with neat sketch and describe its working principle. **05**

c) Explain the factors to be considered for the selection of site for a hydroelectric power plant. **04**

Q.7 Attempt the following.

a) Describe construction & working of single basin Tidal Power plant. **05**

b) Describe construction & working of close cycle Ocean Thermal power plant. **05**

c) Write a short note on: **04**

i) Tidal barrage power system

ii) Flywheel energy storage

SLR-QH-647

Seat No.	

Set P

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Renewable Energy Resources (MECHMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) What is the main environmental benefit of using renewable energy?
a) Increased deforestation
b) Increased air pollution
c) Decreased greenhouse gas emissions
d) Depletion of natural resources

2) Which of the following is not a type of primary resource?
a) Crude Oil b) Coal
c) Sunlight d) Hydrogen Energy

3) Which country is the largest producer of wind energy?
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4) _____ is produced by blending of vegetable oil.
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8) What is the primary need for designing a battery pack in electric vehicles?
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10) What is the primary cause of wind formation?
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13) What is the efficiency range of tidal power plants?
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Seat No.	

Set **P**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Renewable Energy Resources (MECHMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
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Instructions: 1) Solve any two questions from each Section.
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SECTION – I

Q.2 Attempt the following.

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b) Explain construction and working of Horizontal axis wind mill. **05**

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b) Describe with neat sketch working of wind energy system with main components. **05**

c) Write a short note on: **04**
i) Internet of Energy
ii) Photosynthesis process

SECTION – II

Q.5 Attempt the following.

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Seat No.	

Set **Q**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Renewable Energy Resources (MECHMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

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MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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c) Ocean thermal energy contact
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Seat No.	

Set **Q**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Renewable Energy Resources (MECHMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Solve any two questions from each Section.
2) Use of nonprogrammable calculators is allowed.
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SECTION – I

Q.2 Attempt the following.

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c) How renewable energy is different from Conventional one? Discus Indian and global energy scenario. **04**

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c) Explain in brief Biomass Gasification. **04**

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a) Explain the working of Pyrometer with the help of neat sketch. **05**

b) Describe with neat sketch working of wind energy system with main components. **05**

c) Write a short note on: **04**
i) Internet of Energy
ii) Photosynthesis process

SECTION – II

Q.5 Attempt the following.

a) Explain with neat sketch working of pumped hydroelectric storage system. **05**

b) Explain working of lead acid battery. **05**

c) Discuss the need of energy storage devices. **04**

Q.6 Attempt the following.

a) Describe with a schematic diagram medium head hydro power plant. **05**

b) Explain compressed air energy storage with neat sketch and describe its working principle. **05**

c) Explain the factors to be considered for the selection of site for a hydroelectric power plant. **04**

Q.7 Attempt the following.

a) Describe construction & working of single basin Tidal Power plant. **05**

b) Describe construction & working of close cycle Ocean Thermal power plant. **05**

c) Write a short note on: **04**

i) Tidal barrage power system

ii) Flywheel energy storage

Seat No.	

Set **R**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Renewable Energy Resources (MECHMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.
4) Assume suitable data if required & state it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) Which energy storage method is best suited for stabilizing short-term fluctuations in power supply?
a) Pumped hydroelectric storage b) Flywheel energy storage
c) Biomass storage d) Compressed air storage

2) Which turbine is best suited for high-head hydroelectric plants?
a) Kaplan turbine b) Francis turbine
c) Pelton wheel turbine d) Cross-flow turbine

3) What is the efficiency range of tidal power plants?
a) 20-30% b) 35-45%
c) 70-80% d) 85-90%

4) Which component of a fuel cell allows only specific ions to pass through?
a) Electrolyte b) Anode
c) Cathode d) Separator

5) What is the main environmental benefit of using renewable energy?
a) Increased deforestation
b) Increased air pollution
c) Decreased greenhouse gas emissions
d) Depletion of natural resources

6) Which of the following is not a type of primary resource?
a) Crude Oil b) Coal
c) Sunlight d) Hydrogen Energy

7) Which country is the largest producer of wind energy?
a) India b) United States
c) China d) Germany

8) _____ is produced by blending of vegetable oil.
a) CNG b) Methane gas
c) Biogas d) Biodiesel

9) Availability of Solar energy on the earth surface is _____ MW.
a) 190 billion b) 178 billion
c) 150 billion d) 250 billion

10) In wind turbine gear box is used to _____.
a) Step up the speed b) Reduce the speed
c) shut down d) None of these

11) OTEC stands for _____.
a) Ocean thermal energy conversion
b) Ocean thermal energy Component
c) Ocean thermal energy contact
d) Ocean thermodynamic energy conversion

12) What is the primary need for designing a battery pack in electric vehicles?
a) To reduce weight
b) To increase the speed
c) To store and manage electrical energy safely and efficiently
d) To reduce emissions

13) Which of the following instruments is used to measure global solar radiation?
a) Pyrheliometer b) Pyranometer
c) Pyrometer d) Sunshine Recorder

14) What is the primary cause of wind formation?
a) Earth's rotation
b) Uneven heating of the Earth's surface by the sun
c) Gravitational pull of the moon
d) Ocean currents

Seat No.	

Set **R**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Renewable Energy Resources (MECHMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Solve any two questions from each Section.
2) Use of nonprogrammable calculators is allowed.
3) Figures to the right indicate full marks.
4) Assume additional suitable data if necessary and state it clearly.

SECTION – I

Q.2 Attempt the following.

a) What are the renewable energy sources? Write its advantages and obstacles to implement these sources. **05**

b) Explain construction and working of Horizontal axis wind mill. **05**

c) How renewable energy is different from Conventional one? Discus Indian and global energy scenario. **04**

Q.3 Attempt the following.

a) Explain Construction and Working of Flat Plate Collector. **05**

b) Explain the construction and working of Solar distillation (Solar Still) with the help of neat sketch. **05**

c) Explain in brief Biomass Gasification. **04**

Q.4 Attempt the following.

a) Explain the working of Pyrometer with the help of neat sketch. **05**

b) Describe with neat sketch working of wind energy system with main components. **05**

c) Write a short note on: **04**
i) Internet of Energy
ii) Photosynthesis process

SECTION – II

Q.5 Attempt the following.

a) Explain with neat sketch working of pumped hydroelectric storage system. **05**

b) Explain working of lead acid battery. **05**

c) Discuss the need of energy storage devices. **04**

Q.6 Attempt the following.

a) Describe with a schematic diagram medium head hydro power plant. **05**

b) Explain compressed air energy storage with neat sketch and describe its working principle. **05**

c) Explain the factors to be considered for the selection of site for a hydroelectric power plant. **04**

Q.7 Attempt the following.

a) Describe construction & working of single basin Tidal Power plant. **05**

b) Describe construction & working of close cycle Ocean Thermal power plant. **05**

c) Write a short note on: **04**

i) Tidal barrage power system

ii) Flywheel energy storage

Seat No.	

Set **S**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Renewable Energy Resources (MECHMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.
4) Assume suitable data if required & state it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. **14**

1) In wind turbine gear box is used to _____.
a) Step up the speed
b) Reduce the speed
c) shut down
d) None of these

2) OTEC stands for _____.
a) Ocean thermal energy conversion
b) Ocean thermal energy Component
c) Ocean thermal energy contact
d) Ocean thermodynamic energy conversion

3) What is the primary need for designing a battery pack in electric vehicles?
a) To reduce weight
b) To increase the speed
c) To store and manage electrical energy safely and efficiently
d) To reduce emissions

4) Which of the following instruments is used to measure global solar radiation?
a) Pyrheliometer
b) Pyranometer
c) Pyrometer
d) Sunshine Recorder

5) What is the primary cause of wind formation?
a) Earth's rotation
b) Uneven heating of the Earth's surface by the sun
c) Gravitational pull of the moon
d) Ocean currents

6) Which energy storage method is best suited for stabilizing short-term fluctuations in power supply?
a) Pumped hydroelectric storage b) Flywheel energy storage
c) Biomass storage d) Compressed air storage

7) Which turbine is best suited for high-head hydroelectric plants?
a) Kaplan turbine b) Francis turbine
c) Pelton wheel turbine d) Cross-flow turbine

8) What is the efficiency range of tidal power plants?
a) 20-30% b) 35-45%
c) 70-80% d) 85-90%

9) Which component of a fuel cell allows only specific ions to pass through?
a) Electrolyte b) Anode
c) Cathode d) Separator

10) What is the main environmental benefit of using renewable energy?
a) Increased deforestation
b) Increased air pollution
c) Decreased greenhouse gas emissions
d) Depletion of natural resources

11) Which of the following is not a type of primary resource?
a) Crude Oil b) Coal
c) Sunlight d) Hydrogen Energy

12) Which country is the largest producer of wind energy?
a) India b) United States
c) China d) Germany

13) _____ is produced by blending of vegetable oil.
a) CNG b) Methane gas
c) Biogas d) Biodiesel

14) Availability of Solar energy on the earth surface is _____ MW.
a) 190 billion b) 178 billion
c) 150 billion d) 250 billion

SLR-QH-647

Seat No.	

Set S

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Renewable Energy Resources (MECHMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Solve any two questions from each Section.
2) Use of nonprogrammable calculators is allowed.
3) Figures to the right indicate full marks.
4) Assume additional suitable data if necessary and state it clearly.

SECTION – I

Q.2 Attempt the following.

a) What are the renewable energy sources? Write its advantages and obstacles to implement these sources. **05**

b) Explain construction and working of Horizontal axis wind mill. **05**

c) How renewable energy is different from Conventional one? Discus Indian and global energy scenario. **04**

Q.3 Attempt the following.

a) Explain Construction and Working of Flat Plate Collector. **05**

b) Explain the construction and working of Solar distillation (Solar Still) with the help of neat sketch. **05**

c) Explain in brief Biomass Gasification. **04**

Q.4 Attempt the following.

a) Explain the working of Pyrometer with the help of neat sketch. **05**

b) Describe with neat sketch working of wind energy system with main components. **05**

c) Write a short note on: **04**
i) Internet of Energy
ii) Photosynthesis process

SECTION – II

Q.5 Attempt the following.

a) Explain with neat sketch working of pumped hydroelectric storage system. **05**

b) Explain working of lead acid battery. **05**

c) Discuss the need of energy storage devices. **04**

Q.6 Attempt the following.

a) Describe with a schematic diagram medium head hydro power plant. **05**

b) Explain compressed air energy storage with neat sketch and describe its working principle. **05**

c) Explain the factors to be considered for the selection of site for a hydroelectric power plant. **04**

Q.7 Attempt the following.

a) Describe construction & working of single basin Tidal Power plant. **05**

b) Describe construction & working of close cycle Ocean Thermal power plant. **05**

c) Write a short note on: **04**

i) Tidal barrage power system

ii) Flywheel energy storage

SLR-QH-647

Seat No.	

Set P

T.Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Renewable Energy Resources (MECHMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.
4) Assume suitable data if required & state it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) What is the main environmental benefit of using renewable energy?
a) Increased deforestation
b) Increased air pollution
c) Decreased greenhouse gas emissions
d) Depletion of natural resources

2) Which of the following is not a type of primary resource?
a) Crude Oil b) Coal
c) Sunlight d) Hydrogen Energy

3) Which country is the largest producer of wind energy?
a) India b) United States
c) China d) Germany

4) _____ is produced by blending of vegetable oil.
a) CNG b) Methane gas
c) Biogas d) Biodiesel

5) Availability of Solar energy on the earth surface is _____ MW.
a) 190 billion b) 178 billion
c) 150 billion d) 250 billion

6) In wind turbine gear box is used to _____.
a) Step up the speed b) Reduce the speed
c) shut down d) None of these

7) OTEC stands for _____.
a) Ocean thermal energy conversion
b) Ocean thermal energy Component
c) Ocean thermal energy contact
d) Ocean thermodynamic energy conversion

8) What is the primary need for designing a battery pack in electric vehicles?
a) To reduce weight
b) To increase the speed
c) To store and manage electrical energy safely and efficiently
d) To reduce emissions

9) Which of the following instruments is used to measure global solar radiation?
a) Pyrheliometer
b) Pyranometer
c) Pyrometer
d) Sunshine Recorder

10) What is the primary cause of wind formation?
a) Earth's rotation
b) Uneven heating of the Earth's surface by the sun
c) Gravitational pull of the moon
d) Ocean currents

11) Which energy storage method is best suited for stabilizing short-term fluctuations in power supply?
a) Pumped hydroelectric storage
b) Flywheel energy storage
c) Biomass storage
d) Compressed air storage

12) Which turbine is best suited for high-head hydroelectric plants?
a) Kaplan turbine
b) Francis turbine
c) Pelton wheel turbine
d) Cross-flow turbine

13) What is the efficiency range of tidal power plants?
a) 20-30%
b) 35-45%
c) 70-80%
d) 85-90%

14) Which component of a fuel cell allows only specific ions to pass through?
a) Electrolyte
b) Anode
c) Cathode
d) Separator

Seat No.	

Set **P**

T.Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Renewable Energy Resources (MECHMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Solve any two questions from each Section.
2) Use of nonprogrammable calculators is allowed.
3) Figures to the right indicate full marks.
4) Assume additional suitable data if necessary and state it clearly.

SECTION – I

Q.2 Attempt the following.

a) What are the renewable energy sources? Write its advantages and obstacles to implement these sources. **05**

b) Explain construction and working of Horizontal axis wind mill. **05**

c) How renewable energy is different from Conventional one? Discus Indian and global energy scenario. **04**

Q.3 Attempt the following.

a) Explain Construction and Working of Flat Plate Collector. **05**

b) Explain the construction and working of Solar distillation (Solar Still) with the help of neat sketch. **05**

c) Explain in brief Biomass Gasification. **04**

Q.4 Attempt the following.

a) Explain the working of Pyrometer with the help of neat sketch. **05**

b) Describe with neat sketch working of wind energy system with main components. **05**

c) Write a short note on: **04**
i) Internet of Energy
ii) Photosynthesis process

SECTION – II

Q.5 Attempt the following.

a) Explain with neat sketch working of pumped hydroelectric storage system. **05**

b) Explain working of lead acid battery. **05**

c) Discuss the need of energy storage devices. **04**

Q.6 Attempt the following.

a) Describe with a schematic diagram medium head hydro power plant. **05**

b) Explain compressed air energy storage with neat sketch and describe its working principle. **05**

c) Explain the factors to be considered for the selection of site for a hydroelectric power plant. **04**

Q.7 Attempt the following.

a) Describe construction & working of single basin Tidal Power plant. **05**

b) Describe construction & working of close cycle Ocean Thermal power plant. **05**

c) Write a short note on: **04**

i) Tidal barrage power system

ii) Flywheel energy storage

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Renewable Energy Resources (MECHMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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4) Assume suitable data if required & state it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. **14**

1) What is the primary need for designing a battery pack in electric vehicles?
a) To reduce weight
b) To increase the speed
c) To store and manage electrical energy safely and efficiently
d) To reduce emissions

2) Which of the following instruments is used to measure global solar radiation?
a) Pyrheliometer b) Pyranometer
c) Pyrometer d) Sunshine Recorder

3) What is the primary cause of wind formation?
a) Earth's rotation
b) Uneven heating of the Earth's surface by the sun
c) Gravitational pull of the moon
d) Ocean currents

4) Which energy storage method is best suited for stabilizing short-term fluctuations in power supply?
a) Pumped hydroelectric storage b) Flywheel energy storage
c) Biomass storage d) Compressed air storage

5) Which turbine is best suited for high-head hydroelectric plants?
a) Kaplan turbine b) Francis turbine
c) Pelton wheel turbine d) Cross-flow turbine

6) What is the efficiency range of tidal power plants?
a) 20-30% b) 35-45%
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c) Cathode d) Separator

8) What is the main environmental benefit of using renewable energy?
a) Increased deforestation
b) Increased air pollution
c) Decreased greenhouse gas emissions
d) Depletion of natural resources

9) Which of the following is not a type of primary resource?
a) Crude Oil b) Coal
c) Sunlight d) Hydrogen Energy

10) Which country is the largest producer of wind energy?
a) India b) United States
c) China d) Germany

11) _____ is produced by blending of vegetable oil.
a) CNG b) Methane gas
c) Biogas d) Biodiesel

12) Availability of Solar energy on the earth surface is _____ MW.
a) 190 billion b) 178 billion
c) 150 billion d) 250 billion

13) In wind turbine gear box is used to _____.
a) Step up the speed b) Reduce the speed
c) shut down d) None of these

14) OTEC stands for _____.
a) Ocean thermal energy conversion
b) Ocean thermal energy Component
c) Ocean thermal energy contact
d) Ocean thermodynamic energy conversion

SLR-QH-647

Seat No.	

Set Q

T.Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Renewable Energy Resources (MECHMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Solve any two questions from each Section.
2) Use of nonprogrammable calculators is allowed.
3) Figures to the right indicate full marks.
4) Assume additional suitable data if necessary and state it clearly.

SECTION – I

Q.2 Attempt the following.

a) What are the renewable energy sources? Write its advantages and obstacles to implement these sources. **05**

b) Explain construction and working of Horizontal axis wind mill. **05**

c) How renewable energy is different from Conventional one? Discus Indian and global energy scenario. **04**

Q.3 Attempt the following.

a) Explain Construction and Working of Flat Plate Collector. **05**

b) Explain the construction and working of Solar distillation (Solar Still) with the help of neat sketch. **05**

c) Explain in brief Biomass Gasification. **04**

Q.4 Attempt the following.

a) Explain the working of Pyrometer with the help of neat sketch. **05**

b) Describe with neat sketch working of wind energy system with main components. **05**

c) Write a short note on: **04**
i) Internet of Energy
ii) Photosynthesis process

SECTION – II

Q.5 Attempt the following.

a) Explain with neat sketch working of pumped hydroelectric storage system. **05**

b) Explain working of lead acid battery. **05**

c) Discuss the need of energy storage devices. **04**

Q.6 Attempt the following.

a) Describe with a schematic diagram medium head hydro power plant. **05**

b) Explain compressed air energy storage with neat sketch and describe its working principle. **05**

c) Explain the factors to be considered for the selection of site for a hydroelectric power plant. **04**

Q.7 Attempt the following.

a) Describe construction & working of single basin Tidal Power plant. **05**

b) Describe construction & working of close cycle Ocean Thermal power plant. **05**

c) Write a short note on: **04**

i) Tidal barrage power system

ii) Flywheel energy storage

Seat No.	

Set **R**

T.Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Renewable Energy Resources (MECHMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.
4) Assume suitable data if required & state it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) Which energy storage method is best suited for stabilizing short-term fluctuations in power supply?
a) Pumped hydroelectric storage b) Flywheel energy storage
c) Biomass storage d) Compressed air storage

2) Which turbine is best suited for high-head hydroelectric plants?
a) Kaplan turbine b) Francis turbine
c) Pelton wheel turbine d) Cross-flow turbine

3) What is the efficiency range of tidal power plants?
a) 20-30% b) 35-45%
c) 70-80% d) 85-90%

4) Which component of a fuel cell allows only specific ions to pass through?
a) Electrolyte b) Anode
c) Cathode d) Separator

5) What is the main environmental benefit of using renewable energy?
a) Increased deforestation
b) Increased air pollution
c) Decreased greenhouse gas emissions
d) Depletion of natural resources

6) Which of the following is not a type of primary resource?
a) Crude Oil b) Coal
c) Sunlight d) Hydrogen Energy

7) Which country is the largest producer of wind energy?
a) India b) United States
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8) _____ is produced by blending of vegetable oil.
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9) Availability of Solar energy on the earth surface is _____ MW.
a) 190 billion b) 178 billion
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10) In wind turbine gear box is used to _____.
a) Step up the speed b) Reduce the speed
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11) OTEC stands for _____.
a) Ocean thermal energy conversion
b) Ocean thermal energy Component
c) Ocean thermal energy contact
d) Ocean thermodynamic energy conversion

12) What is the primary need for designing a battery pack in electric vehicles?
a) To reduce weight
b) To increase the speed
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13) Which of the following instruments is used to measure global solar radiation?
a) Pyrheliometer b) Pyranometer
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14) What is the primary cause of wind formation?
a) Earth's rotation
b) Uneven heating of the Earth's surface by the sun
c) Gravitational pull of the moon
d) Ocean currents

Seat No.	

Set **R**

T.Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Renewable Energy Resources (MECHMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Solve any two questions from each Section.
2) Use of nonprogrammable calculators is allowed.
3) Figures to the right indicate full marks.
4) Assume additional suitable data if necessary and state it clearly.

SECTION – I

Q.2 Attempt the following.

a) What are the renewable energy sources? Write its advantages and obstacles to implement these sources. **05**

b) Explain construction and working of Horizontal axis wind mill. **05**

c) How renewable energy is different from Conventional one? Discus Indian and global energy scenario. **04**

Q.3 Attempt the following.

a) Explain Construction and Working of Flat Plate Collector. **05**

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a) Explain the working of Pyrometer with the help of neat sketch. **05**

b) Describe with neat sketch working of wind energy system with main components. **05**

c) Write a short note on: **04**
i) Internet of Energy
ii) Photosynthesis process

SECTION – II

Q.5 Attempt the following.

a) Explain with neat sketch working of pumped hydroelectric storage system. **05**

b) Explain working of lead acid battery. **05**

c) Discuss the need of energy storage devices. **04**

Q.6 Attempt the following.

a) Describe with a schematic diagram medium head hydro power plant. **05**

b) Explain compressed air energy storage with neat sketch and describe its working principle. **05**

c) Explain the factors to be considered for the selection of site for a hydroelectric power plant. **04**

Q.7 Attempt the following.

a) Describe construction & working of single basin Tidal Power plant. **05**

b) Describe construction & working of close cycle Ocean Thermal power plant. **05**

c) Write a short note on: **04**

i) Tidal barrage power system

ii) Flywheel energy storage

Seat No.	

Set **S**

T.Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Renewable Energy Resources (MECHMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.
4) Assume suitable data if required & state it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. **14**

1) In wind turbine gear box is used to _____.
a) Step up the speed
b) Reduce the speed
c) shut down
d) None of these

2) OTEC stands for _____.
a) Ocean thermal energy conversion
b) Ocean thermal energy Component
c) Ocean thermal energy contact
d) Ocean thermodynamic energy conversion

3) What is the primary need for designing a battery pack in electric vehicles?
a) To reduce weight
b) To increase the speed
c) To store and manage electrical energy safely and efficiently
d) To reduce emissions

4) Which of the following instruments is used to measure global solar radiation?
a) Pyrheliometer
b) Pyranometer
c) Pyrometer
d) Sunshine Recorder

5) What is the primary cause of wind formation?
a) Earth's rotation
b) Uneven heating of the Earth's surface by the sun
c) Gravitational pull of the moon
d) Ocean currents

6) Which energy storage method is best suited for stabilizing short-term fluctuations in power supply?
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c) Biomass storage d) Compressed air storage

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a) 190 billion b) 178 billion
c) 150 billion d) 250 billion

Seat No.	

Set **S**

T.Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Renewable Energy Resources (MECHMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Solve any two questions from each Section.
2) Use of nonprogrammable calculators is allowed.
3) Figures to the right indicate full marks.
4) Assume additional suitable data if necessary and state it clearly.

SECTION – I

Q.2 Attempt the following.

a) What are the renewable energy sources? Write its advantages and obstacles to implement these sources. **05**

b) Explain construction and working of Horizontal axis wind mill. **05**

c) How renewable energy is different from Conventional one? Discus Indian and global energy scenario. **04**

Q.3 Attempt the following.

a) Explain Construction and Working of Flat Plate Collector. **05**

b) Explain the construction and working of Solar distillation (Solar Still) with the help of neat sketch. **05**

c) Explain in brief Biomass Gasification. **04**

Q.4 Attempt the following.

a) Explain the working of Pyrometer with the help of neat sketch. **05**

b) Describe with neat sketch working of wind energy system with main components. **05**

c) Write a short note on: **04**
i) Internet of Energy
ii) Photosynthesis process

SECTION – II

Q.5 Attempt the following.

a) Explain with neat sketch working of pumped hydroelectric storage system. **05**

b) Explain working of lead acid battery. **05**

c) Discuss the need of energy storage devices. **04**

Q.6 Attempt the following.

a) Describe with a schematic diagram medium head hydro power plant. **05**

b) Explain compressed air energy storage with neat sketch and describe its working principle. **05**

c) Explain the factors to be considered for the selection of site for a hydroelectric power plant. **04**

Q.7 Attempt the following.

a) Describe construction & working of single basin Tidal Power plant. **05**

b) Describe construction & working of close cycle Ocean Thermal power plant. **05**

c) Write a short note on: **04**

i) Tidal barrage power system

ii) Flywheel energy storage

SLR-QH-647

Seat No.	

Set P

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Renewable Energy Resources (MECHMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.
4) Assume suitable data if required & state it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) What is the main environmental benefit of using renewable energy?
a) Increased deforestation
b) Increased air pollution
c) Decreased greenhouse gas emissions
d) Depletion of natural resources

2) Which of the following is not a type of primary resource?
a) Crude Oil b) Coal
c) Sunlight d) Hydrogen Energy

3) Which country is the largest producer of wind energy?
a) India b) United States
c) China d) Germany

4) _____ is produced by blending of vegetable oil.
a) CNG b) Methane gas
c) Biogas d) Biodiesel

5) Availability of Solar energy on the earth surface is _____ MW.
a) 190 billion b) 178 billion
c) 150 billion d) 250 billion

6) In wind turbine gear box is used to _____.
a) Step up the speed b) Reduce the speed
c) shut down d) None of these

7) OTEC stands for _____.
a) Ocean thermal energy conversion
b) Ocean thermal energy Component
c) Ocean thermal energy contact
d) Ocean thermodynamic energy conversion

8) What is the primary need for designing a battery pack in electric vehicles?
a) To reduce weight
b) To increase the speed
c) To store and manage electrical energy safely and efficiently
d) To reduce emissions

9) Which of the following instruments is used to measure global solar radiation?
a) Pyrheliometer
b) Pyranometer
c) Pyrometer
d) Sunshine Recorder

10) What is the primary cause of wind formation?
a) Earth's rotation
b) Uneven heating of the Earth's surface by the sun
c) Gravitational pull of the moon
d) Ocean currents

11) Which energy storage method is best suited for stabilizing short-term fluctuations in power supply?
a) Pumped hydroelectric storage
b) Flywheel energy storage
c) Biomass storage
d) Compressed air storage

12) Which turbine is best suited for high-head hydroelectric plants?
a) Kaplan turbine
b) Francis turbine
c) Pelton wheel turbine
d) Cross-flow turbine

13) What is the efficiency range of tidal power plants?
a) 20-30%
b) 35-45%
c) 70-80%
d) 85-90%

14) Which component of a fuel cell allows only specific ions to pass through?
a) Electrolyte
b) Anode
c) Cathode
d) Separator

Seat No.	

Set **P**

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Renewable Energy Resources (MECHMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Solve any two questions from each Section.
2) Use of nonprogrammable calculators is allowed.
3) Figures to the right indicate full marks.
4) Assume additional suitable data if necessary and state it clearly.

SECTION – I

Q.2 Attempt the following.

a) What are the renewable energy sources? Write its advantages and obstacles to implement these sources. **05**

b) Explain construction and working of Horizontal axis wind mill. **05**

c) How renewable energy is different from Conventional one? Discus Indian and global energy scenario. **04**

Q.3 Attempt the following.

a) Explain Construction and Working of Flat Plate Collector. **05**

b) Explain the construction and working of Solar distillation (Solar Still) with the help of neat sketch. **05**

c) Explain in brief Biomass Gasification. **04**

Q.4 Attempt the following.

a) Explain the working of Pyrometer with the help of neat sketch. **05**

b) Describe with neat sketch working of wind energy system with main components. **05**

c) Write a short note on: **04**
i) Internet of Energy
ii) Photosynthesis process

SECTION – II

Q.5 Attempt the following.

a) Explain with neat sketch working of pumped hydroelectric storage system. **05**

b) Explain working of lead acid battery. **05**

c) Discuss the need of energy storage devices. **04**

Q.6 Attempt the following.

a) Describe with a schematic diagram medium head hydro power plant. **05**

b) Explain compressed air energy storage with neat sketch and describe its working principle. **05**

c) Explain the factors to be considered for the selection of site for a hydroelectric power plant. **04**

Q.7 Attempt the following.

a) Describe construction & working of single basin Tidal Power plant. **05**

b) Describe construction & working of close cycle Ocean Thermal power plant. **05**

c) Write a short note on: **04**

i) Tidal barrage power system

ii) Flywheel energy storage

SLR-QH-647

Seat No.	

Set Q

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Renewable Energy Resources (MECHMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.
4) Assume suitable data if required & state it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) What is the primary need for designing a battery pack in electric vehicles?
a) To reduce weight
b) To increase the speed
c) To store and manage electrical energy safely and efficiently
d) To reduce emissions

2) Which of the following instruments is used to measure global solar radiation?
a) Pyrheliometer b) Pyranometer
c) Pyrometer d) Sunshine Recorder

3) What is the primary cause of wind formation?
a) Earth's rotation
b) Uneven heating of the Earth's surface by the sun
c) Gravitational pull of the moon
d) Ocean currents

4) Which energy storage method is best suited for stabilizing short-term fluctuations in power supply?
a) Pumped hydroelectric storage b) Flywheel energy storage
c) Biomass storage d) Compressed air storage

5) Which turbine is best suited for high-head hydroelectric plants?
a) Kaplan turbine b) Francis turbine
c) Pelton wheel turbine d) Cross-flow turbine

6) What is the efficiency range of tidal power plants?
a) 20-30% b) 35-45%
c) 70-80% d) 85-90%

7) Which component of a fuel cell allows only specific ions to pass through?
a) Electrolyte b) Anode
c) Cathode d) Separator

8) What is the main environmental benefit of using renewable energy?
a) Increased deforestation
b) Increased air pollution
c) Decreased greenhouse gas emissions
d) Depletion of natural resources

9) Which of the following is not a type of primary resource?
a) Crude Oil b) Coal
c) Sunlight d) Hydrogen Energy

10) Which country is the largest producer of wind energy?
a) India b) United States
c) China d) Germany

11) _____ is produced by blending of vegetable oil.
a) CNG b) Methane gas
c) Biogas d) Biodiesel

12) Availability of Solar energy on the earth surface is _____ MW.
a) 190 billion b) 178 billion
c) 150 billion d) 250 billion

13) In wind turbine gear box is used to _____.
a) Step up the speed b) Reduce the speed
c) shut down d) None of these

14) OTEC stands for _____.
a) Ocean thermal energy conversion
b) Ocean thermal energy Component
c) Ocean thermal energy contact
d) Ocean thermodynamic energy conversion

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Renewable Energy Resources (MECHMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Solve any two questions from each Section.
2) Use of nonprogrammable calculators is allowed.
3) Figures to the right indicate full marks.
4) Assume additional suitable data if necessary and state it clearly.

SECTION – I

Q.2 Attempt the following.

a) What are the renewable energy sources? Write its advantages and obstacles to implement these sources. **05**

b) Explain construction and working of Horizontal axis wind mill. **05**

c) How renewable energy is different from Conventional one? Discus Indian and global energy scenario. **04**

Q.3 Attempt the following.

a) Explain Construction and Working of Flat Plate Collector. **05**

b) Explain the construction and working of Solar distillation (Solar Still) with the help of neat sketch. **05**

c) Explain in brief Biomass Gasification. **04**

Q.4 Attempt the following.

a) Explain the working of Pyrometer with the help of neat sketch. **05**

b) Describe with neat sketch working of wind energy system with main components. **05**

c) Write a short note on: **04**
i) Internet of Energy
ii) Photosynthesis process

SECTION – II

Q.5 Attempt the following.

a) Explain with neat sketch working of pumped hydroelectric storage system. **05**

b) Explain working of lead acid battery. **05**

c) Discuss the need of energy storage devices. **04**

Q.6 Attempt the following.

a) Describe with a schematic diagram medium head hydro power plant. **05**

b) Explain compressed air energy storage with neat sketch and describe its working principle. **05**

c) Explain the factors to be considered for the selection of site for a hydroelectric power plant. **04**

Q.7 Attempt the following.

a) Describe construction & working of single basin Tidal Power plant. **05**

b) Describe construction & working of close cycle Ocean Thermal power plant. **05**

c) Write a short note on: **04**

i) Tidal barrage power system

ii) Flywheel energy storage

Seat No.	

Set **R**

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Renewable Energy Resources (MECHMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.
4) Assume suitable data if required & state it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) Which energy storage method is best suited for stabilizing short-term fluctuations in power supply?
a) Pumped hydroelectric storage b) Flywheel energy storage
c) Biomass storage d) Compressed air storage

2) Which turbine is best suited for high-head hydroelectric plants?
a) Kaplan turbine b) Francis turbine
c) Pelton wheel turbine d) Cross-flow turbine

3) What is the efficiency range of tidal power plants?
a) 20-30% b) 35-45%
c) 70-80% d) 85-90%

4) Which component of a fuel cell allows only specific ions to pass through?
a) Electrolyte b) Anode
c) Cathode d) Separator

5) What is the main environmental benefit of using renewable energy?
a) Increased deforestation
b) Increased air pollution
c) Decreased greenhouse gas emissions
d) Depletion of natural resources

6) Which of the following is not a type of primary resource?
a) Crude Oil b) Coal
c) Sunlight d) Hydrogen Energy

7) Which country is the largest producer of wind energy?
a) India b) United States
c) China d) Germany

8) _____ is produced by blending of vegetable oil.
a) CNG b) Methane gas
c) Biogas d) Biodiesel

9) Availability of Solar energy on the earth surface is _____ MW.
a) 190 billion b) 178 billion
c) 150 billion d) 250 billion

10) In wind turbine gear box is used to _____.
a) Step up the speed b) Reduce the speed
c) shut down d) None of these

11) OTEC stands for _____.
a) Ocean thermal energy conversion
b) Ocean thermal energy Component
c) Ocean thermal energy contact
d) Ocean thermodynamic energy conversion

12) What is the primary need for designing a battery pack in electric vehicles?
a) To reduce weight
b) To increase the speed
c) To store and manage electrical energy safely and efficiently
d) To reduce emissions

13) Which of the following instruments is used to measure global solar radiation?
a) Pyrheliometer b) Pyranometer
c) Pyrometer d) Sunshine Recorder

14) What is the primary cause of wind formation?
a) Earth's rotation
b) Uneven heating of the Earth's surface by the sun
c) Gravitational pull of the moon
d) Ocean currents

Seat No.	

Set **R**

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Renewable Energy Resources (MECHMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Solve any two questions from each Section.
2) Use of nonprogrammable calculators is allowed.
3) Figures to the right indicate full marks.
4) Assume additional suitable data if necessary and state it clearly.

SECTION – I

Q.2 Attempt the following.

a) What are the renewable energy sources? Write its advantages and obstacles to implement these sources. **05**

b) Explain construction and working of Horizontal axis wind mill. **05**

c) How renewable energy is different from Conventional one? Discus Indian and global energy scenario. **04**

Q.3 Attempt the following.

a) Explain Construction and Working of Flat Plate Collector. **05**

b) Explain the construction and working of Solar distillation (Solar Still) with the help of neat sketch. **05**

c) Explain in brief Biomass Gasification. **04**

Q.4 Attempt the following.

a) Explain the working of Pyrometer with the help of neat sketch. **05**

b) Describe with neat sketch working of wind energy system with main components. **05**

c) Write a short note on: **04**
i) Internet of Energy
ii) Photosynthesis process

SECTION – II

Q.5 Attempt the following.

a) Explain with neat sketch working of pumped hydroelectric storage system. **05**

b) Explain working of lead acid battery. **05**

c) Discuss the need of energy storage devices. **04**

Q.6 Attempt the following.

a) Describe with a schematic diagram medium head hydro power plant. **05**

b) Explain compressed air energy storage with neat sketch and describe its working principle. **05**

c) Explain the factors to be considered for the selection of site for a hydroelectric power plant. **04**

Q.7 Attempt the following.

a) Describe construction & working of single basin Tidal Power plant. **05**

b) Describe construction & working of close cycle Ocean Thermal power plant. **05**

c) Write a short note on: **04**

i) Tidal barrage power system

ii) Flywheel energy storage

Seat No.	

Set | S

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Renewable Energy Resources (MECHMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.
4) Assume suitable data if required & state it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. **14**

1) In wind turbine gear box is used to _____.
a) Step up the speed b) Reduce the speed
c) shut down d) None of these

2) OTEC stands for _____.
a) Ocean thermal energy conversion
b) Ocean thermal energy Component
c) Ocean thermal energy contact
d) Ocean thermodynamic energy conversion

3) What is the primary need for designing a battery pack in electric vehicles?
a) To reduce weight
b) To increase the speed
c) To store and manage electrical energy safely and efficiently
d) To reduce emissions

4) Which of the following instruments is used to measure global solar radiation?
a) Pyrheliometer b) Pyranometer
c) Pyrometer d) Sunshine Recorder

5) What is the primary cause of wind formation?
a) Earth's rotation
b) Uneven heating of the Earth's surface by the sun
c) Gravitational pull of the moon
d) Ocean currents

6) Which energy storage method is best suited for stabilizing short-term fluctuations in power supply?
a) Pumped hydroelectric storage b) Flywheel energy storage
c) Biomass storage d) Compressed air storage

7) Which turbine is best suited for high-head hydroelectric plants?
a) Kaplan turbine b) Francis turbine
c) Pelton wheel turbine d) Cross-flow turbine

8) What is the efficiency range of tidal power plants?
a) 20-30% b) 35-45%
c) 70-80% d) 85-90%

9) Which component of a fuel cell allows only specific ions to pass through?
a) Electrolyte b) Anode
c) Cathode d) Separator

10) What is the main environmental benefit of using renewable energy?
a) Increased deforestation
b) Increased air pollution
c) Decreased greenhouse gas emissions
d) Depletion of natural resources

11) Which of the following is not a type of primary resource?
a) Crude Oil b) Coal
c) Sunlight d) Hydrogen Energy

12) Which country is the largest producer of wind energy?
a) India b) United States
c) China d) Germany

13) _____ is produced by blending of vegetable oil.
a) CNG b) Methane gas
c) Biogas d) Biodiesel

14) Availability of Solar energy on the earth surface is _____ MW.
a) 190 billion b) 178 billion
c) 150 billion d) 250 billion

Seat No.	

Set **S**

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Renewable Energy Resources (MECHMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Solve any two questions from each Section.
2) Use of nonprogrammable calculators is allowed.
3) Figures to the right indicate full marks.
4) Assume additional suitable data if necessary and state it clearly.

SECTION – I

Q.2 Attempt the following.

a) What are the renewable energy sources? Write its advantages and obstacles to implement these sources. **05**

b) Explain construction and working of Horizontal axis wind mill. **05**

c) How renewable energy is different from Conventional one? Discus Indian and global energy scenario. **04**

Q.3 Attempt the following.

a) Explain Construction and Working of Flat Plate Collector. **05**

b) Explain the construction and working of Solar distillation (Solar Still) with the help of neat sketch. **05**

c) Explain in brief Biomass Gasification. **04**

Q.4 Attempt the following.

a) Explain the working of Pyrometer with the help of neat sketch. **05**

b) Describe with neat sketch working of wind energy system with main components. **05**

c) Write a short note on: **04**
i) Internet of Energy
ii) Photosynthesis process

SECTION – II

Q.5 Attempt the following.

a) Explain with neat sketch working of pumped hydroelectric storage system. **05**

b) Explain working of lead acid battery. **05**

c) Discuss the need of energy storage devices. **04**

Q.6 Attempt the following.

a) Describe with a schematic diagram medium head hydro power plant. **05**

b) Explain compressed air energy storage with neat sketch and describe its working principle. **05**

c) Explain the factors to be considered for the selection of site for a hydroelectric power plant. **04**

Q.7 Attempt the following.

a) Describe construction & working of single basin Tidal Power plant. **05**

b) Describe construction & working of close cycle Ocean Thermal power plant. **05**

c) Write a short note on: **04**

i) Tidal barrage power system

ii) Flywheel energy storage

SLR-QH-647

Seat No.	

Set P

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Renewable Energy Resources (MECHMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.
4) Assume suitable data if required & state it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) What is the main environmental benefit of using renewable energy?
a) Increased deforestation
b) Increased air pollution
c) Decreased greenhouse gas emissions
d) Depletion of natural resources

2) Which of the following is not a type of primary resource?
a) Crude Oil b) Coal
c) Sunlight d) Hydrogen Energy

3) Which country is the largest producer of wind energy?
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4) _____ is produced by blending of vegetable oil.
a) CNG b) Methane gas
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5) Availability of Solar energy on the earth surface is _____ MW.
a) 190 billion b) 178 billion
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7) OTEC stands for _____.
a) Ocean thermal energy conversion
b) Ocean thermal energy Component
c) Ocean thermal energy contact
d) Ocean thermodynamic energy conversion

8) What is the primary need for designing a battery pack in electric vehicles?
a) To reduce weight
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9) Which of the following instruments is used to measure global solar radiation?
a) Pyrheliometer
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10) What is the primary cause of wind formation?
a) Earth's rotation
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11) Which energy storage method is best suited for stabilizing short-term fluctuations in power supply?
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c) Biomass storage
d) Compressed air storage

12) Which turbine is best suited for high-head hydroelectric plants?
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13) What is the efficiency range of tidal power plants?
a) 20-30%
b) 35-45%
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d) 85-90%

14) Which component of a fuel cell allows only specific ions to pass through?
a) Electrolyte
b) Anode
c) Cathode
d) Separator

Seat No.	

Set **P**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Renewable Energy Resources (MECHMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Solve any two questions from each Section.
2) Use of nonprogrammable calculators is allowed.
3) Figures to the right indicate full marks.
4) Assume additional suitable data if necessary and state it clearly.

SECTION – I

Q.2 Attempt the following.

a) What are the renewable energy sources? Write its advantages and obstacles to implement these sources. **05**

b) Explain construction and working of Horizontal axis wind mill. **05**

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Q.4 Attempt the following.

a) Explain the working of Pyrometer with the help of neat sketch. **05**

b) Describe with neat sketch working of wind energy system with main components. **05**

c) Write a short note on: **04**
i) Internet of Energy
ii) Photosynthesis process

SECTION – II

Q.5 Attempt the following.

a) Explain with neat sketch working of pumped hydroelectric storage system. **05**

b) Explain working of lead acid battery. **05**

c) Discuss the need of energy storage devices. **04**

Q.6 Attempt the following.

a) Describe with a schematic diagram medium head hydro power plant. **05**

b) Explain compressed air energy storage with neat sketch and describe its working principle. **05**

c) Explain the factors to be considered for the selection of site for a hydroelectric power plant. **04**

Q.7 Attempt the following.

a) Describe construction & working of single basin Tidal Power plant. **05**

b) Describe construction & working of close cycle Ocean Thermal power plant. **05**

c) Write a short note on: **04**

i) Tidal barrage power system

ii) Flywheel energy storage

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Renewable Energy Resources (MECHMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.
4) Assume suitable data if required & state it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. **14**

1) What is the primary need for designing a battery pack in electric vehicles?
a) To reduce weight
b) To increase the speed
c) To store and manage electrical energy safely and efficiently
d) To reduce emissions

2) Which of the following instruments is used to measure global solar radiation?
a) Pyrheliometer b) Pyranometer
c) Pyrometer d) Sunshine Recorder

3) What is the primary cause of wind formation?
a) Earth's rotation
b) Uneven heating of the Earth's surface by the sun
c) Gravitational pull of the moon
d) Ocean currents

4) Which energy storage method is best suited for stabilizing short-term fluctuations in power supply?
a) Pumped hydroelectric storage b) Flywheel energy storage
c) Biomass storage d) Compressed air storage

5) Which turbine is best suited for high-head hydroelectric plants?
a) Kaplan turbine b) Francis turbine
c) Pelton wheel turbine d) Cross-flow turbine

6) What is the efficiency range of tidal power plants?
a) 20-30% b) 35-45%
c) 70-80% d) 85-90%

7) Which component of a fuel cell allows only specific ions to pass through?
a) Electrolyte b) Anode
c) Cathode d) Separator

8) What is the main environmental benefit of using renewable energy?
a) Increased deforestation
b) Increased air pollution
c) Decreased greenhouse gas emissions
d) Depletion of natural resources

9) Which of the following is not a type of primary resource?
a) Crude Oil b) Coal
c) Sunlight d) Hydrogen Energy

10) Which country is the largest producer of wind energy?
a) India b) United States
c) China d) Germany

11) _____ is produced by blending of vegetable oil.
a) CNG b) Methane gas
c) Biogas d) Biodiesel

12) Availability of Solar energy on the earth surface is _____ MW.
a) 190 billion b) 178 billion
c) 150 billion d) 250 billion

13) In wind turbine gear box is used to _____.
a) Step up the speed b) Reduce the speed
c) shut down d) None of these

14) OTEC stands for _____.
a) Ocean thermal energy conversion
b) Ocean thermal energy Component
c) Ocean thermal energy contact
d) Ocean thermodynamic energy conversion

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Renewable Energy Resources (MECHMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Solve any two questions from each Section.
2) Use of nonprogrammable calculators is allowed.
3) Figures to the right indicate full marks.
4) Assume additional suitable data if necessary and state it clearly.

SECTION – I

Q.2 Attempt the following.

a) What are the renewable energy sources? Write its advantages and obstacles to implement these sources. **05**

b) Explain construction and working of Horizontal axis wind mill. **05**

c) How renewable energy is different from Conventional one? Discus Indian and global energy scenario. **04**

Q.3 Attempt the following.

a) Explain Construction and Working of Flat Plate Collector. **05**

b) Explain the construction and working of Solar distillation (Solar Still) with the help of neat sketch. **05**

c) Explain in brief Biomass Gasification. **04**

Q.4 Attempt the following.

a) Explain the working of Pyrometer with the help of neat sketch. **05**

b) Describe with neat sketch working of wind energy system with main components. **05**

c) Write a short note on: **04**
i) Internet of Energy
ii) Photosynthesis process

SECTION – II

Q.5 Attempt the following.

a) Explain with neat sketch working of pumped hydroelectric storage system. **05**

b) Explain working of lead acid battery. **05**

c) Discuss the need of energy storage devices. **04**

Q.6 Attempt the following.

a) Describe with a schematic diagram medium head hydro power plant. **05**

b) Explain compressed air energy storage with neat sketch and describe its working principle. **05**

c) Explain the factors to be considered for the selection of site for a hydroelectric power plant. **04**

Q.7 Attempt the following.

a) Describe construction & working of single basin Tidal Power plant. **05**

b) Describe construction & working of close cycle Ocean Thermal power plant. **05**

c) Write a short note on: **04**

i) Tidal barrage power system

ii) Flywheel energy storage

Seat No.	

Set **R**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Renewable Energy Resources (MECHMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.
4) Assume suitable data if required & state it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) Which energy storage method is best suited for stabilizing short-term fluctuations in power supply?
a) Pumped hydroelectric storage b) Flywheel energy storage
c) Biomass storage d) Compressed air storage

2) Which turbine is best suited for high-head hydroelectric plants?
a) Kaplan turbine b) Francis turbine
c) Pelton wheel turbine d) Cross-flow turbine

3) What is the efficiency range of tidal power plants?
a) 20-30% b) 35-45%
c) 70-80% d) 85-90%

4) Which component of a fuel cell allows only specific ions to pass through?
a) Electrolyte b) Anode
c) Cathode d) Separator

5) What is the main environmental benefit of using renewable energy?
a) Increased deforestation
b) Increased air pollution
c) Decreased greenhouse gas emissions
d) Depletion of natural resources

6) Which of the following is not a type of primary resource?
a) Crude Oil b) Coal
c) Sunlight d) Hydrogen Energy

7) Which country is the largest producer of wind energy?
a) India b) United States
c) China d) Germany

8) _____ is produced by blending of vegetable oil.
a) CNG b) Methane gas
c) Biogas d) Biodiesel

9) Availability of Solar energy on the earth surface is _____ MW.
a) 190 billion b) 178 billion
c) 150 billion d) 250 billion

10) In wind turbine gear box is used to _____.
a) Step up the speed b) Reduce the speed
c) shut down d) None of these

11) OTEC stands for _____.
a) Ocean thermal energy conversion
b) Ocean thermal energy Component
c) Ocean thermal energy contact
d) Ocean thermodynamic energy conversion

12) What is the primary need for designing a battery pack in electric vehicles?
a) To reduce weight
b) To increase the speed
c) To store and manage electrical energy safely and efficiently
d) To reduce emissions

13) Which of the following instruments is used to measure global solar radiation?
a) Pyrheliometer b) Pyranometer
c) Pyrometer d) Sunshine Recorder

14) What is the primary cause of wind formation?
a) Earth's rotation
b) Uneven heating of the Earth's surface by the sun
c) Gravitational pull of the moon
d) Ocean currents

Seat No.	

Set **R**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Renewable Energy Resources (MECHMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Solve any two questions from each Section.
2) Use of nonprogrammable calculators is allowed.
3) Figures to the right indicate full marks.
4) Assume additional suitable data if necessary and state it clearly.

SECTION – I

Q.2 Attempt the following.

a) What are the renewable energy sources? Write its advantages and obstacles to implement these sources. **05**

b) Explain construction and working of Horizontal axis wind mill. **05**

c) How renewable energy is different from Conventional one? Discus Indian and global energy scenario. **04**

Q.3 Attempt the following.

a) Explain Construction and Working of Flat Plate Collector. **05**

b) Explain the construction and working of Solar distillation (Solar Still) with the help of neat sketch. **05**

c) Explain in brief Biomass Gasification. **04**

Q.4 Attempt the following.

a) Explain the working of Pyrometer with the help of neat sketch. **05**

b) Describe with neat sketch working of wind energy system with main components. **05**

c) Write a short note on: **04**
i) Internet of Energy
ii) Photosynthesis process

SECTION – II

Q.5 Attempt the following.

a) Explain with neat sketch working of pumped hydroelectric storage system. **05**

b) Explain working of lead acid battery. **05**

c) Discuss the need of energy storage devices. **04**

Q.6 Attempt the following.

a) Describe with a schematic diagram medium head hydro power plant. **05**

b) Explain compressed air energy storage with neat sketch and describe its working principle. **05**

c) Explain the factors to be considered for the selection of site for a hydroelectric power plant. **04**

Q.7 Attempt the following.

a) Describe construction & working of single basin Tidal Power plant. **05**

b) Describe construction & working of close cycle Ocean Thermal power plant. **05**

c) Write a short note on: **04**

i) Tidal barrage power system

ii) Flywheel energy storage

Seat No.	

Set **S**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Renewable Energy Resources (MECHMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.
4) Assume suitable data if required & state it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. **14**

1) In wind turbine gear box is used to _____.
a) Step up the speed b) Reduce the speed
c) shut down d) None of these

2) OTEC stands for _____.
a) Ocean thermal energy conversion
b) Ocean thermal energy Component
c) Ocean thermal energy contact
d) Ocean thermodynamic energy conversion

3) What is the primary need for designing a battery pack in electric vehicles?
a) To reduce weight
b) To increase the speed
c) To store and manage electrical energy safely and efficiently
d) To reduce emissions

4) Which of the following instruments is used to measure global solar radiation?
a) Pyrheliometer b) Pyranometer
c) Pyrometer d) Sunshine Recorder

5) What is the primary cause of wind formation?
a) Earth's rotation
b) Uneven heating of the Earth's surface by the sun
c) Gravitational pull of the moon
d) Ocean currents

6) Which energy storage method is best suited for stabilizing short-term fluctuations in power supply?
a) Pumped hydroelectric storage b) Flywheel energy storage
c) Biomass storage d) Compressed air storage

7) Which turbine is best suited for high-head hydroelectric plants?
a) Kaplan turbine b) Francis turbine
c) Pelton wheel turbine d) Cross-flow turbine

8) What is the efficiency range of tidal power plants?
a) 20-30% b) 35-45%
c) 70-80% d) 85-90%

9) Which component of a fuel cell allows only specific ions to pass through?
a) Electrolyte b) Anode
c) Cathode d) Separator

10) What is the main environmental benefit of using renewable energy?
a) Increased deforestation
b) Increased air pollution
c) Decreased greenhouse gas emissions
d) Depletion of natural resources

11) Which of the following is not a type of primary resource?
a) Crude Oil b) Coal
c) Sunlight d) Hydrogen Energy

12) Which country is the largest producer of wind energy?
a) India b) United States
c) China d) Germany

13) _____ is produced by blending of vegetable oil.
a) CNG b) Methane gas
c) Biogas d) Biodiesel

14) Availability of Solar energy on the earth surface is _____ MW.
a) 190 billion b) 178 billion
c) 150 billion d) 250 billion

Seat No.	

Set **S**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Renewable Energy Resources (MECHMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Solve any two questions from each Section.
2) Use of nonprogrammable calculators is allowed.
3) Figures to the right indicate full marks.
4) Assume additional suitable data if necessary and state it clearly.

SECTION – I

Q.2 Attempt the following.

a) What are the renewable energy sources? Write its advantages and obstacles to implement these sources. **05**

b) Explain construction and working of Horizontal axis wind mill. **05**

c) How renewable energy is different from Conventional one? Discus Indian and global energy scenario. **04**

Q.3 Attempt the following.

a) Explain Construction and Working of Flat Plate Collector. **05**

b) Explain the construction and working of Solar distillation (Solar Still) with the help of neat sketch. **05**

c) Explain in brief Biomass Gasification. **04**

Q.4 Attempt the following.

a) Explain the working of Pyrometer with the help of neat sketch. **05**

b) Describe with neat sketch working of wind energy system with main components. **05**

c) Write a short note on: **04**
i) Internet of Energy
ii) Photosynthesis process

SECTION – II

Q.5 Attempt the following.

a) Explain with neat sketch working of pumped hydroelectric storage system. **05**

b) Explain working of lead acid battery. **05**

c) Discuss the need of energy storage devices. **04**

Q.6 Attempt the following.

a) Describe with a schematic diagram medium head hydro power plant. **05**

b) Explain compressed air energy storage with neat sketch and describe its working principle. **05**

c) Explain the factors to be considered for the selection of site for a hydroelectric power plant. **04**

Q.7 Attempt the following.

a) Describe construction & working of single basin Tidal Power plant. **05**

b) Describe construction & working of close cycle Ocean Thermal power plant. **05**

c) Write a short note on: **04**

i) Tidal barrage power system

ii) Flywheel energy storage

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Seat No.		Set	P

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Project Management (MECHMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top on page.
3) Figures to the right indicate full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answers from the given options. 14

1) Project is a _____ endeavour.
a) Perpetual b) Permanent
c) None of the above d) Temporary

2) Which of the following is NOT a characteristic of a project?
a) Unique output b) Defined timeline
c) Infinite duration d) Specific objective

3) An activity which consumes no resources is called _____.
a) Zero Activity b) Critical Activity
c) Dummy Activity d) End Activity

4) With respect to PERT and CPM, slack time is _____.
a) Total project time b) Idle resource
c) Delay time d) Extra time available

5) Payback period method considers _____.
a) Cash recovery time b) Profit only
c) Time value of money d) Risk only

6) IRR is defined as _____.
a) Profit ratio b) Cost ratio
c) Risk factor d) Rate at which NPV = 0

7) Bottom-up estimating is _____.
a) Estimation from top level
b) Detailed estimation of individual tasks
c) Rough estimation
d) Random estimation

8) Analogous estimating is based on _____.
a) Historical data
b) Random data
c) Assumptions only
d) Risk analysis

9) Monte Carlo simulation is used for _____.
a) Cost reduction
b) Risk and uncertainty analysis
c) Scheduling only
d) Resource allocation

10) In the initial stage of the project the probability of completing the project is _____.
a) Zero
b) Low
c) High
d) Medium

11) Critical path is _____.
a) Shortest path
b) Longest duration path
c) Random path
d) Optional path

12) PERT is mainly used when _____.
a) Time is deterministic
b) Cost is fixed
c) Time is uncertain
d) No scheduling needed

13) Gantt chart represents _____.
a) Time schedule
b) Cost
c) Risk
d) Profit

14) Baseline in MS Project is used for _____.
a) Future planning
b) Deleting tasks
c) Comparing planned vs actual
d) Risk management

Seat No.	

Set **P**

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Project Management (MECHMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Solve any Two questions from each section.
2) Figures to the right indicates full marks.
3) Assume suitable data if required.

Section – I

Q.2 **a)** Define a project. Explain the key characteristics of a project with suitable examples. How projects are classified? **07**

b) Describe the role and responsibilities of a project manager in successful **07**

Q.3 **a)** Describe Internal Rate of Return (IRR) and its significance in project. **07**

b) Explain Payback Period and Net Present Value (NPV) methods with advantages and limitations. **07**

Q.4 **a)** Explain Project Budgeting in detail. **07**

b) Describe bottom-up and analogous estimating methods. **07**

Section – II

Q.5 **a)** Explain the concept and importance of Work Breakdown Structure (WBS). **07**

b) A R & D project has a list of tasks to be performed whose time estimates are given in the Table as follows. **07**

- Construct a project network
- Perform forward and backward passes
- State the critical path
- Determine Project completion time

Activity	Predecessor	Duration
A	-	5
B	A	4
C	A	5
D	B	6
E	C	3
F	D,E	4

Q.6	**a)**	What is Project Controlling? Explain Project Control Process.	**07**
	b)	Describe Project Management Information System (PMIS) and its importance.	**07**
Q.7	**a)**	Explain features and applications of MS Project in project management.	**07**
	b)	Write a short note on Gantt chart.	**07**

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Project Management (MECHMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top on page.
3) Figures to the right indicate full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answers from the given options. 14

1) Analogous estimating is based on _____.
a) Historical data b) Random data
c) Assumptions only d) Risk analysis

2) Monte Carlo simulation is used for _____.
a) Cost reduction b) Risk and uncertainty analysis
c) Scheduling only d) Resource allocation

3) In the initial stage of the project the probability of completing the project is _____.
a) Zero b) Low
c) High d) Medium

4) Critical path is _____.
a) Shortest path b) Longest duration path
c) Random path d) Optional path

5) PERT is mainly used when _____.
a) Time is deterministic b) Cost is fixed
c) Time is uncertain d) No scheduling needed

6) Gantt chart represents _____.
a) Time schedule b) Cost
c) Risk d) Profit

7) Baseline in MS Project is used for _____.
a) Future planning
b) Deleting tasks
c) Comparing planned vs actual
d) Risk management

8) Project is a _____ endeavour.
a) Perpetual
b) Permanent
c) None of the above
d) Temporary

9) Which of the following is NOT a characteristic of a project?
a) Unique output
b) Defined timeline
c) Infinite duration
d) Specific objective

10) An activity which consumes no resources is called _____.
a) Zero Activity
b) Critical Activity
c) Dummy Activity
d) End Activity

11) With respect to PERT and CPM, slack time is _____.
a) Total project time
b) Idle resource
c) Delay time
d) Extra time available

12) Payback period method considers _____.
a) Cash recovery time
b) Profit only
c) Time value of money
d) Risk only

13) IRR is defined as _____.
a) Profit ratio
b) Cost ratio
c) Risk factor
d) Rate at which NPV = 0

14) Bottom-up estimating is _____.
a) Estimation from top level
b) Detailed estimation of individual tasks
c) Rough estimation
d) Random estimation

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Project Management (MECHMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Solve any Two questions from each section.
2) Figures to the right indicates full marks.
3) Assume suitable data if required.

Section – I

Q.2 **a)** Define a project. Explain the key characteristics of a project with suitable examples. How projects are classified? **07**

b) Describe the role and responsibilities of a project manager in successful **07**

Q.3 **a)** Describe Internal Rate of Return (IRR) and its significance in project. **07**

b) Explain Payback Period and Net Present Value (NPV) methods with advantages and limitations. **07**

Q.4 **a)** Explain Project Budgeting in detail. **07**

b) Describe bottom-up and analogous estimating methods. **07**

Section – II

Q.5 **a)** Explain the concept and importance of Work Breakdown Structure (WBS). **07**

b) A R & D project has a list of tasks to be performed whose time estimates are given in the Table as follows. **07**

- Construct a project network
- Perform forward and backward passes
- State the critical path
- Determine Project completion time

Activity	Predecessor	Duration
A	-	5
B	A	4
C	A	5
D	B	6
E	C	3
F	D,E	4

Q.6	**a)**	What is Project Controlling? Explain Project Control Process.	**07**
	b)	Describe Project Management Information System (PMIS) and its importance.	**07**
Q.7	**a)**	Explain features and applications of MS Project in project management.	**07**
	b)	Write a short note on Gantt chart.	**07**

Seat No.	

Set | **R**

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Project Management (MECHMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top on page.
3) Figures to the right indicate full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answers from the given options. 14

1) Critical path is _____.
a) Shortest path b) Longest duration path
c) Random path d) Optional path

2) PERT is mainly used when _____.
a) Time is deterministic b) Cost is fixed
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3) Gantt chart represents _____.
a) Time schedule b) Cost
c) Risk d) Profit

4) Baseline in MS Project is used for _____.
a) Future planning
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a) Zero Activity b) Critical Activity
c) Dummy Activity d) End Activity

8) With respect to PERT and CPM, slack time is _____.
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c) Delay time d) Extra time available

9) Payback period method considers _____.
a) Cash recovery time b) Profit only
c) Time value of money d) Risk only

10) IRR is defined as _____.
a) Profit ratio b) Cost ratio
c) Risk factor d) Rate at which NPV = 0

11) Bottom-up estimating is _____.
a) Estimation from top level
b) Detailed estimation of individual tasks
c) Rough estimation
d) Random estimation

12) Analogous estimating is based on _____.
a) Historical data b) Random data
c) Assumptions only d) Risk analysis

13) Monte Carlo simulation is used for _____.
a) Cost reduction b) Risk and uncertainty analysis
c) Scheduling only d) Resource allocation

14) In the initial stage of the project the probability of completing the project is _____.
a) Zero b) Low
c) High d) Medium

Seat No.	

Set **R**

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Project Management (MECHMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Solve any Two questions from each section.
2) Figures to the right indicates full marks.
3) Assume suitable data if required.

Section – I

Q.2 **a)** Define a project. Explain the key characteristics of a project with suitable examples. How projects are classified? **07**

b) Describe the role and responsibilities of a project manager in successful **07**

Q.3 **a)** Describe Internal Rate of Return (IRR) and its significance in project. **07**

b) Explain Payback Period and Net Present Value (NPV) methods with advantages and limitations. **07**

Q.4 **a)** Explain Project Budgeting in detail. **07**

b) Describe bottom-up and analogous estimating methods. **07**

Section – II

Q.5 **a)** Explain the concept and importance of Work Breakdown Structure (WBS). **07**

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Activity	Predecessor	Duration
A	-	5
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E	C	3
F	D,E	4

Q.6	**a)**	What is Project Controlling? Explain Project Control Process.	**07**
	b)	Describe Project Management Information System (PMIS) and its importance.	**07**
Q.7	**a)**	Explain features and applications of MS Project in project management.	**07**
	b)	Write a short note on Gantt chart.	**07**

Seat No.		Set	S

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Project Management (MECHMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top on page.
3) Figures to the right indicate full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answers from the given options. 14

1) IRR is defined as _____.
a) Profit ratio b) Cost ratio
c) Risk factor d) Rate at which NPV = 0

2) Bottom-up estimating is _____.
a) Estimation from top level
b) Detailed estimation of individual tasks
c) Rough estimation
d) Random estimation

3) Analogous estimating is based on _____.
a) Historical data b) Random data
c) Assumptions only d) Risk analysis

4) Monte Carlo simulation is used for _____.
a) Cost reduction b) Risk and uncertainty analysis
c) Scheduling only d) Resource allocation

5) In the initial stage of the project the probability of completing the project is _____.
a) Zero b) Low
c) High d) Medium

6) Critical path is _____.
a) Shortest path b) Longest duration path
c) Random path d) Optional path

7) PERT is mainly used when _____.
a) Time is deterministic b) Cost is fixed
c) Time is uncertain d) No scheduling needed

8) Gantt chart represents _____.
a) Time schedule
b) Cost
c) Risk
d) Profit

9) Baseline in MS Project is used for _____.
a) Future planning
b) Deleting tasks
c) Comparing planned vs actual
d) Risk management

10) Project is a _____ endeavour.
a) Perpetual
b) Permanent
c) None of the above
d) Temporary

11) Which of the following is NOT a characteristic of a project?
a) Unique output
b) Defined timeline
c) Infinite duration
d) Specific objective

12) An activity which consumes no resources is called _____.
a) Zero Activity
b) Critical Activity
c) Dummy Activity
d) End Activity

13) With respect to PERT and CPM, slack time is _____.
a) Total project time
b) Idle resource
c) Delay time
d) Extra time available

14) Payback period method considers _____.
a) Cash recovery time
b) Profit only
c) Time value of money
d) Risk only

Seat No.		Set	S

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Project Management (MECHMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Solve any Two questions from each section.
2) Figures to the right indicates full marks.
3) Assume suitable data if required.

Section – I

Q.2 **a)** Define a project. Explain the key characteristics of a project with suitable examples. How projects are classified? **07**

b) Describe the role and responsibilities of a project manager in successful **07**

Q.3 **a)** Describe Internal Rate of Return (IRR) and its significance in project. **07**

b) Explain Payback Period and Net Present Value (NPV) methods with advantages and limitations. **07**

Q.4 **a)** Explain Project Budgeting in detail. **07**

b) Describe bottom-up and analogous estimating methods. **07**

Section – II

Q.5 **a)** Explain the concept and importance of Work Breakdown Structure (WBS). **07**

b) A R & D project has a list of tasks to be performed whose time estimates are given in the Table as follows. **07**

- Construct a project network
- Perform forward and backward passes
- State the critical path
- Determine Project completion time

Activity	Predecessor	Duration
A	-	5
B	A	4
C	A	5
D	B	6
E	C	3
F	D,E	4

Q.6	**a)**	What is Project Controlling? Explain Project Control Process.	**07**
	b)	Describe Project Management Information System (PMIS) and its importance.	**07**
Q.7	**a)**	Explain features and applications of MS Project in project management.	**07**
	b)	Write a short note on Gantt chart.	**07**

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Seat No.	

Set P

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Project Management (MECHMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top on page.
3) Figures to the right indicate full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answers from the given options. 14

1) Project is a _____ endeavour.
a) Perpetual b) Permanent
c) None of the above d) Temporary

2) Which of the following is NOT a characteristic of a project?
a) Unique output b) Defined timeline
c) Infinite duration d) Specific objective

3) An activity which consumes no resources is called _____.
a) Zero Activity b) Critical Activity
c) Dummy Activity d) End Activity

4) With respect to PERT and CPM, slack time is _____.
a) Total project time b) Idle resource
c) Delay time d) Extra time available

5) Payback period method considers _____.
a) Cash recovery time b) Profit only
c) Time value of money d) Risk only

6) IRR is defined as _____.
a) Profit ratio b) Cost ratio
c) Risk factor d) Rate at which NPV = 0

7) Bottom-up estimating is _____.
a) Estimation from top level
b) Detailed estimation of individual tasks
c) Rough estimation
d) Random estimation

8) Analogous estimating is based on _____.
a) Historical data
b) Random data
c) Assumptions only
d) Risk analysis

9) Monte Carlo simulation is used for _____.
a) Cost reduction
b) Risk and uncertainty analysis
c) Scheduling only
d) Resource allocation

10) In the initial stage of the project the probability of completing the project is _____.
a) Zero
b) Low
c) High
d) Medium

11) Critical path is _____.
a) Shortest path
b) Longest duration path
c) Random path
d) Optional path

12) PERT is mainly used when _____.
a) Time is deterministic
b) Cost is fixed
c) Time is uncertain
d) No scheduling needed

13) Gantt chart represents _____.
a) Time schedule
b) Cost
c) Risk
d) Profit

14) Baseline in MS Project is used for _____.
a) Future planning
b) Deleting tasks
c) Comparing planned vs actual
d) Risk management

Seat No.	

Set **P**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Project Management (MECHMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Solve any Two questions from each section.
2) Figures to the right indicates full marks.
3) Assume suitable data if required.

Section – I

Q.2 **a)** Define a project. Explain the key characteristics of a project with suitable examples. How projects are classified? **07**

b) Describe the role and responsibilities of a project manager in successful **07**

Q.3 **a)** Describe Internal Rate of Return (IRR) and its significance in project. **07**

b) Explain Payback Period and Net Present Value (NPV) methods with advantages and limitations. **07**

Q.4 **a)** Explain Project Budgeting in detail. **07**

b) Describe bottom-up and analogous estimating methods. **07**

Section – II

Q.5 **a)** Explain the concept and importance of Work Breakdown Structure (WBS). **07**

b) A R & D project has a list of tasks to be performed whose time estimates are given in the Table as follows. **07**

- Construct a project network
- Perform forward and backward passes
- State the critical path
- Determine Project completion time

Activity	Predecessor	Duration
A	-	5
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F	D,E	4

Q.6	**a)**	What is Project Controlling? Explain Project Control Process.	**07**
	b)	Describe Project Management Information System (PMIS) and its importance.	**07**
Q.7	**a)**	Explain features and applications of MS Project in project management.	**07**
	b)	Write a short note on Gantt chart.	**07**

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Project Management (MECHMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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3) Figures to the right indicate full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answers from the given options. 14

1) Analogous estimating is based on _____.
a) Historical data b) Random data
c) Assumptions only d) Risk analysis

2) Monte Carlo simulation is used for _____.
a) Cost reduction b) Risk and uncertainty analysis
c) Scheduling only d) Resource allocation

3) In the initial stage of the project the probability of completing the project is _____.
a) Zero b) Low
c) High d) Medium

4) Critical path is _____.
a) Shortest path b) Longest duration path
c) Random path d) Optional path

5) PERT is mainly used when _____.
a) Time is deterministic b) Cost is fixed
c) Time is uncertain d) No scheduling needed

6) Gantt chart represents _____.
a) Time schedule b) Cost
c) Risk d) Profit

7) Baseline in MS Project is used for _____.
a) Future planning
b) Deleting tasks
c) Comparing planned vs actual
d) Risk management

8) Project is a _____ endeavour.
a) Perpetual
b) Permanent
c) None of the above
d) Temporary

9) Which of the following is NOT a characteristic of a project?
a) Unique output
b) Defined timeline
c) Infinite duration
d) Specific objective

10) An activity which consumes no resources is called _____.
a) Zero Activity
b) Critical Activity
c) Dummy Activity
d) End Activity

11) With respect to PERT and CPM, slack time is _____.
a) Total project time
b) Idle resource
c) Delay time
d) Extra time available

12) Payback period method considers _____.
a) Cash recovery time
b) Profit only
c) Time value of money
d) Risk only

13) IRR is defined as _____.
a) Profit ratio
b) Cost ratio
c) Risk factor
d) Rate at which NPV = 0

14) Bottom-up estimating is _____.
a) Estimation from top level
b) Detailed estimation of individual tasks
c) Rough estimation
d) Random estimation

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Project Management (MECHMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Solve any Two questions from each section.
2) Figures to the right indicates full marks.
3) Assume suitable data if required.

Section – I

Q.2 **a)** Define a project. Explain the key characteristics of a project with suitable examples. How projects are classified? **07**

b) Describe the role and responsibilities of a project manager in successful **07**

Q.3 **a)** Describe Internal Rate of Return (IRR) and its significance in project. **07**

b) Explain Payback Period and Net Present Value (NPV) methods with advantages and limitations. **07**

Q.4 **a)** Explain Project Budgeting in detail. **07**

b) Describe bottom-up and analogous estimating methods. **07**

Section – II

Q.5 **a)** Explain the concept and importance of Work Breakdown Structure (WBS). **07**

b) A R & D project has a list of tasks to be performed whose time estimates are given in the Table as follows. **07**

- Construct a project network
- Perform forward and backward passes
- State the critical path
- Determine Project completion time

Activity	Predecessor	Duration
A	-	5
B	A	4
C	A	5
D	B	6
E	C	3
F	D,E	4

Q.6	**a)**	What is Project Controlling? Explain Project Control Process.	**07**
	b)	Describe Project Management Information System (PMIS) and its importance.	**07**
Q.7	**a)**	Explain features and applications of MS Project in project management.	**07**
	b)	Write a short note on Gantt chart.	**07**

Seat No.		Set	R

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Project Management (MECHMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top on page.
3) Figures to the right indicate full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answers from the given options. 14

1) Critical path is _____.
a) Shortest path b) Longest duration path
c) Random path d) Optional path

2) PERT is mainly used when _____.
a) Time is deterministic b) Cost is fixed
c) Time is uncertain d) No scheduling needed

3) Gantt chart represents _____.
a) Time schedule b) Cost
c) Risk d) Profit

4) Baseline in MS Project is used for _____.
a) Future planning
b) Deleting tasks
c) Comparing planned vs actual
d) Risk management

5) Project is a _____ endeavour.
a) Perpetual b) Permanent
c) None of the above d) Temporary

6) Which of the following is NOT a characteristic of a project?
a) Unique output b) Defined timeline
c) Infinite duration d) Specific objective

7) An activity which consumes no resources is called _____.
a) Zero Activity b) Critical Activity
c) Dummy Activity d) End Activity

8) With respect to PERT and CPM, slack time is _____.
a) Total project time b) Idle resource
c) Delay time d) Extra time available

9) Payback period method considers _____.
a) Cash recovery time b) Profit only
c) Time value of money d) Risk only

10) IRR is defined as _____.
a) Profit ratio b) Cost ratio
c) Risk factor d) Rate at which NPV = 0

11) Bottom-up estimating is _____.
a) Estimation from top level
b) Detailed estimation of individual tasks
c) Rough estimation
d) Random estimation

12) Analogous estimating is based on _____.
a) Historical data b) Random data
c) Assumptions only d) Risk analysis

13) Monte Carlo simulation is used for _____.
a) Cost reduction b) Risk and uncertainty analysis
c) Scheduling only d) Resource allocation

14) In the initial stage of the project the probability of completing the project is _____.
a) Zero b) Low
c) High d) Medium

Seat No.	

Set **R**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Project Management (MECHMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Solve any Two questions from each section.
2) Figures to the right indicates full marks.
3) Assume suitable data if required.

Section – I

Q.2 **a)** Define a project. Explain the key characteristics of a project with suitable examples. How projects are classified? **07**

b) Describe the role and responsibilities of a project manager in successful **07**

Q.3 **a)** Describe Internal Rate of Return (IRR) and its significance in project. **07**

b) Explain Payback Period and Net Present Value (NPV) methods with advantages and limitations. **07**

Q.4 **a)** Explain Project Budgeting in detail. **07**

b) Describe bottom-up and analogous estimating methods. **07**

Section – II

Q.5 **a)** Explain the concept and importance of Work Breakdown Structure (WBS). **07**

b) A R & D project has a list of tasks to be performed whose time estimates are given in the Table as follows. **07**

- Construct a project network
- Perform forward and backward passes
- State the critical path
- Determine Project completion time

Activity	Predecessor	Duration
A	-	5
B	A	4
C	A	5
D	B	6
E	C	3
F	D,E	4

Q.6	**a)**	What is Project Controlling? Explain Project Control Process.	**07**
	b)	Describe Project Management Information System (PMIS) and its importance.	**07**
Q.7	**a)**	Explain features and applications of MS Project in project management.	**07**
	b)	Write a short note on Gantt chart.	**07**

Seat No.	

Set **S**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Project Management (MECHMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top on page.
3) Figures to the right indicate full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answers from the given options. 14

1) IRR is defined as _____.
a) Profit ratio b) Cost ratio
c) Risk factor d) Rate at which NPV = 0

2) Bottom-up estimating is _____.
a) Estimation from top level
b) Detailed estimation of individual tasks
c) Rough estimation
d) Random estimation

3) Analogous estimating is based on _____.
a) Historical data b) Random data
c) Assumptions only d) Risk analysis

4) Monte Carlo simulation is used for _____.
a) Cost reduction b) Risk and uncertainty analysis
c) Scheduling only d) Resource allocation

5) In the initial stage of the project the probability of completing the project is _____.
a) Zero b) Low
c) High d) Medium

6) Critical path is _____.
a) Shortest path b) Longest duration path
c) Random path d) Optional path

7) PERT is mainly used when _____.
a) Time is deterministic b) Cost is fixed
c) Time is uncertain d) No scheduling needed

8) Gantt chart represents _____.
a) Time schedule
b) Cost
c) Risk
d) Profit

9) Baseline in MS Project is used for _____.
a) Future planning
b) Deleting tasks
c) Comparing planned vs actual
d) Risk management

10) Project is a _____ endeavour.
a) Perpetual
b) Permanent
c) None of the above
d) Temporary

11) Which of the following is NOT a characteristic of a project?
a) Unique output
b) Defined timeline
c) Infinite duration
d) Specific objective

12) An activity which consumes no resources is called _____.
a) Zero Activity
b) Critical Activity
c) Dummy Activity
d) End Activity

13) With respect to PERT and CPM, slack time is _____.
a) Total project time
b) Idle resource
c) Delay time
d) Extra time available

14) Payback period method considers _____.
a) Cash recovery time
b) Profit only
c) Time value of money
d) Risk only

Seat No.	

Set **S**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Project Management (MECHMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Solve any Two questions from each section.
2) Figures to the right indicates full marks.
3) Assume suitable data if required.

Section – I

Q.2 **a)** Define a project. Explain the key characteristics of a project with suitable examples. How projects are classified? **07**

b) Describe the role and responsibilities of a project manager in successful **07**

Q.3 **a)** Describe Internal Rate of Return (IRR) and its significance in project. **07**

b) Explain Payback Period and Net Present Value (NPV) methods with advantages and limitations. **07**

Q.4 **a)** Explain Project Budgeting in detail. **07**

b) Describe bottom-up and analogous estimating methods. **07**

Section – II

Q.5 **a)** Explain the concept and importance of Work Breakdown Structure (WBS). **07**

b) A R & D project has a list of tasks to be performed whose time estimates are given in the Table as follows. **07**

- Construct a project network
- Perform forward and backward passes
- State the critical path
- Determine Project completion time

Activity	Predecessor	Duration
A	-	5
B	A	4
C	A	5
D	B	6
E	C	3
F	D,E	4

Q.6	**a)**	What is Project Controlling? Explain Project Control Process.	**07**
	b)	Describe Project Management Information System (PMIS) and its importance.	**07**
Q.7	**a)**	Explain features and applications of MS Project in project management.	**07**
	b)	Write a short note on Gantt chart.	**07**

Seat No.	

Set **P**

T.Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Project Management (MECHMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top on page.
3) Figures to the right indicate full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answers from the given options. 14

1) Project is a _____ endeavour.
a) Perpetual b) Permanent
c) None of the above d) Temporary

2) Which of the following is NOT a characteristic of a project?
a) Unique output b) Defined timeline
c) Infinite duration d) Specific objective

3) An activity which consumes no resources is called _____.
a) Zero Activity b) Critical Activity
c) Dummy Activity d) End Activity

4) With respect to PERT and CPM, slack time is _____.
a) Total project time b) Idle resource
c) Delay time d) Extra time available

5) Payback period method considers _____.
a) Cash recovery time b) Profit only
c) Time value of money d) Risk only

6) IRR is defined as _____.
a) Profit ratio b) Cost ratio
c) Risk factor d) Rate at which NPV = 0

7) Bottom-up estimating is _____.
a) Estimation from top level
b) Detailed estimation of individual tasks
c) Rough estimation
d) Random estimation

8) Analogous estimating is based on _____.
a) Historical data
b) Random data
c) Assumptions only
d) Risk analysis

9) Monte Carlo simulation is used for _____.
a) Cost reduction
b) Risk and uncertainty analysis
c) Scheduling only
d) Resource allocation

10) In the initial stage of the project the probability of completing the project is _____.
a) Zero
b) Low
c) High
d) Medium

11) Critical path is _____.
a) Shortest path
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12) PERT is mainly used when _____.
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13) Gantt chart represents _____.
a) Time schedule
b) Cost
c) Risk
d) Profit

14) Baseline in MS Project is used for _____.
a) Future planning
b) Deleting tasks
c) Comparing planned vs actual
d) Risk management

Seat No.		Set	P

T.Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Project Management (MECHMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Solve any Two questions from each section.
2) Figures to the right indicates full marks.
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Section – I

Q.2 **a)** Define a project. Explain the key characteristics of a project with suitable examples. How projects are classified? **07**

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Q.3 **a)** Describe Internal Rate of Return (IRR) and its significance in project. **07**

b) Explain Payback Period and Net Present Value (NPV) methods with advantages and limitations. **07**

Q.4 **a)** Explain Project Budgeting in detail. **07**

b) Describe bottom-up and analogous estimating methods. **07**

Section – II

Q.5 **a)** Explain the concept and importance of Work Breakdown Structure (WBS). **07**

b) A R & D project has a list of tasks to be performed whose time estimates are given in the Table as follows. **07**

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Activity	Predecessor	Duration
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Q.6	**a)**	What is Project Controlling? Explain Project Control Process.	**07**
	b)	Describe Project Management Information System (PMIS) and its importance.	**07**
Q.7	**a)**	Explain features and applications of MS Project in project management.	**07**
	b)	Write a short note on Gantt chart.	**07**

Seat No.		Set	Q

T.Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Project Management (MECHMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
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MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answers from the given options. 14

1) Analogous estimating is based on _____.
a) Historical data b) Random data
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b) Deleting tasks
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a) Perpetual
b) Permanent
c) None of the above
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a) Unique output
b) Defined timeline
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a) Cash recovery time
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a) Profit ratio
b) Cost ratio
c) Risk factor
d) Rate at which NPV = 0

14) Bottom-up estimating is _____.
a) Estimation from top level
b) Detailed estimation of individual tasks
c) Rough estimation
d) Random estimation

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Project Management (MECHMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Solve any Two questions from each section.
2) Figures to the right indicates full marks.
3) Assume suitable data if required.

Section – I

Q.2 **a)** Define a project. Explain the key characteristics of a project with suitable examples. How projects are classified? **07**

b) Describe the role and responsibilities of a project manager in successful **07**

Q.3 **a)** Describe Internal Rate of Return (IRR) and its significance in project. **07**

b) Explain Payback Period and Net Present Value (NPV) methods with advantages and limitations. **07**

Q.4 **a)** Explain Project Budgeting in detail. **07**

b) Describe bottom-up and analogous estimating methods. **07**

Section – II

Q.5 **a)** Explain the concept and importance of Work Breakdown Structure (WBS). **07**

b) A R & D project has a list of tasks to be performed whose time estimates are given in the Table as follows. **07**

- Construct a project network
- Perform forward and backward passes
- State the critical path
- Determine Project completion time

Activity	Predecessor	Duration
A	-	5
B	A	4
C	A	5
D	B	6
E	C	3
F	D,E	4

Q.6	**a)**	What is Project Controlling? Explain Project Control Process.	**07**
	b)	Describe Project Management Information System (PMIS) and its importance.	**07**
Q.7	**a)**	Explain features and applications of MS Project in project management.	**07**
	b)	Write a short note on Gantt chart.	**07**

Seat No.		Set	R

T.Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Project Management (MECHMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top on page.
3) Figures to the right indicate full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answers from the given options. 14

1) Critical path is _____.
a) Shortest path b) Longest duration path
c) Random path d) Optional path

2) PERT is mainly used when _____.
a) Time is deterministic b) Cost is fixed
c) Time is uncertain d) No scheduling needed

3) Gantt chart represents _____.
a) Time schedule b) Cost
c) Risk d) Profit

4) Baseline in MS Project is used for _____.
a) Future planning
b) Deleting tasks
c) Comparing planned vs actual
d) Risk management

5) Project is a _____ endeavour.
a) Perpetual b) Permanent
c) None of the above d) Temporary

6) Which of the following is NOT a characteristic of a project?
a) Unique output b) Defined timeline
c) Infinite duration d) Specific objective

7) An activity which consumes no resources is called _____.
a) Zero Activity b) Critical Activity
c) Dummy Activity d) End Activity

8) With respect to PERT and CPM, slack time is _____.
a) Total project time b) Idle resource
c) Delay time d) Extra time available

9) Payback period method considers _____.
a) Cash recovery time b) Profit only
c) Time value of money d) Risk only

10) IRR is defined as _____.
a) Profit ratio b) Cost ratio
c) Risk factor d) Rate at which NPV = 0

11) Bottom-up estimating is _____.
a) Estimation from top level
b) Detailed estimation of individual tasks
c) Rough estimation
d) Random estimation

12) Analogous estimating is based on _____.
a) Historical data b) Random data
c) Assumptions only d) Risk analysis

13) Monte Carlo simulation is used for _____.
a) Cost reduction b) Risk and uncertainty analysis
c) Scheduling only d) Resource allocation

14) In the initial stage of the project the probability of completing the project is _____.
a) Zero b) Low
c) High d) Medium

Seat No.		Set	R

T.Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Project Management (MECHMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Solve any Two questions from each section.
2) Figures to the right indicates full marks.
3) Assume suitable data if required.

Section – I

Q.2 **a)** Define a project. Explain the key characteristics of a project with suitable examples. How projects are classified? **07**

b) Describe the role and responsibilities of a project manager in successful **07**

Q.3 **a)** Describe Internal Rate of Return (IRR) and its significance in project. **07**

b) Explain Payback Period and Net Present Value (NPV) methods with advantages and limitations. **07**

Q.4 **a)** Explain Project Budgeting in detail. **07**

b) Describe bottom-up and analogous estimating methods. **07**

Section – II

Q.5 **a)** Explain the concept and importance of Work Breakdown Structure (WBS). **07**

b) A R & D project has a list of tasks to be performed whose time estimates are given in the Table as follows. **07**

- Construct a project network
- Perform forward and backward passes
- State the critical path
- Determine Project completion time

Activity	Predecessor	Duration
A	-	5
B	A	4
C	A	5
D	B	6
E	C	3
F	D,E	4

Q.6	**a)**	What is Project Controlling? Explain Project Control Process.	**07**
	b)	Describe Project Management Information System (PMIS) and its importance.	**07**
Q.7	**a)**	Explain features and applications of MS Project in project management.	**07**
	b)	Write a short note on Gantt chart.	**07**

Seat No.		Set	S

T.Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Project Management (MECHMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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3) Figures to the right indicate full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answers from the given options. 14

1) IRR is defined as _____.
a) Profit ratio b) Cost ratio
c) Risk factor d) Rate at which NPV = 0

2) Bottom-up estimating is _____.
a) Estimation from top level
b) Detailed estimation of individual tasks
c) Rough estimation
d) Random estimation

3) Analogous estimating is based on _____.
a) Historical data b) Random data
c) Assumptions only d) Risk analysis

4) Monte Carlo simulation is used for _____.
a) Cost reduction b) Risk and uncertainty analysis
c) Scheduling only d) Resource allocation

5) In the initial stage of the project the probability of completing the project is _____.
a) Zero b) Low
c) High d) Medium

6) Critical path is _____.
a) Shortest path b) Longest duration path
c) Random path d) Optional path

7) PERT is mainly used when _____.
a) Time is deterministic b) Cost is fixed
c) Time is uncertain d) No scheduling needed

8) Gantt chart represents _____.
a) Time schedule
b) Cost
c) Risk
d) Profit

9) Baseline in MS Project is used for _____.
a) Future planning
b) Deleting tasks
c) Comparing planned vs actual
d) Risk management

10) Project is a _____ endeavour.
a) Perpetual
b) Permanent
c) None of the above
d) Temporary

11) Which of the following is NOT a characteristic of a project?
a) Unique output
b) Defined timeline
c) Infinite duration
d) Specific objective

12) An activity which consumes no resources is called _____.
a) Zero Activity
b) Critical Activity
c) Dummy Activity
d) End Activity

13) With respect to PERT and CPM, slack time is _____.
a) Total project time
b) Idle resource
c) Delay time
d) Extra time available

14) Payback period method considers _____.
a) Cash recovery time
b) Profit only
c) Time value of money
d) Risk only

Seat No.		Set	S

T.Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Project Management (MECHMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Solve any Two questions from each section.
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3) Assume suitable data if required.

Section – I

Q.2 **a)** Define a project. Explain the key characteristics of a project with suitable examples. How projects are classified? **07**

b) Describe the role and responsibilities of a project manager in successful **07**

Q.3 **a)** Describe Internal Rate of Return (IRR) and its significance in project. **07**

b) Explain Payback Period and Net Present Value (NPV) methods with advantages and limitations. **07**

Q.4 **a)** Explain Project Budgeting in detail. **07**

b) Describe bottom-up and analogous estimating methods. **07**

Section – II

Q.5 **a)** Explain the concept and importance of Work Breakdown Structure (WBS). **07**

b) A R & D project has a list of tasks to be performed whose time estimates are given in the Table as follows. **07**

- Construct a project network
- Perform forward and backward passes
- State the critical path
- Determine Project completion time

Activity	Predecessor	Duration
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D	B	6
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F	D,E	4

Q.6	**a)**	What is Project Controlling? Explain Project Control Process.	**07**
	b)	Describe Project Management Information System (PMIS) and its importance.	**07**
Q.7	**a)**	Explain features and applications of MS Project in project management.	**07**
	b)	Write a short note on Gantt chart.	**07**

SLR-QH-648

Seat No.		Set	P

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Project Management (MECHMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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3) Figures to the right indicate full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answers from the given options. 14

1) Project is a _____ endeavour.
a) Perpetual b) Permanent
c) None of the above d) Temporary

2) Which of the following is NOT a characteristic of a project?
a) Unique output b) Defined timeline
c) Infinite duration d) Specific objective

3) An activity which consumes no resources is called _____.
a) Zero Activity b) Critical Activity
c) Dummy Activity d) End Activity

4) With respect to PERT and CPM, slack time is _____.
a) Total project time b) Idle resource
c) Delay time d) Extra time available

5) Payback period method considers _____.
a) Cash recovery time b) Profit only
c) Time value of money d) Risk only

6) IRR is defined as _____.
a) Profit ratio b) Cost ratio
c) Risk factor d) Rate at which NPV = 0

7) Bottom-up estimating is _____.
a) Estimation from top level
b) Detailed estimation of individual tasks
c) Rough estimation
d) Random estimation

8) Analogous estimating is based on _____.
a) Historical data
b) Random data
c) Assumptions only
d) Risk analysis

9) Monte Carlo simulation is used for _____.
a) Cost reduction
b) Risk and uncertainty analysis
c) Scheduling only
d) Resource allocation

10) In the initial stage of the project the probability of completing the project is _____.
a) Zero
b) Low
c) High
d) Medium

11) Critical path is _____.
a) Shortest path
b) Longest duration path
c) Random path
d) Optional path

12) PERT is mainly used when _____.
a) Time is deterministic
b) Cost is fixed
c) Time is uncertain
d) No scheduling needed

13) Gantt chart represents _____.
a) Time schedule
b) Cost
c) Risk
d) Profit

14) Baseline in MS Project is used for _____.
a) Future planning
b) Deleting tasks
c) Comparing planned vs actual
d) Risk management

Seat No.	

Set **P**

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Project Management (MECHMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Solve any Two questions from each section.
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3) Assume suitable data if required.

Section – I

Q.2 **a)** Define a project. Explain the key characteristics of a project with suitable examples. How projects are classified? **07**

b) Describe the role and responsibilities of a project manager in successful **07**

Q.3 **a)** Describe Internal Rate of Return (IRR) and its significance in project. **07**

b) Explain Payback Period and Net Present Value (NPV) methods with advantages and limitations. **07**

Q.4 **a)** Explain Project Budgeting in detail. **07**

b) Describe bottom-up and analogous estimating methods. **07**

Section – II

Q.5 **a)** Explain the concept and importance of Work Breakdown Structure (WBS). **07**

b) A R & D project has a list of tasks to be performed whose time estimates are given in the Table as follows. **07**

- Construct a project network
- Perform forward and backward passes
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Activity	Predecessor	Duration
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C	A	5
D	B	6
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F	D,E	4

Q.6	**a)**	What is Project Controlling? Explain Project Control Process.	**07**
	b)	Describe Project Management Information System (PMIS) and its importance.	**07**
Q.7	**a)**	Explain features and applications of MS Project in project management.	**07**
	b)	Write a short note on Gantt chart.	**07**

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Project Management (MECHMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
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4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answers from the given options. 14

1) Analogous estimating is based on _____.
a) Historical data b) Random data
c) Assumptions only d) Risk analysis

2) Monte Carlo simulation is used for _____.
a) Cost reduction b) Risk and uncertainty analysis
c) Scheduling only d) Resource allocation

3) In the initial stage of the project the probability of completing the project is _____.
a) Zero b) Low
c) High d) Medium

4) Critical path is _____.
a) Shortest path b) Longest duration path
c) Random path d) Optional path

5) PERT is mainly used when _____.
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9) Which of the following is NOT a characteristic of a project?
a) Unique output
b) Defined timeline
c) Infinite duration
d) Specific objective

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b) Critical Activity
c) Dummy Activity
d) End Activity

11) With respect to PERT and CPM, slack time is _____.
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b) Idle resource
c) Delay time
d) Extra time available

12) Payback period method considers _____.
a) Cash recovery time
b) Profit only
c) Time value of money
d) Risk only

13) IRR is defined as _____.
a) Profit ratio
b) Cost ratio
c) Risk factor
d) Rate at which NPV = 0

14) Bottom-up estimating is _____.
a) Estimation from top level
b) Detailed estimation of individual tasks
c) Rough estimation
d) Random estimation

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Project Management (MECHMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Solve any Two questions from each section.
2) Figures to the right indicates full marks.
3) Assume suitable data if required.

Section – I

Q.2 **a)** Define a project. Explain the key characteristics of a project with suitable examples. How projects are classified? **07**

b) Describe the role and responsibilities of a project manager in successful **07**

Q.3 **a)** Describe Internal Rate of Return (IRR) and its significance in project. **07**

b) Explain Payback Period and Net Present Value (NPV) methods with advantages and limitations. **07**

Q.4 **a)** Explain Project Budgeting in detail. **07**

b) Describe bottom-up and analogous estimating methods. **07**

Section – II

Q.5 **a)** Explain the concept and importance of Work Breakdown Structure (WBS). **07**

b) A R & D project has a list of tasks to be performed whose time estimates are given in the Table as follows. **07**

- Construct a project network
- Perform forward and backward passes
- State the critical path
- Determine Project completion time

Activity	Predecessor	Duration
A	-	5
B	A	4
C	A	5
D	B	6
E	C	3
F	D,E	4

Q.6	**a)**	What is Project Controlling? Explain Project Control Process.	**07**
	b)	Describe Project Management Information System (PMIS) and its importance.	**07**
Q.7	**a)**	Explain features and applications of MS Project in project management.	**07**
	b)	Write a short note on Gantt chart.	**07**

SLR-QH-648

Seat No.		Set	R

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Project Management (MECHMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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3) Figures to the right indicate full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answers from the given options. 14

1) Critical path is _____.
a) Shortest path b) Longest duration path
c) Random path d) Optional path

2) PERT is mainly used when _____.
a) Time is deterministic b) Cost is fixed
c) Time is uncertain d) No scheduling needed

3) Gantt chart represents _____.
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c) Risk d) Profit

4) Baseline in MS Project is used for _____.
a) Future planning
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5) Project is a _____ endeavour.
a) Perpetual b) Permanent
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6) Which of the following is NOT a characteristic of a project?
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c) Infinite duration d) Specific objective

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a) Historical data b) Random data
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13) Monte Carlo simulation is used for _____.
a) Cost reduction b) Risk and uncertainty analysis
c) Scheduling only d) Resource allocation

14) In the initial stage of the project the probability of completing the project is _____.
a) Zero b) Low
c) High d) Medium

Seat No.	

Set **R**

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Project Management (MECHMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Solve any Two questions from each section.
2) Figures to the right indicates full marks.
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Section – I

Q.2 **a)** Define a project. Explain the key characteristics of a project with suitable examples. How projects are classified? **07**

b) Describe the role and responsibilities of a project manager in successful **07**

Q.3 **a)** Describe Internal Rate of Return (IRR) and its significance in project. **07**

b) Explain Payback Period and Net Present Value (NPV) methods with advantages and limitations. **07**

Q.4 **a)** Explain Project Budgeting in detail. **07**

b) Describe bottom-up and analogous estimating methods. **07**

Section – II

Q.5 **a)** Explain the concept and importance of Work Breakdown Structure (WBS). **07**

b) A R & D project has a list of tasks to be performed whose time estimates are given in the Table as follows. **07**

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Activity	Predecessor	Duration
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Q.6	**a)**	What is Project Controlling? Explain Project Control Process.	**07**
	b)	Describe Project Management Information System (PMIS) and its importance.	**07**
Q.7	**a)**	Explain features and applications of MS Project in project management.	**07**
	b)	Write a short note on Gantt chart.	**07**

Seat No.		Set	S

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Project Management (MECHMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answers from the given options. 14

1) IRR is defined as _____.
a) Profit ratio b) Cost ratio
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c) Delay time
d) Extra time available

14) Payback period method considers _____.
a) Cash recovery time
b) Profit only
c) Time value of money
d) Risk only

Seat No.	

Set **S**

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Project Management (MECHMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Solve any Two questions from each section.
2) Figures to the right indicates full marks.
3) Assume suitable data if required.

Section – I

Q.2 **a)** Define a project. Explain the key characteristics of a project with suitable examples. How projects are classified? **07**

b) Describe the role and responsibilities of a project manager in successful **07**

Q.3 **a)** Describe Internal Rate of Return (IRR) and its significance in project. **07**

b) Explain Payback Period and Net Present Value (NPV) methods with advantages and limitations. **07**

Q.4 **a)** Explain Project Budgeting in detail. **07**

b) Describe bottom-up and analogous estimating methods. **07**

Section – II

Q.5 **a)** Explain the concept and importance of Work Breakdown Structure (WBS). **07**

b) A R & D project has a list of tasks to be performed whose time estimates are given in the Table as follows. **07**

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Activity	Predecessor	Duration
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D	B	6
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F	D,E	4

Q.6	**a)**	What is Project Controlling? Explain Project Control Process.	**07**
	b)	Describe Project Management Information System (PMIS) and its importance.	**07**
Q.7	**a)**	Explain features and applications of MS Project in project management.	**07**
	b)	Write a short note on Gantt chart.	**07**

SLR-QH-648

Seat No.		Set	P

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Project Management (MECHMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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3) Figures to the right indicate full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answers from the given options. 14

1) Project is a _____ endeavour.
a) Perpetual b) Permanent
c) None of the above d) Temporary

2) Which of the following is NOT a characteristic of a project?
a) Unique output b) Defined timeline
c) Infinite duration d) Specific objective

3) An activity which consumes no resources is called _____.
a) Zero Activity b) Critical Activity
c) Dummy Activity d) End Activity

4) With respect to PERT and CPM, slack time is _____.
a) Total project time b) Idle resource
c) Delay time d) Extra time available

5) Payback period method considers _____.
a) Cash recovery time b) Profit only
c) Time value of money d) Risk only

6) IRR is defined as _____.
a) Profit ratio b) Cost ratio
c) Risk factor d) Rate at which NPV = 0

7) Bottom-up estimating is _____.
a) Estimation from top level
b) Detailed estimation of individual tasks
c) Rough estimation
d) Random estimation

8) Analogous estimating is based on _____.
a) Historical data
b) Random data
c) Assumptions only
d) Risk analysis

9) Monte Carlo simulation is used for _____.
a) Cost reduction
b) Risk and uncertainty analysis
c) Scheduling only
d) Resource allocation

10) In the initial stage of the project the probability of completing the project is _____.
a) Zero
b) Low
c) High
d) Medium

11) Critical path is _____.
a) Shortest path
b) Longest duration path
c) Random path
d) Optional path

12) PERT is mainly used when _____.
a) Time is deterministic
b) Cost is fixed
c) Time is uncertain
d) No scheduling needed

13) Gantt chart represents _____.
a) Time schedule
b) Cost
c) Risk
d) Profit

14) Baseline in MS Project is used for _____.
a) Future planning
b) Deleting tasks
c) Comparing planned vs actual
d) Risk management

Seat No.		Set	P

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Project Management (MECHMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Solve any Two questions from each section.
2) Figures to the right indicates full marks.
3) Assume suitable data if required.

Section – I

Q.2 **a)** Define a project. Explain the key characteristics of a project with suitable examples. How projects are classified? **07**

b) Describe the role and responsibilities of a project manager in successful **07**

Q.3 **a)** Describe Internal Rate of Return (IRR) and its significance in project. **07**

b) Explain Payback Period and Net Present Value (NPV) methods with advantages and limitations. **07**

Q.4 **a)** Explain Project Budgeting in detail. **07**

b) Describe bottom-up and analogous estimating methods. **07**

Section – II

Q.5 **a)** Explain the concept and importance of Work Breakdown Structure (WBS). **07**

b) A R & D project has a list of tasks to be performed whose time estimates are given in the Table as follows. **07**

- Construct a project network
- Perform forward and backward passes
- State the critical path
- Determine Project completion time

Activity	Predecessor	Duration
A	-	5
B	A	4
C	A	5
D	B	6
E	C	3
F	D,E	4

Q.6	**a)**	What is Project Controlling? Explain Project Control Process.	**07**
	b)	Describe Project Management Information System (PMIS) and its importance.	**07**
Q.7	**a)**	Explain features and applications of MS Project in project management.	**07**
	b)	Write a short note on Gantt chart.	**07**

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Project Management (MECHMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top on page.
3) Figures to the right indicate full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answers from the given options. 14

1) Analogous estimating is based on _____.
a) Historical data b) Random data
c) Assumptions only d) Risk analysis

2) Monte Carlo simulation is used for _____.
a) Cost reduction b) Risk and uncertainty analysis
c) Scheduling only d) Resource allocation

3) In the initial stage of the project the probability of completing the project is _____.
a) Zero b) Low
c) High d) Medium

4) Critical path is _____.
a) Shortest path b) Longest duration path
c) Random path d) Optional path

5) PERT is mainly used when _____.
a) Time is deterministic b) Cost is fixed
c) Time is uncertain d) No scheduling needed

6) Gantt chart represents _____.
a) Time schedule b) Cost
c) Risk d) Profit

7) Baseline in MS Project is used for _____.
a) Future planning
b) Deleting tasks
c) Comparing planned vs actual
d) Risk management

8) Project is a _____ endeavour.
a) Perpetual
b) Permanent
c) None of the above
d) Temporary

9) Which of the following is NOT a characteristic of a project?
a) Unique output
b) Defined timeline
c) Infinite duration
d) Specific objective

10) An activity which consumes no resources is called _____.
a) Zero Activity
b) Critical Activity
c) Dummy Activity
d) End Activity

11) With respect to PERT and CPM, slack time is _____.
a) Total project time
b) Idle resource
c) Delay time
d) Extra time available

12) Payback period method considers _____.
a) Cash recovery time
b) Profit only
c) Time value of money
d) Risk only

13) IRR is defined as _____.
a) Profit ratio
b) Cost ratio
c) Risk factor
d) Rate at which NPV = 0

14) Bottom-up estimating is _____.
a) Estimation from top level
b) Detailed estimation of individual tasks
c) Rough estimation
d) Random estimation

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Project Management (MECHMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Solve any Two questions from each section.
2) Figures to the right indicates full marks.
3) Assume suitable data if required.

Section – I

Q.2 **a)** Define a project. Explain the key characteristics of a project with suitable examples. How projects are classified? **07**

b) Describe the role and responsibilities of a project manager in successful **07**

Q.3 **a)** Describe Internal Rate of Return (IRR) and its significance in project. **07**

b) Explain Payback Period and Net Present Value (NPV) methods with advantages and limitations. **07**

Q.4 **a)** Explain Project Budgeting in detail. **07**

b) Describe bottom-up and analogous estimating methods. **07**

Section – II

Q.5 **a)** Explain the concept and importance of Work Breakdown Structure (WBS). **07**

b) A R & D project has a list of tasks to be performed whose time estimates are given in the Table as follows. **07**

- Construct a project network
- Perform forward and backward passes
- State the critical path
- Determine Project completion time

Activity	Predecessor	Duration
A	-	5
B	A	4
C	A	5
D	B	6
E	C	3
F	D,E	4

Q.6	**a)**	What is Project Controlling? Explain Project Control Process.	**07**
	b)	Describe Project Management Information System (PMIS) and its importance.	**07**
Q.7	**a)**	Explain features and applications of MS Project in project management.	**07**
	b)	Write a short note on Gantt chart.	**07**

Seat No.	

Set R

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Project Management (MECHMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top on page.
3) Figures to the right indicate full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answers from the given options. 14

1) Critical path is _____.
a) Shortest path b) Longest duration path
c) Random path d) Optional path

2) PERT is mainly used when _____.
a) Time is deterministic b) Cost is fixed
c) Time is uncertain d) No scheduling needed

3) Gantt chart represents _____.
a) Time schedule b) Cost
c) Risk d) Profit

4) Baseline in MS Project is used for _____.
a) Future planning
b) Deleting tasks
c) Comparing planned vs actual
d) Risk management

5) Project is a _____ endeavour.
a) Perpetual b) Permanent
c) None of the above d) Temporary

6) Which of the following is NOT a characteristic of a project?
a) Unique output b) Defined timeline
c) Infinite duration d) Specific objective

7) An activity which consumes no resources is called _____.
a) Zero Activity b) Critical Activity
c) Dummy Activity d) End Activity

8) With respect to PERT and CPM, slack time is _____.
a) Total project time b) Idle resource
c) Delay time d) Extra time available

9) Payback period method considers _____.
a) Cash recovery time b) Profit only
c) Time value of money d) Risk only

10) IRR is defined as _____.
a) Profit ratio b) Cost ratio
c) Risk factor d) Rate at which NPV = 0

11) Bottom-up estimating is _____.
a) Estimation from top level
b) Detailed estimation of individual tasks
c) Rough estimation
d) Random estimation

12) Analogous estimating is based on _____.
a) Historical data b) Random data
c) Assumptions only d) Risk analysis

13) Monte Carlo simulation is used for _____.
a) Cost reduction b) Risk and uncertainty analysis
c) Scheduling only d) Resource allocation

14) In the initial stage of the project the probability of completing the project is _____.
a) Zero b) Low
c) High d) Medium

Seat No.	

Set **R**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Project Management (MECHMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Solve any Two questions from each section.
2) Figures to the right indicates full marks.
3) Assume suitable data if required.

Section – I

Q.2 **a)** Define a project. Explain the key characteristics of a project with suitable examples. How projects are classified? **07**

b) Describe the role and responsibilities of a project manager in successful **07**

Q.3 **a)** Describe Internal Rate of Return (IRR) and its significance in project. **07**

b) Explain Payback Period and Net Present Value (NPV) methods with advantages and limitations. **07**

Q.4 **a)** Explain Project Budgeting in detail. **07**

b) Describe bottom-up and analogous estimating methods. **07**

Section – II

Q.5 **a)** Explain the concept and importance of Work Breakdown Structure (WBS). **07**

b) A R & D project has a list of tasks to be performed whose time estimates are given in the Table as follows. **07**

- Construct a project network
- Perform forward and backward passes
- State the critical path
- Determine Project completion time

Activity	Predecessor	Duration
A	-	5
B	A	4
C	A	5
D	B	6
E	C	3
F	D,E	4

Q.6	**a)**	What is Project Controlling? Explain Project Control Process.	**07**
	b)	Describe Project Management Information System (PMIS) and its importance.	**07**
Q.7	**a)**	Explain features and applications of MS Project in project management.	**07**
	b)	Write a short note on Gantt chart.	**07**

Seat No.		Set	S

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Project Management (MECHMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top on page.
3) Figures to the right indicate full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answers from the given options. 14

1) IRR is defined as _____.
a) Profit ratio b) Cost ratio
c) Risk factor d) Rate at which NPV = 0

2) Bottom-up estimating is _____.
a) Estimation from top level
b) Detailed estimation of individual tasks
c) Rough estimation
d) Random estimation

3) Analogous estimating is based on _____.
a) Historical data b) Random data
c) Assumptions only d) Risk analysis

4) Monte Carlo simulation is used for _____.
a) Cost reduction b) Risk and uncertainty analysis
c) Scheduling only d) Resource allocation

5) In the initial stage of the project the probability of completing the project is _____.
a) Zero b) Low
c) High d) Medium

6) Critical path is _____.
a) Shortest path b) Longest duration path
c) Random path d) Optional path

7) PERT is mainly used when _____.
a) Time is deterministic b) Cost is fixed
c) Time is uncertain d) No scheduling needed

8) Gantt chart represents _____.
a) Time schedule
b) Cost
c) Risk
d) Profit

9) Baseline in MS Project is used for _____.
a) Future planning
b) Deleting tasks
c) Comparing planned vs actual
d) Risk management

10) Project is a _____ endeavour.
a) Perpetual
b) Permanent
c) None of the above
d) Temporary

11) Which of the following is NOT a characteristic of a project?
a) Unique output
b) Defined timeline
c) Infinite duration
d) Specific objective

12) An activity which consumes no resources is called _____.
a) Zero Activity
b) Critical Activity
c) Dummy Activity
d) End Activity

13) With respect to PERT and CPM, slack time is _____.
a) Total project time
b) Idle resource
c) Delay time
d) Extra time available

14) Payback period method considers _____.
a) Cash recovery time
b) Profit only
c) Time value of money
d) Risk only

Seat No.		Set	S

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Project Management (MECHMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Solve any Two questions from each section.
2) Figures to the right indicates full marks.
3) Assume suitable data if required.

Section – I

Q.2 **a)** Define a project. Explain the key characteristics of a project with suitable examples. How projects are classified? **07**

b) Describe the role and responsibilities of a project manager in successful **07**

Q.3 **a)** Describe Internal Rate of Return (IRR) and its significance in project. **07**

b) Explain Payback Period and Net Present Value (NPV) methods with advantages and limitations. **07**

Q.4 **a)** Explain Project Budgeting in detail. **07**

b) Describe bottom-up and analogous estimating methods. **07**

Section – II

Q.5 **a)** Explain the concept and importance of Work Breakdown Structure (WBS). **07**

b) A R & D project has a list of tasks to be performed whose time estimates are given in the Table as follows. **07**

- Construct a project network
- Perform forward and backward passes
- State the critical path
- Determine Project completion time

Activity	Predecessor	Duration
A	-	5
B	A	4
C	A	5
D	B	6
E	C	3
F	D,E	4

Q.6	**a)**	What is Project Controlling? Explain Project Control Process.	**07**
	b)	Describe Project Management Information System (PMIS) and its importance.	**07**
Q.7	**a)**	Explain features and applications of MS Project in project management.	**07**
	b)	Write a short note on Gantt chart.	**07**

SLR-QH-649

Seat No.	

Set P

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Advanced Microcontrollers (ENTMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 AM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) ARM processors use how many general purpose registers?
a) 8 b) 13
c) 16 d) 32

2) Which header file is used in Embedded C?
a) stdio.h b) reg51.h
c) math.h d) string.h

3) DC motor converts?
a) Electrical to mechanical b) Mechanical to electrical
c) Heat to motion d) None

4) LM35 output is proportional to?
a) Current b) Voltage
c) Resistance d) Power

5) Digital camera uses embedded system for?
a) Image processing b) Gaming
c) Networking d) None

6) Common anode display means?
a) Common positive b) Common negative
c) Floating d) Grounded

7) Total digital I/O pins in UNO?
a) 10 b) 12
c) 14 d) 16

8) Bootloader is used for?
a) Programming b) Power supply
c) Reset d) Clock

9) Which pin is used for PWM?
a) Analog
b) Digital
c) PWM marked pins
d) Vcc

10) setup() function runs?
a) Continuously
b) Once
c) Twice
d) Never

11) PIR sensor detects?
a) Heat motion
b) Sound
c) Light
d) Gas

12) MQ sensors are?
a) Gas sensors
b) Light sensors
c) Pressure sensors
d) Motion sensors

13) Capacitive sensor senses?
a) Pressure
b) Touch
c) Sound
d) Heat

14) Bluetooth HC-05 uses?
a) I2C
b) SPI
c) UART
d) USB

Seat No.	

Set **P**

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Advanced Microcontrollers (ENTMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 AM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

SECTION – I

Q.2 Attempt the following. (Any Four) **16**

a) Explain the fundamentals and key features of ARM processors. Discuss why ARM architecture is preferred in embedded systems.

b) Analyze the ARM register organization and illustrate the role of CPSR in processor operation with suitable examples.

c) Examine the ARM pipeline mechanism and compare it with non-pipelined execution in terms of performance.

d) Explain the basic structure of an Embedded C program for LPC2148. Describe the role of header files, special function registers, GPIO configuration, and delay routines with a suitable example.

e) Develop an Embedded C program to interface LEDs and push buttons with LPC2148 such that the LED glows based on button status. Illustrate the pin connections and explain the logic used.

Q.3 Attempt the following. (Any Two) **12**

a) Describe the architecture of the ARM7TDMI core with the help of a neat block diagram. Explain the function of each major block.

b) Implement an Embedded C program to interface a DC motor or stepper motor with LPC2148. Evaluate the advantages of stepper motor control over DC motor control in precision applications.

c) Design an interfacing circuit for a 7-segment display with LPC2148 and demonstrate how numerical digits (0-9) can be displayed using Embedded C programming.

SECTION – II

Q.4 Attempt the following. (Any Four) **16**

a) Explain the introduction and key features of Arduino. Describe how Arduino differs from traditional microcontroller development boards.

b) Identify and classify the pins of Arduino UNO.
Demonstrate the use of digital, analog, power, and communication pins with suitable examples.

c) Develop an Arduino program to control an LED or buzzer. Evaluate the importance of Arduino IDE and libraries in rapid prototyping.

d) Install and configure the Arduino IDE on a computer/laptop. Analyze common errors during installation and suggest suitable troubleshooting methods.

e) Illustrate the interfacing of a Bluetooth module with Arduino and describe how wireless data communication is established for device control.

Q.5 Attempt the following. (Any Two) **12**

a) Illustrate the architecture of Arduino UNO with a neat block diagram. Explain the role of microcontroller, clock circuit, power supply, and communication interfaces.

b) Design and develop an Arduino-based security system using PIR and IR sensors, and evaluate its effectiveness in motion detection.

c) Design and implement a smart agriculture monitoring system using LDR and Soil Moisture Sensor interfaced with Arduino and justify the choice of sensors.

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Advanced Microcontrollers (ENTMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 AM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) Bootloader is used for?
a) Programming b) Power supply
c) Reset d) Clock

2) Which pin is used for PWM?
a) Analog b) Digital
c) PWM marked pins d) Vcc

3) setup() function runs?
a) Continuously b) Once
c) Twice d) Never

4) PIR sensor detects?
a) Heat motion b) Sound
c) Light d) Gas

5) MQ sensors are?
a) Gas sensors b) Light sensors
c) Pressure sensors d) Motion sensors

6) Capacitive sensor senses?
a) Pressure b) Touch
c) Sound d) Heat

7) Bluetooth HC-05 uses?
a) I2C b) SPI
c) UART d) USB

8) ARM processors use how many general purpose registers?
a) 8 b) 13
c) 16 d) 32

9) Which header file is used in Embedded C?
a) stdio.h b) reg51.h
c) math.h d) string.h

10) DC motor converts?
a) Electrical to mechanical b) Mechanical to electrical
c) Heat to motion d) None

11) LM35 output is proportional to?
a) Current b) Voltage
c) Resistance d) Power

12) Digital camera uses embedded system for?
a) Image processing b) Gaming
c) Networking d) None

13) Common anode display means?
a) Common positive b) Common negative
c) Floating d) Grounded

14) Total digital I/O pins in UNO?
a) 10 b) 12
c) 14 d) 16

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Advanced Microcontrollers (ENTMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 AM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

SECTION – I

Q.2 Attempt the following. (Any Four) **16**

a) Explain the fundamentals and key features of ARM processors. Discuss why ARM architecture is preferred in embedded systems.

b) Analyze the ARM register organization and illustrate the role of CPSR in processor operation with suitable examples.

c) Examine the ARM pipeline mechanism and compare it with non-pipelined execution in terms of performance.

d) Explain the basic structure of an Embedded C program for LPC2148. Describe the role of header files, special function registers, GPIO configuration, and delay routines with a suitable example.

e) Develop an Embedded C program to interface LEDs and push buttons with LPC2148 such that the LED glows based on button status. Illustrate the pin connections and explain the logic used.

Q.3 Attempt the following. (Any Two) **12**

a) Describe the architecture of the ARM7TDMI core with the help of a neat block diagram. Explain the function of each major block.

b) Implement an Embedded C program to interface a DC motor or stepper motor with LPC2148. Evaluate the advantages of stepper motor control over DC motor control in precision applications.

c) Design an interfacing circuit for a 7-segment display with LPC2148 and demonstrate how numerical digits (0-9) can be displayed using Embedded C programming.

SECTION – II

Q.4 Attempt the following. (Any Four) **16**

a) Explain the introduction and key features of Arduino. Describe how Arduino differs from traditional microcontroller development boards.

b) Identify and classify the pins of Arduino UNO.
Demonstrate the use of digital, analog, power, and communication pins with suitable examples.

c) Develop an Arduino program to control an LED or buzzer. Evaluate the importance of Arduino IDE and libraries in rapid prototyping.

d) Install and configure the Arduino IDE on a computer/laptop. Analyze common errors during installation and suggest suitable troubleshooting methods.

e) Illustrate the interfacing of a Bluetooth module with Arduino and describe how wireless data communication is established for device control.

Q.5 Attempt the following. (Any Two) **12**

a) Illustrate the architecture of Arduino UNO with a neat block diagram. Explain the role of microcontroller, clock circuit, power supply, and communication interfaces.

b) Design and develop an Arduino-based security system using PIR and IR sensors, and evaluate its effectiveness in motion detection.

c) Design and implement a smart agriculture monitoring system using LDR and Soil Moisture Sensor interfaced with Arduino and justify the choice of sensors.

Seat No.	

Set **R**

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Advanced Microcontrollers (ENTMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 AM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) PIR sensor detects?
a) Heat motion b) Sound
c) Light d) Gas

2) MQ sensors are?
a) Gas sensors b) Light sensors
c) Pressure sensors d) Motion sensors

3) Capacitive sensor senses?
a) Pressure b) Touch
c) Sound d) Heat

4) Bluetooth HC-05 uses?
a) I2C b) SPI
c) UART d) USB

5) ARM processors use how many general purpose registers?
a) 8 b) 13
c) 16 d) 32

6) Which header file is used in Embedded C?
a) stdio.h b) reg51.h
c) math.h d) string.h

7) DC motor converts?
a) Electrical to mechanical b) Mechanical to electrical
c) Heat to motion d) None

8) LM35 output is proportional to?
a) Current b) Voltage
c) Resistance d) Power

9) Digital camera uses embedded system for?
- a) Image processing
- b) Gaming
- c) Networking
- d) None

10) Common anode display means?
- a) Common positive
- b) Common negative
- c) Floating
- d) Grounded

11) Total digital I/O pins in UNO?
- a) 10
- b) 12
- c) 14
- d) 16

12) Bootloader is used for?
- a) Programming
- b) Power supply
- c) Reset
- d) Clock

13) Which pin is used for PWM?
- a) Analog
- b) Digital
- c) PWM marked pins
- d) Vcc

14) setup() function runs?
- a) Continuously
- b) Once
- c) Twice
- d) Never

Seat No.	

Set **R**

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Advanced Microcontrollers (ENTMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 AM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

SECTION – I

Q.2 Attempt the following. (Any Four) **16**

a) Explain the fundamentals and key features of ARM processors. Discuss why ARM architecture is preferred in embedded systems.

b) Analyze the ARM register organization and illustrate the role of CPSR in processor operation with suitable examples.

c) Examine the ARM pipeline mechanism and compare it with non-pipelined execution in terms of performance.

d) Explain the basic structure of an Embedded C program for LPC2148. Describe the role of header files, special function registers, GPIO configuration, and delay routines with a suitable example.

e) Develop an Embedded C program to interface LEDs and push buttons with LPC2148 such that the LED glows based on button status. Illustrate the pin connections and explain the logic used.

Q.3 Attempt the following. (Any Two) **12**

a) Describe the architecture of the ARM7TDMI core with the help of a neat block diagram. Explain the function of each major block.

b) Implement an Embedded C program to interface a DC motor or stepper motor with LPC2148. Evaluate the advantages of stepper motor control over DC motor control in precision applications.

c) Design an interfacing circuit for a 7-segment display with LPC2148 and demonstrate how numerical digits (0-9) can be displayed using Embedded C programming.

SECTION – II

Q.4 Attempt the following. (Any Four) **16**

a) Explain the introduction and key features of Arduino. Describe how Arduino differs from traditional microcontroller development boards.

b) Identify and classify the pins of Arduino UNO.
Demonstrate the use of digital, analog, power, and communication pins with suitable examples.

c) Develop an Arduino program to control an LED or buzzer. Evaluate the importance of Arduino IDE and libraries in rapid prototyping.

d) Install and configure the Arduino IDE on a computer/laptop. Analyze common errors during installation and suggest suitable troubleshooting methods.

e) Illustrate the interfacing of a Bluetooth module with Arduino and describe how wireless data communication is established for device control.

Q.5 Attempt the following. (Any Two) **12**

a) Illustrate the architecture of Arduino UNO with a neat block diagram. Explain the role of microcontroller, clock circuit, power supply, and communication interfaces.

b) Design and develop an Arduino-based security system using PIR and IR sensors, and evaluate its effectiveness in motion detection.

c) Design and implement a smart agriculture monitoring system using LDR and Soil Moisture Sensor interfaced with Arduino and justify the choice of sensors.

Seat No.	

Set **S**

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Advanced Microcontrollers (ENTMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 AM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) Common anode display means?
a) Common positive b) Common negative
c) Floating d) Grounded

2) Total digital I/O pins in UNO?
a) 10 b) 12
c) 14 d) 16

3) Bootloader is used for?
a) Programming b) Power supply
c) Reset d) Clock

4) Which pin is used for PWM?
a) Analog b) Digital
c) PWM marked pins d) Vcc

5) setup() function runs?
a) Continuously b) Once
c) Twice d) Never

6) PIR sensor detects?
a) Heat motion b) Sound
c) Light d) Gas

7) MQ sensors are?
a) Gas sensors b) Light sensors
c) Pressure sensors d) Motion sensors

8) Capacitive sensor senses?
a) Pressure b) Touch
c) Sound d) Heat

9) Bluetooth HC-05 uses?
a) I2C b) SPI
c) UART d) USB

10) ARM processors use how many general purpose registers?
a) 8 b) 13
c) 16 d) 32

11) Which header file is used in Embedded C?
a) stdio.h b) reg51.h
c) math.h d) string.h

12) DC motor converts?
a) Electrical to mechanical b) Mechanical to electrical
c) Heat to motion d) None

13) LM35 output is proportional to?
a) Current b) Voltage
c) Resistance d) Power

14) Digital camera uses embedded system for?
a) Image processing b) Gaming
c) Networking d) None

Seat No.	

Set | S

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Advanced Microcontrollers (ENTMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 AM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

SECTION – I

Q.2 Attempt the following. (Any Four) **16**

a) Explain the fundamentals and key features of ARM processors. Discuss why ARM architecture is preferred in embedded systems.

b) Analyze the ARM register organization and illustrate the role of CPSR in processor operation with suitable examples.

c) Examine the ARM pipeline mechanism and compare it with non-pipelined execution in terms of performance.

d) Explain the basic structure of an Embedded C program for LPC2148. Describe the role of header files, special function registers, GPIO configuration, and delay routines with a suitable example.

e) Develop an Embedded C program to interface LEDs and push buttons with LPC2148 such that the LED glows based on button status. Illustrate the pin connections and explain the logic used.

Q.3 Attempt the following. (Any Two) **12**

a) Describe the architecture of the ARM7TDMI core with the help of a neat block diagram. Explain the function of each major block.

b) Implement an Embedded C program to interface a DC motor or stepper motor with LPC2148. Evaluate the advantages of stepper motor control over DC motor control in precision applications.

c) Design an interfacing circuit for a 7-segment display with LPC2148 and demonstrate how numerical digits (0-9) can be displayed using Embedded C programming.

SECTION – II

Q.4 Attempt the following. (Any Four) **16**

a) Explain the introduction and key features of Arduino. Describe how Arduino differs from traditional microcontroller development boards.

b) Identify and classify the pins of Arduino UNO.
Demonstrate the use of digital, analog, power, and communication pins with suitable examples.

c) Develop an Arduino program to control an LED or buzzer. Evaluate the importance of Arduino IDE and libraries in rapid prototyping.

d) Install and configure the Arduino IDE on a computer/laptop. Analyze common errors during installation and suggest suitable troubleshooting methods.

e) Illustrate the interfacing of a Bluetooth module with Arduino and describe how wireless data communication is established for device control.

Q.5 Attempt the following. (Any Two) **12**

a) Illustrate the architecture of Arduino UNO with a neat block diagram. Explain the role of microcontroller, clock circuit, power supply, and communication interfaces.

b) Design and develop an Arduino-based security system using PIR and IR sensors, and evaluate its effectiveness in motion detection.

c) Design and implement a smart agriculture monitoring system using LDR and Soil Moisture Sensor interfaced with Arduino and justify the choice of sensors.

SLR-QH-649

Seat No.	

Set P

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Advanced Microcontrollers (ENTMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 AM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) ARM processors use how many general purpose registers?
a) 8 b) 13
c) 16 d) 32

2) Which header file is used in Embedded C?
a) stdio.h b) reg51.h
c) math.h d) string.h

3) DC motor converts?
a) Electrical to mechanical b) Mechanical to electrical
c) Heat to motion d) None

4) LM35 output is proportional to?
a) Current b) Voltage
c) Resistance d) Power

5) Digital camera uses embedded system for?
a) Image processing b) Gaming
c) Networking d) None

6) Common anode display means?
a) Common positive b) Common negative
c) Floating d) Grounded

7) Total digital I/O pins in UNO?
a) 10 b) 12
c) 14 d) 16

8) Bootloader is used for?
a) Programming b) Power supply
c) Reset d) Clock

9) Which pin is used for PWM?
a) Analog
b) Digital
c) PWM marked pins
d) Vcc

10) setup() function runs?
a) Continuously
b) Once
c) Twice
d) Never

11) PIR sensor detects?
a) Heat motion
b) Sound
c) Light
d) Gas

12) MQ sensors are?
a) Gas sensors
b) Light sensors
c) Pressure sensors
d) Motion sensors

13) Capacitive sensor senses?
a) Pressure
b) Touch
c) Sound
d) Heat

14) Bluetooth HC-05 uses?
a) I2C
b) SPI
c) UART
d) USB

Seat No.	

Set P

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Advanced Microcontrollers (ENTMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 AM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

SECTION – I

Q.2 Attempt the following. (Any Four) **16**

a) Explain the fundamentals and key features of ARM processors. Discuss why ARM architecture is preferred in embedded systems.

b) Analyze the ARM register organization and illustrate the role of CPSR in processor operation with suitable examples.

c) Examine the ARM pipeline mechanism and compare it with non-pipelined execution in terms of performance.

d) Explain the basic structure of an Embedded C program for LPC2148. Describe the role of header files, special function registers, GPIO configuration, and delay routines with a suitable example.

e) Develop an Embedded C program to interface LEDs and push buttons with LPC2148 such that the LED glows based on button status. Illustrate the pin connections and explain the logic used.

Q.3 Attempt the following. (Any Two) **12**

a) Describe the architecture of the ARM7TDMI core with the help of a neat block diagram. Explain the function of each major block.

b) Implement an Embedded C program to interface a DC motor or stepper motor with LPC2148. Evaluate the advantages of stepper motor control over DC motor control in precision applications.

c) Design an interfacing circuit for a 7-segment display with LPC2148 and demonstrate how numerical digits (0-9) can be displayed using Embedded C programming.

SECTION – II

Q.4 Attempt the following. (Any Four) **16**

a) Explain the introduction and key features of Arduino. Describe how Arduino differs from traditional microcontroller development boards.

b) Identify and classify the pins of Arduino UNO.
Demonstrate the use of digital, analog, power, and communication pins with suitable examples.

c) Develop an Arduino program to control an LED or buzzer. Evaluate the importance of Arduino IDE and libraries in rapid prototyping.

d) Install and configure the Arduino IDE on a computer/laptop. Analyze common errors during installation and suggest suitable troubleshooting methods.

e) Illustrate the interfacing of a Bluetooth module with Arduino and describe how wireless data communication is established for device control.

Q.5 Attempt the following. (Any Two) **12**

a) Illustrate the architecture of Arduino UNO with a neat block diagram. Explain the role of microcontroller, clock circuit, power supply, and communication interfaces.

b) Design and develop an Arduino-based security system using PIR and IR sensors, and evaluate its effectiveness in motion detection.

c) Design and implement a smart agriculture monitoring system using LDR and Soil Moisture Sensor interfaced with Arduino and justify the choice of sensors.

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Advanced Microcontrollers (ENTMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 AM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. **14**

1) Bootloader is used for?
a) Programming b) Power supply
c) Reset d) Clock

2) Which pin is used for PWM?
a) Analog b) Digital
c) PWM marked pins d) Vcc

3) setup() function runs?
a) Continuously b) Once
c) Twice d) Never

4) PIR sensor detects?
a) Heat motion b) Sound
c) Light d) Gas

5) MQ sensors are?
a) Gas sensors b) Light sensors
c) Pressure sensors d) Motion sensors

6) Capacitive sensor senses?
a) Pressure b) Touch
c) Sound d) Heat

7) Bluetooth HC-05 uses?
a) I2C b) SPI
c) UART d) USB

8) ARM processors use how many general purpose registers?
a) 8 b) 13
c) 16 d) 32

9) Which header file is used in Embedded C?
a) stdio.h b) reg51.h
c) math.h d) string.h

10) DC motor converts?
a) Electrical to mechanical b) Mechanical to electrical
c) Heat to motion d) None

11) LM35 output is proportional to?
a) Current b) Voltage
c) Resistance d) Power

12) Digital camera uses embedded system for?
a) Image processing b) Gaming
c) Networking d) None

13) Common anode display means?
a) Common positive b) Common negative
c) Floating d) Grounded

14) Total digital I/O pins in UNO?
a) 10 b) 12
c) 14 d) 16

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Advanced Microcontrollers (ENTMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 AM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

SECTION – I

Q.2 Attempt the following. (Any Four) **16**

a) Explain the fundamentals and key features of ARM processors. Discuss why ARM architecture is preferred in embedded systems.

b) Analyze the ARM register organization and illustrate the role of CPSR in processor operation with suitable examples.

c) Examine the ARM pipeline mechanism and compare it with non-pipelined execution in terms of performance.

d) Explain the basic structure of an Embedded C program for LPC2148. Describe the role of header files, special function registers, GPIO configuration, and delay routines with a suitable example.

e) Develop an Embedded C program to interface LEDs and push buttons with LPC2148 such that the LED glows based on button status. Illustrate the pin connections and explain the logic used.

Q.3 Attempt the following. (Any Two) **12**

a) Describe the architecture of the ARM7TDMI core with the help of a neat block diagram. Explain the function of each major block.

b) Implement an Embedded C program to interface a DC motor or stepper motor with LPC2148. Evaluate the advantages of stepper motor control over DC motor control in precision applications.

c) Design an interfacing circuit for a 7-segment display with LPC2148 and demonstrate how numerical digits (0-9) can be displayed using Embedded C programming.

SECTION – II

Q.4 Attempt the following. (Any Four) **16**

a) Explain the introduction and key features of Arduino. Describe how Arduino differs from traditional microcontroller development boards.

b) Identify and classify the pins of Arduino UNO.
Demonstrate the use of digital, analog, power, and communication pins with suitable examples.

c) Develop an Arduino program to control an LED or buzzer. Evaluate the importance of Arduino IDE and libraries in rapid prototyping.

d) Install and configure the Arduino IDE on a computer/laptop. Analyze common errors during installation and suggest suitable troubleshooting methods.

e) Illustrate the interfacing of a Bluetooth module with Arduino and describe how wireless data communication is established for device control.

Q.5 Attempt the following. (Any Two) **12**

a) Illustrate the architecture of Arduino UNO with a neat block diagram. Explain the role of microcontroller, clock circuit, power supply, and communication interfaces.

b) Design and develop an Arduino-based security system using PIR and IR sensors, and evaluate its effectiveness in motion detection.

c) Design and implement a smart agriculture monitoring system using LDR and Soil Moisture Sensor interfaced with Arduino and justify the choice of sensors.

Seat No.	

Set **R**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Advanced Microcontrollers (ENTMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 AM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) PIR sensor detects?
a) Heat motion b) Sound
c) Light d) Gas

2) MQ sensors are?
a) Gas sensors b) Light sensors
c) Pressure sensors d) Motion sensors

3) Capacitive sensor senses?
a) Pressure b) Touch
c) Sound d) Heat

4) Bluetooth HC-05 uses?
a) I2C b) SPI
c) UART d) USB

5) ARM processors use how many general purpose registers?
a) 8 b) 13
c) 16 d) 32

6) Which header file is used in Embedded C?
a) stdio.h b) reg51.h
c) math.h d) string.h

7) DC motor converts?
a) Electrical to mechanical b) Mechanical to electrical
c) Heat to motion d) None

8) LM35 output is proportional to?
a) Current b) Voltage
c) Resistance d) Power

9) Digital camera uses embedded system for?
- a) Image processing
- b) Gaming
- c) Networking
- d) None

10) Common anode display means?
- a) Common positive
- b) Common negative
- c) Floating
- d) Grounded

11) Total digital I/O pins in UNO?
- a) 10
- b) 12
- c) 14
- d) 16

12) Bootloader is used for?
- a) Programming
- b) Power supply
- c) Reset
- d) Clock

13) Which pin is used for PWM?
- a) Analog
- b) Digital
- c) PWM marked pins
- d) Vcc

14) setup() function runs?
- a) Continuously
- b) Once
- c) Twice
- d) Never

Seat No.	

Set R

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Advanced Microcontrollers (ENTMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 AM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

SECTION – I

Q.2 Attempt the following. (Any Four) **16**

a) Explain the fundamentals and key features of ARM processors. Discuss why ARM architecture is preferred in embedded systems.

b) Analyze the ARM register organization and illustrate the role of CPSR in processor operation with suitable examples.

c) Examine the ARM pipeline mechanism and compare it with non-pipelined execution in terms of performance.

d) Explain the basic structure of an Embedded C program for LPC2148. Describe the role of header files, special function registers, GPIO configuration, and delay routines with a suitable example.

e) Develop an Embedded C program to interface LEDs and push buttons with LPC2148 such that the LED glows based on button status. Illustrate the pin connections and explain the logic used.

Q.3 Attempt the following. (Any Two) **12**

a) Describe the architecture of the ARM7TDMI core with the help of a neat block diagram. Explain the function of each major block.

b) Implement an Embedded C program to interface a DC motor or stepper motor with LPC2148. Evaluate the advantages of stepper motor control over DC motor control in precision applications.

c) Design an interfacing circuit for a 7-segment display with LPC2148 and demonstrate how numerical digits (0-9) can be displayed using Embedded C programming.

SECTION – II

Q.4 Attempt the following. (Any Four) **16**

a) Explain the introduction and key features of Arduino. Describe how Arduino differs from traditional microcontroller development boards.

b) Identify and classify the pins of Arduino UNO.
Demonstrate the use of digital, analog, power, and communication pins with suitable examples.

c) Develop an Arduino program to control an LED or buzzer. Evaluate the importance of Arduino IDE and libraries in rapid prototyping.

d) Install and configure the Arduino IDE on a computer/laptop. Analyze common errors during installation and suggest suitable troubleshooting methods.

e) Illustrate the interfacing of a Bluetooth module with Arduino and describe how wireless data communication is established for device control.

Q.5 Attempt the following. (Any Two) **12**

a) Illustrate the architecture of Arduino UNO with a neat block diagram. Explain the role of microcontroller, clock circuit, power supply, and communication interfaces.

b) Design and develop an Arduino-based security system using PIR and IR sensors, and evaluate its effectiveness in motion detection.

c) Design and implement a smart agriculture monitoring system using LDR and Soil Moisture Sensor interfaced with Arduino and justify the choice of sensors.

Seat No.	

Set **S**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Advanced Microcontrollers (ENTMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 AM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. **14**

1) Common anode display means?
a) Common positive b) Common negative
c) Floating d) Grounded

2) Total digital I/O pins in UNO?
a) 10 b) 12
c) 14 d) 16

3) Bootloader is used for?
a) Programming b) Power supply
c) Reset d) Clock

4) Which pin is used for PWM?
a) Analog b) Digital
c) PWM marked pins d) Vcc

5) setup() function runs?
a) Continuously b) Once
c) Twice d) Never

6) PIR sensor detects?
a) Heat motion b) Sound
c) Light d) Gas

7) MQ sensors are?
a) Gas sensors b) Light sensors
c) Pressure sensors d) Motion sensors

8) Capacitive sensor senses?
a) Pressure b) Touch
c) Sound d) Heat

9) Bluetooth HC-05 uses?
a) I2C b) SPI
c) UART d) USB

10) ARM processors use how many general purpose registers?
a) 8 b) 13
c) 16 d) 32

11) Which header file is used in Embedded C?
a) stdio.h b) reg51.h
c) math.h d) string.h

12) DC motor converts?
a) Electrical to mechanical b) Mechanical to electrical
c) Heat to motion d) None

13) LM35 output is proportional to?
a) Current b) Voltage
c) Resistance d) Power

14) Digital camera uses embedded system for?
a) Image processing b) Gaming
c) Networking d) None

Seat No.	

Set | S

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Advanced Microcontrollers (ENTMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 AM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

SECTION – I

Q.2 Attempt the following. (Any Four) **16**

a) Explain the fundamentals and key features of ARM processors. Discuss why ARM architecture is preferred in embedded systems.

b) Analyze the ARM register organization and illustrate the role of CPSR in processor operation with suitable examples.

c) Examine the ARM pipeline mechanism and compare it with non-pipelined execution in terms of performance.

d) Explain the basic structure of an Embedded C program for LPC2148. Describe the role of header files, special function registers, GPIO configuration, and delay routines with a suitable example.

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Q.3 Attempt the following. (Any Two) **12**

a) Describe the architecture of the ARM7TDMI core with the help of a neat block diagram. Explain the function of each major block.

b) Implement an Embedded C program to interface a DC motor or stepper motor with LPC2148. Evaluate the advantages of stepper motor control over DC motor control in precision applications.

c) Design an interfacing circuit for a 7-segment display with LPC2148 and demonstrate how numerical digits (0-9) can be displayed using Embedded C programming.

SECTION – II

Q.4 Attempt the following. (Any Four) **16**

a) Explain the introduction and key features of Arduino. Describe how Arduino differs from traditional microcontroller development boards.

b) Identify and classify the pins of Arduino UNO.
Demonstrate the use of digital, analog, power, and communication pins with suitable examples.

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d) Install and configure the Arduino IDE on a computer/laptop. Analyze common errors during installation and suggest suitable troubleshooting methods.

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Q.5 Attempt the following. (Any Two) **12**

a) Illustrate the architecture of Arduino UNO with a neat block diagram. Explain the role of microcontroller, clock circuit, power supply, and communication interfaces.

b) Design and develop an Arduino-based security system using PIR and IR sensors, and evaluate its effectiveness in motion detection.

c) Design and implement a smart agriculture monitoring system using LDR and Soil Moisture Sensor interfaced with Arduino and justify the choice of sensors.

SLR-QH-649

Seat No.	

Set P

T.Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Advanced Microcontrollers (ENTMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 AM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) ARM processors use how many general purpose registers?
a) 8 b) 13
c) 16 d) 32

2) Which header file is used in Embedded C?
a) stdio.h b) reg51.h
c) math.h d) string.h

3) DC motor converts?
a) Electrical to mechanical b) Mechanical to electrical
c) Heat to motion d) None

4) LM35 output is proportional to?
a) Current b) Voltage
c) Resistance d) Power

5) Digital camera uses embedded system for?
a) Image processing b) Gaming
c) Networking d) None

6) Common anode display means?
a) Common positive b) Common negative
c) Floating d) Grounded

7) Total digital I/O pins in UNO?
a) 10 b) 12
c) 14 d) 16

8) Bootloader is used for?
a) Programming b) Power supply
c) Reset d) Clock

9) Which pin is used for PWM?
a) Analog
b) Digital
c) PWM marked pins
d) Vcc

10) setup() function runs?
a) Continuously
b) Once
c) Twice
d) Never

11) PIR sensor detects?
a) Heat motion
b) Sound
c) Light
d) Gas

12) MQ sensors are?
a) Gas sensors
b) Light sensors
c) Pressure sensors
d) Motion sensors

13) Capacitive sensor senses?
a) Pressure
b) Touch
c) Sound
d) Heat

14) Bluetooth HC-05 uses?
a) I2C
b) SPI
c) UART
d) USB

Seat No.	

Set **P**

T.Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Advanced Microcontrollers (ENTMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 AM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

SECTION – I

Q.2 Attempt the following. (Any Four) **16**

a) Explain the fundamentals and key features of ARM processors. Discuss why ARM architecture is preferred in embedded systems.

b) Analyze the ARM register organization and illustrate the role of CPSR in processor operation with suitable examples.

c) Examine the ARM pipeline mechanism and compare it with non-pipelined execution in terms of performance.

d) Explain the basic structure of an Embedded C program for LPC2148. Describe the role of header files, special function registers, GPIO configuration, and delay routines with a suitable example.

e) Develop an Embedded C program to interface LEDs and push buttons with LPC2148 such that the LED glows based on button status. Illustrate the pin connections and explain the logic used.

Q.3 Attempt the following. (Any Two) **12**

a) Describe the architecture of the ARM7TDMI core with the help of a neat block diagram. Explain the function of each major block.

b) Implement an Embedded C program to interface a DC motor or stepper motor with LPC2148. Evaluate the advantages of stepper motor control over DC motor control in precision applications.

c) Design an interfacing circuit for a 7-segment display with LPC2148 and demonstrate how numerical digits (0-9) can be displayed using Embedded C programming.

SECTION – II

Q.4 Attempt the following. (Any Four) **16**

a) Explain the introduction and key features of Arduino. Describe how Arduino differs from traditional microcontroller development boards.

b) Identify and classify the pins of Arduino UNO.
Demonstrate the use of digital, analog, power, and communication pins with suitable examples.

c) Develop an Arduino program to control an LED or buzzer. Evaluate the importance of Arduino IDE and libraries in rapid prototyping.

d) Install and configure the Arduino IDE on a computer/laptop. Analyze common errors during installation and suggest suitable troubleshooting methods.

e) Illustrate the interfacing of a Bluetooth module with Arduino and describe how wireless data communication is established for device control.

Q.5 Attempt the following. (Any Two) **12**

a) Illustrate the architecture of Arduino UNO with a neat block diagram. Explain the role of microcontroller, clock circuit, power supply, and communication interfaces.

b) Design and develop an Arduino-based security system using PIR and IR sensors, and evaluate its effectiveness in motion detection.

c) Design and implement a smart agriculture monitoring system using LDR and Soil Moisture Sensor interfaced with Arduino and justify the choice of sensors.

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Advanced Microcontrollers (ENTMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 AM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) Bootloader is used for?
a) Programming b) Power supply
c) Reset d) Clock

2) Which pin is used for PWM?
a) Analog b) Digital
c) PWM marked pins d) Vcc

3) setup() function runs?
a) Continuously b) Once
c) Twice d) Never

4) PIR sensor detects?
a) Heat motion b) Sound
c) Light d) Gas

5) MQ sensors are?
a) Gas sensors b) Light sensors
c) Pressure sensors d) Motion sensors

6) Capacitive sensor senses?
a) Pressure b) Touch
c) Sound d) Heat

7) Bluetooth HC-05 uses?
a) I2C b) SPI
c) UART d) USB

8) ARM processors use how many general purpose registers?
a) 8 b) 13
c) 16 d) 32

9) Which header file is used in Embedded C?
a) stdio.h b) reg51.h
c) math.h d) string.h

10) DC motor converts?
a) Electrical to mechanical b) Mechanical to electrical
c) Heat to motion d) None

11) LM35 output is proportional to?
a) Current b) Voltage
c) Resistance d) Power

12) Digital camera uses embedded system for?
a) Image processing b) Gaming
c) Networking d) None

13) Common anode display means?
a) Common positive b) Common negative
c) Floating d) Grounded

14) Total digital I/O pins in UNO?
a) 10 b) 12
c) 14 d) 16

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Advanced Microcontrollers (ENTMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 AM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

SECTION – I

Q.2 Attempt the following. (Any Four) **16**

a) Explain the fundamentals and key features of ARM processors. Discuss why ARM architecture is preferred in embedded systems.

b) Analyze the ARM register organization and illustrate the role of CPSR in processor operation with suitable examples.

c) Examine the ARM pipeline mechanism and compare it with non-pipelined execution in terms of performance.

d) Explain the basic structure of an Embedded C program for LPC2148. Describe the role of header files, special function registers, GPIO configuration, and delay routines with a suitable example.

e) Develop an Embedded C program to interface LEDs and push buttons with LPC2148 such that the LED glows based on button status. Illustrate the pin connections and explain the logic used.

Q.3 Attempt the following. (Any Two) **12**

a) Describe the architecture of the ARM7TDMI core with the help of a neat block diagram. Explain the function of each major block.

b) Implement an Embedded C program to interface a DC motor or stepper motor with LPC2148. Evaluate the advantages of stepper motor control over DC motor control in precision applications.

c) Design an interfacing circuit for a 7-segment display with LPC2148 and demonstrate how numerical digits (0-9) can be displayed using Embedded C programming.

SECTION – II

Q.4 Attempt the following. (Any Four) **16**

a) Explain the introduction and key features of Arduino. Describe how Arduino differs from traditional microcontroller development boards.

b) Identify and classify the pins of Arduino UNO.
Demonstrate the use of digital, analog, power, and communication pins with suitable examples.

c) Develop an Arduino program to control an LED or buzzer. Evaluate the importance of Arduino IDE and libraries in rapid prototyping.

d) Install and configure the Arduino IDE on a computer/laptop. Analyze common errors during installation and suggest suitable troubleshooting methods.

e) Illustrate the interfacing of a Bluetooth module with Arduino and describe how wireless data communication is established for device control.

Q.5 Attempt the following. (Any Two) **12**

a) Illustrate the architecture of Arduino UNO with a neat block diagram. Explain the role of microcontroller, clock circuit, power supply, and communication interfaces.

b) Design and develop an Arduino-based security system using PIR and IR sensors, and evaluate its effectiveness in motion detection.

c) Design and implement a smart agriculture monitoring system using LDR and Soil Moisture Sensor interfaced with Arduino and justify the choice of sensors.

Seat No.	

Set **R**

T.Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Advanced Microcontrollers (ENTMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 AM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) PIR sensor detects?
a) Heat motion b) Sound
c) Light d) Gas

2) MQ sensors are?
a) Gas sensors b) Light sensors
c) Pressure sensors d) Motion sensors

3) Capacitive sensor senses?
a) Pressure b) Touch
c) Sound d) Heat

4) Bluetooth HC-05 uses?
a) I2C b) SPI
c) UART d) USB

5) ARM processors use how many general purpose registers?
a) 8 b) 13
c) 16 d) 32

6) Which header file is used in Embedded C?
a) stdio.h b) reg51.h
c) math.h d) string.h

7) DC motor converts?
a) Electrical to mechanical b) Mechanical to electrical
c) Heat to motion d) None

8) LM35 output is proportional to?
a) Current b) Voltage
c) Resistance d) Power

9) Digital camera uses embedded system for?
- a) Image processing
- b) Gaming
- c) Networking
- d) None

10) Common anode display means?
- a) Common positive
- b) Common negative
- c) Floating
- d) Grounded

11) Total digital I/O pins in UNO?
- a) 10
- b) 12
- c) 14
- d) 16

12) Bootloader is used for?
- a) Programming
- b) Power supply
- c) Reset
- d) Clock

13) Which pin is used for PWM?
- a) Analog
- b) Digital
- c) PWM marked pins
- d) Vcc

14) setup() function runs?
- a) Continuously
- b) Once
- c) Twice
- d) Never

Seat No.	

Set **R**

T.Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Advanced Microcontrollers (ENTMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 AM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

SECTION – I

Q.2 Attempt the following. (Any Four) **16**

a) Explain the fundamentals and key features of ARM processors. Discuss why ARM architecture is preferred in embedded systems.

b) Analyze the ARM register organization and illustrate the role of CPSR in processor operation with suitable examples.

c) Examine the ARM pipeline mechanism and compare it with non-pipelined execution in terms of performance.

d) Explain the basic structure of an Embedded C program for LPC2148. Describe the role of header files, special function registers, GPIO configuration, and delay routines with a suitable example.

e) Develop an Embedded C program to interface LEDs and push buttons with LPC2148 such that the LED glows based on button status. Illustrate the pin connections and explain the logic used.

Q.3 Attempt the following. (Any Two) **12**

a) Describe the architecture of the ARM7TDMI core with the help of a neat block diagram. Explain the function of each major block.

b) Implement an Embedded C program to interface a DC motor or stepper motor with LPC2148. Evaluate the advantages of stepper motor control over DC motor control in precision applications.

c) Design an interfacing circuit for a 7-segment display with LPC2148 and demonstrate how numerical digits (0-9) can be displayed using Embedded C programming.

SECTION – II

Q.4 Attempt the following. (Any Four) **16**

a) Explain the introduction and key features of Arduino. Describe how Arduino differs from traditional microcontroller development boards.

b) Identify and classify the pins of Arduino UNO.
Demonstrate the use of digital, analog, power, and communication pins with suitable examples.

c) Develop an Arduino program to control an LED or buzzer. Evaluate the importance of Arduino IDE and libraries in rapid prototyping.

d) Install and configure the Arduino IDE on a computer/laptop. Analyze common errors during installation and suggest suitable troubleshooting methods.

e) Illustrate the interfacing of a Bluetooth module with Arduino and describe how wireless data communication is established for device control.

Q.5 Attempt the following. (Any Two) **12**

a) Illustrate the architecture of Arduino UNO with a neat block diagram. Explain the role of microcontroller, clock circuit, power supply, and communication interfaces.

b) Design and develop an Arduino-based security system using PIR and IR sensors, and evaluate its effectiveness in motion detection.

c) Design and implement a smart agriculture monitoring system using LDR and Soil Moisture Sensor interfaced with Arduino and justify the choice of sensors.

Seat No.	

Set **S**

T.Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Advanced Microcontrollers (ENTMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 AM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) Common anode display means?
a) Common positive b) Common negative
c) Floating d) Grounded

2) Total digital I/O pins in UNO?
a) 10 b) 12
c) 14 d) 16

3) Bootloader is used for?
a) Programming b) Power supply
c) Reset d) Clock

4) Which pin is used for PWM?
a) Analog b) Digital
c) PWM marked pins d) Vcc

5) setup() function runs?
a) Continuously b) Once
c) Twice d) Never

6) PIR sensor detects?
a) Heat motion b) Sound
c) Light d) Gas

7) MQ sensors are?
a) Gas sensors b) Light sensors
c) Pressure sensors d) Motion sensors

8) Capacitive sensor senses?
a) Pressure b) Touch
c) Sound d) Heat

9) Bluetooth HC-05 uses?
a) I2C b) SPI
c) UART d) USB

10) ARM processors use how many general purpose registers?
a) 8 b) 13
c) 16 d) 32

11) Which header file is used in Embedded C?
a) stdio.h b) reg51.h
c) math.h d) string.h

12) DC motor converts?
a) Electrical to mechanical b) Mechanical to electrical
c) Heat to motion d) None

13) LM35 output is proportional to?
a) Current b) Voltage
c) Resistance d) Power

14) Digital camera uses embedded system for?
a) Image processing b) Gaming
c) Networking d) None

Seat No.	

Set | S

T.Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Advanced Microcontrollers (ENTMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 AM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

SECTION – I

Q.2 Attempt the following. (Any Four) **16**

a) Explain the fundamentals and key features of ARM processors. Discuss why ARM architecture is preferred in embedded systems.

b) Analyze the ARM register organization and illustrate the role of CPSR in processor operation with suitable examples.

c) Examine the ARM pipeline mechanism and compare it with non-pipelined execution in terms of performance.

d) Explain the basic structure of an Embedded C program for LPC2148. Describe the role of header files, special function registers, GPIO configuration, and delay routines with a suitable example.

e) Develop an Embedded C program to interface LEDs and push buttons with LPC2148 such that the LED glows based on button status. Illustrate the pin connections and explain the logic used.

Q.3 Attempt the following. (Any Two) **12**

a) Describe the architecture of the ARM7TDMI core with the help of a neat block diagram. Explain the function of each major block.

b) Implement an Embedded C program to interface a DC motor or stepper motor with LPC2148. Evaluate the advantages of stepper motor control over DC motor control in precision applications.

c) Design an interfacing circuit for a 7-segment display with LPC2148 and demonstrate how numerical digits (0-9) can be displayed using Embedded C programming.

SECTION – II

Q.4 Attempt the following. (Any Four) **16**

a) Explain the introduction and key features of Arduino. Describe how Arduino differs from traditional microcontroller development boards.

b) Identify and classify the pins of Arduino UNO.
Demonstrate the use of digital, analog, power, and communication pins with suitable examples.

c) Develop an Arduino program to control an LED or buzzer. Evaluate the importance of Arduino IDE and libraries in rapid prototyping.

d) Install and configure the Arduino IDE on a computer/laptop. Analyze common errors during installation and suggest suitable troubleshooting methods.

e) Illustrate the interfacing of a Bluetooth module with Arduino and describe how wireless data communication is established for device control.

Q.5 Attempt the following. (Any Two) **12**

a) Illustrate the architecture of Arduino UNO with a neat block diagram. Explain the role of microcontroller, clock circuit, power supply, and communication interfaces.

b) Design and develop an Arduino-based security system using PIR and IR sensors, and evaluate its effectiveness in motion detection.

c) Design and implement a smart agriculture monitoring system using LDR and Soil Moisture Sensor interfaced with Arduino and justify the choice of sensors.

Seat No.	

Set **P**

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Advanced Microcontrollers (ENTMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 AM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) ARM processors use how many general purpose registers?
a) 8 b) 13
c) 16 d) 32

2) Which header file is used in Embedded C?
a) stdio.h b) reg51.h
c) math.h d) string.h

3) DC motor converts?
a) Electrical to mechanical b) Mechanical to electrical
c) Heat to motion d) None

4) LM35 output is proportional to?
a) Current b) Voltage
c) Resistance d) Power

5) Digital camera uses embedded system for?
a) Image processing b) Gaming
c) Networking d) None

6) Common anode display means?
a) Common positive b) Common negative
c) Floating d) Grounded

7) Total digital I/O pins in UNO?
a) 10 b) 12
c) 14 d) 16

8) Bootloader is used for?
a) Programming b) Power supply
c) Reset d) Clock

9) Which pin is used for PWM?
a) Analog
b) Digital
c) PWM marked pins
d) Vcc

10) setup() function runs?
a) Continuously
b) Once
c) Twice
d) Never

11) PIR sensor detects?
a) Heat motion
b) Sound
c) Light
d) Gas

12) MQ sensors are?
a) Gas sensors
b) Light sensors
c) Pressure sensors
d) Motion sensors

13) Capacitive sensor senses?
a) Pressure
b) Touch
c) Sound
d) Heat

14) Bluetooth HC-05 uses?
a) I2C
b) SPI
c) UART
d) USB

Seat No.	

Set **P**

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Advanced Microcontrollers (ENTMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 AM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

SECTION – I

Q.2 Attempt the following. (Any Four) **16**

a) Explain the fundamentals and key features of ARM processors. Discuss why ARM architecture is preferred in embedded systems.

b) Analyze the ARM register organization and illustrate the role of CPSR in processor operation with suitable examples.

c) Examine the ARM pipeline mechanism and compare it with non-pipelined execution in terms of performance.

d) Explain the basic structure of an Embedded C program for LPC2148. Describe the role of header files, special function registers, GPIO configuration, and delay routines with a suitable example.

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Q.3 Attempt the following. (Any Two) **12**

a) Describe the architecture of the ARM7TDMI core with the help of a neat block diagram. Explain the function of each major block.

b) Implement an Embedded C program to interface a DC motor or stepper motor with LPC2148. Evaluate the advantages of stepper motor control over DC motor control in precision applications.

c) Design an interfacing circuit for a 7-segment display with LPC2148 and demonstrate how numerical digits (0-9) can be displayed using Embedded C programming.

SECTION – II

Q.4 Attempt the following. (Any Four) **16**

a) Explain the introduction and key features of Arduino. Describe how Arduino differs from traditional microcontroller development boards.

b) Identify and classify the pins of Arduino UNO.
Demonstrate the use of digital, analog, power, and communication pins with suitable examples.

c) Develop an Arduino program to control an LED or buzzer. Evaluate the importance of Arduino IDE and libraries in rapid prototyping.

d) Install and configure the Arduino IDE on a computer/laptop. Analyze common errors during installation and suggest suitable troubleshooting methods.

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Q.5 Attempt the following. (Any Two) **12**

a) Illustrate the architecture of Arduino UNO with a neat block diagram. Explain the role of microcontroller, clock circuit, power supply, and communication interfaces.

b) Design and develop an Arduino-based security system using PIR and IR sensors, and evaluate its effectiveness in motion detection.

c) Design and implement a smart agriculture monitoring system using LDR and Soil Moisture Sensor interfaced with Arduino and justify the choice of sensors.

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Advanced Microcontrollers (ENTMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 AM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. **14**

1) Bootloader is used for?
a) Programming b) Power supply
c) Reset d) Clock

2) Which pin is used for PWM?
a) Analog b) Digital
c) PWM marked pins d) Vcc

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c) Twice d) Never

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5) MQ sensors are?
a) Gas sensors b) Light sensors
c) Pressure sensors d) Motion sensors

6) Capacitive sensor senses?
a) Pressure b) Touch
c) Sound d) Heat

7) Bluetooth HC-05 uses?
a) I2C b) SPI
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8) ARM processors use how many general purpose registers?
a) 8 b) 13
c) 16 d) 32

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a) stdio.h b) reg51.h
c) math.h d) string.h

10) DC motor converts?
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11) LM35 output is proportional to?
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c) Resistance d) Power

12) Digital camera uses embedded system for?
a) Image processing b) Gaming
c) Networking d) None

13) Common anode display means?
a) Common positive b) Common negative
c) Floating d) Grounded

14) Total digital I/O pins in UNO?
a) 10 b) 12
c) 14 d) 16

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Advanced Microcontrollers (ENTMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 AM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

SECTION – I

Q.2 Attempt the following. (Any Four) **16**

a) Explain the fundamentals and key features of ARM processors. Discuss why ARM architecture is preferred in embedded systems.

b) Analyze the ARM register organization and illustrate the role of CPSR in processor operation with suitable examples.

c) Examine the ARM pipeline mechanism and compare it with non-pipelined execution in terms of performance.

d) Explain the basic structure of an Embedded C program for LPC2148. Describe the role of header files, special function registers, GPIO configuration, and delay routines with a suitable example.

e) Develop an Embedded C program to interface LEDs and push buttons with LPC2148 such that the LED glows based on button status. Illustrate the pin connections and explain the logic used.

Q.3 Attempt the following. (Any Two) **12**

a) Describe the architecture of the ARM7TDMI core with the help of a neat block diagram. Explain the function of each major block.

b) Implement an Embedded C program to interface a DC motor or stepper motor with LPC2148. Evaluate the advantages of stepper motor control over DC motor control in precision applications.

c) Design an interfacing circuit for a 7-segment display with LPC2148 and demonstrate how numerical digits (0-9) can be displayed using Embedded C programming.

SECTION – II

Q.4 Attempt the following. (Any Four) **16**

a) Explain the introduction and key features of Arduino. Describe how Arduino differs from traditional microcontroller development boards.

b) Identify and classify the pins of Arduino UNO.
Demonstrate the use of digital, analog, power, and communication pins with suitable examples.

c) Develop an Arduino program to control an LED or buzzer. Evaluate the importance of Arduino IDE and libraries in rapid prototyping.

d) Install and configure the Arduino IDE on a computer/laptop. Analyze common errors during installation and suggest suitable troubleshooting methods.

e) Illustrate the interfacing of a Bluetooth module with Arduino and describe how wireless data communication is established for device control.

Q.5 Attempt the following. (Any Two) **12**

a) Illustrate the architecture of Arduino UNO with a neat block diagram. Explain the role of microcontroller, clock circuit, power supply, and communication interfaces.

b) Design and develop an Arduino-based security system using PIR and IR sensors, and evaluate its effectiveness in motion detection.

c) Design and implement a smart agriculture monitoring system using LDR and Soil Moisture Sensor interfaced with Arduino and justify the choice of sensors.

Seat No.	

Set **R**

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Advanced Microcontrollers (ENTMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 AM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) PIR sensor detects?
a) Heat motion b) Sound
c) Light d) Gas

2) MQ sensors are?
a) Gas sensors b) Light sensors
c) Pressure sensors d) Motion sensors

3) Capacitive sensor senses?
a) Pressure b) Touch
c) Sound d) Heat

4) Bluetooth HC-05 uses?
a) I2C b) SPI
c) UART d) USB

5) ARM processors use how many general purpose registers?
a) 8 b) 13
c) 16 d) 32

6) Which header file is used in Embedded C?
a) stdio.h b) reg51.h
c) math.h d) string.h

7) DC motor converts?
a) Electrical to mechanical b) Mechanical to electrical
c) Heat to motion d) None

8) LM35 output is proportional to?
a) Current b) Voltage
c) Resistance d) Power

9) Digital camera uses embedded system for?
- a) Image processing
- b) Gaming
- c) Networking
- d) None

10) Common anode display means?
- a) Common positive
- b) Common negative
- c) Floating
- d) Grounded

11) Total digital I/O pins in UNO?
- a) 10
- b) 12
- c) 14
- d) 16

12) Bootloader is used for?
- a) Programming
- b) Power supply
- c) Reset
- d) Clock

13) Which pin is used for PWM?
- a) Analog
- b) Digital
- c) PWM marked pins
- d) Vcc

14) setup() function runs?
- a) Continuously
- b) Once
- c) Twice
- d) Never

Seat No.	

Set **R**

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Advanced Microcontrollers (ENTMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 AM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

SECTION – I

Q.2 Attempt the following. (Any Four) **16**

a) Explain the fundamentals and key features of ARM processors. Discuss why ARM architecture is preferred in embedded systems.

b) Analyze the ARM register organization and illustrate the role of CPSR in processor operation with suitable examples.

c) Examine the ARM pipeline mechanism and compare it with non-pipelined execution in terms of performance.

d) Explain the basic structure of an Embedded C program for LPC2148. Describe the role of header files, special function registers, GPIO configuration, and delay routines with a suitable example.

e) Develop an Embedded C program to interface LEDs and push buttons with LPC2148 such that the LED glows based on button status. Illustrate the pin connections and explain the logic used.

Q.3 Attempt the following. (Any Two) **12**

a) Describe the architecture of the ARM7TDMI core with the help of a neat block diagram. Explain the function of each major block.

b) Implement an Embedded C program to interface a DC motor or stepper motor with LPC2148. Evaluate the advantages of stepper motor control over DC motor control in precision applications.

c) Design an interfacing circuit for a 7-segment display with LPC2148 and demonstrate how numerical digits (0-9) can be displayed using Embedded C programming.

SECTION – II

Q.4 Attempt the following. (Any Four) **16**

a) Explain the introduction and key features of Arduino. Describe how Arduino differs from traditional microcontroller development boards.

b) Identify and classify the pins of Arduino UNO.
Demonstrate the use of digital, analog, power, and communication pins with suitable examples.

c) Develop an Arduino program to control an LED or buzzer. Evaluate the importance of Arduino IDE and libraries in rapid prototyping.

d) Install and configure the Arduino IDE on a computer/laptop. Analyze common errors during installation and suggest suitable troubleshooting methods.

e) Illustrate the interfacing of a Bluetooth module with Arduino and describe how wireless data communication is established for device control.

Q.5 Attempt the following. (Any Two) **12**

a) Illustrate the architecture of Arduino UNO with a neat block diagram. Explain the role of microcontroller, clock circuit, power supply, and communication interfaces.

b) Design and develop an Arduino-based security system using PIR and IR sensors, and evaluate its effectiveness in motion detection.

c) Design and implement a smart agriculture monitoring system using LDR and Soil Moisture Sensor interfaced with Arduino and justify the choice of sensors.

Seat No.	

Set **S**

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Advanced Microcontrollers (ENTMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 AM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) Common anode display means?
a) Common positive b) Common negative
c) Floating d) Grounded

2) Total digital I/O pins in UNO?
a) 10 b) 12
c) 14 d) 16

3) Bootloader is used for?
a) Programming b) Power supply
c) Reset d) Clock

4) Which pin is used for PWM?
a) Analog b) Digital
c) PWM marked pins d) Vcc

5) setup() function runs?
a) Continuously b) Once
c) Twice d) Never

6) PIR sensor detects?
a) Heat motion b) Sound
c) Light d) Gas

7) MQ sensors are?
a) Gas sensors b) Light sensors
c) Pressure sensors d) Motion sensors

8) Capacitive sensor senses?
a) Pressure b) Touch
c) Sound d) Heat

9) Bluetooth HC-05 uses?
a) I2C b) SPI
c) UART d) USB

10) ARM processors use how many general purpose registers?
a) 8 b) 13
c) 16 d) 32

11) Which header file is used in Embedded C?
a) stdio.h b) reg51.h
c) math.h d) string.h

12) DC motor converts?
a) Electrical to mechanical b) Mechanical to electrical
c) Heat to motion d) None

13) LM35 output is proportional to?
a) Current b) Voltage
c) Resistance d) Power

14) Digital camera uses embedded system for?
a) Image processing b) Gaming
c) Networking d) None

Seat No.	

Set **S**

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Advanced Microcontrollers (ENTMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 AM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

SECTION – I

Q.2 Attempt the following. (Any Four) **16**

a) Explain the fundamentals and key features of ARM processors. Discuss why ARM architecture is preferred in embedded systems.

b) Analyze the ARM register organization and illustrate the role of CPSR in processor operation with suitable examples.

c) Examine the ARM pipeline mechanism and compare it with non-pipelined execution in terms of performance.

d) Explain the basic structure of an Embedded C program for LPC2148. Describe the role of header files, special function registers, GPIO configuration, and delay routines with a suitable example.

e) Develop an Embedded C program to interface LEDs and push buttons with LPC2148 such that the LED glows based on button status. Illustrate the pin connections and explain the logic used.

Q.3 Attempt the following. (Any Two) **12**

a) Describe the architecture of the ARM7TDMI core with the help of a neat block diagram. Explain the function of each major block.

b) Implement an Embedded C program to interface a DC motor or stepper motor with LPC2148. Evaluate the advantages of stepper motor control over DC motor control in precision applications.

c) Design an interfacing circuit for a 7-segment display with LPC2148 and demonstrate how numerical digits (0-9) can be displayed using Embedded C programming.

SECTION – II

Q.4 Attempt the following. (Any Four) **16**

a) Explain the introduction and key features of Arduino. Describe how Arduino differs from traditional microcontroller development boards.

b) Identify and classify the pins of Arduino UNO.
Demonstrate the use of digital, analog, power, and communication pins with suitable examples.

c) Develop an Arduino program to control an LED or buzzer. Evaluate the importance of Arduino IDE and libraries in rapid prototyping.

d) Install and configure the Arduino IDE on a computer/laptop. Analyze common errors during installation and suggest suitable troubleshooting methods.

e) Illustrate the interfacing of a Bluetooth module with Arduino and describe how wireless data communication is established for device control.

Q.5 Attempt the following. (Any Two) **12**

a) Illustrate the architecture of Arduino UNO with a neat block diagram. Explain the role of microcontroller, clock circuit, power supply, and communication interfaces.

b) Design and develop an Arduino-based security system using PIR and IR sensors, and evaluate its effectiveness in motion detection.

c) Design and implement a smart agriculture monitoring system using LDR and Soil Moisture Sensor interfaced with Arduino and justify the choice of sensors.

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Seat No.	

Set P

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Advanced Microcontrollers (ENTMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 AM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) ARM processors use how many general purpose registers?
a) 8 b) 13
c) 16 d) 32

2) Which header file is used in Embedded C?
a) stdio.h b) reg51.h
c) math.h d) string.h

3) DC motor converts?
a) Electrical to mechanical b) Mechanical to electrical
c) Heat to motion d) None

4) LM35 output is proportional to?
a) Current b) Voltage
c) Resistance d) Power

5) Digital camera uses embedded system for?
a) Image processing b) Gaming
c) Networking d) None

6) Common anode display means?
a) Common positive b) Common negative
c) Floating d) Grounded

7) Total digital I/O pins in UNO?
a) 10 b) 12
c) 14 d) 16

8) Bootloader is used for?
a) Programming b) Power supply
c) Reset d) Clock

9) Which pin is used for PWM?
a) Analog
b) Digital
c) PWM marked pins
d) Vcc

10) setup() function runs?
a) Continuously
b) Once
c) Twice
d) Never

11) PIR sensor detects?
a) Heat motion
b) Sound
c) Light
d) Gas

12) MQ sensors are?
a) Gas sensors
b) Light sensors
c) Pressure sensors
d) Motion sensors

13) Capacitive sensor senses?
a) Pressure
b) Touch
c) Sound
d) Heat

14) Bluetooth HC-05 uses?
a) I2C
b) SPI
c) UART
d) USB

Seat No.	

Set **P**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Advanced Microcontrollers (ENTMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 AM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

SECTION – I

Q.2 Attempt the following. (Any Four) **16**

a) Explain the fundamentals and key features of ARM processors. Discuss why ARM architecture is preferred in embedded systems.

b) Analyze the ARM register organization and illustrate the role of CPSR in processor operation with suitable examples.

c) Examine the ARM pipeline mechanism and compare it with non-pipelined execution in terms of performance.

d) Explain the basic structure of an Embedded C program for LPC2148. Describe the role of header files, special function registers, GPIO configuration, and delay routines with a suitable example.

e) Develop an Embedded C program to interface LEDs and push buttons with LPC2148 such that the LED glows based on button status. Illustrate the pin connections and explain the logic used.

Q.3 Attempt the following. (Any Two) **12**

a) Describe the architecture of the ARM7TDMI core with the help of a neat block diagram. Explain the function of each major block.

b) Implement an Embedded C program to interface a DC motor or stepper motor with LPC2148. Evaluate the advantages of stepper motor control over DC motor control in precision applications.

c) Design an interfacing circuit for a 7-segment display with LPC2148 and demonstrate how numerical digits (0-9) can be displayed using Embedded C programming.

SECTION – II

Q.4 Attempt the following. (Any Four) **16**

a) Explain the introduction and key features of Arduino. Describe how Arduino differs from traditional microcontroller development boards.

b) Identify and classify the pins of Arduino UNO.
Demonstrate the use of digital, analog, power, and communication pins with suitable examples.

c) Develop an Arduino program to control an LED or buzzer. Evaluate the importance of Arduino IDE and libraries in rapid prototyping.

d) Install and configure the Arduino IDE on a computer/laptop. Analyze common errors during installation and suggest suitable troubleshooting methods.

e) Illustrate the interfacing of a Bluetooth module with Arduino and describe how wireless data communication is established for device control.

Q.5 Attempt the following. (Any Two) **12**

a) Illustrate the architecture of Arduino UNO with a neat block diagram. Explain the role of microcontroller, clock circuit, power supply, and communication interfaces.

b) Design and develop an Arduino-based security system using PIR and IR sensors, and evaluate its effectiveness in motion detection.

c) Design and implement a smart agriculture monitoring system using LDR and Soil Moisture Sensor interfaced with Arduino and justify the choice of sensors.

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Advanced Microcontrollers (ENTMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 AM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. **14**

1) Bootloader is used for?
a) Programming b) Power supply
c) Reset d) Clock

2) Which pin is used for PWM?
a) Analog b) Digital
c) PWM marked pins d) Vcc

3) setup() function runs?
a) Continuously b) Once
c) Twice d) Never

4) PIR sensor detects?
a) Heat motion b) Sound
c) Light d) Gas

5) MQ sensors are?
a) Gas sensors b) Light sensors
c) Pressure sensors d) Motion sensors

6) Capacitive sensor senses?
a) Pressure b) Touch
c) Sound d) Heat

7) Bluetooth HC-05 uses?
a) I2C b) SPI
c) UART d) USB

8) ARM processors use how many general purpose registers?
a) 8 b) 13
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9) Which header file is used in Embedded C?
a) stdio.h b) reg51.h
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10) DC motor converts?
a) Electrical to mechanical b) Mechanical to electrical
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11) LM35 output is proportional to?
a) Current b) Voltage
c) Resistance d) Power

12) Digital camera uses embedded system for?
a) Image processing b) Gaming
c) Networking d) None

13) Common anode display means?
a) Common positive b) Common negative
c) Floating d) Grounded

14) Total digital I/O pins in UNO?
a) 10 b) 12
c) 14 d) 16

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Advanced Microcontrollers (ENTMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 AM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

SECTION – I

Q.2 Attempt the following. (Any Four) **16**

a) Explain the fundamentals and key features of ARM processors. Discuss why ARM architecture is preferred in embedded systems.

b) Analyze the ARM register organization and illustrate the role of CPSR in processor operation with suitable examples.

c) Examine the ARM pipeline mechanism and compare it with non-pipelined execution in terms of performance.

d) Explain the basic structure of an Embedded C program for LPC2148. Describe the role of header files, special function registers, GPIO configuration, and delay routines with a suitable example.

e) Develop an Embedded C program to interface LEDs and push buttons with LPC2148 such that the LED glows based on button status. Illustrate the pin connections and explain the logic used.

Q.3 Attempt the following. (Any Two) **12**

a) Describe the architecture of the ARM7TDMI core with the help of a neat block diagram. Explain the function of each major block.

b) Implement an Embedded C program to interface a DC motor or stepper motor with LPC2148. Evaluate the advantages of stepper motor control over DC motor control in precision applications.

c) Design an interfacing circuit for a 7-segment display with LPC2148 and demonstrate how numerical digits (0-9) can be displayed using Embedded C programming.

SECTION – II

Q.4 Attempt the following. (Any Four) **16**

a) Explain the introduction and key features of Arduino. Describe how Arduino differs from traditional microcontroller development boards.

b) Identify and classify the pins of Arduino UNO.
Demonstrate the use of digital, analog, power, and communication pins with suitable examples.

c) Develop an Arduino program to control an LED or buzzer. Evaluate the importance of Arduino IDE and libraries in rapid prototyping.

d) Install and configure the Arduino IDE on a computer/laptop. Analyze common errors during installation and suggest suitable troubleshooting methods.

e) Illustrate the interfacing of a Bluetooth module with Arduino and describe how wireless data communication is established for device control.

Q.5 Attempt the following. (Any Two) **12**

a) Illustrate the architecture of Arduino UNO with a neat block diagram. Explain the role of microcontroller, clock circuit, power supply, and communication interfaces.

b) Design and develop an Arduino-based security system using PIR and IR sensors, and evaluate its effectiveness in motion detection.

c) Design and implement a smart agriculture monitoring system using LDR and Soil Moisture Sensor interfaced with Arduino and justify the choice of sensors.

Seat No.	

Set **R**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Advanced Microcontrollers (ENTMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 AM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) PIR sensor detects?
a) Heat motion b) Sound
c) Light d) Gas

2) MQ sensors are?
a) Gas sensors b) Light sensors
c) Pressure sensors d) Motion sensors

3) Capacitive sensor senses?
a) Pressure b) Touch
c) Sound d) Heat

4) Bluetooth HC-05 uses?
a) I2C b) SPI
c) UART d) USB

5) ARM processors use how many general purpose registers?
a) 8 b) 13
c) 16 d) 32

6) Which header file is used in Embedded C?
a) stdio.h b) reg51.h
c) math.h d) string.h

7) DC motor converts?
a) Electrical to mechanical b) Mechanical to electrical
c) Heat to motion d) None

8) LM35 output is proportional to?
a) Current b) Voltage
c) Resistance d) Power

9) Digital camera uses embedded system for?
- a) Image processing
- b) Gaming
- c) Networking
- d) None

10) Common anode display means?
- a) Common positive
- b) Common negative
- c) Floating
- d) Grounded

11) Total digital I/O pins in UNO?
- a) 10
- b) 12
- c) 14
- d) 16

12) Bootloader is used for?
- a) Programming
- b) Power supply
- c) Reset
- d) Clock

13) Which pin is used for PWM?
- a) Analog
- b) Digital
- c) PWM marked pins
- d) Vcc

14) setup() function runs?
- a) Continuously
- b) Once
- c) Twice
- d) Never

Seat No.	

Set **R**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Advanced Microcontrollers (ENTMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 AM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

SECTION – I

Q.2 Attempt the following. (Any Four) **16**

a) Explain the fundamentals and key features of ARM processors. Discuss why ARM architecture is preferred in embedded systems.

b) Analyze the ARM register organization and illustrate the role of CPSR in processor operation with suitable examples.

c) Examine the ARM pipeline mechanism and compare it with non-pipelined execution in terms of performance.

d) Explain the basic structure of an Embedded C program for LPC2148. Describe the role of header files, special function registers, GPIO configuration, and delay routines with a suitable example.

e) Develop an Embedded C program to interface LEDs and push buttons with LPC2148 such that the LED glows based on button status. Illustrate the pin connections and explain the logic used.

Q.3 Attempt the following. (Any Two) **12**

a) Describe the architecture of the ARM7TDMI core with the help of a neat block diagram. Explain the function of each major block.

b) Implement an Embedded C program to interface a DC motor or stepper motor with LPC2148. Evaluate the advantages of stepper motor control over DC motor control in precision applications.

c) Design an interfacing circuit for a 7-segment display with LPC2148 and demonstrate how numerical digits (0-9) can be displayed using Embedded C programming.

SECTION – II

Q.4 Attempt the following. (Any Four) **16**

a) Explain the introduction and key features of Arduino. Describe how Arduino differs from traditional microcontroller development boards.

b) Identify and classify the pins of Arduino UNO.
Demonstrate the use of digital, analog, power, and communication pins with suitable examples.

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Q.5 Attempt the following. (Any Two) **12**

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c) Design and implement a smart agriculture monitoring system using LDR and Soil Moisture Sensor interfaced with Arduino and justify the choice of sensors.

Seat No.	

Set **S**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Advanced Microcontrollers (ENTMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 AM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. **14**

1) Common anode display means?
a) Common positive b) Common negative
c) Floating d) Grounded

2) Total digital I/O pins in UNO?
a) 10 b) 12
c) 14 d) 16

3) Bootloader is used for?
a) Programming b) Power supply
c) Reset d) Clock

4) Which pin is used for PWM?
a) Analog b) Digital
c) PWM marked pins d) Vcc

5) setup() function runs?
a) Continuously b) Once
c) Twice d) Never

6) PIR sensor detects?
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8) Capacitive sensor senses?
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c) Sound d) Heat

9) Bluetooth HC-05 uses?
a) I2C b) SPI
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10) ARM processors use how many general purpose registers?
a) 8 b) 13
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12) DC motor converts?
a) Electrical to mechanical b) Mechanical to electrical
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13) LM35 output is proportional to?
a) Current b) Voltage
c) Resistance d) Power

14) Digital camera uses embedded system for?
a) Image processing b) Gaming
c) Networking d) None

Seat No.		Set	S

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Advanced Microcontrollers (ENTMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 AM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

SECTION – I

Q.2 Attempt the following. (Any Four) **16**

a) Explain the fundamentals and key features of ARM processors. Discuss why ARM architecture is preferred in embedded systems.

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c) Design an interfacing circuit for a 7-segment display with LPC2148 and demonstrate how numerical digits (0-9) can be displayed using Embedded C programming.

SECTION – II

Q.4 Attempt the following. (Any Four) **16**

a) Explain the introduction and key features of Arduino. Describe how Arduino differs from traditional microcontroller development boards.

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Demonstrate the use of digital, analog, power, and communication pins with suitable examples.

c) Develop an Arduino program to control an LED or buzzer. Evaluate the importance of Arduino IDE and libraries in rapid prototyping.

d) Install and configure the Arduino IDE on a computer/laptop. Analyze common errors during installation and suggest suitable troubleshooting methods.

e) Illustrate the interfacing of a Bluetooth module with Arduino and describe how wireless data communication is established for device control.

Q.5 Attempt the following. (Any Two) **12**

a) Illustrate the architecture of Arduino UNO with a neat block diagram. Explain the role of microcontroller, clock circuit, power supply, and communication interfaces.

b) Design and develop an Arduino-based security system using PIR and IR sensors, and evaluate its effectiveness in motion detection.

c) Design and implement a smart agriculture monitoring system using LDR and Soil Moisture Sensor interfaced with Arduino and justify the choice of sensors.

SLR-QH-650

Seat No.	

Set P

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April - 2026
Industrial IoT (ENTMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options and rewrite the sentence. **14**

1) What is the main characteristic that differentiates IIoT from IoT?
a) Use of social media integration
b) Focus on consumer applications
c) Emphasis on industrial automation and reliability
d) Limited use of sensors

2) Which component is a key part of the IIoT structure?
a) Entertainment systems
b) Industrial sensors and actuators
c) Mobile gaming platforms
d) Social networking tools

3) In Industry 4.0, smart factories mainly rely on _____.
a) Manual labor only
b) Paper-based communication
c) Cyber-physical systems and real-time data
d) Isolated machines

4) What is the primary function of a sensor in an industrial IoT system?
a) To control machines directly
b) To convert physical parameters into electrical signals
c) To store large amounts of data
d) To transmit power

5) Actuators in industrial processes are used to _____.
a) Measure environmental conditions
b) Analyze data
c) Convert electrical signals into physical action
d) Store sensor data

6) Which network is specifically designed for connecting multiple sensors in an IoT environment?
   a) LAN
   b) MAN
   c) Sensor Network (WSN)
   d) PAN

7) In IoT-based process automation, data acquisition refers to _____.
   a) Manual data entry
   b) Collection of data from sensors in real time
   c) Deleting unwanted data
   d) Data encryption only

8) What is the main role of an IoT Gateway?
   a) To manufacture sensors
   b) To connect IoT devices with cloud and perform protocol conversion
   c) To store data permanently
   d) To replace sensors

9) Predictive maintenance using IIoT technology helps to _____.
   a) Increase unexpected machine failures
   b) Perform maintenance only after breakdown
   c) Predict equipment failures using data analytics
   d) Eliminate need of sensors

10) Real-time dashboards in IoT systems are used for _____.
   a) Manual data recording
   b) Offline data storage only
   c) Visual monitoring and analysis of live data
   d) Controlling power supply

11) Why is IIoT security critical in the manufacturing industry?
   a) To increase manual operations
   b) To protect industrial systems from cyber-attacks and data breaches
   c) To reduce use of automation
   d) To eliminate sensors

12) Which of the following is a major security concern in IIoT systems?
   a) High power consumption
   b) Unauthorized access to devices and data
   c) Low storage capacity
   d) Limited connectivity

13) Secure remote access for IIoT devices is typically achieved using _____.

a) Open public networks without protection
b) VPNs and encrypted communication protocols
c) Only physical access
d) No authentication methods

14) Process automation in IIoT helps in _____.

a) Increasing manual intervention
b) Reducing efficiency
c) Improving productivity and accuracy
d) Eliminating all sensors

Seat No.	

Set **P**

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April - 2026
Industrial IoT (ENTMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculator is allowed.

SECTION – I

Q.2 Attempt the following. (Any Four) **16**

a) Define IIoT and explain the structure of IIoT with its key components.

b) Differentiate between IoT and IIoT. Explain the role of IoT and IIoT in industrial applications.

c) What is Industry 4.0? Explain its key features, support systems, and the concept of smart factories.

d) Explain sensors and actuators used in industrial processes. Describe their roles with suitable examples.

e) What is an IoT Hub system? Explain its functions and importance in IoT architecture.

Q.3 Attempt the following. (Any Two) **12**

a) Describe wireless sensor nodes in detail. Explain the working and comparison of Bluetooth, WiFi, and LoRa protocols, and discuss the role of IoT Hub systems in managing connected devices and data.

b) What is a sensor network? Explain process automation and data acquisition on an IoT platform with a neat block diagram.

c) What are smart factories? Explain their features, advantages, and working mechanism.

SECTION – II

Q.4 Attempt the following. (Any Four) **16**

a) What is an IoT Gateway? Explain its functions in an IoT system.

b) Explain cloud computing in IoT. How is it used for real-time dashboard data monitoring.

c) Explain the role of IIoT in the manufacturing industry with suitable examples.

d) Explain secure remote access for IIoT devices and its importance in industry.

e) What is predictive maintenance? Explain its benefits using IIoT technology.

Q.5 Attempt the following. (Any Two) **12**

a) Explain data analytics in IIoT. Discuss predictive maintenance and its importance in industrial applications.

b) Describe secure remote access for IIoT devices. Explain the methods and importance of ensuring secure communication.

c) Discuss different types of industrial needs for IoT security with suitable examples.

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April - 2026
Industrial IoT (ENTMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options and rewrite the sentence. **14**

1) What is the main role of an IoT Gateway?
a) To manufacture sensors
b) To connect IoT devices with cloud and perform protocol conversion
c) To store data permanently
d) To replace sensors

2) Predictive maintenance using IIoT technology helps to _____.
a) Increase unexpected machine failures
b) Perform maintenance only after breakdown
c) Predict equipment failures using data analytics
d) Eliminate need of sensors

3) Real-time dashboards in IoT systems are used for _____.
a) Manual data recording
b) Offline data storage only
c) Visual monitoring and analysis of live data
d) Controlling power supply

4) Why is IIoT security critical in the manufacturing industry?
a) To increase manual operations
b) To protect industrial systems from cyber-attacks and data breaches
c) To reduce use of automation
d) To eliminate sensors

5) Which of the following is a major security concern in IIoT systems?
a) High power consumption
b) Unauthorized access to devices and data
c) Low storage capacity
d) Limited connectivity

6) Secure remote access for IIoT devices is typically achieved using _____.
   a) Open public networks without protection
   b) VPNs and encrypted communication protocols
   c) Only physical access
   d) No authentication methods

7) Process automation in IIoT helps in _____.
   a) Increasing manual intervention
   b) Reducing efficiency
   c) Improving productivity and accuracy
   d) Eliminating all sensors

8) What is the main characteristic that differentiates IIoT from IoT?
   a) Use of social media integration
   b) Focus on consumer applications
   c) Emphasis on industrial automation and reliability
   d) Limited use of sensors

9) Which component is a key part of the IIoT structure?
   a) Entertainment systems
   b) Industrial sensors and actuators
   c) Mobile gaming platforms
   d) Social networking tools

10) In Industry 4.0, smart factories mainly rely on _____.
   a) Manual labor only
   b) Paper-based communication
   c) Cyber-physical systems and real-time data
   d) Isolated machines

11) What is the primary function of a sensor in an industrial IoT system?
   a) To control machines directly
   b) To convert physical parameters into electrical signals
   c) To store large amounts of data
   d) To transmit power

12) Actuators in industrial processes are used to _____.
   a) Measure environmental conditions
   b) Analyze data
   c) Convert electrical signals into physical action
   d) Store sensor data

13) Which network is specifically designed for connecting multiple sensors in an IoT environment?
   a) LAN
   b) MAN
   c) Sensor Network (WSN)
   d) PAN

14) In loT-based process automation, data acquisition refers to _____.

a) Manual data entry
b) Collection of data from sensors in real time
c) Deleting unwanted data
d) Data encryption only

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April - 2026
Industrial IoT (ENTMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculator is allowed.

SECTION – I

Q.2 Attempt the following. (Any Four) **16**

a) Define IIoT and explain the structure of IIoT with its key components.

b) Differentiate between IoT and IIoT. Explain the role of IoT and IIoT in industrial applications.

c) What is Industry 4.0? Explain its key features, support systems, and the concept of smart factories.

d) Explain sensors and actuators used in industrial processes. Describe their roles with suitable examples.

e) What is an IoT Hub system? Explain its functions and importance in IoT architecture.

Q.3 Attempt the following. (Any Two) **12**

a) Describe wireless sensor nodes in detail. Explain the working and comparison of Bluetooth, WiFi, and LoRa protocols, and discuss the role of IoT Hub systems in managing connected devices and data.

b) What is a sensor network? Explain process automation and data acquisition on an IoT platform with a neat block diagram.

c) What are smart factories? Explain their features, advantages, and working mechanism.

SECTION – II

Q.4 Attempt the following. (Any Four) **16**

a) What is an IoT Gateway? Explain its functions in an IoT system.

b) Explain cloud computing in IoT. How is it used for real-time dashboard data monitoring.

c) Explain the role of IIoT in the manufacturing industry with suitable examples.

d) Explain secure remote access for IIoT devices and its importance in industry.

e) What is predictive maintenance? Explain its benefits using IIoT technology.

Q.5 Attempt the following. (Any Two) **12**

a) Explain data analytics in IIoT. Discuss predictive maintenance and its importance in industrial applications.

b) Describe secure remote access for IIoT devices. Explain the methods and importance of ensuring secure communication.

c) Discuss different types of industrial needs for IoT security with suitable examples.

SLR-QH-650

Seat No.	

Set R

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April - 2026
Industrial IoT (ENTMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options and rewrite the sentence. **14**

1) Why is IIoT security critical in the manufacturing industry?
a) To increase manual operations
b) To protect industrial systems from cyber-attacks and data breaches
c) To reduce use of automation
d) To eliminate sensors

2) Which of the following is a major security concern in IIoT systems?
a) High power consumption
b) Unauthorized access to devices and data
c) Low storage capacity
d) Limited connectivity

3) Secure remote access for IIoT devices is typically achieved using _____.
a) Open public networks without protection
b) VPNs and encrypted communication protocols
c) Only physical access
d) No authentication methods

4) Process automation in IIoT helps in _____.
a) Increasing manual intervention
b) Reducing efficiency
c) Improving productivity and accuracy
d) Eliminating all sensors

5) What is the main characteristic that differentiates IIoT from IoT?
a) Use of social media integration
b) Focus on consumer applications
c) Emphasis on industrial automation and reliability
d) Limited use of sensors

6) Which component is a key part of the IIoT structure?
   a) Entertainment systems
   b) Industrial sensors and actuators
   c) Mobile gaming platforms
   d) Social networking tools

7) In Industry 4.0, smart factories mainly rely on _____.
   a) Manual labor only
   b) Paper-based communication
   c) Cyber-physical systems and real-time data
   d) Isolated machines

8) What is the primary function of a sensor in an industrial IoT system?
   a) To control machines directly
   b) To convert physical parameters into electrical signals
   c) To store large amounts of data
   d) To transmit power

9) Actuators in industrial processes are used to _____.
   a) Measure environmental conditions
   b) Analyze data
   c) Convert electrical signals into physical action
   d) Store sensor data

10) Which network is specifically designed for connecting multiple sensors in an IoT environment?
   a) LAN
   b) MAN
   c) Sensor Network (WSN)
   d) PAN

11) In IoT-based process automation, data acquisition refers to _____.
   a) Manual data entry
   b) Collection of data from sensors in real time
   c) Deleting unwanted data
   d) Data encryption only

12) What is the main role of an IoT Gateway?
   a) To manufacture sensors
   b) To connect IoT devices with cloud and perform protocol conversion
   c) To store data permanently
   d) To replace sensors

13) Predictive maintenance using IIoT technology helps to _____.
   a) Increase unexpected machine failures
   b) Perform maintenance only after breakdown
   c) Predict equipment failures using data analytics
   d) Eliminate need of sensors

14) Real-time dashboards in IoT systems are used for _____.

a) Manual data recording
b) Offline data storage only
c) Visual monitoring and analysis of live data
d) Controlling power supply

Seat No.	

Set **R**

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April - 2026
Industrial IoT (ENTMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculator is allowed.

SECTION – I

Q.2 Attempt the following. (Any Four) **16**

a) Define IIoT and explain the structure of IIoT with its key components.

b) Differentiate between IoT and IIoT. Explain the role of IoT and IIoT in industrial applications.

c) What is Industry 4.0? Explain its key features, support systems, and the concept of smart factories.

d) Explain sensors and actuators used in industrial processes. Describe their roles with suitable examples.

e) What is an IoT Hub system? Explain its functions and importance in IoT architecture.

Q.3 Attempt the following. (Any Two) **12**

a) Describe wireless sensor nodes in detail. Explain the working and comparison of Bluetooth, WiFi, and LoRa protocols, and discuss the role of IoT Hub systems in managing connected devices and data.

b) What is a sensor network? Explain process automation and data acquisition on an IoT platform with a neat block diagram.

c) What are smart factories? Explain their features, advantages, and working mechanism.

SECTION – II

Q.4 Attempt the following. (Any Four) **16**

a) What is an IoT Gateway? Explain its functions in an IoT system.

b) Explain cloud computing in IoT. How is it used for real-time dashboard data monitoring.

c) Explain the role of IIoT in the manufacturing industry with suitable examples.

d) Explain secure remote access for IIoT devices and its importance in industry.

e) What is predictive maintenance? Explain its benefits using IIoT technology.

Q.5 Attempt the following. (Any Two) **12**

a) Explain data analytics in IIoT. Discuss predictive maintenance and its importance in industrial applications.

b) Describe secure remote access for IIoT devices. Explain the methods and importance of ensuring secure communication.

c) Discuss different types of industrial needs for IoT security with suitable examples.

SLR-QH-650

Seat No.	

Set S

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April - 2026
Industrial IoT (ENTMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options and rewrite the sentence. **14**

1) Which network is specifically designed for connecting multiple sensors in an IoT environment?
a) LAN b) MAN
c) Sensor Network (WSN) d) PAN

2) In IoT-based process automation, data acquisition refers to _____.
a) Manual data entry
b) Collection of data from sensors in real time
c) Deleting unwanted data
d) Data encryption only

3) What is the main role of an IoT Gateway?
a) To manufacture sensors
b) To connect IoT devices with cloud and perform protocol conversion
c) To store data permanently
d) To replace sensors

4) Predictive maintenance using IIoT technology helps to _____.
a) Increase unexpected machine failures
b) Perform maintenance only after breakdown
c) Predict equipment failures using data analytics
d) Eliminate need of sensors

5) Real-time dashboards in IoT systems are used for _____.
a) Manual data recording
b) Offline data storage only
c) Visual monitoring and analysis of live data
d) Controlling power supply

6) Why is IIoT security critical in the manufacturing industry?
   a) To increase manual operations
   b) To protect industrial systems from cyber-attacks and data breaches
   c) To reduce use of automation
   d) To eliminate sensors

7) Which of the following is a major security concern in IIoT systems?
   a) High power consumption
   b) Unauthorized access to devices and data
   c) Low storage capacity
   d) Limited connectivity

8) Secure remote access for IIoT devices is typically achieved using _____.
   a) Open public networks without protection
   b) VPNs and encrypted communication protocols
   c) Only physical access
   d) No authentication methods

9) Process automation in IIoT helps in _____.
   a) Increasing manual intervention
   b) Reducing efficiency
   c) Improving productivity and accuracy
   d) Eliminating all sensors

10) What is the main characteristic that differentiates IIoT from IoT?
   a) Use of social media integration
   b) Focus on consumer applications
   c) Emphasis on industrial automation and reliability
   d) Limited use of sensors

11) Which component is a key part of the IIoT structure?
   a) Entertainment systems
   b) Industrial sensors and actuators
   c) Mobile gaming platforms
   d) Social networking tools

12) In Industry 4.0, smart factories mainly rely on _____.
   a) Manual labor only
   b) Paper-based communication
   c) Cyber-physical systems and real-time data
   d) Isolated machines

13) What is the primary function of a sensor in an industrial IoT system?
   a) To control machines directly
   b) To convert physical parameters into electrical signals
   c) To store large amounts of data
   d) To transmit power

14) Actuators in industrial processes are used to _____.

a) Measure environmental conditions
b) Analyze data
c) Convert electrical signals into physical action
d) Store sensor data

Seat No.		Set	S

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April - 2026
Industrial IoT (ENTMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculator is allowed.

SECTION – I

Q.2 Attempt the following. (Any Four) **16**

a) Define IIoT and explain the structure of IIoT with its key components.

b) Differentiate between IoT and IIoT. Explain the role of IoT and IIoT in industrial applications.

c) What is Industry 4.0? Explain its key features, support systems, and the concept of smart factories.

d) Explain sensors and actuators used in industrial processes. Describe their roles with suitable examples.

e) What is an IoT Hub system? Explain its functions and importance in IoT architecture.

Q.3 Attempt the following. (Any Two) **12**

a) Describe wireless sensor nodes in detail. Explain the working and comparison of Bluetooth, WiFi, and LoRa protocols, and discuss the role of IoT Hub systems in managing connected devices and data.

b) What is a sensor network? Explain process automation and data acquisition on an IoT platform with a neat block diagram.

c) What are smart factories? Explain their features, advantages, and working mechanism.

SECTION – II

Q.4 Attempt the following. (Any Four) **16**

a) What is an IoT Gateway? Explain its functions in an IoT system.

b) Explain cloud computing in IoT. How is it used for real-time dashboard data monitoring.

c) Explain the role of IIoT in the manufacturing industry with suitable examples.

d) Explain secure remote access for IIoT devices and its importance in industry.

e) What is predictive maintenance? Explain its benefits using IIoT technology.

Q.5 Attempt the following. (Any Two) **12**

a) Explain data analytics in IIoT. Discuss predictive maintenance and its importance in industrial applications.

b) Describe secure remote access for IIoT devices. Explain the methods and importance of ensuring secure communication.

c) Discuss different types of industrial needs for IoT security with suitable examples.

SLR-QH-650

Seat No.	

Set P

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026
Industrial IoT (ENTMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options and rewrite the sentence. **14**

1) What is the main characteristic that differentiates IIoT from IoT?
a) Use of social media integration
b) Focus on consumer applications
c) Emphasis on industrial automation and reliability
d) Limited use of sensors

2) Which component is a key part of the IIoT structure?
a) Entertainment systems
b) Industrial sensors and actuators
c) Mobile gaming platforms
d) Social networking tools

3) In Industry 4.0, smart factories mainly rely on _____.
a) Manual labor only
b) Paper-based communication
c) Cyber-physical systems and real-time data
d) Isolated machines

4) What is the primary function of a sensor in an industrial IoT system?
a) To control machines directly
b) To convert physical parameters into electrical signals
c) To store large amounts of data
d) To transmit power

5) Actuators in industrial processes are used to _____.
a) Measure environmental conditions
b) Analyze data
c) Convert electrical signals into physical action
d) Store sensor data

6) Which network is specifically designed for connecting multiple sensors in an IoT environment?
   a) LAN
   b) MAN
   c) Sensor Network (WSN)
   d) PAN

7) In IoT-based process automation, data acquisition refers to _____.
   a) Manual data entry
   b) Collection of data from sensors in real time
   c) Deleting unwanted data
   d) Data encryption only

8) What is the main role of an IoT Gateway?
   a) To manufacture sensors
   b) To connect IoT devices with cloud and perform protocol conversion
   c) To store data permanently
   d) To replace sensors

9) Predictive maintenance using IIoT technology helps to _____.
   a) Increase unexpected machine failures
   b) Perform maintenance only after breakdown
   c) Predict equipment failures using data analytics
   d) Eliminate need of sensors

10) Real-time dashboards in IoT systems are used for _____.
   a) Manual data recording
   b) Offline data storage only
   c) Visual monitoring and analysis of live data
   d) Controlling power supply

11) Why is IIoT security critical in the manufacturing industry?
   a) To increase manual operations
   b) To protect industrial systems from cyber-attacks and data breaches
   c) To reduce use of automation
   d) To eliminate sensors

12) Which of the following is a major security concern in IIoT systems?
   a) High power consumption
   b) Unauthorized access to devices and data
   c) Low storage capacity
   d) Limited connectivity

13) Secure remote access for IIoT devices is typically achieved using _____.

a) Open public networks without protection
b) VPNs and encrypted communication protocols
c) Only physical access
d) No authentication methods

14) Process automation in IIoT helps in _____.

a) Increasing manual intervention
b) Reducing efficiency
c) Improving productivity and accuracy
d) Eliminating all sensors

Seat No.	

Set | P

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026
Industrial IoT (ENTMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculator is allowed.

SECTION – I

Q.2 Attempt the following. (Any Four) **16**

a) Define IIoT and explain the structure of IIoT with its key components.

b) Differentiate between IoT and IIoT. Explain the role of IoT and IIoT in industrial applications.

c) What is Industry 4.0? Explain its key features, support systems, and the concept of smart factories.

d) Explain sensors and actuators used in industrial processes. Describe their roles with suitable examples.

e) What is an IoT Hub system? Explain its functions and importance in IoT architecture.

Q.3 Attempt the following. (Any Two) **12**

a) Describe wireless sensor nodes in detail. Explain the working and comparison of Bluetooth, WiFi, and LoRa protocols, and discuss the role of IoT Hub systems in managing connected devices and data.

b) What is a sensor network? Explain process automation and data acquisition on an IoT platform with a neat block diagram.

c) What are smart factories? Explain their features, advantages, and working mechanism.

SECTION – II

Q.4 Attempt the following. (Any Four) **16**

a) What is an IoT Gateway? Explain its functions in an IoT system.

b) Explain cloud computing in IoT. How is it used for real-time dashboard data monitoring.

c) Explain the role of IIoT in the manufacturing industry with suitable examples.

d) Explain secure remote access for IIoT devices and its importance in industry.

e) What is predictive maintenance? Explain its benefits using IIoT technology.

Q.5 Attempt the following. (Any Two) **12**

a) Explain data analytics in IIoT. Discuss predictive maintenance and its importance in industrial applications.

b) Describe secure remote access for IIoT devices. Explain the methods and importance of ensuring secure communication.

c) Discuss different types of industrial needs for IoT security with suitable examples.

SLR-QH-650

Seat No.	

Set Q

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026
Industrial IoT (ENTMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options and rewrite the sentence. **14**

1) What is the main role of an IoT Gateway?
a) To manufacture sensors
b) To connect IoT devices with cloud and perform protocol conversion
c) To store data permanently
d) To replace sensors

2) Predictive maintenance using IIoT technology helps to _____.
a) Increase unexpected machine failures
b) Perform maintenance only after breakdown
c) Predict equipment failures using data analytics
d) Eliminate need of sensors

3) Real-time dashboards in IoT systems are used for _____.
a) Manual data recording
b) Offline data storage only
c) Visual monitoring and analysis of live data
d) Controlling power supply

4) Why is IIoT security critical in the manufacturing industry?
a) To increase manual operations
b) To protect industrial systems from cyber-attacks and data breaches
c) To reduce use of automation
d) To eliminate sensors

5) Which of the following is a major security concern in IIoT systems?
a) High power consumption
b) Unauthorized access to devices and data
c) Low storage capacity
d) Limited connectivity

6) Secure remote access for IIoT devices is typically achieved using _____.
   a) Open public networks without protection
   b) VPNs and encrypted communication protocols
   c) Only physical access
   d) No authentication methods

7) Process automation in IIoT helps in _____.
   a) Increasing manual intervention
   b) Reducing efficiency
   c) Improving productivity and accuracy
   d) Eliminating all sensors

8) What is the main characteristic that differentiates IIoT from IoT?
   a) Use of social media integration
   b) Focus on consumer applications
   c) Emphasis on industrial automation and reliability
   d) Limited use of sensors

9) Which component is a key part of the IIoT structure?
   a) Entertainment systems
   b) Industrial sensors and actuators
   c) Mobile gaming platforms
   d) Social networking tools

10) In Industry 4.0, smart factories mainly rely on _____.
   a) Manual labor only
   b) Paper-based communication
   c) Cyber-physical systems and real-time data
   d) Isolated machines

11) What is the primary function of a sensor in an industrial IoT system?
   a) To control machines directly
   b) To convert physical parameters into electrical signals
   c) To store large amounts of data
   d) To transmit power

12) Actuators in industrial processes are used to _____.
   a) Measure environmental conditions
   b) Analyze data
   c) Convert electrical signals into physical action
   d) Store sensor data

13) Which network is specifically designed for connecting multiple sensors in an IoT environment?
   a) LAN
   b) MAN
   c) Sensor Network (WSN)
   d) PAN

14) In loT-based process automation, data acquisition refers to _____.

a) Manual data entry
b) Collection of data from sensors in real time
c) Deleting unwanted data
d) Data encryption only

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026
Industrial IoT (ENTMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculator is allowed.

SECTION – I

Q.2 Attempt the following. (Any Four) **16**

a) Define IIoT and explain the structure of IIoT with its key components.

b) Differentiate between IoT and IIoT. Explain the role of IoT and IIoT in industrial applications.

c) What is Industry 4.0? Explain its key features, support systems, and the concept of smart factories.

d) Explain sensors and actuators used in industrial processes. Describe their roles with suitable examples.

e) What is an IoT Hub system? Explain its functions and importance in IoT architecture.

Q.3 Attempt the following. (Any Two) **12**

a) Describe wireless sensor nodes in detail. Explain the working and comparison of Bluetooth, WiFi, and LoRa protocols, and discuss the role of IoT Hub systems in managing connected devices and data.

b) What is a sensor network? Explain process automation and data acquisition on an IoT platform with a neat block diagram.

c) What are smart factories? Explain their features, advantages, and working mechanism.

SECTION – II

Q.4 Attempt the following. (Any Four) **16**

a) What is an IoT Gateway? Explain its functions in an IoT system.

b) Explain cloud computing in IoT. How is it used for real-time dashboard data monitoring.

c) Explain the role of IIoT in the manufacturing industry with suitable examples.

d) Explain secure remote access for IIoT devices and its importance in industry.

e) What is predictive maintenance? Explain its benefits using IIoT technology.

Q.5 Attempt the following. (Any Two) **12**

a) Explain data analytics in IIoT. Discuss predictive maintenance and its importance in industrial applications.

b) Describe secure remote access for IIoT devices. Explain the methods and importance of ensuring secure communication.

c) Discuss different types of industrial needs for IoT security with suitable examples.

SLR-QH-650

Seat No.	

Set R

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026
Industrial IoT (ENTMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options and rewrite the sentence. **14**

1) Why is IIoT security critical in the manufacturing industry?
a) To increase manual operations
b) To protect industrial systems from cyber-attacks and data breaches
c) To reduce use of automation
d) To eliminate sensors

2) Which of the following is a major security concern in IIoT systems?
a) High power consumption
b) Unauthorized access to devices and data
c) Low storage capacity
d) Limited connectivity

3) Secure remote access for IIoT devices is typically achieved using _____.
a) Open public networks without protection
b) VPNs and encrypted communication protocols
c) Only physical access
d) No authentication methods

4) Process automation in IIoT helps in _____.
a) Increasing manual intervention
b) Reducing efficiency
c) Improving productivity and accuracy
d) Eliminating all sensors

5) What is the main characteristic that differentiates IIoT from IoT?
a) Use of social media integration
b) Focus on consumer applications
c) Emphasis on industrial automation and reliability
d) Limited use of sensors

6) Which component is a key part of the IIoT structure?
   a) Entertainment systems
   b) Industrial sensors and actuators
   c) Mobile gaming platforms
   d) Social networking tools

7) In Industry 4.0, smart factories mainly rely on _____.
   a) Manual labor only
   b) Paper-based communication
   c) Cyber-physical systems and real-time data
   d) Isolated machines

8) What is the primary function of a sensor in an industrial IoT system?
   a) To control machines directly
   b) To convert physical parameters into electrical signals
   c) To store large amounts of data
   d) To transmit power

9) Actuators in industrial processes are used to _____.
   a) Measure environmental conditions
   b) Analyze data
   c) Convert electrical signals into physical action
   d) Store sensor data

10) Which network is specifically designed for connecting multiple sensors in an IoT environment?
   a) LAN
   b) MAN
   c) Sensor Network (WSN)
   d) PAN

11) In IoT-based process automation, data acquisition refers to _____.
   a) Manual data entry
   b) Collection of data from sensors in real time
   c) Deleting unwanted data
   d) Data encryption only

12) What is the main role of an IoT Gateway?
   a) To manufacture sensors
   b) To connect IoT devices with cloud and perform protocol conversion
   c) To store data permanently
   d) To replace sensors

13) Predictive maintenance using IIoT technology helps to _____.
   a) Increase unexpected machine failures
   b) Perform maintenance only after breakdown
   c) Predict equipment failures using data analytics
   d) Eliminate need of sensors

14) Real-time dashboards in IoT systems are used for _____.

a) Manual data recording
b) Offline data storage only
c) Visual monitoring and analysis of live data
d) Controlling power supply

Seat No.	

Set **R**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026
Industrial IoT (ENTMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculator is allowed.

SECTION – I

Q.2 Attempt the following. (Any Four) **16**

a) Define IIoT and explain the structure of IIoT with its key components.

b) Differentiate between IoT and IIoT. Explain the role of IoT and IIoT in industrial applications.

c) What is Industry 4.0? Explain its key features, support systems, and the concept of smart factories.

d) Explain sensors and actuators used in industrial processes. Describe their roles with suitable examples.

e) What is an IoT Hub system? Explain its functions and importance in IoT architecture.

Q.3 Attempt the following. (Any Two) **12**

a) Describe wireless sensor nodes in detail. Explain the working and comparison of Bluetooth, WiFi, and LoRa protocols, and discuss the role of IoT Hub systems in managing connected devices and data.

b) What is a sensor network? Explain process automation and data acquisition on an IoT platform with a neat block diagram.

c) What are smart factories? Explain their features, advantages, and working mechanism.

SECTION – II

Q.4 Attempt the following. (Any Four) **16**

a) What is an IoT Gateway? Explain its functions in an IoT system.

b) Explain cloud computing in IoT. How is it used for real-time dashboard data monitoring.

c) Explain the role of IIoT in the manufacturing industry with suitable examples.

d) Explain secure remote access for IIoT devices and its importance in industry.

e) What is predictive maintenance? Explain its benefits using IIoT technology.

Q.5 Attempt the following. (Any Two) **12**

a) Explain data analytics in IIoT. Discuss predictive maintenance and its importance in industrial applications.

b) Describe secure remote access for IIoT devices. Explain the methods and importance of ensuring secure communication.

c) Discuss different types of industrial needs for IoT security with suitable examples.

Seat No.	

Set | S

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026
Industrial IoT (ENTMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options and rewrite the sentence. **14**

1) Which network is specifically designed for connecting multiple sensors in an IoT environment?
a) LAN b) MAN
c) Sensor Network (WSN) d) PAN

2) In IoT-based process automation, data acquisition refers to _____.
a) Manual data entry
b) Collection of data from sensors in real time
c) Deleting unwanted data
d) Data encryption only

3) What is the main role of an IoT Gateway?
a) To manufacture sensors
b) To connect IoT devices with cloud and perform protocol conversion
c) To store data permanently
d) To replace sensors

4) Predictive maintenance using IIoT technology helps to _____.
a) Increase unexpected machine failures
b) Perform maintenance only after breakdown
c) Predict equipment failures using data analytics
d) Eliminate need of sensors

5) Real-time dashboards in IoT systems are used for _____.
a) Manual data recording
b) Offline data storage only
c) Visual monitoring and analysis of live data
d) Controlling power supply

6) Why is IIoT security critical in the manufacturing industry?
   a) To increase manual operations
   b) To protect industrial systems from cyber-attacks and data breaches
   c) To reduce use of automation
   d) To eliminate sensors

7) Which of the following is a major security concern in IIoT systems?
   a) High power consumption
   b) Unauthorized access to devices and data
   c) Low storage capacity
   d) Limited connectivity

8) Secure remote access for IIoT devices is typically achieved using _____.
   a) Open public networks without protection
   b) VPNs and encrypted communication protocols
   c) Only physical access
   d) No authentication methods

9) Process automation in IIoT helps in _____.
   a) Increasing manual intervention
   b) Reducing efficiency
   c) Improving productivity and accuracy
   d) Eliminating all sensors

10) What is the main characteristic that differentiates IIoT from IoT?
   a) Use of social media integration
   b) Focus on consumer applications
   c) Emphasis on industrial automation and reliability
   d) Limited use of sensors

11) Which component is a key part of the IIoT structure?
   a) Entertainment systems
   b) Industrial sensors and actuators
   c) Mobile gaming platforms
   d) Social networking tools

12) In Industry 4.0, smart factories mainly rely on _____.
   a) Manual labor only
   b) Paper-based communication
   c) Cyber-physical systems and real-time data
   d) Isolated machines

13) What is the primary function of a sensor in an industrial IoT system?
   a) To control machines directly
   b) To convert physical parameters into electrical signals
   c) To store large amounts of data
   d) To transmit power

14) Actuators in industrial processes are used to _____.

a) Measure environmental conditions
b) Analyze data
c) Convert electrical signals into physical action
d) Store sensor data

Seat No.	

Set | S

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026
Industrial IoT (ENTMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculator is allowed.

SECTION – I

Q.2 Attempt the following. (Any Four) **16**

a) Define IIoT and explain the structure of IIoT with its key components.

b) Differentiate between IoT and IIoT. Explain the role of IoT and IIoT in industrial applications.

c) What is Industry 4.0? Explain its key features, support systems, and the concept of smart factories.

d) Explain sensors and actuators used in industrial processes. Describe their roles with suitable examples.

e) What is an IoT Hub system? Explain its functions and importance in IoT architecture.

Q.3 Attempt the following. (Any Two) **12**

a) Describe wireless sensor nodes in detail. Explain the working and comparison of Bluetooth, WiFi, and LoRa protocols, and discuss the role of IoT Hub systems in managing connected devices and data.

b) What is a sensor network? Explain process automation and data acquisition on an IoT platform with a neat block diagram.

c) What are smart factories? Explain their features, advantages, and working mechanism.

SECTION – II

Q.4 Attempt the following. (Any Four) **16**

a) What is an IoT Gateway? Explain its functions in an IoT system.

b) Explain cloud computing in IoT. How is it used for real-time dashboard data monitoring.

c) Explain the role of IIoT in the manufacturing industry with suitable examples.

d) Explain secure remote access for IIoT devices and its importance in industry.

e) What is predictive maintenance? Explain its benefits using IIoT technology.

Q.5 Attempt the following. (Any Two) **12**

a) Explain data analytics in IIoT. Discuss predictive maintenance and its importance in industrial applications.

b) Describe secure remote access for IIoT devices. Explain the methods and importance of ensuring secure communication.

c) Discuss different types of industrial needs for IoT security with suitable examples.

SLR-QH-650

Seat No.	

Set P

T.Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026
Industrial IoT (ENTMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options and rewrite the sentence. **14**

1) What is the main characteristic that differentiates IIoT from IoT?
a) Use of social media integration
b) Focus on consumer applications
c) Emphasis on industrial automation and reliability
d) Limited use of sensors

2) Which component is a key part of the IIoT structure?
a) Entertainment systems
b) Industrial sensors and actuators
c) Mobile gaming platforms
d) Social networking tools

3) In Industry 4.0, smart factories mainly rely on _____.
a) Manual labor only
b) Paper-based communication
c) Cyber-physical systems and real-time data
d) Isolated machines

4) What is the primary function of a sensor in an industrial IoT system?
a) To control machines directly
b) To convert physical parameters into electrical signals
c) To store large amounts of data
d) To transmit power

5) Actuators in industrial processes are used to _____.
a) Measure environmental conditions
b) Analyze data
c) Convert electrical signals into physical action
d) Store sensor data

6) Which network is specifically designed for connecting multiple sensors in an IoT environment?
   a) LAN
   b) MAN
   c) Sensor Network (WSN)
   d) PAN

7) In IoT-based process automation, data acquisition refers to _____.
   a) Manual data entry
   b) Collection of data from sensors in real time
   c) Deleting unwanted data
   d) Data encryption only

8) What is the main role of an IoT Gateway?
   a) To manufacture sensors
   b) To connect IoT devices with cloud and perform protocol conversion
   c) To store data permanently
   d) To replace sensors

9) Predictive maintenance using IIoT technology helps to _____.
   a) Increase unexpected machine failures
   b) Perform maintenance only after breakdown
   c) Predict equipment failures using data analytics
   d) Eliminate need of sensors

10) Real-time dashboards in IoT systems are used for _____.
   a) Manual data recording
   b) Offline data storage only
   c) Visual monitoring and analysis of live data
   d) Controlling power supply

11) Why is IIoT security critical in the manufacturing industry?
   a) To increase manual operations
   b) To protect industrial systems from cyber-attacks and data breaches
   c) To reduce use of automation
   d) To eliminate sensors

12) Which of the following is a major security concern in IIoT systems?
   a) High power consumption
   b) Unauthorized access to devices and data
   c) Low storage capacity
   d) Limited connectivity

13) Secure remote access for IIoT devices is typically achieved using _____.

a) Open public networks without protection
b) VPNs and encrypted communication protocols
c) Only physical access
d) No authentication methods

14) Process automation in IIoT helps in _____.

a) Increasing manual intervention
b) Reducing efficiency
c) Improving productivity and accuracy
d) Eliminating all sensors

Seat No.	

Set **P**

T.Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026
Industrial IoT (ENTMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculator is allowed.

SECTION – I

Q.2 Attempt the following. (Any Four) **16**

a) Define IIoT and explain the structure of IIoT with its key components.

b) Differentiate between IoT and IIoT. Explain the role of IoT and IIoT in industrial applications.

c) What is Industry 4.0? Explain its key features, support systems, and the concept of smart factories.

d) Explain sensors and actuators used in industrial processes. Describe their roles with suitable examples.

e) What is an IoT Hub system? Explain its functions and importance in IoT architecture.

Q.3 Attempt the following. (Any Two) **12**

a) Describe wireless sensor nodes in detail. Explain the working and comparison of Bluetooth, WiFi, and LoRa protocols, and discuss the role of IoT Hub systems in managing connected devices and data.

b) What is a sensor network? Explain process automation and data acquisition on an IoT platform with a neat block diagram.

c) What are smart factories? Explain their features, advantages, and working mechanism.

SECTION – II

Q.4 Attempt the following. (Any Four) **16**

a) What is an IoT Gateway? Explain its functions in an IoT system.

b) Explain cloud computing in IoT. How is it used for real-time dashboard data monitoring.

c) Explain the role of IIoT in the manufacturing industry with suitable examples.

d) Explain secure remote access for IIoT devices and its importance in industry.

e) What is predictive maintenance? Explain its benefits using IIoT technology.

Q.5 Attempt the following. (Any Two) **12**

a) Explain data analytics in IIoT. Discuss predictive maintenance and its importance in industrial applications.

b) Describe secure remote access for IIoT devices. Explain the methods and importance of ensuring secure communication.

c) Discuss different types of industrial needs for IoT security with suitable examples.

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026
Industrial IoT (ENTMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options and rewrite the sentence. **14**

1) What is the main role of an IoT Gateway?
a) To manufacture sensors
b) To connect IoT devices with cloud and perform protocol conversion
c) To store data permanently
d) To replace sensors

2) Predictive maintenance using IIoT technology helps to _____.
a) Increase unexpected machine failures
b) Perform maintenance only after breakdown
c) Predict equipment failures using data analytics
d) Eliminate need of sensors

3) Real-time dashboards in IoT systems are used for _____.
a) Manual data recording
b) Offline data storage only
c) Visual monitoring and analysis of live data
d) Controlling power supply

4) Why is IIoT security critical in the manufacturing industry?
a) To increase manual operations
b) To protect industrial systems from cyber-attacks and data breaches
c) To reduce use of automation
d) To eliminate sensors

5) Which of the following is a major security concern in IIoT systems?
a) High power consumption
b) Unauthorized access to devices and data
c) Low storage capacity
d) Limited connectivity

6) Secure remote access for IIoT devices is typically achieved using _____.
   a) Open public networks without protection
   b) VPNs and encrypted communication protocols
   c) Only physical access
   d) No authentication methods

7) Process automation in IIoT helps in _____.
   a) Increasing manual intervention
   b) Reducing efficiency
   c) Improving productivity and accuracy
   d) Eliminating all sensors

8) What is the main characteristic that differentiates IIoT from IoT?
   a) Use of social media integration
   b) Focus on consumer applications
   c) Emphasis on industrial automation and reliability
   d) Limited use of sensors

9) Which component is a key part of the IIoT structure?
   a) Entertainment systems
   b) Industrial sensors and actuators
   c) Mobile gaming platforms
   d) Social networking tools

10) In Industry 4.0, smart factories mainly rely on _____.
   a) Manual labor only
   b) Paper-based communication
   c) Cyber-physical systems and real-time data
   d) Isolated machines

11) What is the primary function of a sensor in an industrial IoT system?
   a) To control machines directly
   b) To convert physical parameters into electrical signals
   c) To store large amounts of data
   d) To transmit power

12) Actuators in industrial processes are used to _____.
   a) Measure environmental conditions
   b) Analyze data
   c) Convert electrical signals into physical action
   d) Store sensor data

13) Which network is specifically designed for connecting multiple sensors in an IoT environment?
   a) LAN
   b) MAN
   c) Sensor Network (WSN)
   d) PAN

14) In loT-based process automation, data acquisition refers to _____.

a) Manual data entry
b) Collection of data from sensors in real time
c) Deleting unwanted data
d) Data encryption only

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026
Industrial IoT (ENTMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculator is allowed.

SECTION – I

Q.2 Attempt the following. (Any Four) **16**

a) Define IIoT and explain the structure of IIoT with its key components.

b) Differentiate between IoT and IIoT. Explain the role of IoT and IIoT in industrial applications.

c) What is Industry 4.0? Explain its key features, support systems, and the concept of smart factories.

d) Explain sensors and actuators used in industrial processes. Describe their roles with suitable examples.

e) What is an IoT Hub system? Explain its functions and importance in IoT architecture.

Q.3 Attempt the following. (Any Two) **12**

a) Describe wireless sensor nodes in detail. Explain the working and comparison of Bluetooth, WiFi, and LoRa protocols, and discuss the role of IoT Hub systems in managing connected devices and data.

b) What is a sensor network? Explain process automation and data acquisition on an IoT platform with a neat block diagram.

c) What are smart factories? Explain their features, advantages, and working mechanism.

SECTION – II

Q.4 Attempt the following. (Any Four) **16**

a) What is an IoT Gateway? Explain its functions in an IoT system.

b) Explain cloud computing in IoT. How is it used for real-time dashboard data monitoring.

c) Explain the role of IIoT in the manufacturing industry with suitable examples.

d) Explain secure remote access for IIoT devices and its importance in industry.

e) What is predictive maintenance? Explain its benefits using IIoT technology.

Q.5 Attempt the following. (Any Two) **12**

a) Explain data analytics in IIoT. Discuss predictive maintenance and its importance in industrial applications.

b) Describe secure remote access for IIoT devices. Explain the methods and importance of ensuring secure communication.

c) Discuss different types of industrial needs for IoT security with suitable examples.

Seat No.	

Set **R**

T.Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026
Industrial IoT (ENTMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options and rewrite the sentence. **14**

1) Why is IIoT security critical in the manufacturing industry?
a) To increase manual operations
b) To protect industrial systems from cyber-attacks and data breaches
c) To reduce use of automation
d) To eliminate sensors

2) Which of the following is a major security concern in IIoT systems?
a) High power consumption
b) Unauthorized access to devices and data
c) Low storage capacity
d) Limited connectivity

3) Secure remote access for IIoT devices is typically achieved using _____.
a) Open public networks without protection
b) VPNs and encrypted communication protocols
c) Only physical access
d) No authentication methods

4) Process automation in IIoT helps in _____.
a) Increasing manual intervention
b) Reducing efficiency
c) Improving productivity and accuracy
d) Eliminating all sensors

5) What is the main characteristic that differentiates IIoT from IoT?
a) Use of social media integration
b) Focus on consumer applications
c) Emphasis on industrial automation and reliability
d) Limited use of sensors

6) Which component is a key part of the IIoT structure?
   a) Entertainment systems
   b) Industrial sensors and actuators
   c) Mobile gaming platforms
   d) Social networking tools

7) In Industry 4.0, smart factories mainly rely on _____.
   a) Manual labor only
   b) Paper-based communication
   c) Cyber-physical systems and real-time data
   d) Isolated machines

8) What is the primary function of a sensor in an industrial IoT system?
   a) To control machines directly
   b) To convert physical parameters into electrical signals
   c) To store large amounts of data
   d) To transmit power

9) Actuators in industrial processes are used to _____.
   a) Measure environmental conditions
   b) Analyze data
   c) Convert electrical signals into physical action
   d) Store sensor data

10) Which network is specifically designed for connecting multiple sensors in an IoT environment?
   a) LAN
   b) MAN
   c) Sensor Network (WSN)
   d) PAN

11) In IoT-based process automation, data acquisition refers to _____.
   a) Manual data entry
   b) Collection of data from sensors in real time
   c) Deleting unwanted data
   d) Data encryption only

12) What is the main role of an IoT Gateway?
   a) To manufacture sensors
   b) To connect IoT devices with cloud and perform protocol conversion
   c) To store data permanently
   d) To replace sensors

13) Predictive maintenance using IIoT technology helps to _____.
   a) Increase unexpected machine failures
   b) Perform maintenance only after breakdown
   c) Predict equipment failures using data analytics
   d) Eliminate need of sensors

14) Real-time dashboards in IoT systems are used for _____.

a) Manual data recording
b) Offline data storage only
c) Visual monitoring and analysis of live data
d) Controlling power supply

Seat No.	

Set **R**

T.Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026
Industrial IoT (ENTMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculator is allowed.

SECTION – I

Q.2 Attempt the following. (Any Four) **16**

a) Define IIoT and explain the structure of IIoT with its key components.

b) Differentiate between IoT and IIoT. Explain the role of IoT and IIoT in industrial applications.

c) What is Industry 4.0? Explain its key features, support systems, and the concept of smart factories.

d) Explain sensors and actuators used in industrial processes. Describe their roles with suitable examples.

e) What is an IoT Hub system? Explain its functions and importance in IoT architecture.

Q.3 Attempt the following. (Any Two) **12**

a) Describe wireless sensor nodes in detail. Explain the working and comparison of Bluetooth, WiFi, and LoRa protocols, and discuss the role of IoT Hub systems in managing connected devices and data.

b) What is a sensor network? Explain process automation and data acquisition on an IoT platform with a neat block diagram.

c) What are smart factories? Explain their features, advantages, and working mechanism.

SECTION – II

Q.4 Attempt the following. (Any Four) **16**

a) What is an IoT Gateway? Explain its functions in an IoT system.

b) Explain cloud computing in IoT. How is it used for real-time dashboard data monitoring.

c) Explain the role of IIoT in the manufacturing industry with suitable examples.

d) Explain secure remote access for IIoT devices and its importance in industry.

e) What is predictive maintenance? Explain its benefits using IIoT technology.

Q.5 Attempt the following. (Any Two) **12**

a) Explain data analytics in IIoT. Discuss predictive maintenance and its importance in industrial applications.

b) Describe secure remote access for IIoT devices. Explain the methods and importance of ensuring secure communication.

c) Discuss different types of industrial needs for IoT security with suitable examples.

Seat No.	

Set | S

T.Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026
Industrial IoT (ENTMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options and rewrite the sentence. **14**

1) Which network is specifically designed for connecting multiple sensors in an IoT environment?
a) LAN b) MAN
c) Sensor Network (WSN) d) PAN

2) In IoT-based process automation, data acquisition refers to _____.
a) Manual data entry
b) Collection of data from sensors in real time
c) Deleting unwanted data
d) Data encryption only

3) What is the main role of an IoT Gateway?
a) To manufacture sensors
b) To connect IoT devices with cloud and perform protocol conversion
c) To store data permanently
d) To replace sensors

4) Predictive maintenance using IIoT technology helps to _____.
a) Increase unexpected machine failures
b) Perform maintenance only after breakdown
c) Predict equipment failures using data analytics
d) Eliminate need of sensors

5) Real-time dashboards in IoT systems are used for _____.
a) Manual data recording
b) Offline data storage only
c) Visual monitoring and analysis of live data
d) Controlling power supply

6) Why is IIoT security critical in the manufacturing industry?
   a) To increase manual operations
   b) To protect industrial systems from cyber-attacks and data breaches
   c) To reduce use of automation
   d) To eliminate sensors

7) Which of the following is a major security concern in IIoT systems?
   a) High power consumption
   b) Unauthorized access to devices and data
   c) Low storage capacity
   d) Limited connectivity

8) Secure remote access for IIoT devices is typically achieved using _____.
   a) Open public networks without protection
   b) VPNs and encrypted communication protocols
   c) Only physical access
   d) No authentication methods

9) Process automation in IIoT helps in _____.
   a) Increasing manual intervention
   b) Reducing efficiency
   c) Improving productivity and accuracy
   d) Eliminating all sensors

10) What is the main characteristic that differentiates IIoT from IoT?
   a) Use of social media integration
   b) Focus on consumer applications
   c) Emphasis on industrial automation and reliability
   d) Limited use of sensors

11) Which component is a key part of the IIoT structure?
   a) Entertainment systems
   b) Industrial sensors and actuators
   c) Mobile gaming platforms
   d) Social networking tools

12) In Industry 4.0, smart factories mainly rely on _____.
   a) Manual labor only
   b) Paper-based communication
   c) Cyber-physical systems and real-time data
   d) Isolated machines

13) What is the primary function of a sensor in an industrial IoT system?
   a) To control machines directly
   b) To convert physical parameters into electrical signals
   c) To store large amounts of data
   d) To transmit power

14) Actuators in industrial processes are used to _____.

a) Measure environmental conditions
b) Analyze data
c) Convert electrical signals into physical action
d) Store sensor data

Seat No.		Set	S

T.Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026
Industrial IoT (ENTMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculator is allowed.

SECTION – I

Q.2 Attempt the following. (Any Four) **16**

a) Define IIoT and explain the structure of IIoT with its key components.

b) Differentiate between IoT and IIoT. Explain the role of IoT and IIoT in industrial applications.

c) What is Industry 4.0? Explain its key features, support systems, and the concept of smart factories.

d) Explain sensors and actuators used in industrial processes. Describe their roles with suitable examples.

e) What is an IoT Hub system? Explain its functions and importance in IoT architecture.

Q.3 Attempt the following. (Any Two) **12**

a) Describe wireless sensor nodes in detail. Explain the working and comparison of Bluetooth, WiFi, and LoRa protocols, and discuss the role of IoT Hub systems in managing connected devices and data.

b) What is a sensor network? Explain process automation and data acquisition on an IoT platform with a neat block diagram.

c) What are smart factories? Explain their features, advantages, and working mechanism.

SECTION – II

Q.4 Attempt the following. (Any Four) **16**

a) What is an IoT Gateway? Explain its functions in an IoT system.

b) Explain cloud computing in IoT. How is it used for real-time dashboard data monitoring.

c) Explain the role of IIoT in the manufacturing industry with suitable examples.

d) Explain secure remote access for IIoT devices and its importance in industry.

e) What is predictive maintenance? Explain its benefits using IIoT technology.

Q.5 Attempt the following. (Any Two) **12**

a) Explain data analytics in IIoT. Discuss predictive maintenance and its importance in industrial applications.

b) Describe secure remote access for IIoT devices. Explain the methods and importance of ensuring secure communication.

c) Discuss different types of industrial needs for IoT security with suitable examples.

SLR-QH-650

Seat No.	

Set P

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026
Industrial IoT (ENTMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options and rewrite the sentence. **14**

1) What is the main characteristic that differentiates IIoT from IoT?
a) Use of social media integration
b) Focus on consumer applications
c) Emphasis on industrial automation and reliability
d) Limited use of sensors

2) Which component is a key part of the IIoT structure?
a) Entertainment systems
b) Industrial sensors and actuators
c) Mobile gaming platforms
d) Social networking tools

3) In Industry 4.0, smart factories mainly rely on _____.
a) Manual labor only
b) Paper-based communication
c) Cyber-physical systems and real-time data
d) Isolated machines

4) What is the primary function of a sensor in an industrial IoT system?
a) To control machines directly
b) To convert physical parameters into electrical signals
c) To store large amounts of data
d) To transmit power

5) Actuators in industrial processes are used to _____.
a) Measure environmental conditions
b) Analyze data
c) Convert electrical signals into physical action
d) Store sensor data

6) Which network is specifically designed for connecting multiple sensors in an IoT environment?
   a) LAN
   b) MAN
   c) Sensor Network (WSN)
   d) PAN

7) In IoT-based process automation, data acquisition refers to _____.
   a) Manual data entry
   b) Collection of data from sensors in real time
   c) Deleting unwanted data
   d) Data encryption only

8) What is the main role of an IoT Gateway?
   a) To manufacture sensors
   b) To connect IoT devices with cloud and perform protocol conversion
   c) To store data permanently
   d) To replace sensors

9) Predictive maintenance using IIoT technology helps to _____.
   a) Increase unexpected machine failures
   b) Perform maintenance only after breakdown
   c) Predict equipment failures using data analytics
   d) Eliminate need of sensors

10) Real-time dashboards in IoT systems are used for _____.
   a) Manual data recording
   b) Offline data storage only
   c) Visual monitoring and analysis of live data
   d) Controlling power supply

11) Why is IIoT security critical in the manufacturing industry?
   a) To increase manual operations
   b) To protect industrial systems from cyber-attacks and data breaches
   c) To reduce use of automation
   d) To eliminate sensors

12) Which of the following is a major security concern in IIoT systems?
   a) High power consumption
   b) Unauthorized access to devices and data
   c) Low storage capacity
   d) Limited connectivity

13) Secure remote access for IIoT devices is typically achieved using _____.

a) Open public networks without protection
b) VPNs and encrypted communication protocols
c) Only physical access
d) No authentication methods

14) Process automation in IIoT helps in _____.

a) Increasing manual intervention
b) Reducing efficiency
c) Improving productivity and accuracy
d) Eliminating all sensors

Seat No.	

Set **P**

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026
Industrial IoT (ENTMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculator is allowed.

SECTION – I

Q.2 Attempt the following. (Any Four) **16**

a) Define IIoT and explain the structure of IIoT with its key components.

b) Differentiate between IoT and IIoT. Explain the role of IoT and IIoT in industrial applications.

c) What is Industry 4.0? Explain its key features, support systems, and the concept of smart factories.

d) Explain sensors and actuators used in industrial processes. Describe their roles with suitable examples.

e) What is an IoT Hub system? Explain its functions and importance in IoT architecture.

Q.3 Attempt the following. (Any Two) **12**

a) Describe wireless sensor nodes in detail. Explain the working and comparison of Bluetooth, WiFi, and LoRa protocols, and discuss the role of IoT Hub systems in managing connected devices and data.

b) What is a sensor network? Explain process automation and data acquisition on an IoT platform with a neat block diagram.

c) What are smart factories? Explain their features, advantages, and working mechanism.

SECTION – II

Q.4 Attempt the following. (Any Four) **16**

a) What is an IoT Gateway? Explain its functions in an IoT system.

b) Explain cloud computing in IoT. How is it used for real-time dashboard data monitoring.

c) Explain the role of IIoT in the manufacturing industry with suitable examples.

d) Explain secure remote access for IIoT devices and its importance in industry.

e) What is predictive maintenance? Explain its benefits using IIoT technology.

Q.5 Attempt the following. (Any Two) **12**

a) Explain data analytics in IIoT. Discuss predictive maintenance and its importance in industrial applications.

b) Describe secure remote access for IIoT devices. Explain the methods and importance of ensuring secure communication.

c) Discuss different types of industrial needs for IoT security with suitable examples.

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026
Industrial IoT (ENTMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options and rewrite the sentence. **14**

1) What is the main role of an IoT Gateway?
a) To manufacture sensors
b) To connect IoT devices with cloud and perform protocol conversion
c) To store data permanently
d) To replace sensors

2) Predictive maintenance using IIoT technology helps to _____.
a) Increase unexpected machine failures
b) Perform maintenance only after breakdown
c) Predict equipment failures using data analytics
d) Eliminate need of sensors

3) Real-time dashboards in IoT systems are used for _____.
a) Manual data recording
b) Offline data storage only
c) Visual monitoring and analysis of live data
d) Controlling power supply

4) Why is IIoT security critical in the manufacturing industry?
a) To increase manual operations
b) To protect industrial systems from cyber-attacks and data breaches
c) To reduce use of automation
d) To eliminate sensors

5) Which of the following is a major security concern in IIoT systems?
a) High power consumption
b) Unauthorized access to devices and data
c) Low storage capacity
d) Limited connectivity

6) Secure remote access for IIoT devices is typically achieved using _____.
   a) Open public networks without protection
   b) VPNs and encrypted communication protocols
   c) Only physical access
   d) No authentication methods

7) Process automation in IIoT helps in _____.
   a) Increasing manual intervention
   b) Reducing efficiency
   c) Improving productivity and accuracy
   d) Eliminating all sensors

8) What is the main characteristic that differentiates IIoT from IoT?
   a) Use of social media integration
   b) Focus on consumer applications
   c) Emphasis on industrial automation and reliability
   d) Limited use of sensors

9) Which component is a key part of the IIoT structure?
   a) Entertainment systems
   b) Industrial sensors and actuators
   c) Mobile gaming platforms
   d) Social networking tools

10) In Industry 4.0, smart factories mainly rely on _____.
   a) Manual labor only
   b) Paper-based communication
   c) Cyber-physical systems and real-time data
   d) Isolated machines

11) What is the primary function of a sensor in an industrial IoT system?
   a) To control machines directly
   b) To convert physical parameters into electrical signals
   c) To store large amounts of data
   d) To transmit power

12) Actuators in industrial processes are used to _____.
   a) Measure environmental conditions
   b) Analyze data
   c) Convert electrical signals into physical action
   d) Store sensor data

13) Which network is specifically designed for connecting multiple sensors in an IoT environment?
   a) LAN
   b) MAN
   c) Sensor Network (WSN)
   d) PAN

14) In loT-based process automation, data acquisition refers to _____.

a) Manual data entry
b) Collection of data from sensors in real time
c) Deleting unwanted data
d) Data encryption only

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026
Industrial IoT (ENTMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculator is allowed.

SECTION – I

Q.2 Attempt the following. (Any Four) **16**

a) Define IIoT and explain the structure of IIoT with its key components.

b) Differentiate between IoT and IIoT. Explain the role of IoT and IIoT in industrial applications.

c) What is Industry 4.0? Explain its key features, support systems, and the concept of smart factories.

d) Explain sensors and actuators used in industrial processes. Describe their roles with suitable examples.

e) What is an IoT Hub system? Explain its functions and importance in IoT architecture.

Q.3 Attempt the following. (Any Two) **12**

a) Describe wireless sensor nodes in detail. Explain the working and comparison of Bluetooth, WiFi, and LoRa protocols, and discuss the role of IoT Hub systems in managing connected devices and data.

b) What is a sensor network? Explain process automation and data acquisition on an IoT platform with a neat block diagram.

c) What are smart factories? Explain their features, advantages, and working mechanism.

SECTION – II

Q.4 Attempt the following. (Any Four) **16**

a) What is an IoT Gateway? Explain its functions in an IoT system.

b) Explain cloud computing in IoT. How is it used for real-time dashboard data monitoring.

c) Explain the role of IIoT in the manufacturing industry with suitable examples.

d) Explain secure remote access for IIoT devices and its importance in industry.

e) What is predictive maintenance? Explain its benefits using IIoT technology.

Q.5 Attempt the following. (Any Two) **12**

a) Explain data analytics in IIoT. Discuss predictive maintenance and its importance in industrial applications.

b) Describe secure remote access for IIoT devices. Explain the methods and importance of ensuring secure communication.

c) Discuss different types of industrial needs for IoT security with suitable examples.

Seat No.	

Set **R**

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026
Industrial IoT (ENTMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options and rewrite the sentence. **14**

1) Why is IIoT security critical in the manufacturing industry?
a) To increase manual operations
b) To protect industrial systems from cyber-attacks and data breaches
c) To reduce use of automation
d) To eliminate sensors

2) Which of the following is a major security concern in IIoT systems?
a) High power consumption
b) Unauthorized access to devices and data
c) Low storage capacity
d) Limited connectivity

3) Secure remote access for IIoT devices is typically achieved using _____.
a) Open public networks without protection
b) VPNs and encrypted communication protocols
c) Only physical access
d) No authentication methods

4) Process automation in IIoT helps in _____.
a) Increasing manual intervention
b) Reducing efficiency
c) Improving productivity and accuracy
d) Eliminating all sensors

5) What is the main characteristic that differentiates IIoT from IoT?
a) Use of social media integration
b) Focus on consumer applications
c) Emphasis on industrial automation and reliability
d) Limited use of sensors

6) Which component is a key part of the IIoT structure?
   a) Entertainment systems
   b) Industrial sensors and actuators
   c) Mobile gaming platforms
   d) Social networking tools

7) In Industry 4.0, smart factories mainly rely on _____.
   a) Manual labor only
   b) Paper-based communication
   c) Cyber-physical systems and real-time data
   d) Isolated machines

8) What is the primary function of a sensor in an industrial IoT system?
   a) To control machines directly
   b) To convert physical parameters into electrical signals
   c) To store large amounts of data
   d) To transmit power

9) Actuators in industrial processes are used to _____.
   a) Measure environmental conditions
   b) Analyze data
   c) Convert electrical signals into physical action
   d) Store sensor data

10) Which network is specifically designed for connecting multiple sensors in an IoT environment?
   a) LAN
   b) MAN
   c) Sensor Network (WSN)
   d) PAN

11) In IoT-based process automation, data acquisition refers to _____.
   a) Manual data entry
   b) Collection of data from sensors in real time
   c) Deleting unwanted data
   d) Data encryption only

12) What is the main role of an IoT Gateway?
   a) To manufacture sensors
   b) To connect IoT devices with cloud and perform protocol conversion
   c) To store data permanently
   d) To replace sensors

13) Predictive maintenance using IIoT technology helps to _____.
   a) Increase unexpected machine failures
   b) Perform maintenance only after breakdown
   c) Predict equipment failures using data analytics
   d) Eliminate need of sensors

14) Real-time dashboards in IoT systems are used for _____.

a) Manual data recording
b) Offline data storage only
c) Visual monitoring and analysis of live data
d) Controlling power supply

Seat No.	

Set **R**

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026
Industrial IoT (ENTMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculator is allowed.

SECTION – I

Q.2 Attempt the following. (Any Four) **16**

a) Define IIoT and explain the structure of IIoT with its key components.

b) Differentiate between IoT and IIoT. Explain the role of IoT and IIoT in industrial applications.

c) What is Industry 4.0? Explain its key features, support systems, and the concept of smart factories.

d) Explain sensors and actuators used in industrial processes. Describe their roles with suitable examples.

e) What is an IoT Hub system? Explain its functions and importance in IoT architecture.

Q.3 Attempt the following. (Any Two) **12**

a) Describe wireless sensor nodes in detail. Explain the working and comparison of Bluetooth, WiFi, and LoRa protocols, and discuss the role of IoT Hub systems in managing connected devices and data.

b) What is a sensor network? Explain process automation and data acquisition on an IoT platform with a neat block diagram.

c) What are smart factories? Explain their features, advantages, and working mechanism.

SECTION – II

Q.4 Attempt the following. (Any Four) **16**

a) What is an IoT Gateway? Explain its functions in an IoT system.

b) Explain cloud computing in IoT. How is it used for real-time dashboard data monitoring.

c) Explain the role of IIoT in the manufacturing industry with suitable examples.

d) Explain secure remote access for IIoT devices and its importance in industry.

e) What is predictive maintenance? Explain its benefits using IIoT technology.

Q.5 Attempt the following. (Any Two) **12**

a) Explain data analytics in IIoT. Discuss predictive maintenance and its importance in industrial applications.

b) Describe secure remote access for IIoT devices. Explain the methods and importance of ensuring secure communication.

c) Discuss different types of industrial needs for IoT security with suitable examples.

Seat No.	

Set | S

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026
Industrial IoT (ENTMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options and rewrite the sentence. **14**

1) Which network is specifically designed for connecting multiple sensors in an IoT environment?
a) LAN b) MAN
c) Sensor Network (WSN) d) PAN

2) In IoT-based process automation, data acquisition refers to _____.
a) Manual data entry
b) Collection of data from sensors in real time
c) Deleting unwanted data
d) Data encryption only

3) What is the main role of an IoT Gateway?
a) To manufacture sensors
b) To connect IoT devices with cloud and perform protocol conversion
c) To store data permanently
d) To replace sensors

4) Predictive maintenance using IIoT technology helps to _____.
a) Increase unexpected machine failures
b) Perform maintenance only after breakdown
c) Predict equipment failures using data analytics
d) Eliminate need of sensors

5) Real-time dashboards in IoT systems are used for _____.
a) Manual data recording
b) Offline data storage only
c) Visual monitoring and analysis of live data
d) Controlling power supply

6) Why is IIoT security critical in the manufacturing industry?
   a) To increase manual operations
   b) To protect industrial systems from cyber-attacks and data breaches
   c) To reduce use of automation
   d) To eliminate sensors

7) Which of the following is a major security concern in IIoT systems?
   a) High power consumption
   b) Unauthorized access to devices and data
   c) Low storage capacity
   d) Limited connectivity

8) Secure remote access for IIoT devices is typically achieved using _____.
   a) Open public networks without protection
   b) VPNs and encrypted communication protocols
   c) Only physical access
   d) No authentication methods

9) Process automation in IIoT helps in _____.
   a) Increasing manual intervention
   b) Reducing efficiency
   c) Improving productivity and accuracy
   d) Eliminating all sensors

10) What is the main characteristic that differentiates IIoT from IoT?
   a) Use of social media integration
   b) Focus on consumer applications
   c) Emphasis on industrial automation and reliability
   d) Limited use of sensors

11) Which component is a key part of the IIoT structure?
   a) Entertainment systems
   b) Industrial sensors and actuators
   c) Mobile gaming platforms
   d) Social networking tools

12) In Industry 4.0, smart factories mainly rely on _____.
   a) Manual labor only
   b) Paper-based communication
   c) Cyber-physical systems and real-time data
   d) Isolated machines

13) What is the primary function of a sensor in an industrial IoT system?
   a) To control machines directly
   b) To convert physical parameters into electrical signals
   c) To store large amounts of data
   d) To transmit power

14) Actuators in industrial processes are used to _____.

a) Measure environmental conditions
b) Analyze data
c) Convert electrical signals into physical action
d) Store sensor data

Seat No.	

Set **S**

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026
Industrial IoT (ENTMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculator is allowed.

SECTION – I

Q.2 Attempt the following. (Any Four) **16**

a) Define IIoT and explain the structure of IIoT with its key components.

b) Differentiate between IoT and IIoT. Explain the role of IoT and IIoT in industrial applications.

c) What is Industry 4.0? Explain its key features, support systems, and the concept of smart factories.

d) Explain sensors and actuators used in industrial processes. Describe their roles with suitable examples.

e) What is an IoT Hub system? Explain its functions and importance in IoT architecture.

Q.3 Attempt the following. (Any Two) **12**

a) Describe wireless sensor nodes in detail. Explain the working and comparison of Bluetooth, WiFi, and LoRa protocols, and discuss the role of IoT Hub systems in managing connected devices and data.

b) What is a sensor network? Explain process automation and data acquisition on an IoT platform with a neat block diagram.

c) What are smart factories? Explain their features, advantages, and working mechanism.

SECTION – II

Q.4 Attempt the following. (Any Four) **16**

a) What is an IoT Gateway? Explain its functions in an IoT system.

b) Explain cloud computing in IoT. How is it used for real-time dashboard data monitoring.

c) Explain the role of IIoT in the manufacturing industry with suitable examples.

d) Explain secure remote access for IIoT devices and its importance in industry.

e) What is predictive maintenance? Explain its benefits using IIoT technology.

Q.5 Attempt the following. (Any Two) **12**

a) Explain data analytics in IIoT. Discuss predictive maintenance and its importance in industrial applications.

b) Describe secure remote access for IIoT devices. Explain the methods and importance of ensuring secure communication.

c) Discuss different types of industrial needs for IoT security with suitable examples.

SLR-QH-650

Seat No.	

Set P

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026
Industrial IoT (ENTMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options and rewrite the sentence. **14**

1) What is the main characteristic that differentiates IIoT from IoT?
a) Use of social media integration
b) Focus on consumer applications
c) Emphasis on industrial automation and reliability
d) Limited use of sensors

2) Which component is a key part of the IIoT structure?
a) Entertainment systems
b) Industrial sensors and actuators
c) Mobile gaming platforms
d) Social networking tools

3) In Industry 4.0, smart factories mainly rely on _____.
a) Manual labor only
b) Paper-based communication
c) Cyber-physical systems and real-time data
d) Isolated machines

4) What is the primary function of a sensor in an industrial IoT system?
a) To control machines directly
b) To convert physical parameters into electrical signals
c) To store large amounts of data
d) To transmit power

5) Actuators in industrial processes are used to _____.
a) Measure environmental conditions
b) Analyze data
c) Convert electrical signals into physical action
d) Store sensor data

6) Which network is specifically designed for connecting multiple sensors in an IoT environment?
   a) LAN
   b) MAN
   c) Sensor Network (WSN)
   d) PAN

7) In IoT-based process automation, data acquisition refers to _____.
   a) Manual data entry
   b) Collection of data from sensors in real time
   c) Deleting unwanted data
   d) Data encryption only

8) What is the main role of an IoT Gateway?
   a) To manufacture sensors
   b) To connect IoT devices with cloud and perform protocol conversion
   c) To store data permanently
   d) To replace sensors

9) Predictive maintenance using IIoT technology helps to _____.
   a) Increase unexpected machine failures
   b) Perform maintenance only after breakdown
   c) Predict equipment failures using data analytics
   d) Eliminate need of sensors

10) Real-time dashboards in IoT systems are used for _____.
   a) Manual data recording
   b) Offline data storage only
   c) Visual monitoring and analysis of live data
   d) Controlling power supply

11) Why is IIoT security critical in the manufacturing industry?
   a) To increase manual operations
   b) To protect industrial systems from cyber-attacks and data breaches
   c) To reduce use of automation
   d) To eliminate sensors

12) Which of the following is a major security concern in IIoT systems?
   a) High power consumption
   b) Unauthorized access to devices and data
   c) Low storage capacity
   d) Limited connectivity

13) Secure remote access for IIoT devices is typically achieved using _____.

a) Open public networks without protection
b) VPNs and encrypted communication protocols
c) Only physical access
d) No authentication methods

14) Process automation in IIoT helps in _____.

a) Increasing manual intervention
b) Reducing efficiency
c) Improving productivity and accuracy
d) Eliminating all sensors

Seat No.		Set	P

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026
Industrial IoT (ENTMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculator is allowed.

SECTION – I

Q.2 Attempt the following. (Any Four) **16**

a) Define IIoT and explain the structure of IIoT with its key components.

b) Differentiate between IoT and IIoT. Explain the role of IoT and IIoT in industrial applications.

c) What is Industry 4.0? Explain its key features, support systems, and the concept of smart factories.

d) Explain sensors and actuators used in industrial processes. Describe their roles with suitable examples.

e) What is an IoT Hub system? Explain its functions and importance in IoT architecture.

Q.3 Attempt the following. (Any Two) **12**

a) Describe wireless sensor nodes in detail. Explain the working and comparison of Bluetooth, WiFi, and LoRa protocols, and discuss the role of IoT Hub systems in managing connected devices and data.

b) What is a sensor network? Explain process automation and data acquisition on an IoT platform with a neat block diagram.

c) What are smart factories? Explain their features, advantages, and working mechanism.

SECTION – II

Q.4 Attempt the following. (Any Four) **16**

a) What is an IoT Gateway? Explain its functions in an IoT system.

b) Explain cloud computing in IoT. How is it used for real-time dashboard data monitoring.

c) Explain the role of IIoT in the manufacturing industry with suitable examples.

d) Explain secure remote access for IIoT devices and its importance in industry.

e) What is predictive maintenance? Explain its benefits using IIoT technology.

Q.5 Attempt the following. (Any Two) **12**

a) Explain data analytics in IIoT. Discuss predictive maintenance and its importance in industrial applications.

b) Describe secure remote access for IIoT devices. Explain the methods and importance of ensuring secure communication.

c) Discuss different types of industrial needs for IoT security with suitable examples.

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026
Industrial IoT (ENTMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options and rewrite the sentence. **14**

1) What is the main role of an IoT Gateway?
a) To manufacture sensors
b) To connect IoT devices with cloud and perform protocol conversion
c) To store data permanently
d) To replace sensors

2) Predictive maintenance using IIoT technology helps to _____.
a) Increase unexpected machine failures
b) Perform maintenance only after breakdown
c) Predict equipment failures using data analytics
d) Eliminate need of sensors

3) Real-time dashboards in IoT systems are used for _____.
a) Manual data recording
b) Offline data storage only
c) Visual monitoring and analysis of live data
d) Controlling power supply

4) Why is IIoT security critical in the manufacturing industry?
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b) To protect industrial systems from cyber-attacks and data breaches
c) To reduce use of automation
d) To eliminate sensors

5) Which of the following is a major security concern in IIoT systems?
a) High power consumption
b) Unauthorized access to devices and data
c) Low storage capacity
d) Limited connectivity

6) Secure remote access for IIoT devices is typically achieved using _____.
   a) Open public networks without protection
   b) VPNs and encrypted communication protocols
   c) Only physical access
   d) No authentication methods

7) Process automation in IIoT helps in _____.
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   c) Improving productivity and accuracy
   d) Eliminating all sensors

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   c) Emphasis on industrial automation and reliability
   d) Limited use of sensors

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   d) Social networking tools

10) In Industry 4.0, smart factories mainly rely on _____.
   a) Manual labor only
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   c) Cyber-physical systems and real-time data
   d) Isolated machines

11) What is the primary function of a sensor in an industrial IoT system?
   a) To control machines directly
   b) To convert physical parameters into electrical signals
   c) To store large amounts of data
   d) To transmit power

12) Actuators in industrial processes are used to _____.
   a) Measure environmental conditions
   b) Analyze data
   c) Convert electrical signals into physical action
   d) Store sensor data

13) Which network is specifically designed for connecting multiple sensors in an IoT environment?
   a) LAN
   b) MAN
   c) Sensor Network (WSN)
   d) PAN

14) In loT-based process automation, data acquisition refers to _____.

a) Manual data entry
b) Collection of data from sensors in real time
c) Deleting unwanted data
d) Data encryption only

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026
Industrial IoT (ENTMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculator is allowed.

SECTION – I

Q.2 Attempt the following. (Any Four) **16**

a) Define IIoT and explain the structure of IIoT with its key components.

b) Differentiate between IoT and IIoT. Explain the role of IoT and IIoT in industrial applications.

c) What is Industry 4.0? Explain its key features, support systems, and the concept of smart factories.

d) Explain sensors and actuators used in industrial processes. Describe their roles with suitable examples.

e) What is an IoT Hub system? Explain its functions and importance in IoT architecture.

Q.3 Attempt the following. (Any Two) **12**

a) Describe wireless sensor nodes in detail. Explain the working and comparison of Bluetooth, WiFi, and LoRa protocols, and discuss the role of IoT Hub systems in managing connected devices and data.

b) What is a sensor network? Explain process automation and data acquisition on an IoT platform with a neat block diagram.

c) What are smart factories? Explain their features, advantages, and working mechanism.

SECTION – II

Q.4 Attempt the following. (Any Four) **16**

a) What is an IoT Gateway? Explain its functions in an IoT system.

b) Explain cloud computing in IoT. How is it used for real-time dashboard data monitoring.

c) Explain the role of IIoT in the manufacturing industry with suitable examples.

d) Explain secure remote access for IIoT devices and its importance in industry.

e) What is predictive maintenance? Explain its benefits using IIoT technology.

Q.5 Attempt the following. (Any Two) **12**

a) Explain data analytics in IIoT. Discuss predictive maintenance and its importance in industrial applications.

b) Describe secure remote access for IIoT devices. Explain the methods and importance of ensuring secure communication.

c) Discuss different types of industrial needs for IoT security with suitable examples.

Seat No.	

Set **R**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026
Industrial IoT (ENTMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options and rewrite the sentence. **14**

1) Why is IIoT security critical in the manufacturing industry?
a) To increase manual operations
b) To protect industrial systems from cyber-attacks and data breaches
c) To reduce use of automation
d) To eliminate sensors

2) Which of the following is a major security concern in IIoT systems?
a) High power consumption
b) Unauthorized access to devices and data
c) Low storage capacity
d) Limited connectivity

3) Secure remote access for IIoT devices is typically achieved using _____.
a) Open public networks without protection
b) VPNs and encrypted communication protocols
c) Only physical access
d) No authentication methods

4) Process automation in IIoT helps in _____.
a) Increasing manual intervention
b) Reducing efficiency
c) Improving productivity and accuracy
d) Eliminating all sensors

5) What is the main characteristic that differentiates IIoT from IoT?
a) Use of social media integration
b) Focus on consumer applications
c) Emphasis on industrial automation and reliability
d) Limited use of sensors

6) Which component is a key part of the IIoT structure?
   a) Entertainment systems
   b) Industrial sensors and actuators
   c) Mobile gaming platforms
   d) Social networking tools

7) In Industry 4.0, smart factories mainly rely on _____.
   a) Manual labor only
   b) Paper-based communication
   c) Cyber-physical systems and real-time data
   d) Isolated machines

8) What is the primary function of a sensor in an industrial IoT system?
   a) To control machines directly
   b) To convert physical parameters into electrical signals
   c) To store large amounts of data
   d) To transmit power

9) Actuators in industrial processes are used to _____.
   a) Measure environmental conditions
   b) Analyze data
   c) Convert electrical signals into physical action
   d) Store sensor data

10) Which network is specifically designed for connecting multiple sensors in an IoT environment?
   a) LAN
   b) MAN
   c) Sensor Network (WSN)
   d) PAN

11) In IoT-based process automation, data acquisition refers to _____.
   a) Manual data entry
   b) Collection of data from sensors in real time
   c) Deleting unwanted data
   d) Data encryption only

12) What is the main role of an IoT Gateway?
   a) To manufacture sensors
   b) To connect IoT devices with cloud and perform protocol conversion
   c) To store data permanently
   d) To replace sensors

13) Predictive maintenance using IIoT technology helps to _____.
   a) Increase unexpected machine failures
   b) Perform maintenance only after breakdown
   c) Predict equipment failures using data analytics
   d) Eliminate need of sensors

14) Real-time dashboards in IoT systems are used for _____.

a) Manual data recording
b) Offline data storage only
c) Visual monitoring and analysis of live data
d) Controlling power supply

Seat No.	

Set **R**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026
Industrial IoT (ENTMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculator is allowed.

SECTION – I

Q.2 Attempt the following. (Any Four) **16**

a) Define IIoT and explain the structure of IIoT with its key components.

b) Differentiate between IoT and IIoT. Explain the role of IoT and IIoT in industrial applications.

c) What is Industry 4.0? Explain its key features, support systems, and the concept of smart factories.

d) Explain sensors and actuators used in industrial processes. Describe their roles with suitable examples.

e) What is an IoT Hub system? Explain its functions and importance in IoT architecture.

Q.3 Attempt the following. (Any Two) **12**

a) Describe wireless sensor nodes in detail. Explain the working and comparison of Bluetooth, WiFi, and LoRa protocols, and discuss the role of IoT Hub systems in managing connected devices and data.

b) What is a sensor network? Explain process automation and data acquisition on an IoT platform with a neat block diagram.

c) What are smart factories? Explain their features, advantages, and working mechanism.

SECTION – II

Q.4 Attempt the following. (Any Four) **16**

a) What is an IoT Gateway? Explain its functions in an IoT system.

b) Explain cloud computing in IoT. How is it used for real-time dashboard data monitoring.

c) Explain the role of IIoT in the manufacturing industry with suitable examples.

d) Explain secure remote access for IIoT devices and its importance in industry.

e) What is predictive maintenance? Explain its benefits using IIoT technology.

Q.5 Attempt the following. (Any Two) **12**

a) Explain data analytics in IIoT. Discuss predictive maintenance and its importance in industrial applications.

b) Describe secure remote access for IIoT devices. Explain the methods and importance of ensuring secure communication.

c) Discuss different types of industrial needs for IoT security with suitable examples.

Seat No.	

Set | S

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026
Industrial IoT (ENTMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options and rewrite the sentence. **14**

1) Which network is specifically designed for connecting multiple sensors in an IoT environment?
a) LAN b) MAN
c) Sensor Network (WSN) d) PAN

2) In IoT-based process automation, data acquisition refers to _____.
a) Manual data entry
b) Collection of data from sensors in real time
c) Deleting unwanted data
d) Data encryption only

3) What is the main role of an IoT Gateway?
a) To manufacture sensors
b) To connect IoT devices with cloud and perform protocol conversion
c) To store data permanently
d) To replace sensors

4) Predictive maintenance using IIoT technology helps to _____.
a) Increase unexpected machine failures
b) Perform maintenance only after breakdown
c) Predict equipment failures using data analytics
d) Eliminate need of sensors

5) Real-time dashboards in IoT systems are used for _____.
a) Manual data recording
b) Offline data storage only
c) Visual monitoring and analysis of live data
d) Controlling power supply

6) Why is IIoT security critical in the manufacturing industry?
   a) To increase manual operations
   b) To protect industrial systems from cyber-attacks and data breaches
   c) To reduce use of automation
   d) To eliminate sensors

7) Which of the following is a major security concern in IIoT systems?
   a) High power consumption
   b) Unauthorized access to devices and data
   c) Low storage capacity
   d) Limited connectivity

8) Secure remote access for IIoT devices is typically achieved using _____.
   a) Open public networks without protection
   b) VPNs and encrypted communication protocols
   c) Only physical access
   d) No authentication methods

9) Process automation in IIoT helps in _____.
   a) Increasing manual intervention
   b) Reducing efficiency
   c) Improving productivity and accuracy
   d) Eliminating all sensors

10) What is the main characteristic that differentiates IIoT from IoT?
   a) Use of social media integration
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11) Which component is a key part of the IIoT structure?
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   d) Social networking tools

12) In Industry 4.0, smart factories mainly rely on _____.
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   b) Paper-based communication
   c) Cyber-physical systems and real-time data
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13) What is the primary function of a sensor in an industrial IoT system?
   a) To control machines directly
   b) To convert physical parameters into electrical signals
   c) To store large amounts of data
   d) To transmit power

14) Actuators in industrial processes are used to _____.

a) Measure environmental conditions
b) Analyze data
c) Convert electrical signals into physical action
d) Store sensor data

Seat No.		Set	S

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026
Industrial IoT (ENTMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculator is allowed.

SECTION – I

Q.2 Attempt the following. (Any Four) **16**

a) Define IIoT and explain the structure of IIoT with its key components.

b) Differentiate between IoT and IIoT. Explain the role of IoT and IIoT in industrial applications.

c) What is Industry 4.0? Explain its key features, support systems, and the concept of smart factories.

d) Explain sensors and actuators used in industrial processes. Describe their roles with suitable examples.

e) What is an IoT Hub system? Explain its functions and importance in IoT architecture.

Q.3 Attempt the following. (Any Two) **12**

a) Describe wireless sensor nodes in detail. Explain the working and comparison of Bluetooth, WiFi, and LoRa protocols, and discuss the role of IoT Hub systems in managing connected devices and data.

b) What is a sensor network? Explain process automation and data acquisition on an IoT platform with a neat block diagram.

c) What are smart factories? Explain their features, advantages, and working mechanism.

SECTION – II

Q.4 Attempt the following. (Any Four) **16**

a) What is an IoT Gateway? Explain its functions in an IoT system.

b) Explain cloud computing in IoT. How is it used for real-time dashboard data monitoring.

c) Explain the role of IIoT in the manufacturing industry with suitable examples.

d) Explain secure remote access for IIoT devices and its importance in industry.

e) What is predictive maintenance? Explain its benefits using IIoT technology.

Q.5 Attempt the following. (Any Two) **12**

a) Explain data analytics in IIoT. Discuss predictive maintenance and its importance in industrial applications.

b) Describe secure remote access for IIoT devices. Explain the methods and importance of ensuring secure communication.

c) Discuss different types of industrial needs for IoT security with suitable examples.

SLR-QH-651

Seat No.	

Set P

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Predictive Analytics (CSEMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) Predictive analytics mainly focuses on _____.
a) Describing past events
b) Explaining why something happened
c) Predicting future outcomes using historical data
d) Storing business data

2) In healthcare, predictive analytics is commonly used for _____.
a) Designing buildings
b) Disease risk prediction
c) Writing prescriptions manually
d) Managing payroll

3) In online marketing, predictive analytics helps to _____.
a) Reduce internet speed
b) Predict customer buying behavior
c) Manufacture products
d) Design office furniture

4) Target marketing focuses on _____.
a) Selling to everyone equally
b) Identifying specific customer segments
c) Ignoring customer data
d) Increasing product cost

5) Which of the following is a structured data type?
a) Text documents b) Images
c) Relational database tables d) Videos

6) Predictive analytics is closely related to _____.
   a) Literature
   b) Statistics and Machine Learning
   c) Architecture
   d) Geography

7) Which of the following is a challenge due to constantly changing data?
   a) Data remains static
   b) Data becomes outdated quickly
   c) Data size decreases
   d) Data cannot be stored

8) Exploration of raw data means _____.
   a) Deleting original data
   b) Encrypting the data
   c) Analyzing data before processing
   d) Storing data in files

9) In Data Modelling, a simulation is used to _____.
   a) Store Data Permanently
   b) Represent Real-world Processes over time
   c) Delete Unwanted data
   d) Compress Large datasets

10) The Target Store Case study is related to _____.
   a) Disease Prediction
   b) Weather Prediction
   c) Customer Behavior Analysis
   d) Network Security

11) In document Processing, a Term- document Matrix represents _____.
   a) Images in documents
   b) Numbers of Users
   c) Document size only
   d) Frequency of terms in documents

12) Association Rule Mining is Mainly Used to _____.
   a) Find relationships between data items
   b) Detect hardware faults
   c) Improve Network Speed
   d) Encrypt Messages

13) Which of the following is a technique for predicting a continuous target variable?
   a) Classification
   b) Regression
   c) Clustering
   d) Dimensionality Reduction

14) Which of the following is a technique for grouping similar data points together?

a) Classification
b) Regression
c) Clustering
d) Dimensionality Reduction

Seat No.	

Set **P**

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Predictive Analytics (CSEMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Solve the following. (Any Four) **16**

a) What is Predictive Analytics? Explain Advantages and strategies of predictive Analytics.

b) Write a short note on: Surveying Marketplace

c) Explain Predictive modelling lifecycle.

d) Explain Online marketing and retail.

e) Compare Business Intelligence Vs. Big Data Analytics

Q.3 Answer the following. (Any Two) **12**

a) Explain Business value of predictive analytics Key applications in healthcare, finance.

b) Explain connecting to related disciplines in statistics, data mining and machine learning.

c) Explain complexities in searching your data. And discuss how data growth can affects the complexities in data system.

SECTION – II

Q.4 Solve the following. (Any Four) **16**

a) Explain Healthcare analytics case studies: Google flu trends, Cancer survivability predictors.

b) Explain Data Clustering in detail.

c) Explain KNN Algorithm with example.

d) Explain Twitter-based predictors of earthquakes.

e) Explain Markov model with example.

Q.5 Answer the following. (Any Two) **12**

a) Define Modelling of Data. Explain Models, Simulation and Categories with Examples.

b) Explain in brief Data Classification. How it can be introduced in Business?

c) Explain structuring the data: extracting, transforming and loading the data.

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Predictive Analytics (CSEMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) Exploration of raw data means _____.
a) Deleting original data
b) Encrypting the data
c) Analyzing data before processing
d) Storing data in files

2) In Data Modelling, a simulation is used to _____.
a) Store Data Permanently
b) Represent Real-world Processes over time
c) Delete Unwanted data
d) Compress Large datasets

3) The Target Store Case study is related to _____.
a) Disease Prediction b) Weather Prediction
c) Customer Behavior Analysis d) Network Security

4) In document Processing, a Term- document Matrix represents _____.
a) Images in documents
b) Numbers of Users
c) Document size only
d) Frequency of terms in documents

5) Association Rule Mining is Mainly Used to _____.
a) Find relationships between data items
b) Detect hardware faults
c) Improve Network Speed
d) Encrypt Messages

6) Which of the following is a technique for predicting a continuous target variable?
a) Classification b) Regression
c) Clustering d) Dimensionality Reduction

7) Which of the following is a technique for grouping similar data points together?
   a) Classification
   b) Regression
   c) Clustering
   d) Dimensionality Reduction

8) Predictive analytics mainly focuses on _____.
   a) Describing past events
   b) Explaining why something happened
   c) Predicting future outcomes using historical data
   d) Storing business data

9) In healthcare, predictive analytics is commonly used for _____.
   a) Designing buildings
   b) Disease risk prediction
   c) Writing prescriptions manually
   d) Managing payroll

10) In online marketing, predictive analytics helps to _____.
   a) Reduce internet speed
   b) Predict customer buying behavior
   c) Manufacture products
   d) Design office furniture

11) Target marketing focuses on _____.
   a) Selling to everyone equally
   b) Identifying specific customer segments
   c) Ignoring customer data
   d) Increasing product cost

12) Which of the following is a structured data type?
   a) Text documents
   b) Images
   c) Relational database tables
   d) Videos

13) Predictive analytics is closely related to _____.
   a) Literature
   b) Statistics and Machine Learning
   c) Architecture
   d) Geography

14) Which of the following is a challenge due to constantly changing data?
   a) Data remains static
   b) Data becomes outdated quickly
   c) Data size decreases
   d) Data cannot be stored

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Predictive Analytics (CSEMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Solve the following. (Any Four) **16**

a) What is Predictive Analytics? Explain Advantages and strategies of predictive Analytics.

b) Write a short note on: Surveying Marketplace

c) Explain Predictive modelling lifecycle.

d) Explain Online marketing and retail.

e) Compare Business Intelligence Vs. Big Data Analytics

Q.3 Answer the following. (Any Two) **12**

a) Explain Business value of predictive analytics Key applications in healthcare, finance.

b) Explain connecting to related disciplines in statistics, data mining and machine learning.

c) Explain complexities in searching your data. And discuss how data growth can affects the complexities in data system.

SECTION – II

Q.4 Solve the following. (Any Four) **16**

a) Explain Healthcare analytics case studies: Google flu trends, Cancer survivability predictors.

b) Explain Data Clustering in detail.

c) Explain KNN Algorithm with example.

d) Explain Twitter-based predictors of earthquakes.

e) Explain Markov model with example.

Q.5 Answer the following. (Any Two) **12**

a) Define Modelling of Data. Explain Models, Simulation and Categories with Examples.

b) Explain in brief Data Classification. How it can be introduced in Business?

c) Explain structuring the data: extracting, transforming and loading the data.

Seat No.	

Set **R**

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Predictive Analytics (CSEMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) In document Processing, a Term- document Matrix represents _____.
a) Images in documents
b) Numbers of Users
c) Document size only
d) Frequency of terms in documents

2) Association Rule Mining is Mainly Used to _____.
a) Find relationships between data items
b) Detect hardware faults
c) Improve Network Speed
d) Encrypt Messages

3) Which of the following is a technique for predicting a continuous target variable?
a) Classification
b) Regression
c) Clustering
d) Dimensionality Reduction

4) Which of the following is a technique for grouping similar data points together?
a) Classification
b) Regression
c) Clustering
d) Dimensionality Reduction

5) Predictive analytics mainly focuses on _____.
a) Describing past events
b) Explaining why something happened
c) Predicting future outcomes using historical data
d) Storing business data

6) In healthcare, predictive analytics is commonly used for _____.
   a) Designing buildings
   b) Disease risk prediction
   c) Writing prescriptions manually
   d) Managing payroll

7) In online marketing, predictive analytics helps to _____.
   a) Reduce internet speed
   b) Predict customer buying behavior
   c) Manufacture products
   d) Design office furniture

8) Target marketing focuses on _____.
   a) Selling to everyone equally
   b) Identifying specific customer segments
   c) Ignoring customer data
   d) Increasing product cost

9) Which of the following is a structured data type?
   a) Text documents b) Images
   c) Relational database tables d) Videos

10) Predictive analytics is closely related to _____.
   a) Literature
   b) Statistics and Machine Learning
   c) Architecture
   d) Geography

11) Which of the following is a challenge due to constantly changing data?
   a) Data remains static
   b) Data becomes outdated quickly
   c) Data size decreases
   d) Data cannot be stored

12) Exploration of raw data means _____.
   a) Deleting original data
   b) Encrypting the data
   c) Analyzing data before processing
   d) Storing data in files

13) In Data Modelling, a simulation is used to _____.
   a) Store Data Permanently
   b) Represent Real-world Processes over time
   c) Delete Unwanted data
   d) Compress Large datasets

14) The Target Store Case study is related to _____.
   a) Disease Prediction b) Weather Prediction
   c) Customer Behavior Analysis d) Network Security

Seat No.	

Set **R**

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Predictive Analytics (CSEMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Solve the following. (Any Four) **16**

a) What is Predictive Analytics? Explain Advantages and strategies of predictive Analytics.

b) Write a short note on: Surveying Marketplace

c) Explain Predictive modelling lifecycle.

d) Explain Online marketing and retail.

e) Compare Business Intelligence Vs. Big Data Analytics

Q.3 Answer the following. (Any Two) **12**

a) Explain Business value of predictive analytics Key applications in healthcare, finance.

b) Explain connecting to related disciplines in statistics, data mining and machine learning.

c) Explain complexities in searching your data. And discuss how data growth can affects the complexities in data system.

SECTION – II

Q.4 Solve the following. (Any Four) **16**

a) Explain Healthcare analytics case studies: Google flu trends, Cancer survivability predictors.

b) Explain Data Clustering in detail.

c) Explain KNN Algorithm with example.

d) Explain Twitter-based predictors of earthquakes.

e) Explain Markov model with example.

Q.5 Answer the following. (Any Two) **12**

a) Define Modelling of Data. Explain Models, Simulation and Categories with Examples.

b) Explain in brief Data Classification. How it can be introduced in Business?

c) Explain structuring the data: extracting, transforming and loading the data.

SLR-QH-651

Seat No.	

Set S

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Predictive Analytics (CSEMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) Predictive analytics is closely related to _____.
a) Literature
b) Statistics and Machine Learning
c) Architecture
d) Geography

2) Which of the following is a challenge due to constantly changing data?
a) Data remains static
b) Data becomes outdated quickly
c) Data size decreases
d) Data cannot be stored

3) Exploration of raw data means _____.
a) Deleting original data
b) Encrypting the data
c) Analyzing data before processing
d) Storing data in files

4) In Data Modelling, a simulation is used to _____.
a) Store Data Permanently
b) Represent Real-world Processes over time
c) Delete Unwanted data
d) Compress Large datasets

5) The Target Store Case study is related to _____.
a) Disease Prediction b) Weather Prediction
c) Customer Behavior Analysis d) Network Security

6) In document Processing, a Term- document Matrix represents _____.
   a) Images in documents
   b) Numbers of Users
   c) Document size only
   d) Frequency of terms in documents

7) Association Rule Mining is Mainly Used to _____.
   a) Find relationships between data items
   b) Detect hardware faults
   c) Improve Network Speed
   d) Encrypt Messages

8) Which of the following is a technique for predicting a continuous target variable?
   a) Classification
   b) Regression
   c) Clustering
   d) Dimensionality Reduction

9) Which of the following is a technique for grouping similar data points together?
   a) Classification
   b) Regression
   c) Clustering
   d) Dimensionality Reduction

10) Predictive analytics mainly focuses on _____.
   a) Describing past events
   b) Explaining why something happened
   c) Predicting future outcomes using historical data
   d) Storing business data

11) In healthcare, predictive analytics is commonly used for _____.
   a) Designing buildings
   b) Disease risk prediction
   c) Writing prescriptions manually
   d) Managing payroll

12) In online marketing, predictive analytics helps to _____.
   a) Reduce internet speed
   b) Predict customer buying behavior
   c) Manufacture products
   d) Design office furniture

13) Target marketing focuses on _____.
   a) Selling to everyone equally
   b) Identifying specific customer segments
   c) Ignoring customer data
   d) Increasing product cost

14) Which of the following is a structured data type?
   a) Text documents
   b) Images
   c) Relational database tables
   d) Videos

Seat No.	

Set **S**

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Predictive Analytics (CSEMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Solve the following. (Any Four) **16**

a) What is Predictive Analytics? Explain Advantages and strategies of predictive Analytics.

b) Write a short note on: Surveying Marketplace

c) Explain Predictive modelling lifecycle.

d) Explain Online marketing and retail.

e) Compare Business Intelligence Vs. Big Data Analytics

Q.3 Answer the following. (Any Two) **12**

a) Explain Business value of predictive analytics Key applications in healthcare, finance.

b) Explain connecting to related disciplines in statistics, data mining and machine learning.

c) Explain complexities in searching your data. And discuss how data growth can affects the complexities in data system.

SECTION – II

Q.4 Solve the following. (Any Four) **16**

a) Explain Healthcare analytics case studies: Google flu trends, Cancer survivability predictors.

b) Explain Data Clustering in detail.

c) Explain KNN Algorithm with example.

d) Explain Twitter-based predictors of earthquakes.

e) Explain Markov model with example.

Q.5 Answer the following. (Any Two) **12**

a) Define Modelling of Data. Explain Models, Simulation and Categories with Examples.

b) Explain in brief Data Classification. How it can be introduced in Business?

c) Explain structuring the data: extracting, transforming and loading the data.

SLR-QH-651

Seat No.	

Set P

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Predictive Analytics (CSEMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) Predictive analytics mainly focuses on _____.
a) Describing past events
b) Explaining why something happened
c) Predicting future outcomes using historical data
d) Storing business data

2) In healthcare, predictive analytics is commonly used for _____.
a) Designing buildings
b) Disease risk prediction
c) Writing prescriptions manually
d) Managing payroll

3) In online marketing, predictive analytics helps to _____.
a) Reduce internet speed
b) Predict customer buying behavior
c) Manufacture products
d) Design office furniture

4) Target marketing focuses on _____.
a) Selling to everyone equally
b) Identifying specific customer segments
c) Ignoring customer data
d) Increasing product cost

5) Which of the following is a structured data type?
a) Text documents b) Images
c) Relational database tables d) Videos

6) Predictive analytics is closely related to _____.
   a) Literature
   b) Statistics and Machine Learning
   c) Architecture
   d) Geography

7) Which of the following is a challenge due to constantly changing data?
   a) Data remains static
   b) Data becomes outdated quickly
   c) Data size decreases
   d) Data cannot be stored

8) Exploration of raw data means _____.
   a) Deleting original data
   b) Encrypting the data
   c) Analyzing data before processing
   d) Storing data in files

9) In Data Modelling, a simulation is used to _____.
   a) Store Data Permanently
   b) Represent Real-world Processes over time
   c) Delete Unwanted data
   d) Compress Large datasets

10) The Target Store Case study is related to _____.
   a) Disease Prediction
   b) Weather Prediction
   c) Customer Behavior Analysis
   d) Network Security

11) In document Processing, a Term- document Matrix represents _____.
   a) Images in documents
   b) Numbers of Users
   c) Document size only
   d) Frequency of terms in documents

12) Association Rule Mining is Mainly Used to _____.
   a) Find relationships between data items
   b) Detect hardware faults
   c) Improve Network Speed
   d) Encrypt Messages

13) Which of the following is a technique for predicting a continuous target variable?
   a) Classification
   b) Regression
   c) Clustering
   d) Dimensionality Reduction

14) Which of the following is a technique for grouping similar data points together?

a) Classification
b) Regression
c) Clustering
d) Dimensionality Reduction

Seat No.	

Set **P**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Predictive Analytics (CSEMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Solve the following. (Any Four) **16**

a) What is Predictive Analytics? Explain Advantages and strategies of predictive Analytics.

b) Write a short note on: Surveying Marketplace

c) Explain Predictive modelling lifecycle.

d) Explain Online marketing and retail.

e) Compare Business Intelligence Vs. Big Data Analytics

Q.3 Answer the following. (Any Two) **12**

a) Explain Business value of predictive analytics Key applications in healthcare, finance.

b) Explain connecting to related disciplines in statistics, data mining and machine learning.

c) Explain complexities in searching your data. And discuss how data growth can affects the complexities in data system.

SECTION – II

Q.4 Solve the following. (Any Four) **16**

a) Explain Healthcare analytics case studies: Google flu trends, Cancer survivability predictors.

b) Explain Data Clustering in detail.

c) Explain KNN Algorithm with example.

d) Explain Twitter-based predictors of earthquakes.

e) Explain Markov model with example.

Q.5 Answer the following. (Any Two) **12**

a) Define Modelling of Data. Explain Models, Simulation and Categories with Examples.

b) Explain in brief Data Classification. How it can be introduced in Business?

c) Explain structuring the data: extracting, transforming and loading the data.

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Predictive Analytics (CSEMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) Exploration of raw data means _____.
a) Deleting original data
b) Encrypting the data
c) Analyzing data before processing
d) Storing data in files

2) In Data Modelling, a simulation is used to _____.
a) Store Data Permanently
b) Represent Real-world Processes over time
c) Delete Unwanted data
d) Compress Large datasets

3) The Target Store Case study is related to _____.
a) Disease Prediction b) Weather Prediction
c) Customer Behavior Analysis d) Network Security

4) In document Processing, a Term- document Matrix represents _____.
a) Images in documents
b) Numbers of Users
c) Document size only
d) Frequency of terms in documents

5) Association Rule Mining is Mainly Used to _____.
a) Find relationships between data items
b) Detect hardware faults
c) Improve Network Speed
d) Encrypt Messages

6) Which of the following is a technique for predicting a continuous target variable?
a) Classification b) Regression
c) Clustering d) Dimensionality Reduction

7) Which of the following is a technique for grouping similar data points together?
   a) Classification
   b) Regression
   c) Clustering
   d) Dimensionality Reduction

8) Predictive analytics mainly focuses on _____.
   a) Describing past events
   b) Explaining why something happened
   c) Predicting future outcomes using historical data
   d) Storing business data

9) In healthcare, predictive analytics is commonly used for _____.
   a) Designing buildings
   b) Disease risk prediction
   c) Writing prescriptions manually
   d) Managing payroll

10) In online marketing, predictive analytics helps to _____.
   a) Reduce internet speed
   b) Predict customer buying behavior
   c) Manufacture products
   d) Design office furniture

11) Target marketing focuses on _____.
   a) Selling to everyone equally
   b) Identifying specific customer segments
   c) Ignoring customer data
   d) Increasing product cost

12) Which of the following is a structured data type?
   a) Text documents
   b) Images
   c) Relational database tables
   d) Videos

13) Predictive analytics is closely related to _____.
   a) Literature
   b) Statistics and Machine Learning
   c) Architecture
   d) Geography

14) Which of the following is a challenge due to constantly changing data?
   a) Data remains static
   b) Data becomes outdated quickly
   c) Data size decreases
   d) Data cannot be stored

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Predictive Analytics (CSEMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Solve the following. (Any Four) **16**

a) What is Predictive Analytics? Explain Advantages and strategies of predictive Analytics.

b) Write a short note on: Surveying Marketplace

c) Explain Predictive modelling lifecycle.

d) Explain Online marketing and retail.

e) Compare Business Intelligence Vs. Big Data Analytics

Q.3 Answer the following. (Any Two) **12**

a) Explain Business value of predictive analytics Key applications in healthcare, finance.

b) Explain connecting to related disciplines in statistics, data mining and machine learning.

c) Explain complexities in searching your data. And discuss how data growth can affects the complexities in data system.

SECTION – II

Q.4 Solve the following. (Any Four) **16**

a) Explain Healthcare analytics case studies: Google flu trends, Cancer survivability predictors.

b) Explain Data Clustering in detail.

c) Explain KNN Algorithm with example.

d) Explain Twitter-based predictors of earthquakes.

e) Explain Markov model with example.

Q.5 Answer the following. (Any Two) **12**

a) Define Modelling of Data. Explain Models, Simulation and Categories with Examples.

b) Explain in brief Data Classification. How it can be introduced in Business?

c) Explain structuring the data: extracting, transforming and loading the data.

Seat No.	

Set **R**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Predictive Analytics (CSEMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) In document Processing, a Term- document Matrix represents _____.
a) Images in documents
b) Numbers of Users
c) Document size only
d) Frequency of terms in documents

2) Association Rule Mining is Mainly Used to _____.
a) Find relationships between data items
b) Detect hardware faults
c) Improve Network Speed
d) Encrypt Messages

3) Which of the following is a technique for predicting a continuous target variable?
a) Classification
b) Regression
c) Clustering
d) Dimensionality Reduction

4) Which of the following is a technique for grouping similar data points together?
a) Classification
b) Regression
c) Clustering
d) Dimensionality Reduction

5) Predictive analytics mainly focuses on _____.
a) Describing past events
b) Explaining why something happened
c) Predicting future outcomes using historical data
d) Storing business data

6) In healthcare, predictive analytics is commonly used for _____.
   a) Designing buildings
   b) Disease risk prediction
   c) Writing prescriptions manually
   d) Managing payroll

7) In online marketing, predictive analytics helps to _____.
   a) Reduce internet speed
   b) Predict customer buying behavior
   c) Manufacture products
   d) Design office furniture

8) Target marketing focuses on _____.
   a) Selling to everyone equally
   b) Identifying specific customer segments
   c) Ignoring customer data
   d) Increasing product cost

9) Which of the following is a structured data type?
   a) Text documents b) Images
   c) Relational database tables d) Videos

10) Predictive analytics is closely related to _____.
   a) Literature
   b) Statistics and Machine Learning
   c) Architecture
   d) Geography

11) Which of the following is a challenge due to constantly changing data?
   a) Data remains static
   b) Data becomes outdated quickly
   c) Data size decreases
   d) Data cannot be stored

12) Exploration of raw data means _____.
   a) Deleting original data
   b) Encrypting the data
   c) Analyzing data before processing
   d) Storing data in files

13) In Data Modelling, a simulation is used to _____.
   a) Store Data Permanently
   b) Represent Real-world Processes over time
   c) Delete Unwanted data
   d) Compress Large datasets

14) The Target Store Case study is related to _____.
   a) Disease Prediction b) Weather Prediction
   c) Customer Behavior Analysis d) Network Security

Seat No.	

Set **R**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Predictive Analytics (CSEMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Solve the following. (Any Four) **16**

a) What is Predictive Analytics? Explain Advantages and strategies of predictive Analytics.

b) Write a short note on: Surveying Marketplace

c) Explain Predictive modelling lifecycle.

d) Explain Online marketing and retail.

e) Compare Business Intelligence Vs. Big Data Analytics

Q.3 Answer the following. (Any Two) **12**

a) Explain Business value of predictive analytics Key applications in healthcare, finance.

b) Explain connecting to related disciplines in statistics, data mining and machine learning.

c) Explain complexities in searching your data. And discuss how data growth can affects the complexities in data system.

SECTION – II

Q.4 Solve the following. (Any Four) **16**

a) Explain Healthcare analytics case studies: Google flu trends, Cancer survivability predictors.

b) Explain Data Clustering in detail.

c) Explain KNN Algorithm with example.

d) Explain Twitter-based predictors of earthquakes.

e) Explain Markov model with example.

Q.5 Answer the following. (Any Two) **12**

a) Define Modelling of Data. Explain Models, Simulation and Categories with Examples.

b) Explain in brief Data Classification. How it can be introduced in Business?

c) Explain structuring the data: extracting, transforming and loading the data.

SLR-QH-651

Seat No.	

Set S

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Predictive Analytics (CSEMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) Predictive analytics is closely related to _____.
a) Literature
b) Statistics and Machine Learning
c) Architecture
d) Geography

2) Which of the following is a challenge due to constantly changing data?
a) Data remains static
b) Data becomes outdated quickly
c) Data size decreases
d) Data cannot be stored

3) Exploration of raw data means _____.
a) Deleting original data
b) Encrypting the data
c) Analyzing data before processing
d) Storing data in files

4) In Data Modelling, a simulation is used to _____.
a) Store Data Permanently
b) Represent Real-world Processes over time
c) Delete Unwanted data
d) Compress Large datasets

5) The Target Store Case study is related to _____.
a) Disease Prediction b) Weather Prediction
c) Customer Behavior Analysis d) Network Security

6) In document Processing, a Term- document Matrix represents _____.
   a) Images in documents
   b) Numbers of Users
   c) Document size only
   d) Frequency of terms in documents

7) Association Rule Mining is Mainly Used to _____.
   a) Find relationships between data items
   b) Detect hardware faults
   c) Improve Network Speed
   d) Encrypt Messages

8) Which of the following is a technique for predicting a continuous target variable?
   a) Classification
   b) Regression
   c) Clustering
   d) Dimensionality Reduction

9) Which of the following is a technique for grouping similar data points together?
   a) Classification
   b) Regression
   c) Clustering
   d) Dimensionality Reduction

10) Predictive analytics mainly focuses on _____.
   a) Describing past events
   b) Explaining why something happened
   c) Predicting future outcomes using historical data
   d) Storing business data

11) In healthcare, predictive analytics is commonly used for _____.
   a) Designing buildings
   b) Disease risk prediction
   c) Writing prescriptions manually
   d) Managing payroll

12) In online marketing, predictive analytics helps to _____.
   a) Reduce internet speed
   b) Predict customer buying behavior
   c) Manufacture products
   d) Design office furniture

13) Target marketing focuses on _____.
   a) Selling to everyone equally
   b) Identifying specific customer segments
   c) Ignoring customer data
   d) Increasing product cost

14) Which of the following is a structured data type?
   a) Text documents
   b) Images
   c) Relational database tables
   d) Videos

Seat No.	

Set **S**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Predictive Analytics (CSEMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Solve the following. (Any Four) **16**

a) What is Predictive Analytics? Explain Advantages and strategies of predictive Analytics.

b) Write a short note on: Surveying Marketplace

c) Explain Predictive modelling lifecycle.

d) Explain Online marketing and retail.

e) Compare Business Intelligence Vs. Big Data Analytics

Q.3 Answer the following. (Any Two) **12**

a) Explain Business value of predictive analytics Key applications in healthcare, finance.

b) Explain connecting to related disciplines in statistics, data mining and machine learning.

c) Explain complexities in searching your data. And discuss how data growth can affects the complexities in data system.

SECTION – II

Q.4 Solve the following. (Any Four) **16**

a) Explain Healthcare analytics case studies: Google flu trends, Cancer survivability predictors.

b) Explain Data Clustering in detail.

c) Explain KNN Algorithm with example.

d) Explain Twitter-based predictors of earthquakes.

e) Explain Markov model with example.

Q.5 Answer the following. (Any Two) **12**

a) Define Modelling of Data. Explain Models, Simulation and Categories with Examples.

b) Explain in brief Data Classification. How it can be introduced in Business?

c) Explain structuring the data: extracting, transforming and loading the data.

SLR-QH-651

Seat No.	

Set P

T.Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Predictive Analytics (CSEMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) Predictive analytics mainly focuses on _____.
a) Describing past events
b) Explaining why something happened
c) Predicting future outcomes using historical data
d) Storing business data

2) In healthcare, predictive analytics is commonly used for _____.
a) Designing buildings
b) Disease risk prediction
c) Writing prescriptions manually
d) Managing payroll

3) In online marketing, predictive analytics helps to _____.
a) Reduce internet speed
b) Predict customer buying behavior
c) Manufacture products
d) Design office furniture

4) Target marketing focuses on _____.
a) Selling to everyone equally
b) Identifying specific customer segments
c) Ignoring customer data
d) Increasing product cost

5) Which of the following is a structured data type?
a) Text documents b) Images
c) Relational database tables d) Videos

6) Predictive analytics is closely related to _____.
   a) Literature
   b) Statistics and Machine Learning
   c) Architecture
   d) Geography

7) Which of the following is a challenge due to constantly changing data?
   a) Data remains static
   b) Data becomes outdated quickly
   c) Data size decreases
   d) Data cannot be stored

8) Exploration of raw data means _____.
   a) Deleting original data
   b) Encrypting the data
   c) Analyzing data before processing
   d) Storing data in files

9) In Data Modelling, a simulation is used to _____.
   a) Store Data Permanently
   b) Represent Real-world Processes over time
   c) Delete Unwanted data
   d) Compress Large datasets

10) The Target Store Case study is related to _____.
   a) Disease Prediction
   b) Weather Prediction
   c) Customer Behavior Analysis
   d) Network Security

11) In document Processing, a Term- document Matrix represents _____.
   a) Images in documents
   b) Numbers of Users
   c) Document size only
   d) Frequency of terms in documents

12) Association Rule Mining is Mainly Used to _____.
   a) Find relationships between data items
   b) Detect hardware faults
   c) Improve Network Speed
   d) Encrypt Messages

13) Which of the following is a technique for predicting a continuous target variable?
   a) Classification
   b) Regression
   c) Clustering
   d) Dimensionality Reduction

14) Which of the following is a technique for grouping similar data points together?

a) Classification
b) Regression
c) Clustering
d) Dimensionality Reduction

Seat No.	

Set **P**

T.Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Predictive Analytics (CSEMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Solve the following. (Any Four) **16**

a) What is Predictive Analytics? Explain Advantages and strategies of predictive Analytics.

b) Write a short note on: Surveying Marketplace

c) Explain Predictive modelling lifecycle.

d) Explain Online marketing and retail.

e) Compare Business Intelligence Vs. Big Data Analytics

Q.3 Answer the following. (Any Two) **12**

a) Explain Business value of predictive analytics Key applications in healthcare, finance.

b) Explain connecting to related disciplines in statistics, data mining and machine learning.

c) Explain complexities in searching your data. And discuss how data growth can affects the complexities in data system.

SECTION – II

Q.4 Solve the following. (Any Four) **16**

a) Explain Healthcare analytics case studies: Google flu trends, Cancer survivability predictors.

b) Explain Data Clustering in detail.

c) Explain KNN Algorithm with example.

d) Explain Twitter-based predictors of earthquakes.

e) Explain Markov model with example.

Q.5 Answer the following. (Any Two) **12**

a) Define Modelling of Data. Explain Models, Simulation and Categories with Examples.

b) Explain in brief Data Classification. How it can be introduced in Business?

c) Explain structuring the data: extracting, transforming and loading the data.

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Predictive Analytics (CSEMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) Exploration of raw data means _____.
a) Deleting original data
b) Encrypting the data
c) Analyzing data before processing
d) Storing data in files

2) In Data Modelling, a simulation is used to _____.
a) Store Data Permanently
b) Represent Real-world Processes over time
c) Delete Unwanted data
d) Compress Large datasets

3) The Target Store Case study is related to _____.
a) Disease Prediction b) Weather Prediction
c) Customer Behavior Analysis d) Network Security

4) In document Processing, a Term- document Matrix represents _____.
a) Images in documents
b) Numbers of Users
c) Document size only
d) Frequency of terms in documents

5) Association Rule Mining is Mainly Used to _____.
a) Find relationships between data items
b) Detect hardware faults
c) Improve Network Speed
d) Encrypt Messages

6) Which of the following is a technique for predicting a continuous target variable?
a) Classification b) Regression
c) Clustering d) Dimensionality Reduction

7) Which of the following is a technique for grouping similar data points together?
   a) Classification
   b) Regression
   c) Clustering
   d) Dimensionality Reduction

8) Predictive analytics mainly focuses on _____.
   a) Describing past events
   b) Explaining why something happened
   c) Predicting future outcomes using historical data
   d) Storing business data

9) In healthcare, predictive analytics is commonly used for _____.
   a) Designing buildings
   b) Disease risk prediction
   c) Writing prescriptions manually
   d) Managing payroll

10) In online marketing, predictive analytics helps to _____.
   a) Reduce internet speed
   b) Predict customer buying behavior
   c) Manufacture products
   d) Design office furniture

11) Target marketing focuses on _____.
   a) Selling to everyone equally
   b) Identifying specific customer segments
   c) Ignoring customer data
   d) Increasing product cost

12) Which of the following is a structured data type?
   a) Text documents
   b) Images
   c) Relational database tables
   d) Videos

13) Predictive analytics is closely related to _____.
   a) Literature
   b) Statistics and Machine Learning
   c) Architecture
   d) Geography

14) Which of the following is a challenge due to constantly changing data?
   a) Data remains static
   b) Data becomes outdated quickly
   c) Data size decreases
   d) Data cannot be stored

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Predictive Analytics (CSEMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Solve the following. (Any Four) **16**

a) What is Predictive Analytics? Explain Advantages and strategies of predictive Analytics.

b) Write a short note on: Surveying Marketplace

c) Explain Predictive modelling lifecycle.

d) Explain Online marketing and retail.

e) Compare Business Intelligence Vs. Big Data Analytics

Q.3 Answer the following. (Any Two) **12**

a) Explain Business value of predictive analytics Key applications in healthcare, finance.

b) Explain connecting to related disciplines in statistics, data mining and machine learning.

c) Explain complexities in searching your data. And discuss how data growth can affects the complexities in data system.

SECTION – II

Q.4 Solve the following. (Any Four) **16**

a) Explain Healthcare analytics case studies: Google flu trends, Cancer survivability predictors.

b) Explain Data Clustering in detail.

c) Explain KNN Algorithm with example.

d) Explain Twitter-based predictors of earthquakes.

e) Explain Markov model with example.

Q.5 Answer the following. (Any Two) **12**

a) Define Modelling of Data. Explain Models, Simulation and Categories with Examples.

b) Explain in brief Data Classification. How it can be introduced in Business?

c) Explain structuring the data: extracting, transforming and loading the data.

Seat No.	

Set **R**

T.Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Predictive Analytics (CSEMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) In document Processing, a Term- document Matrix represents _____.
a) Images in documents
b) Numbers of Users
c) Document size only
d) Frequency of terms in documents

2) Association Rule Mining is Mainly Used to _____.
a) Find relationships between data items
b) Detect hardware faults
c) Improve Network Speed
d) Encrypt Messages

3) Which of the following is a technique for predicting a continuous target variable?
a) Classification
b) Regression
c) Clustering
d) Dimensionality Reduction

4) Which of the following is a technique for grouping similar data points together?
a) Classification
b) Regression
c) Clustering
d) Dimensionality Reduction

5) Predictive analytics mainly focuses on _____.
a) Describing past events
b) Explaining why something happened
c) Predicting future outcomes using historical data
d) Storing business data

6) In healthcare, predictive analytics is commonly used for _____.
   a) Designing buildings
   b) Disease risk prediction
   c) Writing prescriptions manually
   d) Managing payroll

7) In online marketing, predictive analytics helps to _____.
   a) Reduce internet speed
   b) Predict customer buying behavior
   c) Manufacture products
   d) Design office furniture

8) Target marketing focuses on _____.
   a) Selling to everyone equally
   b) Identifying specific customer segments
   c) Ignoring customer data
   d) Increasing product cost

9) Which of the following is a structured data type?
   a) Text documents b) Images
   c) Relational database tables d) Videos

10) Predictive analytics is closely related to _____.
   a) Literature
   b) Statistics and Machine Learning
   c) Architecture
   d) Geography

11) Which of the following is a challenge due to constantly changing data?
   a) Data remains static
   b) Data becomes outdated quickly
   c) Data size decreases
   d) Data cannot be stored

12) Exploration of raw data means _____.
   a) Deleting original data
   b) Encrypting the data
   c) Analyzing data before processing
   d) Storing data in files

13) In Data Modelling, a simulation is used to _____.
   a) Store Data Permanently
   b) Represent Real-world Processes over time
   c) Delete Unwanted data
   d) Compress Large datasets

14) The Target Store Case study is related to _____.
   a) Disease Prediction b) Weather Prediction
   c) Customer Behavior Analysis d) Network Security

Seat No.	

Set **R**

T.Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Predictive Analytics (CSEMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Solve the following. (Any Four) **16**

a) What is Predictive Analytics? Explain Advantages and strategies of predictive Analytics.

b) Write a short note on: Surveying Marketplace

c) Explain Predictive modelling lifecycle.

d) Explain Online marketing and retail.

e) Compare Business Intelligence Vs. Big Data Analytics

Q.3 Answer the following. (Any Two) **12**

a) Explain Business value of predictive analytics Key applications in healthcare, finance.

b) Explain connecting to related disciplines in statistics, data mining and machine learning.

c) Explain complexities in searching your data. And discuss how data growth can affects the complexities in data system.

SECTION – II

Q.4 Solve the following. (Any Four) **16**

a) Explain Healthcare analytics case studies: Google flu trends, Cancer survivability predictors.

b) Explain Data Clustering in detail.

c) Explain KNN Algorithm with example.

d) Explain Twitter-based predictors of earthquakes.

e) Explain Markov model with example.

Q.5 Answer the following. (Any Two) **12**

a) Define Modelling of Data. Explain Models, Simulation and Categories with Examples.

b) Explain in brief Data Classification. How it can be introduced in Business?

c) Explain structuring the data: extracting, transforming and loading the data.

Seat No.	

Set | S

T.Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Predictive Analytics (CSEMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) Predictive analytics is closely related to _____.
a) Literature
b) Statistics and Machine Learning
c) Architecture
d) Geography

2) Which of the following is a challenge due to constantly changing data?
a) Data remains static
b) Data becomes outdated quickly
c) Data size decreases
d) Data cannot be stored

3) Exploration of raw data means _____.
a) Deleting original data
b) Encrypting the data
c) Analyzing data before processing
d) Storing data in files

4) In Data Modelling, a simulation is used to _____.
a) Store Data Permanently
b) Represent Real-world Processes over time
c) Delete Unwanted data
d) Compress Large datasets

5) The Target Store Case study is related to _____.
a) Disease Prediction b) Weather Prediction
c) Customer Behavior Analysis d) Network Security

6) In document Processing, a Term- document Matrix represents _____.
   a) Images in documents
   b) Numbers of Users
   c) Document size only
   d) Frequency of terms in documents

7) Association Rule Mining is Mainly Used to _____.
   a) Find relationships between data items
   b) Detect hardware faults
   c) Improve Network Speed
   d) Encrypt Messages

8) Which of the following is a technique for predicting a continuous target variable?
   a) Classification
   b) Regression
   c) Clustering
   d) Dimensionality Reduction

9) Which of the following is a technique for grouping similar data points together?
   a) Classification
   b) Regression
   c) Clustering
   d) Dimensionality Reduction

10) Predictive analytics mainly focuses on _____.
   a) Describing past events
   b) Explaining why something happened
   c) Predicting future outcomes using historical data
   d) Storing business data

11) In healthcare, predictive analytics is commonly used for _____.
   a) Designing buildings
   b) Disease risk prediction
   c) Writing prescriptions manually
   d) Managing payroll

12) In online marketing, predictive analytics helps to _____.
   a) Reduce internet speed
   b) Predict customer buying behavior
   c) Manufacture products
   d) Design office furniture

13) Target marketing focuses on _____.
   a) Selling to everyone equally
   b) Identifying specific customer segments
   c) Ignoring customer data
   d) Increasing product cost

14) Which of the following is a structured data type?
   a) Text documents
   b) Images
   c) Relational database tables
   d) Videos

Seat No.	

Set | S

T.Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Predictive Analytics (CSEMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Solve the following. (Any Four) **16**

a) What is Predictive Analytics? Explain Advantages and strategies of predictive Analytics.

b) Write a short note on: Surveying Marketplace

c) Explain Predictive modelling lifecycle.

d) Explain Online marketing and retail.

e) Compare Business Intelligence Vs. Big Data Analytics

Q.3 Answer the following. (Any Two) **12**

a) Explain Business value of predictive analytics Key applications in healthcare, finance.

b) Explain connecting to related disciplines in statistics, data mining and machine learning.

c) Explain complexities in searching your data. And discuss how data growth can affects the complexities in data system.

SECTION – II

Q.4 Solve the following. (Any Four) **16**

a) Explain Healthcare analytics case studies: Google flu trends, Cancer survivability predictors.

b) Explain Data Clustering in detail.

c) Explain KNN Algorithm with example.

d) Explain Twitter-based predictors of earthquakes.

e) Explain Markov model with example.

Q.5 Answer the following. (Any Two) **12**

a) Define Modelling of Data. Explain Models, Simulation and Categories with Examples.

b) Explain in brief Data Classification. How it can be introduced in Business?

c) Explain structuring the data: extracting, transforming and loading the data.

SLR-QH-651

Seat No.	

Set P

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Predictive Analytics (CSEMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) Predictive analytics mainly focuses on _____.
a) Describing past events
b) Explaining why something happened
c) Predicting future outcomes using historical data
d) Storing business data

2) In healthcare, predictive analytics is commonly used for _____.
a) Designing buildings
b) Disease risk prediction
c) Writing prescriptions manually
d) Managing payroll

3) In online marketing, predictive analytics helps to _____.
a) Reduce internet speed
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4) Target marketing focuses on _____.
a) Selling to everyone equally
b) Identifying specific customer segments
c) Ignoring customer data
d) Increasing product cost

5) Which of the following is a structured data type?
a) Text documents b) Images
c) Relational database tables d) Videos

6) Predictive analytics is closely related to _____.
   a) Literature
   b) Statistics and Machine Learning
   c) Architecture
   d) Geography

7) Which of the following is a challenge due to constantly changing data?
   a) Data remains static
   b) Data becomes outdated quickly
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8) Exploration of raw data means _____.
   a) Deleting original data
   b) Encrypting the data
   c) Analyzing data before processing
   d) Storing data in files

9) In Data Modelling, a simulation is used to _____.
   a) Store Data Permanently
   b) Represent Real-world Processes over time
   c) Delete Unwanted data
   d) Compress Large datasets

10) The Target Store Case study is related to _____.
   a) Disease Prediction
   b) Weather Prediction
   c) Customer Behavior Analysis
   d) Network Security

11) In document Processing, a Term- document Matrix represents _____.
   a) Images in documents
   b) Numbers of Users
   c) Document size only
   d) Frequency of terms in documents

12) Association Rule Mining is Mainly Used to _____.
   a) Find relationships between data items
   b) Detect hardware faults
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   d) Encrypt Messages

13) Which of the following is a technique for predicting a continuous target variable?
   a) Classification
   b) Regression
   c) Clustering
   d) Dimensionality Reduction

14) Which of the following is a technique for grouping similar data points together?

a) Classification
b) Regression
c) Clustering
d) Dimensionality Reduction

Seat No.	

Set **P**

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Predictive Analytics (CSEMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Solve the following. (Any Four) **16**

a) What is Predictive Analytics? Explain Advantages and strategies of predictive Analytics.

b) Write a short note on: Surveying Marketplace

c) Explain Predictive modelling lifecycle.

d) Explain Online marketing and retail.

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b) Explain connecting to related disciplines in statistics, data mining and machine learning.

c) Explain complexities in searching your data. And discuss how data growth can affects the complexities in data system.

SECTION – II

Q.4 Solve the following. (Any Four) **16**

a) Explain Healthcare analytics case studies: Google flu trends, Cancer survivability predictors.

b) Explain Data Clustering in detail.

c) Explain KNN Algorithm with example.

d) Explain Twitter-based predictors of earthquakes.

e) Explain Markov model with example.

Q.5 Answer the following. (Any Two) **12**

a) Define Modelling of Data. Explain Models, Simulation and Categories with Examples.

b) Explain in brief Data Classification. How it can be introduced in Business?

c) Explain structuring the data: extracting, transforming and loading the data.

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Predictive Analytics (CSEMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) Exploration of raw data means _____.
a) Deleting original data
b) Encrypting the data
c) Analyzing data before processing
d) Storing data in files

2) In Data Modelling, a simulation is used to _____.
a) Store Data Permanently
b) Represent Real-world Processes over time
c) Delete Unwanted data
d) Compress Large datasets

3) The Target Store Case study is related to _____.
a) Disease Prediction b) Weather Prediction
c) Customer Behavior Analysis d) Network Security

4) In document Processing, a Term- document Matrix represents _____.
a) Images in documents
b) Numbers of Users
c) Document size only
d) Frequency of terms in documents

5) Association Rule Mining is Mainly Used to _____.
a) Find relationships between data items
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c) Improve Network Speed
d) Encrypt Messages

6) Which of the following is a technique for predicting a continuous target variable?
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   a) Designing buildings
   b) Disease risk prediction
   c) Writing prescriptions manually
   d) Managing payroll

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   b) Predict customer buying behavior
   c) Manufacture products
   d) Design office furniture

11) Target marketing focuses on _____.
   a) Selling to everyone equally
   b) Identifying specific customer segments
   c) Ignoring customer data
   d) Increasing product cost

12) Which of the following is a structured data type?
   a) Text documents
   b) Images
   c) Relational database tables
   d) Videos

13) Predictive analytics is closely related to _____.
   a) Literature
   b) Statistics and Machine Learning
   c) Architecture
   d) Geography

14) Which of the following is a challenge due to constantly changing data?
   a) Data remains static
   b) Data becomes outdated quickly
   c) Data size decreases
   d) Data cannot be stored

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Predictive Analytics (CSEMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Solve the following. (Any Four) **16**

a) What is Predictive Analytics? Explain Advantages and strategies of predictive Analytics.

b) Write a short note on: Surveying Marketplace

c) Explain Predictive modelling lifecycle.

d) Explain Online marketing and retail.

e) Compare Business Intelligence Vs. Big Data Analytics

Q.3 Answer the following. (Any Two) **12**

a) Explain Business value of predictive analytics Key applications in healthcare, finance.

b) Explain connecting to related disciplines in statistics, data mining and machine learning.

c) Explain complexities in searching your data. And discuss how data growth can affects the complexities in data system.

SECTION – II

Q.4 Solve the following. (Any Four) **16**

a) Explain Healthcare analytics case studies: Google flu trends, Cancer survivability predictors.

b) Explain Data Clustering in detail.

c) Explain KNN Algorithm with example.

d) Explain Twitter-based predictors of earthquakes.

e) Explain Markov model with example.

Q.5 Answer the following. (Any Two) **12**

a) Define Modelling of Data. Explain Models, Simulation and Categories with Examples.

b) Explain in brief Data Classification. How it can be introduced in Business?

c) Explain structuring the data: extracting, transforming and loading the data.

Seat No.	

Set **R**

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Predictive Analytics (CSEMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) In document Processing, a Term- document Matrix represents _____.
a) Images in documents
b) Numbers of Users
c) Document size only
d) Frequency of terms in documents

2) Association Rule Mining is Mainly Used to _____.
a) Find relationships between data items
b) Detect hardware faults
c) Improve Network Speed
d) Encrypt Messages

3) Which of the following is a technique for predicting a continuous target variable?
a) Classification
b) Regression
c) Clustering
d) Dimensionality Reduction

4) Which of the following is a technique for grouping similar data points together?
a) Classification
b) Regression
c) Clustering
d) Dimensionality Reduction

5) Predictive analytics mainly focuses on _____.
a) Describing past events
b) Explaining why something happened
c) Predicting future outcomes using historical data
d) Storing business data

6) In healthcare, predictive analytics is commonly used for _____.
   a) Designing buildings
   b) Disease risk prediction
   c) Writing prescriptions manually
   d) Managing payroll

7) In online marketing, predictive analytics helps to _____.
   a) Reduce internet speed
   b) Predict customer buying behavior
   c) Manufacture products
   d) Design office furniture

8) Target marketing focuses on _____.
   a) Selling to everyone equally
   b) Identifying specific customer segments
   c) Ignoring customer data
   d) Increasing product cost

9) Which of the following is a structured data type?
   a) Text documents b) Images
   c) Relational database tables d) Videos

10) Predictive analytics is closely related to _____.
   a) Literature
   b) Statistics and Machine Learning
   c) Architecture
   d) Geography

11) Which of the following is a challenge due to constantly changing data?
   a) Data remains static
   b) Data becomes outdated quickly
   c) Data size decreases
   d) Data cannot be stored

12) Exploration of raw data means _____.
   a) Deleting original data
   b) Encrypting the data
   c) Analyzing data before processing
   d) Storing data in files

13) In Data Modelling, a simulation is used to _____.
   a) Store Data Permanently
   b) Represent Real-world Processes over time
   c) Delete Unwanted data
   d) Compress Large datasets

14) The Target Store Case study is related to _____.
   a) Disease Prediction b) Weather Prediction
   c) Customer Behavior Analysis d) Network Security

Seat No.	

Set R

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Predictive Analytics (CSEMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Solve the following. (Any Four) **16**

a) What is Predictive Analytics? Explain Advantages and strategies of predictive Analytics.

b) Write a short note on: Surveying Marketplace

c) Explain Predictive modelling lifecycle.

d) Explain Online marketing and retail.

e) Compare Business Intelligence Vs. Big Data Analytics

Q.3 Answer the following. (Any Two) **12**

a) Explain Business value of predictive analytics Key applications in healthcare, finance.

b) Explain connecting to related disciplines in statistics, data mining and machine learning.

c) Explain complexities in searching your data. And discuss how data growth can affects the complexities in data system.

SECTION – II

Q.4 Solve the following. (Any Four) **16**

a) Explain Healthcare analytics case studies: Google flu trends, Cancer survivability predictors.

b) Explain Data Clustering in detail.

c) Explain KNN Algorithm with example.

d) Explain Twitter-based predictors of earthquakes.

e) Explain Markov model with example.

Q.5 Answer the following. (Any Two) **12**

a) Define Modelling of Data. Explain Models, Simulation and Categories with Examples.

b) Explain in brief Data Classification. How it can be introduced in Business?

c) Explain structuring the data: extracting, transforming and loading the data.

SLR-QH-651

Seat No.	

Set S

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Predictive Analytics (CSEMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) Predictive analytics is closely related to _____.
a) Literature
b) Statistics and Machine Learning
c) Architecture
d) Geography

2) Which of the following is a challenge due to constantly changing data?
a) Data remains static
b) Data becomes outdated quickly
c) Data size decreases
d) Data cannot be stored

3) Exploration of raw data means _____.
a) Deleting original data
b) Encrypting the data
c) Analyzing data before processing
d) Storing data in files

4) In Data Modelling, a simulation is used to _____.
a) Store Data Permanently
b) Represent Real-world Processes over time
c) Delete Unwanted data
d) Compress Large datasets

5) The Target Store Case study is related to _____.
a) Disease Prediction b) Weather Prediction
c) Customer Behavior Analysis d) Network Security

6) In document Processing, a Term- document Matrix represents _____.
   a) Images in documents
   b) Numbers of Users
   c) Document size only
   d) Frequency of terms in documents

7) Association Rule Mining is Mainly Used to _____.
   a) Find relationships between data items
   b) Detect hardware faults
   c) Improve Network Speed
   d) Encrypt Messages

8) Which of the following is a technique for predicting a continuous target variable?
   a) Classification
   b) Regression
   c) Clustering
   d) Dimensionality Reduction

9) Which of the following is a technique for grouping similar data points together?
   a) Classification
   b) Regression
   c) Clustering
   d) Dimensionality Reduction

10) Predictive analytics mainly focuses on _____.
   a) Describing past events
   b) Explaining why something happened
   c) Predicting future outcomes using historical data
   d) Storing business data

11) In healthcare, predictive analytics is commonly used for _____.
   a) Designing buildings
   b) Disease risk prediction
   c) Writing prescriptions manually
   d) Managing payroll

12) In online marketing, predictive analytics helps to _____.
   a) Reduce internet speed
   b) Predict customer buying behavior
   c) Manufacture products
   d) Design office furniture

13) Target marketing focuses on _____.
   a) Selling to everyone equally
   b) Identifying specific customer segments
   c) Ignoring customer data
   d) Increasing product cost

14) Which of the following is a structured data type?
   a) Text documents
   b) Images
   c) Relational database tables
   d) Videos

Seat No.		Set	S

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Predictive Analytics (CSEMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Solve the following. (Any Four) **16**

a) What is Predictive Analytics? Explain Advantages and strategies of predictive Analytics.

b) Write a short note on: Surveying Marketplace

c) Explain Predictive modelling lifecycle.

d) Explain Online marketing and retail.

e) Compare Business Intelligence Vs. Big Data Analytics

Q.3 Answer the following. (Any Two) **12**

a) Explain Business value of predictive analytics Key applications in healthcare, finance.

b) Explain connecting to related disciplines in statistics, data mining and machine learning.

c) Explain complexities in searching your data. And discuss how data growth can affects the complexities in data system.

SECTION – II

Q.4 Solve the following. (Any Four) **16**

a) Explain Healthcare analytics case studies: Google flu trends, Cancer survivability predictors.

b) Explain Data Clustering in detail.

c) Explain KNN Algorithm with example.

d) Explain Twitter-based predictors of earthquakes.

e) Explain Markov model with example.

Q.5 Answer the following. (Any Two) **12**

a) Define Modelling of Data. Explain Models, Simulation and Categories with Examples.

b) Explain in brief Data Classification. How it can be introduced in Business?

c) Explain structuring the data: extracting, transforming and loading the data.

SLR-QH-651

Seat No.	

Set P

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Predictive Analytics (CSEMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) Predictive analytics mainly focuses on _____.
a) Describing past events
b) Explaining why something happened
c) Predicting future outcomes using historical data
d) Storing business data

2) In healthcare, predictive analytics is commonly used for _____.
a) Designing buildings
b) Disease risk prediction
c) Writing prescriptions manually
d) Managing payroll

3) In online marketing, predictive analytics helps to _____.
a) Reduce internet speed
b) Predict customer buying behavior
c) Manufacture products
d) Design office furniture

4) Target marketing focuses on _____.
a) Selling to everyone equally
b) Identifying specific customer segments
c) Ignoring customer data
d) Increasing product cost

5) Which of the following is a structured data type?
a) Text documents b) Images
c) Relational database tables d) Videos

6) Predictive analytics is closely related to _____.
   a) Literature
   b) Statistics and Machine Learning
   c) Architecture
   d) Geography

7) Which of the following is a challenge due to constantly changing data?
   a) Data remains static
   b) Data becomes outdated quickly
   c) Data size decreases
   d) Data cannot be stored

8) Exploration of raw data means _____.
   a) Deleting original data
   b) Encrypting the data
   c) Analyzing data before processing
   d) Storing data in files

9) In Data Modelling, a simulation is used to _____.
   a) Store Data Permanently
   b) Represent Real-world Processes over time
   c) Delete Unwanted data
   d) Compress Large datasets

10) The Target Store Case study is related to _____.
   a) Disease Prediction
   b) Weather Prediction
   c) Customer Behavior Analysis
   d) Network Security

11) In document Processing, a Term- document Matrix represents _____.
   a) Images in documents
   b) Numbers of Users
   c) Document size only
   d) Frequency of terms in documents

12) Association Rule Mining is Mainly Used to _____.
   a) Find relationships between data items
   b) Detect hardware faults
   c) Improve Network Speed
   d) Encrypt Messages

13) Which of the following is a technique for predicting a continuous target variable?
   a) Classification
   b) Regression
   c) Clustering
   d) Dimensionality Reduction

14) Which of the following is a technique for grouping similar data points together?

a) Classification
b) Regression
c) Clustering
d) Dimensionality Reduction

Seat No.	

Set **P**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Predictive Analytics (CSEMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Solve the following. (Any Four) **16**

a) What is Predictive Analytics? Explain Advantages and strategies of predictive Analytics.

b) Write a short note on: Surveying Marketplace

c) Explain Predictive modelling lifecycle.

d) Explain Online marketing and retail.

e) Compare Business Intelligence Vs. Big Data Analytics

Q.3 Answer the following. (Any Two) **12**

a) Explain Business value of predictive analytics Key applications in healthcare, finance.

b) Explain connecting to related disciplines in statistics, data mining and machine learning.

c) Explain complexities in searching your data. And discuss how data growth can affects the complexities in data system.

SECTION – II

Q.4 Solve the following. (Any Four) **16**

a) Explain Healthcare analytics case studies: Google flu trends, Cancer survivability predictors.

b) Explain Data Clustering in detail.

c) Explain KNN Algorithm with example.

d) Explain Twitter-based predictors of earthquakes.

e) Explain Markov model with example.

Q.5 Answer the following. (Any Two) **12**

a) Define Modelling of Data. Explain Models, Simulation and Categories with Examples.

b) Explain in brief Data Classification. How it can be introduced in Business?

c) Explain structuring the data: extracting, transforming and loading the data.

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Predictive Analytics (CSEMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) Exploration of raw data means _____.
a) Deleting original data
b) Encrypting the data
c) Analyzing data before processing
d) Storing data in files

2) In Data Modelling, a simulation is used to _____.
a) Store Data Permanently
b) Represent Real-world Processes over time
c) Delete Unwanted data
d) Compress Large datasets

3) The Target Store Case study is related to _____.
a) Disease Prediction b) Weather Prediction
c) Customer Behavior Analysis d) Network Security

4) In document Processing, a Term- document Matrix represents _____.
a) Images in documents
b) Numbers of Users
c) Document size only
d) Frequency of terms in documents

5) Association Rule Mining is Mainly Used to _____.
a) Find relationships between data items
b) Detect hardware faults
c) Improve Network Speed
d) Encrypt Messages

6) Which of the following is a technique for predicting a continuous target variable?
a) Classification b) Regression
c) Clustering d) Dimensionality Reduction

7) Which of the following is a technique for grouping similar data points together?
   a) Classification
   b) Regression
   c) Clustering
   d) Dimensionality Reduction

8) Predictive analytics mainly focuses on _____.
   a) Describing past events
   b) Explaining why something happened
   c) Predicting future outcomes using historical data
   d) Storing business data

9) In healthcare, predictive analytics is commonly used for _____.
   a) Designing buildings
   b) Disease risk prediction
   c) Writing prescriptions manually
   d) Managing payroll

10) In online marketing, predictive analytics helps to _____.
   a) Reduce internet speed
   b) Predict customer buying behavior
   c) Manufacture products
   d) Design office furniture

11) Target marketing focuses on _____.
   a) Selling to everyone equally
   b) Identifying specific customer segments
   c) Ignoring customer data
   d) Increasing product cost

12) Which of the following is a structured data type?
   a) Text documents
   b) Images
   c) Relational database tables
   d) Videos

13) Predictive analytics is closely related to _____.
   a) Literature
   b) Statistics and Machine Learning
   c) Architecture
   d) Geography

14) Which of the following is a challenge due to constantly changing data?
   a) Data remains static
   b) Data becomes outdated quickly
   c) Data size decreases
   d) Data cannot be stored

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Predictive Analytics (CSEMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Solve the following. (Any Four) **16**

a) What is Predictive Analytics? Explain Advantages and strategies of predictive Analytics.

b) Write a short note on: Surveying Marketplace

c) Explain Predictive modelling lifecycle.

d) Explain Online marketing and retail.

e) Compare Business Intelligence Vs. Big Data Analytics

Q.3 Answer the following. (Any Two) **12**

a) Explain Business value of predictive analytics Key applications in healthcare, finance.

b) Explain connecting to related disciplines in statistics, data mining and machine learning.

c) Explain complexities in searching your data. And discuss how data growth can affects the complexities in data system.

SECTION – II

Q.4 Solve the following. (Any Four) **16**

a) Explain Healthcare analytics case studies: Google flu trends, Cancer survivability predictors.

b) Explain Data Clustering in detail.

c) Explain KNN Algorithm with example.

d) Explain Twitter-based predictors of earthquakes.

e) Explain Markov model with example.

Q.5 Answer the following. (Any Two) **12**

a) Define Modelling of Data. Explain Models, Simulation and Categories with Examples.

b) Explain in brief Data Classification. How it can be introduced in Business?

c) Explain structuring the data: extracting, transforming and loading the data.

Seat No.	

Set **R**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Predictive Analytics (CSEMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) In document Processing, a Term- document Matrix represents _____.
a) Images in documents
b) Numbers of Users
c) Document size only
d) Frequency of terms in documents

2) Association Rule Mining is Mainly Used to _____.
a) Find relationships between data items
b) Detect hardware faults
c) Improve Network Speed
d) Encrypt Messages

3) Which of the following is a technique for predicting a continuous target variable?
a) Classification
b) Regression
c) Clustering
d) Dimensionality Reduction

4) Which of the following is a technique for grouping similar data points together?
a) Classification
b) Regression
c) Clustering
d) Dimensionality Reduction

5) Predictive analytics mainly focuses on _____.
a) Describing past events
b) Explaining why something happened
c) Predicting future outcomes using historical data
d) Storing business data

6) In healthcare, predictive analytics is commonly used for _____.
   a) Designing buildings
   b) Disease risk prediction
   c) Writing prescriptions manually
   d) Managing payroll

7) In online marketing, predictive analytics helps to _____.
   a) Reduce internet speed
   b) Predict customer buying behavior
   c) Manufacture products
   d) Design office furniture

8) Target marketing focuses on _____.
   a) Selling to everyone equally
   b) Identifying specific customer segments
   c) Ignoring customer data
   d) Increasing product cost

9) Which of the following is a structured data type?
   a) Text documents b) Images
   c) Relational database tables d) Videos

10) Predictive analytics is closely related to _____.
   a) Literature
   b) Statistics and Machine Learning
   c) Architecture
   d) Geography

11) Which of the following is a challenge due to constantly changing data?
   a) Data remains static
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12) Exploration of raw data means _____.
   a) Deleting original data
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13) In Data Modelling, a simulation is used to _____.
   a) Store Data Permanently
   b) Represent Real-world Processes over time
   c) Delete Unwanted data
   d) Compress Large datasets

14) The Target Store Case study is related to _____.
   a) Disease Prediction b) Weather Prediction
   c) Customer Behavior Analysis d) Network Security

Seat No.	

Set **R**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Predictive Analytics (CSEMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Solve the following. (Any Four) **16**

a) What is Predictive Analytics? Explain Advantages and strategies of predictive Analytics.

b) Write a short note on: Surveying Marketplace

c) Explain Predictive modelling lifecycle.

d) Explain Online marketing and retail.

e) Compare Business Intelligence Vs. Big Data Analytics

Q.3 Answer the following. (Any Two) **12**

a) Explain Business value of predictive analytics Key applications in healthcare, finance.

b) Explain connecting to related disciplines in statistics, data mining and machine learning.

c) Explain complexities in searching your data. And discuss how data growth can affects the complexities in data system.

SECTION – II

Q.4 Solve the following. (Any Four) **16**

a) Explain Healthcare analytics case studies: Google flu trends, Cancer survivability predictors.

b) Explain Data Clustering in detail.

c) Explain KNN Algorithm with example.

d) Explain Twitter-based predictors of earthquakes.

e) Explain Markov model with example.

Q.5 Answer the following. (Any Two) **12**

a) Define Modelling of Data. Explain Models, Simulation and Categories with Examples.

b) Explain in brief Data Classification. How it can be introduced in Business?

c) Explain structuring the data: extracting, transforming and loading the data.

Seat No.		Set	S

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Predictive Analytics (CSEMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) Predictive analytics is closely related to _____.
a) Literature
b) Statistics and Machine Learning
c) Architecture
d) Geography

2) Which of the following is a challenge due to constantly changing data?
a) Data remains static
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3) Exploration of raw data means _____.
a) Deleting original data
b) Encrypting the data
c) Analyzing data before processing
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4) In Data Modelling, a simulation is used to _____.
a) Store Data Permanently
b) Represent Real-world Processes over time
c) Delete Unwanted data
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5) The Target Store Case study is related to _____.
a) Disease Prediction b) Weather Prediction
c) Customer Behavior Analysis d) Network Security

6) In document Processing, a Term- document Matrix represents _____.
   a) Images in documents
   b) Numbers of Users
   c) Document size only
   d) Frequency of terms in documents

7) Association Rule Mining is Mainly Used to _____.
   a) Find relationships between data items
   b) Detect hardware faults
   c) Improve Network Speed
   d) Encrypt Messages

8) Which of the following is a technique for predicting a continuous target variable?
   a) Classification
   b) Regression
   c) Clustering
   d) Dimensionality Reduction

9) Which of the following is a technique for grouping similar data points together?
   a) Classification
   b) Regression
   c) Clustering
   d) Dimensionality Reduction

10) Predictive analytics mainly focuses on _____.
   a) Describing past events
   b) Explaining why something happened
   c) Predicting future outcomes using historical data
   d) Storing business data

11) In healthcare, predictive analytics is commonly used for _____.
   a) Designing buildings
   b) Disease risk prediction
   c) Writing prescriptions manually
   d) Managing payroll

12) In online marketing, predictive analytics helps to _____.
   a) Reduce internet speed
   b) Predict customer buying behavior
   c) Manufacture products
   d) Design office furniture

13) Target marketing focuses on _____.
   a) Selling to everyone equally
   b) Identifying specific customer segments
   c) Ignoring customer data
   d) Increasing product cost

14) Which of the following is a structured data type?
   a) Text documents
   b) Images
   c) Relational database tables
   d) Videos

Seat No.	

Set **S**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Predictive Analytics (CSEMDM-04A)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Solve the following. (Any Four) **16**

a) What is Predictive Analytics? Explain Advantages and strategies of predictive Analytics.

b) Write a short note on: Surveying Marketplace

c) Explain Predictive modelling lifecycle.

d) Explain Online marketing and retail.

e) Compare Business Intelligence Vs. Big Data Analytics

Q.3 Answer the following. (Any Two) **12**

a) Explain Business value of predictive analytics Key applications in healthcare, finance.

b) Explain connecting to related disciplines in statistics, data mining and machine learning.

c) Explain complexities in searching your data. And discuss how data growth can affects the complexities in data system.

SECTION – II

Q.4 Solve the following. (Any Four) **16**

a) Explain Healthcare analytics case studies: Google flu trends, Cancer survivability predictors.

b) Explain Data Clustering in detail.

c) Explain KNN Algorithm with example.

d) Explain Twitter-based predictors of earthquakes.

e) Explain Markov model with example.

Q.5 Answer the following. (Any Two) **12**

a) Define Modelling of Data. Explain Models, Simulation and Categories with Examples.

b) Explain in brief Data Classification. How it can be introduced in Business?

c) Explain structuring the data: extracting, transforming and loading the data.

SLR-QH-652

Seat No.	

Set P

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Management Information System (CSEMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. **14**

1) What is the main goal of social business tools?
a) Replace meetings b) Enhance collaboration
c) Automate payroll d) Reduce staff

2) How do information systems transform business processes?
a) By increasing paperwork b) By automating workflows
c) By stopping data growth d) By removing all software

3) What is a major challenge when implementing strategic information systems?
a) Lowering costs b) System integration
c) Faster decisions d) Increasing revenue

4) EBay is an example of _____.
a) click-and-mortar business b) C2C electronic commerce
c) B2C electronic commerce d) an online exchange

5) An enterprise is a group of people with _____.
a) common goal
b) separate goal for each department
c) multiple goals
d) two or more goal

6) A Decision Support System (DSS) is an application for information systems that helps in _____.
a) System Design b) System Analysis
c) Decision making d) All of the mentioned above

7) If a university sets up a web-based information system that faculty could access to record student grades and to advise students, that would be an example of a/an _____.

a) CRM
b) Intranet
c) ERP
d) Extranet

8) DBMS have a data definition language to do all of the following except _____.

a) Define the characteristics of the fields in each table
b) Add, change, delete, and retrieve data in the database
c) Specify the structure of the content of the database
d) Specify the creation of the database tables

9) Permission given with the knowledge of all the facts needed to make a rational decision is called _____.

a) Informed consent
b) Liability
c) Responsibility
d) Due process

10) The principles and standards that guide our behaviour toward other people are collectively called _____.

a) Intellectual property
b) Copyright
c) Ethics
d) Fair Use Doctrine

11) What is a core capability of a Database Management System (DBMS)?

a) Selling hardware
b) Managing data access
c) Translating languages
d) Replacing managers

12) How do databases support business decisions?

a) By hiding data
b) By providing analytical insights
c) By deleting old records
d) By restricting user access

13) Which of the following is a key security management tool?

a) Firewalls
b) Paper logs
c) Public passwords
d) Open cables

14) What is the goal of defending against a Denial of Service (DoS) attack?

a) Increasing traffic
b) Maintaining availability
c) Encrypting databases
d) Monitoring emails

Seat No.	

Set **P**

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Management Information System (CSEMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt the following. (Any Four) **16**

a) Explain how information systems are transforming contemporary business operations and changing the overall competitive landscape.

b) What is Management Information System? What is the role of Information System in business?

c) Discuss the economic and behavioural theories that explain how information systems change organizational structures and flatten traditional hierarchies.

d) Explain the structure of an organization.

e) What are the Ethical, Social, political issues raised by information systems?

Q.3 Attempt the following. (Any Two) **12**

a) Discuss how advanced data profiling and analytics pose severe challenges to the protection of individual privacy and intellectual property rights today.

b) Explain the challenges to protection of individual's privacy and intellectual property.

c) What are different features of an organization? And explain each feature in detail.

SECTION – II

Q.4 Attempt the following. (Any Four) **16**

a) Define IT infrastructure and describe the major hardware and software components required to build an enterprise-level computing environment.

b) Discuss the primary management issues and governance challenges involved in scaling and handling technological obsolescence in infrastructure investments.

c) What are the issues related to building e-commerce?

d) Explain Management Issues related to Information system.

e) How to improve business performance & decision making?

Q.5 Attempt the following. (Any Two) **12**

a) Detail the role of security monitors and formal security codes of conduct in establishing comprehensive monitoring and regulatory safety inside an organization.

b) Explain the Role of M-commerce in business & its applications.

c) Discuss the function of firewalls and encryption mechanisms as essential network tools for defending digital enterprise assets.

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Management Information System (CSEMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

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MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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b) System Analysis
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d) All of the mentioned above

14) If a university sets up a web-based information system that faculty could access to record student grades and to advise students, that would be an example of a/an _____.
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c) ERP
d) Extranet

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Management Information System (CSEMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
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SECTION – I

Q.2 Attempt the following. (Any Four) **16**

a) Explain how information systems are transforming contemporary business operations and changing the overall competitive landscape.

b) What is Management Information System? What is the role of Information System in business?

c) Discuss the economic and behavioural theories that explain how information systems change organizational structures and flatten traditional hierarchies.

d) Explain the structure of an organization.

e) What are the Ethical, Social, political issues raised by information systems?

Q.3 Attempt the following. (Any Two) **12**

a) Discuss how advanced data profiling and analytics pose severe challenges to the protection of individual privacy and intellectual property rights today.

b) Explain the challenges to protection of individual's privacy and intellectual property.

c) What are different features of an organization? And explain each feature in detail.

SECTION – II

Q.4 Attempt the following. (Any Four) **16**

a) Define IT infrastructure and describe the major hardware and software components required to build an enterprise-level computing environment.

b) Discuss the primary management issues and governance challenges involved in scaling and handling technological obsolescence in infrastructure investments.

c) What are the issues related to building e-commerce?

d) Explain Management Issues related to Information system.

e) How to improve business performance & decision making?

Q.5 Attempt the following. (Any Two) **12**

a) Detail the role of security monitors and formal security codes of conduct in establishing comprehensive monitoring and regulatory safety inside an organization.

b) Explain the Role of M-commerce in business & its applications.

c) Discuss the function of firewalls and encryption mechanisms as essential network tools for defending digital enterprise assets.

Seat No.	

Set **R**

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Management Information System (CSEMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) What is a core capability of a Database Management System (DBMS)?
a) Selling hardware b) Managing data access
c) Translating languages d) Replacing managers

2) How do databases support business decisions?
a) By hiding data
b) By providing analytical insights
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3) Which of the following is a key security management tool?
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Seat No.	

Set **R**

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Management Information System (CSEMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
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SECTION – I

Q.2 Attempt the following. (Any Four) **16**

a) Explain how information systems are transforming contemporary business operations and changing the overall competitive landscape.

b) What is Management Information System? What is the role of Information System in business?

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d) Explain the structure of an organization.

e) What are the Ethical, Social, political issues raised by information systems?

Q.3 Attempt the following. (Any Two) **12**

a) Discuss how advanced data profiling and analytics pose severe challenges to the protection of individual privacy and intellectual property rights today.

b) Explain the challenges to protection of individual's privacy and intellectual property.

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SECTION – II

Q.4 Attempt the following. (Any Four) **16**

a) Define IT infrastructure and describe the major hardware and software components required to build an enterprise-level computing environment.

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a) Detail the role of security monitors and formal security codes of conduct in establishing comprehensive monitoring and regulatory safety inside an organization.

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Seat No.	

Set **S**

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Management Information System (CSEMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. **14**

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c) Decision making d) All of the mentioned above

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Seat No.	

Set | S

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Management Information System (CSEMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
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SECTION – I

Q.2 Attempt the following. (Any Four) **16**

a) Explain how information systems are transforming contemporary business operations and changing the overall competitive landscape.

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SECTION – II

Q.4 Attempt the following. (Any Four) **16**

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a) Detail the role of security monitors and formal security codes of conduct in establishing comprehensive monitoring and regulatory safety inside an organization.

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SLR-QH-652

Seat No.	

Set P

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Management Information System (CSEMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

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MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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Seat No.	

Set **P**

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Seat No.	

Set **Q**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Management Information System (CSEMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
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Duration: 30 Minutes Marks:14

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Seat No.	

Set **Q**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Management Information System (CSEMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt the following. (Any Four) **16**

a) Explain how information systems are transforming contemporary business operations and changing the overall competitive landscape.

b) What is Management Information System? What is the role of Information System in business?

c) Discuss the economic and behavioural theories that explain how information systems change organizational structures and flatten traditional hierarchies.

d) Explain the structure of an organization.

e) What are the Ethical, Social, political issues raised by information systems?

Q.3 Attempt the following. (Any Two) **12**

a) Discuss how advanced data profiling and analytics pose severe challenges to the protection of individual privacy and intellectual property rights today.

b) Explain the challenges to protection of individual's privacy and intellectual property.

c) What are different features of an organization? And explain each feature in detail.

SECTION – II

Q.4 Attempt the following. (Any Four) **16**

a) Define IT infrastructure and describe the major hardware and software components required to build an enterprise-level computing environment.

b) Discuss the primary management issues and governance challenges involved in scaling and handling technological obsolescence in infrastructure investments.

c) What are the issues related to building e-commerce?

d) Explain Management Issues related to Information system.

e) How to improve business performance & decision making?

Q.5 Attempt the following. (Any Two) **12**

a) Detail the role of security monitors and formal security codes of conduct in establishing comprehensive monitoring and regulatory safety inside an organization.

b) Explain the Role of M-commerce in business & its applications.

c) Discuss the function of firewalls and encryption mechanisms as essential network tools for defending digital enterprise assets.

Seat No.	

Set **R**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Management Information System (CSEMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) What is a core capability of a Database Management System (DBMS)?
a) Selling hardware b) Managing data access
c) Translating languages d) Replacing managers

2) How do databases support business decisions?
a) By hiding data
b) By providing analytical insights
c) By deleting old records
d) By restricting user access

3) Which of the following is a key security management tool?
a) Firewalls b) Paper logs
c) Public passwords d) Open cables

4) What is the goal of defending against a Denial of Service (DoS) attack?
a) Increasing traffic b) Maintaining availability
c) Encrypting databases d) Monitoring emails

5) What is the main goal of social business tools?
a) Replace meetings b) Enhance collaboration
c) Automate payroll d) Reduce staff

6) How do information systems transform business processes?
a) By increasing paperwork b) By automating workflows
c) By stopping data growth d) By removing all software

7) What is a major challenge when implementing strategic information systems?
a) Lowering costs b) System integration
c) Faster decisions d) Increasing revenue

8) EBay is an example of _____.
a) click-and-mortar business
b) C2C electronic commerce
c) B2C electronic commerce
d) an online exchange

9) An enterprise is a group of people with _____.
a) common goal
b) separate goal for each department
c) multiple goals
d) two or more goal

10) A Decision Support System (DSS) is an application for information systems that helps in _____.
a) System Design
b) System Analysis
c) Decision making
d) All of the mentioned above

11) If a university sets up a web-based information system that faculty could access to record student grades and to advise students, that would be an example of a/an _____.
a) CRM
b) Intranet
c) ERP
d) Extranet

12) DBMS have a data definition language to do all of the following except _____.
a) Define the characteristics of the fields in each table
b) Add, change, delete, and retrieve data in the database
c) Specify the structure of the content of the database
d) Specify the creation of the database tables

13) Permission given with the knowledge of all the facts needed to make a rational decision is called _____.
a) Informed consent
b) Liability
c) Responsibility
d) Due process

14) The principles and standards that guide our behaviour toward other people are collectively called _____.
a) Intellectual property
b) Copyright
c) Ethics
d) Fair Use Doctrine

Seat No.	

Set R

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Management Information System (CSEMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt the following. (Any Four) **16**

a) Explain how information systems are transforming contemporary business operations and changing the overall competitive landscape.

b) What is Management Information System? What is the role of Information System in business?

c) Discuss the economic and behavioural theories that explain how information systems change organizational structures and flatten traditional hierarchies.

d) Explain the structure of an organization.

e) What are the Ethical, Social, political issues raised by information systems?

Q.3 Attempt the following. (Any Two) **12**

a) Discuss how advanced data profiling and analytics pose severe challenges to the protection of individual privacy and intellectual property rights today.

b) Explain the challenges to protection of individual's privacy and intellectual property.

c) What are different features of an organization? And explain each feature in detail.

SECTION – II

Q.4 Attempt the following. (Any Four) **16**

a) Define IT infrastructure and describe the major hardware and software components required to build an enterprise-level computing environment.

b) Discuss the primary management issues and governance challenges involved in scaling and handling technological obsolescence in infrastructure investments.

c) What are the issues related to building e-commerce?

d) Explain Management Issues related to Information system.

e) How to improve business performance & decision making?

Q.5 Attempt the following. (Any Two) **12**

a) Detail the role of security monitors and formal security codes of conduct in establishing comprehensive monitoring and regulatory safety inside an organization.

b) Explain the Role of M-commerce in business & its applications.

c) Discuss the function of firewalls and encryption mechanisms as essential network tools for defending digital enterprise assets.

Seat No.	

Set | S

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Management Information System (CSEMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) A Decision Support System (DSS) is an application for information systems that helps in _____.
a) System Design b) System Analysis
c) Decision making d) All of the mentioned above

2) If a university sets up a web-based information system that faculty could access to record student grades and to advise students, that would be an example of a/an _____.
a) CRM b) Intranet
c) ERP d) Extranet

3) DBMS have a data definition language to do all of the following except _____.
a) Define the characteristics of the fields in each table
b) Add, change, delete, and retrieve data in the database
c) Specify the structure of the content of the database
d) Specify the creation of the database tables

4) Permission given with the knowledge of all the facts needed to make a rational decision is called _____.
a) Informed consent b) Liability
c) Responsibility d) Due process

5) The principles and standards that guide our behaviour toward other people are collectively called _____.
a) Intellectual property b) Copyright
c) Ethics d) Fair Use Doctrine

6) What is a core capability of a Database Management System (DBMS)?
a) Selling hardware b) Managing data access
c) Translating languages d) Replacing managers

7) How do databases support business decisions?
a) By hiding data
b) By providing analytical insights
c) By deleting old records
d) By restricting user access

8) Which of the following is a key security management tool?
a) Firewalls
b) Paper logs
c) Public passwords
d) Open cables

9) What is the goal of defending against a Denial of Service (DoS) attack?
a) Increasing traffic
b) Maintaining availability
c) Encrypting databases
d) Monitoring emails

10) What is the main goal of social business tools?
a) Replace meetings
b) Enhance collaboration
c) Automate payroll
d) Reduce staff

11) How do information systems transform business processes?
a) By increasing paperwork
b) By automating workflows
c) By stopping data growth
d) By removing all software

12) What is a major challenge when implementing strategic information systems?
a) Lowering costs
b) System integration
c) Faster decisions
d) Increasing revenue

13) EBay is an example of _____.
a) click-and-mortar business
b) C2C electronic commerce
c) B2C electronic commerce
d) an online exchange

14) An enterprise is a group of people with _____.
a) common goal
b) separate goal for each department
c) multiple goals
d) two or more goal

Seat No.	

Set **S**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Management Information System (CSEMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt the following. (Any Four) **16**

a) Explain how information systems are transforming contemporary business operations and changing the overall competitive landscape.

b) What is Management Information System? What is the role of Information System in business?

c) Discuss the economic and behavioural theories that explain how information systems change organizational structures and flatten traditional hierarchies.

d) Explain the structure of an organization.

e) What are the Ethical, Social, political issues raised by information systems?

Q.3 Attempt the following. (Any Two) **12**

a) Discuss how advanced data profiling and analytics pose severe challenges to the protection of individual privacy and intellectual property rights today.

b) Explain the challenges to protection of individual's privacy and intellectual property.

c) What are different features of an organization? And explain each feature in detail.

SECTION – II

Q.4 Attempt the following. (Any Four) **16**

a) Define IT infrastructure and describe the major hardware and software components required to build an enterprise-level computing environment.

b) Discuss the primary management issues and governance challenges involved in scaling and handling technological obsolescence in infrastructure investments.

c) What are the issues related to building e-commerce?

d) Explain Management Issues related to Information system.

e) How to improve business performance & decision making?

Q.5 Attempt the following. (Any Two) **12**

a) Detail the role of security monitors and formal security codes of conduct in establishing comprehensive monitoring and regulatory safety inside an organization.

b) Explain the Role of M-commerce in business & its applications.

c) Discuss the function of firewalls and encryption mechanisms as essential network tools for defending digital enterprise assets.

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Seat No.	

Set P

T.Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Management Information System (CSEMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) What is the main goal of social business tools?
a) Replace meetings b) Enhance collaboration
c) Automate payroll d) Reduce staff

2) How do information systems transform business processes?
a) By increasing paperwork b) By automating workflows
c) By stopping data growth d) By removing all software

3) What is a major challenge when implementing strategic information systems?
a) Lowering costs b) System integration
c) Faster decisions d) Increasing revenue

4) EBay is an example of _____.
a) click-and-mortar business b) C2C electronic commerce
c) B2C electronic commerce d) an online exchange

5) An enterprise is a group of people with _____.
a) common goal
b) separate goal for each department
c) multiple goals
d) two or more goal

6) A Decision Support System (DSS) is an application for information systems that helps in _____.
a) System Design b) System Analysis
c) Decision making d) All of the mentioned above

7) If a university sets up a web-based information system that faculty could access to record student grades and to advise students, that would be an example of a/an _____.

a) CRM
b) Intranet
c) ERP
d) Extranet

8) DBMS have a data definition language to do all of the following except _____.

a) Define the characteristics of the fields in each table
b) Add, change, delete, and retrieve data in the database
c) Specify the structure of the content of the database
d) Specify the creation of the database tables

9) Permission given with the knowledge of all the facts needed to make a rational decision is called _____.

a) Informed consent
b) Liability
c) Responsibility
d) Due process

10) The principles and standards that guide our behaviour toward other people are collectively called _____.

a) Intellectual property
b) Copyright
c) Ethics
d) Fair Use Doctrine

11) What is a core capability of a Database Management System (DBMS)?

a) Selling hardware
b) Managing data access
c) Translating languages
d) Replacing managers

12) How do databases support business decisions?

a) By hiding data
b) By providing analytical insights
c) By deleting old records
d) By restricting user access

13) Which of the following is a key security management tool?

a) Firewalls
b) Paper logs
c) Public passwords
d) Open cables

14) What is the goal of defending against a Denial of Service (DoS) attack?

a) Increasing traffic
b) Maintaining availability
c) Encrypting databases
d) Monitoring emails

Seat No.	

Set **P**

T.Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Management Information System (CSEMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt the following. (Any Four) **16**

a) Explain how information systems are transforming contemporary business operations and changing the overall competitive landscape.

b) What is Management Information System? What is the role of Information System in business?

c) Discuss the economic and behavioural theories that explain how information systems change organizational structures and flatten traditional hierarchies.

d) Explain the structure of an organization.

e) What are the Ethical, Social, political issues raised by information systems?

Q.3 Attempt the following. (Any Two) **12**

a) Discuss how advanced data profiling and analytics pose severe challenges to the protection of individual privacy and intellectual property rights today.

b) Explain the challenges to protection of individual's privacy and intellectual property.

c) What are different features of an organization? And explain each feature in detail.

SECTION – II

Q.4 Attempt the following. (Any Four) **16**

a) Define IT infrastructure and describe the major hardware and software components required to build an enterprise-level computing environment.

b) Discuss the primary management issues and governance challenges involved in scaling and handling technological obsolescence in infrastructure investments.

c) What are the issues related to building e-commerce?

d) Explain Management Issues related to Information system.

e) How to improve business performance & decision making?

Q.5 Attempt the following. (Any Two) **12**

a) Detail the role of security monitors and formal security codes of conduct in establishing comprehensive monitoring and regulatory safety inside an organization.

b) Explain the Role of M-commerce in business & its applications.

c) Discuss the function of firewalls and encryption mechanisms as essential network tools for defending digital enterprise assets.

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Management Information System (CSEMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) DBMS have a data definition language to do all of the following except _____.
a) Define the characteristics of the fields in each table
b) Add, change, delete, and retrieve data in the database
c) Specify the structure of the content of the database
d) Specify the creation of the database tables

2) Permission given with the knowledge of all the facts needed to make a rational decision is called _____.
a) Informed consent b) Liability
c) Responsibility d) Due process

3) The principles and standards that guide our behaviour toward other people are collectively called _____.
a) Intellectual property b) Copyright
c) Ethics d) Fair Use Doctrine

4) What is a core capability of a Database Management System (DBMS)?
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c) Translating languages d) Replacing managers

5) How do databases support business decisions?
a) By hiding data
b) By providing analytical insights
c) By deleting old records
d) By restricting user access

6) Which of the following is a key security management tool?
a) Firewalls b) Paper logs
c) Public passwords d) Open cables

7) What is the goal of defending against a Denial of Service (DoS) attack?
a) Increasing traffic
b) Maintaining availability
c) Encrypting databases
d) Monitoring emails

8) What is the main goal of social business tools?
a) Replace meetings
b) Enhance collaboration
c) Automate payroll
d) Reduce staff

9) How do information systems transform business processes?
a) By increasing paperwork
b) By automating workflows
c) By stopping data growth
d) By removing all software

10) What is a major challenge when implementing strategic information systems?
a) Lowering costs
b) System integration
c) Faster decisions
d) Increasing revenue

11) EBay is an example of _____.
a) click-and-mortar business
b) C2C electronic commerce
c) B2C electronic commerce
d) an online exchange

12) An enterprise is a group of people with _____.
a) common goal
b) separate goal for each department
c) multiple goals
d) two or more goal

13) A Decision Support System (DSS) is an application for information systems that helps in _____.
a) System Design
b) System Analysis
c) Decision making
d) All of the mentioned above

14) If a university sets up a web-based information system that faculty could access to record student grades and to advise students, that would be an example of a/an _____.
a) CRM
b) Intranet
c) ERP
d) Extranet

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Management Information System (CSEMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt the following. (Any Four) **16**

a) Explain how information systems are transforming contemporary business operations and changing the overall competitive landscape.

b) What is Management Information System? What is the role of Information System in business?

c) Discuss the economic and behavioural theories that explain how information systems change organizational structures and flatten traditional hierarchies.

d) Explain the structure of an organization.

e) What are the Ethical, Social, political issues raised by information systems?

Q.3 Attempt the following. (Any Two) **12**

a) Discuss how advanced data profiling and analytics pose severe challenges to the protection of individual privacy and intellectual property rights today.

b) Explain the challenges to protection of individual's privacy and intellectual property.

c) What are different features of an organization? And explain each feature in detail.

SECTION – II

Q.4 Attempt the following. (Any Four) **16**

a) Define IT infrastructure and describe the major hardware and software components required to build an enterprise-level computing environment.

b) Discuss the primary management issues and governance challenges involved in scaling and handling technological obsolescence in infrastructure investments.

c) What are the issues related to building e-commerce?

d) Explain Management Issues related to Information system.

e) How to improve business performance & decision making?

Q.5 Attempt the following. (Any Two) **12**

a) Detail the role of security monitors and formal security codes of conduct in establishing comprehensive monitoring and regulatory safety inside an organization.

b) Explain the Role of M-commerce in business & its applications.

c) Discuss the function of firewalls and encryption mechanisms as essential network tools for defending digital enterprise assets.

Seat No.	

Set **R**

T.Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Management Information System (CSEMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) What is a core capability of a Database Management System (DBMS)?
a) Selling hardware b) Managing data access
c) Translating languages d) Replacing managers

2) How do databases support business decisions?
a) By hiding data
b) By providing analytical insights
c) By deleting old records
d) By restricting user access

3) Which of the following is a key security management tool?
a) Firewalls b) Paper logs
c) Public passwords d) Open cables

4) What is the goal of defending against a Denial of Service (DoS) attack?
a) Increasing traffic b) Maintaining availability
c) Encrypting databases d) Monitoring emails

5) What is the main goal of social business tools?
a) Replace meetings b) Enhance collaboration
c) Automate payroll d) Reduce staff

6) How do information systems transform business processes?
a) By increasing paperwork b) By automating workflows
c) By stopping data growth d) By removing all software

7) What is a major challenge when implementing strategic information systems?
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c) Faster decisions d) Increasing revenue

8) EBay is an example of _____.
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11) If a university sets up a web-based information system that faculty could access to record student grades and to advise students, that would be an example of a/an _____.
a) CRM
b) Intranet
c) ERP
d) Extranet

12) DBMS have a data definition language to do all of the following except _____.
a) Define the characteristics of the fields in each table
b) Add, change, delete, and retrieve data in the database
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d) Specify the creation of the database tables

13) Permission given with the knowledge of all the facts needed to make a rational decision is called _____.
a) Informed consent
b) Liability
c) Responsibility
d) Due process

14) The principles and standards that guide our behaviour toward other people are collectively called _____.
a) Intellectual property
b) Copyright
c) Ethics
d) Fair Use Doctrine

Seat No.	

Set **R**

T.Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Management Information System (CSEMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt the following. (Any Four) **16**

a) Explain how information systems are transforming contemporary business operations and changing the overall competitive landscape.

b) What is Management Information System? What is the role of Information System in business?

c) Discuss the economic and behavioural theories that explain how information systems change organizational structures and flatten traditional hierarchies.

d) Explain the structure of an organization.

e) What are the Ethical, Social, political issues raised by information systems?

Q.3 Attempt the following. (Any Two) **12**

a) Discuss how advanced data profiling and analytics pose severe challenges to the protection of individual privacy and intellectual property rights today.

b) Explain the challenges to protection of individual's privacy and intellectual property.

c) What are different features of an organization? And explain each feature in detail.

SECTION – II

Q.4 Attempt the following. (Any Four) **16**

a) Define IT infrastructure and describe the major hardware and software components required to build an enterprise-level computing environment.

b) Discuss the primary management issues and governance challenges involved in scaling and handling technological obsolescence in infrastructure investments.

c) What are the issues related to building e-commerce?

d) Explain Management Issues related to Information system.

e) How to improve business performance & decision making?

Q.5 Attempt the following. (Any Two) **12**

a) Detail the role of security monitors and formal security codes of conduct in establishing comprehensive monitoring and regulatory safety inside an organization.

b) Explain the Role of M-commerce in business & its applications.

c) Discuss the function of firewalls and encryption mechanisms as essential network tools for defending digital enterprise assets.

Seat No.	

Set **S**

T.Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Management Information System (CSEMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. **14**

1) A Decision Support System (DSS) is an application for information systems that helps in _____.
a) System Design b) System Analysis
c) Decision making d) All of the mentioned above

2) If a university sets up a web-based information system that faculty could access to record student grades and to advise students, that would be an example of a/an _____.
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c) ERP d) Extranet

3) DBMS have a data definition language to do all of the following except _____.
a) Define the characteristics of the fields in each table
b) Add, change, delete, and retrieve data in the database
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d) Specify the creation of the database tables

4) Permission given with the knowledge of all the facts needed to make a rational decision is called _____.
a) Informed consent b) Liability
c) Responsibility d) Due process

5) The principles and standards that guide our behaviour toward other people are collectively called _____.
a) Intellectual property b) Copyright
c) Ethics d) Fair Use Doctrine

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a) Selling hardware b) Managing data access
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a) By hiding data
b) By providing analytical insights
c) By deleting old records
d) By restricting user access

8) Which of the following is a key security management tool?
a) Firewalls
b) Paper logs
c) Public passwords
d) Open cables

9) What is the goal of defending against a Denial of Service (DoS) attack?
a) Increasing traffic
b) Maintaining availability
c) Encrypting databases
d) Monitoring emails

10) What is the main goal of social business tools?
a) Replace meetings
b) Enhance collaboration
c) Automate payroll
d) Reduce staff

11) How do information systems transform business processes?
a) By increasing paperwork
b) By automating workflows
c) By stopping data growth
d) By removing all software

12) What is a major challenge when implementing strategic information systems?
a) Lowering costs
b) System integration
c) Faster decisions
d) Increasing revenue

13) EBay is an example of _____.
a) click-and-mortar business
b) C2C electronic commerce
c) B2C electronic commerce
d) an online exchange

14) An enterprise is a group of people with _____.
a) common goal
b) separate goal for each department
c) multiple goals
d) two or more goal

Seat No.	

Set **S**

T.Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Management Information System (CSEMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt the following. (Any Four) **16**

a) Explain how information systems are transforming contemporary business operations and changing the overall competitive landscape.

b) What is Management Information System? What is the role of Information System in business?

c) Discuss the economic and behavioural theories that explain how information systems change organizational structures and flatten traditional hierarchies.

d) Explain the structure of an organization.

e) What are the Ethical, Social, political issues raised by information systems?

Q.3 Attempt the following. (Any Two) **12**

a) Discuss how advanced data profiling and analytics pose severe challenges to the protection of individual privacy and intellectual property rights today.

b) Explain the challenges to protection of individual's privacy and intellectual property.

c) What are different features of an organization? And explain each feature in detail.

SECTION – II

Q.4 Attempt the following. (Any Four) **16**

a) Define IT infrastructure and describe the major hardware and software components required to build an enterprise-level computing environment.

b) Discuss the primary management issues and governance challenges involved in scaling and handling technological obsolescence in infrastructure investments.

c) What are the issues related to building e-commerce?

d) Explain Management Issues related to Information system.

e) How to improve business performance & decision making?

Q.5 Attempt the following. (Any Two) **12**

a) Detail the role of security monitors and formal security codes of conduct in establishing comprehensive monitoring and regulatory safety inside an organization.

b) Explain the Role of M-commerce in business & its applications.

c) Discuss the function of firewalls and encryption mechanisms as essential network tools for defending digital enterprise assets.

Seat No.	

Set **P**

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Management Information System (CSEMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. **14**

1) What is the main goal of social business tools?
a) Replace meetings b) Enhance collaboration
c) Automate payroll d) Reduce staff

2) How do information systems transform business processes?
a) By increasing paperwork b) By automating workflows
c) By stopping data growth d) By removing all software

3) What is a major challenge when implementing strategic information systems?
a) Lowering costs b) System integration
c) Faster decisions d) Increasing revenue

4) EBay is an example of _____.
a) click-and-mortar business b) C2C electronic commerce
c) B2C electronic commerce d) an online exchange

5) An enterprise is a group of people with _____.
a) common goal
b) separate goal for each department
c) multiple goals
d) two or more goal

6) A Decision Support System (DSS) is an application for information systems that helps in _____.
a) System Design b) System Analysis
c) Decision making d) All of the mentioned above

7) If a university sets up a web-based information system that faculty could access to record student grades and to advise students, that would be an example of a/an _____.

a) CRM
b) Intranet
c) ERP
d) Extranet

8) DBMS have a data definition language to do all of the following except _____.

a) Define the characteristics of the fields in each table
b) Add, change, delete, and retrieve data in the database
c) Specify the structure of the content of the database
d) Specify the creation of the database tables

9) Permission given with the knowledge of all the facts needed to make a rational decision is called _____.

a) Informed consent
b) Liability
c) Responsibility
d) Due process

10) The principles and standards that guide our behaviour toward other people are collectively called _____.

a) Intellectual property
b) Copyright
c) Ethics
d) Fair Use Doctrine

11) What is a core capability of a Database Management System (DBMS)?

a) Selling hardware
b) Managing data access
c) Translating languages
d) Replacing managers

12) How do databases support business decisions?

a) By hiding data
b) By providing analytical insights
c) By deleting old records
d) By restricting user access

13) Which of the following is a key security management tool?

a) Firewalls
b) Paper logs
c) Public passwords
d) Open cables

14) What is the goal of defending against a Denial of Service (DoS) attack?

a) Increasing traffic
b) Maintaining availability
c) Encrypting databases
d) Monitoring emails

Seat No.	

Set **P**

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Management Information System (CSEMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt the following. (Any Four) **16**

a) Explain how information systems are transforming contemporary business operations and changing the overall competitive landscape.

b) What is Management Information System? What is the role of Information System in business?

c) Discuss the economic and behavioural theories that explain how information systems change organizational structures and flatten traditional hierarchies.

d) Explain the structure of an organization.

e) What are the Ethical, Social, political issues raised by information systems?

Q.3 Attempt the following. (Any Two) **12**

a) Discuss how advanced data profiling and analytics pose severe challenges to the protection of individual privacy and intellectual property rights today.

b) Explain the challenges to protection of individual's privacy and intellectual property.

c) What are different features of an organization? And explain each feature in detail.

SECTION – II

Q.4 Attempt the following. (Any Four) **16**

a) Define IT infrastructure and describe the major hardware and software components required to build an enterprise-level computing environment.

b) Discuss the primary management issues and governance challenges involved in scaling and handling technological obsolescence in infrastructure investments.

c) What are the issues related to building e-commerce?

d) Explain Management Issues related to Information system.

e) How to improve business performance & decision making?

Q.5 Attempt the following. (Any Two) **12**

a) Detail the role of security monitors and formal security codes of conduct in establishing comprehensive monitoring and regulatory safety inside an organization.

b) Explain the Role of M-commerce in business & its applications.

c) Discuss the function of firewalls and encryption mechanisms as essential network tools for defending digital enterprise assets.

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Management Information System (CSEMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. **14**

1) DBMS have a data definition language to do all of the following except _____.
a) Define the characteristics of the fields in each table
b) Add, change, delete, and retrieve data in the database
c) Specify the structure of the content of the database
d) Specify the creation of the database tables

2) Permission given with the knowledge of all the facts needed to make a rational decision is called _____.
a) Informed consent b) Liability
c) Responsibility d) Due process

3) The principles and standards that guide our behaviour toward other people are collectively called _____.
a) Intellectual property b) Copyright
c) Ethics d) Fair Use Doctrine

4) What is a core capability of a Database Management System (DBMS)?
a) Selling hardware b) Managing data access
c) Translating languages d) Replacing managers

5) How do databases support business decisions?
a) By hiding data
b) By providing analytical insights
c) By deleting old records
d) By restricting user access

6) Which of the following is a key security management tool?
a) Firewalls b) Paper logs
c) Public passwords d) Open cables

7) What is the goal of defending against a Denial of Service (DoS) attack?
a) Increasing traffic
b) Maintaining availability
c) Encrypting databases
d) Monitoring emails

8) What is the main goal of social business tools?
a) Replace meetings
b) Enhance collaboration
c) Automate payroll
d) Reduce staff

9) How do information systems transform business processes?
a) By increasing paperwork
b) By automating workflows
c) By stopping data growth
d) By removing all software

10) What is a major challenge when implementing strategic information systems?
a) Lowering costs
b) System integration
c) Faster decisions
d) Increasing revenue

11) EBay is an example of _____.
a) click-and-mortar business
b) C2C electronic commerce
c) B2C electronic commerce
d) an online exchange

12) An enterprise is a group of people with _____.
a) common goal
b) separate goal for each department
c) multiple goals
d) two or more goal

13) A Decision Support System (DSS) is an application for information systems that helps in _____.
a) System Design
b) System Analysis
c) Decision making
d) All of the mentioned above

14) If a university sets up a web-based information system that faculty could access to record student grades and to advise students, that would be an example of a/an _____.
a) CRM
b) Intranet
c) ERP
d) Extranet

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Management Information System (CSEMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt the following. (Any Four) **16**

a) Explain how information systems are transforming contemporary business operations and changing the overall competitive landscape.

b) What is Management Information System? What is the role of Information System in business?

c) Discuss the economic and behavioural theories that explain how information systems change organizational structures and flatten traditional hierarchies.

d) Explain the structure of an organization.

e) What are the Ethical, Social, political issues raised by information systems?

Q.3 Attempt the following. (Any Two) **12**

a) Discuss how advanced data profiling and analytics pose severe challenges to the protection of individual privacy and intellectual property rights today.

b) Explain the challenges to protection of individual's privacy and intellectual property.

c) What are different features of an organization? And explain each feature in detail.

SECTION – II

Q.4 Attempt the following. (Any Four) **16**

a) Define IT infrastructure and describe the major hardware and software components required to build an enterprise-level computing environment.

b) Discuss the primary management issues and governance challenges involved in scaling and handling technological obsolescence in infrastructure investments.

c) What are the issues related to building e-commerce?

d) Explain Management Issues related to Information system.

e) How to improve business performance & decision making?

Q.5 Attempt the following. (Any Two) **12**

a) Detail the role of security monitors and formal security codes of conduct in establishing comprehensive monitoring and regulatory safety inside an organization.

b) Explain the Role of M-commerce in business & its applications.

c) Discuss the function of firewalls and encryption mechanisms as essential network tools for defending digital enterprise assets.

Seat No.	

Set **R**

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Management Information System (CSEMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) What is a core capability of a Database Management System (DBMS)?
a) Selling hardware b) Managing data access
c) Translating languages d) Replacing managers

2) How do databases support business decisions?
a) By hiding data
b) By providing analytical insights
c) By deleting old records
d) By restricting user access

3) Which of the following is a key security management tool?
a) Firewalls b) Paper logs
c) Public passwords d) Open cables

4) What is the goal of defending against a Denial of Service (DoS) attack?
a) Increasing traffic b) Maintaining availability
c) Encrypting databases d) Monitoring emails

5) What is the main goal of social business tools?
a) Replace meetings b) Enhance collaboration
c) Automate payroll d) Reduce staff

6) How do information systems transform business processes?
a) By increasing paperwork b) By automating workflows
c) By stopping data growth d) By removing all software

7) What is a major challenge when implementing strategic information systems?
a) Lowering costs b) System integration
c) Faster decisions d) Increasing revenue

8) EBay is an example of _____.
a) click-and-mortar business
b) C2C electronic commerce
c) B2C electronic commerce
d) an online exchange

9) An enterprise is a group of people with _____.
a) common goal
b) separate goal for each department
c) multiple goals
d) two or more goal

10) A Decision Support System (DSS) is an application for information systems that helps in _____.
a) System Design
b) System Analysis
c) Decision making
d) All of the mentioned above

11) If a university sets up a web-based information system that faculty could access to record student grades and to advise students, that would be an example of a/an _____.
a) CRM
b) Intranet
c) ERP
d) Extranet

12) DBMS have a data definition language to do all of the following except _____.
a) Define the characteristics of the fields in each table
b) Add, change, delete, and retrieve data in the database
c) Specify the structure of the content of the database
d) Specify the creation of the database tables

13) Permission given with the knowledge of all the facts needed to make a rational decision is called _____.
a) Informed consent
b) Liability
c) Responsibility
d) Due process

14) The principles and standards that guide our behaviour toward other people are collectively called _____.
a) Intellectual property
b) Copyright
c) Ethics
d) Fair Use Doctrine

Seat No.	

Set **R**

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Management Information System (CSEMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt the following. (Any Four) **16**

a) Explain how information systems are transforming contemporary business operations and changing the overall competitive landscape.

b) What is Management Information System? What is the role of Information System in business?

c) Discuss the economic and behavioural theories that explain how information systems change organizational structures and flatten traditional hierarchies.

d) Explain the structure of an organization.

e) What are the Ethical, Social, political issues raised by information systems?

Q.3 Attempt the following. (Any Two) **12**

a) Discuss how advanced data profiling and analytics pose severe challenges to the protection of individual privacy and intellectual property rights today.

b) Explain the challenges to protection of individual's privacy and intellectual property.

c) What are different features of an organization? And explain each feature in detail.

SECTION – II

Q.4 Attempt the following. (Any Four) **16**

a) Define IT infrastructure and describe the major hardware and software components required to build an enterprise-level computing environment.

b) Discuss the primary management issues and governance challenges involved in scaling and handling technological obsolescence in infrastructure investments.

c) What are the issues related to building e-commerce?

d) Explain Management Issues related to Information system.

e) How to improve business performance & decision making?

Q.5 Attempt the following. (Any Two) **12**

a) Detail the role of security monitors and formal security codes of conduct in establishing comprehensive monitoring and regulatory safety inside an organization.

b) Explain the Role of M-commerce in business & its applications.

c) Discuss the function of firewalls and encryption mechanisms as essential network tools for defending digital enterprise assets.

Seat No.	

Set **S**

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Management Information System (CSEMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. **14**

1) A Decision Support System (DSS) is an application for information systems that helps in _____.
a) System Design b) System Analysis
c) Decision making d) All of the mentioned above

2) If a university sets up a web-based information system that faculty could access to record student grades and to advise students, that would be an example of a/an _____.
a) CRM b) Intranet
c) ERP d) Extranet

3) DBMS have a data definition language to do all of the following except _____.
a) Define the characteristics of the fields in each table
b) Add, change, delete, and retrieve data in the database
c) Specify the structure of the content of the database
d) Specify the creation of the database tables

4) Permission given with the knowledge of all the facts needed to make a rational decision is called _____.
a) Informed consent b) Liability
c) Responsibility d) Due process

5) The principles and standards that guide our behaviour toward other people are collectively called _____.
a) Intellectual property b) Copyright
c) Ethics d) Fair Use Doctrine

6) What is a core capability of a Database Management System (DBMS)?
a) Selling hardware b) Managing data access
c) Translating languages d) Replacing managers

7) How do databases support business decisions?
a) By hiding data
b) By providing analytical insights
c) By deleting old records
d) By restricting user access

8) Which of the following is a key security management tool?
a) Firewalls
b) Paper logs
c) Public passwords
d) Open cables

9) What is the goal of defending against a Denial of Service (DoS) attack?
a) Increasing traffic
b) Maintaining availability
c) Encrypting databases
d) Monitoring emails

10) What is the main goal of social business tools?
a) Replace meetings
b) Enhance collaboration
c) Automate payroll
d) Reduce staff

11) How do information systems transform business processes?
a) By increasing paperwork
b) By automating workflows
c) By stopping data growth
d) By removing all software

12) What is a major challenge when implementing strategic information systems?
a) Lowering costs
b) System integration
c) Faster decisions
d) Increasing revenue

13) EBay is an example of _____.
a) click-and-mortar business
b) C2C electronic commerce
c) B2C electronic commerce
d) an online exchange

14) An enterprise is a group of people with _____.
a) common goal
b) separate goal for each department
c) multiple goals
d) two or more goal

Seat No.	

Set **S**

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Management Information System (CSEMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt the following. (Any Four) **16**

a) Explain how information systems are transforming contemporary business operations and changing the overall competitive landscape.

b) What is Management Information System? What is the role of Information System in business?

c) Discuss the economic and behavioural theories that explain how information systems change organizational structures and flatten traditional hierarchies.

d) Explain the structure of an organization.

e) What are the Ethical, Social, political issues raised by information systems?

Q.3 Attempt the following. (Any Two) **12**

a) Discuss how advanced data profiling and analytics pose severe challenges to the protection of individual privacy and intellectual property rights today.

b) Explain the challenges to protection of individual's privacy and intellectual property.

c) What are different features of an organization? And explain each feature in detail.

SECTION – II

Q.4 Attempt the following. (Any Four) **16**

a) Define IT infrastructure and describe the major hardware and software components required to build an enterprise-level computing environment.

b) Discuss the primary management issues and governance challenges involved in scaling and handling technological obsolescence in infrastructure investments.

c) What are the issues related to building e-commerce?

d) Explain Management Issues related to Information system.

e) How to improve business performance & decision making?

Q.5 Attempt the following. (Any Two) **12**

a) Detail the role of security monitors and formal security codes of conduct in establishing comprehensive monitoring and regulatory safety inside an organization.

b) Explain the Role of M-commerce in business & its applications.

c) Discuss the function of firewalls and encryption mechanisms as essential network tools for defending digital enterprise assets.

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Seat No.	

Set P

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Management Information System (CSEMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) What is the main goal of social business tools?
a) Replace meetings b) Enhance collaboration
c) Automate payroll d) Reduce staff

2) How do information systems transform business processes?
a) By increasing paperwork b) By automating workflows
c) By stopping data growth d) By removing all software

3) What is a major challenge when implementing strategic information systems?
a) Lowering costs b) System integration
c) Faster decisions d) Increasing revenue

4) EBay is an example of _____.
a) click-and-mortar business b) C2C electronic commerce
c) B2C electronic commerce d) an online exchange

5) An enterprise is a group of people with _____.
a) common goal
b) separate goal for each department
c) multiple goals
d) two or more goal

6) A Decision Support System (DSS) is an application for information systems that helps in _____.
a) System Design b) System Analysis
c) Decision making d) All of the mentioned above

7) If a university sets up a web-based information system that faculty could access to record student grades and to advise students, that would be an example of a/an _____.

a) CRM
b) Intranet
c) ERP
d) Extranet

8) DBMS have a data definition language to do all of the following except _____.

a) Define the characteristics of the fields in each table
b) Add, change, delete, and retrieve data in the database
c) Specify the structure of the content of the database
d) Specify the creation of the database tables

9) Permission given with the knowledge of all the facts needed to make a rational decision is called _____.

a) Informed consent
b) Liability
c) Responsibility
d) Due process

10) The principles and standards that guide our behaviour toward other people are collectively called _____.

a) Intellectual property
b) Copyright
c) Ethics
d) Fair Use Doctrine

11) What is a core capability of a Database Management System (DBMS)?

a) Selling hardware
b) Managing data access
c) Translating languages
d) Replacing managers

12) How do databases support business decisions?

a) By hiding data
b) By providing analytical insights
c) By deleting old records
d) By restricting user access

13) Which of the following is a key security management tool?

a) Firewalls
b) Paper logs
c) Public passwords
d) Open cables

14) What is the goal of defending against a Denial of Service (DoS) attack?

a) Increasing traffic
b) Maintaining availability
c) Encrypting databases
d) Monitoring emails

Seat No.	

Set **P**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Management Information System (CSEMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt the following. (Any Four) **16**

a) Explain how information systems are transforming contemporary business operations and changing the overall competitive landscape.

b) What is Management Information System? What is the role of Information System in business?

c) Discuss the economic and behavioural theories that explain how information systems change organizational structures and flatten traditional hierarchies.

d) Explain the structure of an organization.

e) What are the Ethical, Social, political issues raised by information systems?

Q.3 Attempt the following. (Any Two) **12**

a) Discuss how advanced data profiling and analytics pose severe challenges to the protection of individual privacy and intellectual property rights today.

b) Explain the challenges to protection of individual's privacy and intellectual property.

c) What are different features of an organization? And explain each feature in detail.

SECTION – II

Q.4 Attempt the following. (Any Four) **16**

a) Define IT infrastructure and describe the major hardware and software components required to build an enterprise-level computing environment.

b) Discuss the primary management issues and governance challenges involved in scaling and handling technological obsolescence in infrastructure investments.

c) What are the issues related to building e-commerce?

d) Explain Management Issues related to Information system.

e) How to improve business performance & decision making?

Q.5 Attempt the following. (Any Two) **12**

a) Detail the role of security monitors and formal security codes of conduct in establishing comprehensive monitoring and regulatory safety inside an organization.

b) Explain the Role of M-commerce in business & its applications.

c) Discuss the function of firewalls and encryption mechanisms as essential network tools for defending digital enterprise assets.

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Management Information System (CSEMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) DBMS have a data definition language to do all of the following except _____.
a) Define the characteristics of the fields in each table
b) Add, change, delete, and retrieve data in the database
c) Specify the structure of the content of the database
d) Specify the creation of the database tables

2) Permission given with the knowledge of all the facts needed to make a rational decision is called _____.
a) Informed consent b) Liability
c) Responsibility d) Due process

3) The principles and standards that guide our behaviour toward other people are collectively called _____.
a) Intellectual property b) Copyright
c) Ethics d) Fair Use Doctrine

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a) Selling hardware b) Managing data access
c) Translating languages d) Replacing managers

5) How do databases support business decisions?
a) By hiding data
b) By providing analytical insights
c) By deleting old records
d) By restricting user access

6) Which of the following is a key security management tool?
a) Firewalls b) Paper logs
c) Public passwords d) Open cables

7) What is the goal of defending against a Denial of Service (DoS) attack?
a) Increasing traffic
b) Maintaining availability
c) Encrypting databases
d) Monitoring emails

8) What is the main goal of social business tools?
a) Replace meetings
b) Enhance collaboration
c) Automate payroll
d) Reduce staff

9) How do information systems transform business processes?
a) By increasing paperwork
b) By automating workflows
c) By stopping data growth
d) By removing all software

10) What is a major challenge when implementing strategic information systems?
a) Lowering costs
b) System integration
c) Faster decisions
d) Increasing revenue

11) EBay is an example of _____.
a) click-and-mortar business
b) C2C electronic commerce
c) B2C electronic commerce
d) an online exchange

12) An enterprise is a group of people with _____.
a) common goal
b) separate goal for each department
c) multiple goals
d) two or more goal

13) A Decision Support System (DSS) is an application for information systems that helps in _____.
a) System Design
b) System Analysis
c) Decision making
d) All of the mentioned above

14) If a university sets up a web-based information system that faculty could access to record student grades and to advise students, that would be an example of a/an _____.
a) CRM
b) Intranet
c) ERP
d) Extranet

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Management Information System (CSEMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt the following. (Any Four) **16**

a) Explain how information systems are transforming contemporary business operations and changing the overall competitive landscape.

b) What is Management Information System? What is the role of Information System in business?

c) Discuss the economic and behavioural theories that explain how information systems change organizational structures and flatten traditional hierarchies.

d) Explain the structure of an organization.

e) What are the Ethical, Social, political issues raised by information systems?

Q.3 Attempt the following. (Any Two) **12**

a) Discuss how advanced data profiling and analytics pose severe challenges to the protection of individual privacy and intellectual property rights today.

b) Explain the challenges to protection of individual's privacy and intellectual property.

c) What are different features of an organization? And explain each feature in detail.

SECTION – II

Q.4 Attempt the following. (Any Four) **16**

a) Define IT infrastructure and describe the major hardware and software components required to build an enterprise-level computing environment.

b) Discuss the primary management issues and governance challenges involved in scaling and handling technological obsolescence in infrastructure investments.

c) What are the issues related to building e-commerce?

d) Explain Management Issues related to Information system.

e) How to improve business performance & decision making?

Q.5 Attempt the following. (Any Two) **12**

a) Detail the role of security monitors and formal security codes of conduct in establishing comprehensive monitoring and regulatory safety inside an organization.

b) Explain the Role of M-commerce in business & its applications.

c) Discuss the function of firewalls and encryption mechanisms as essential network tools for defending digital enterprise assets.

Seat No.	

Set **R**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Management Information System (CSEMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) What is a core capability of a Database Management System (DBMS)?
a) Selling hardware b) Managing data access
c) Translating languages d) Replacing managers

2) How do databases support business decisions?
a) By hiding data
b) By providing analytical insights
c) By deleting old records
d) By restricting user access

3) Which of the following is a key security management tool?
a) Firewalls b) Paper logs
c) Public passwords d) Open cables

4) What is the goal of defending against a Denial of Service (DoS) attack?
a) Increasing traffic b) Maintaining availability
c) Encrypting databases d) Monitoring emails

5) What is the main goal of social business tools?
a) Replace meetings b) Enhance collaboration
c) Automate payroll d) Reduce staff

6) How do information systems transform business processes?
a) By increasing paperwork b) By automating workflows
c) By stopping data growth d) By removing all software

7) What is a major challenge when implementing strategic information systems?
a) Lowering costs b) System integration
c) Faster decisions d) Increasing revenue

8) EBay is an example of _____.
a) click-and-mortar business
b) C2C electronic commerce
c) B2C electronic commerce
d) an online exchange

9) An enterprise is a group of people with _____.
a) common goal
b) separate goal for each department
c) multiple goals
d) two or more goal

10) A Decision Support System (DSS) is an application for information systems that helps in _____.
a) System Design
b) System Analysis
c) Decision making
d) All of the mentioned above

11) If a university sets up a web-based information system that faculty could access to record student grades and to advise students, that would be an example of a/an _____.
a) CRM
b) Intranet
c) ERP
d) Extranet

12) DBMS have a data definition language to do all of the following except _____.
a) Define the characteristics of the fields in each table
b) Add, change, delete, and retrieve data in the database
c) Specify the structure of the content of the database
d) Specify the creation of the database tables

13) Permission given with the knowledge of all the facts needed to make a rational decision is called _____.
a) Informed consent
b) Liability
c) Responsibility
d) Due process

14) The principles and standards that guide our behaviour toward other people are collectively called _____.
a) Intellectual property
b) Copyright
c) Ethics
d) Fair Use Doctrine

Seat No.	

Set **R**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Management Information System (CSEMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt the following. (Any Four) **16**

a) Explain how information systems are transforming contemporary business operations and changing the overall competitive landscape.

b) What is Management Information System? What is the role of Information System in business?

c) Discuss the economic and behavioural theories that explain how information systems change organizational structures and flatten traditional hierarchies.

d) Explain the structure of an organization.

e) What are the Ethical, Social, political issues raised by information systems?

Q.3 Attempt the following. (Any Two) **12**

a) Discuss how advanced data profiling and analytics pose severe challenges to the protection of individual privacy and intellectual property rights today.

b) Explain the challenges to protection of individual's privacy and intellectual property.

c) What are different features of an organization? And explain each feature in detail.

SECTION – II

Q.4 Attempt the following. (Any Four) **16**

a) Define IT infrastructure and describe the major hardware and software components required to build an enterprise-level computing environment.

b) Discuss the primary management issues and governance challenges involved in scaling and handling technological obsolescence in infrastructure investments.

c) What are the issues related to building e-commerce?

d) Explain Management Issues related to Information system.

e) How to improve business performance & decision making?

Q.5 Attempt the following. (Any Two) **12**

a) Detail the role of security monitors and formal security codes of conduct in establishing comprehensive monitoring and regulatory safety inside an organization.

b) Explain the Role of M-commerce in business & its applications.

c) Discuss the function of firewalls and encryption mechanisms as essential network tools for defending digital enterprise assets.

Seat No.	

Set | S

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Management Information System (CSEMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) A Decision Support System (DSS) is an application for information systems that helps in _____.
a) System Design b) System Analysis
c) Decision making d) All of the mentioned above

2) If a university sets up a web-based information system that faculty could access to record student grades and to advise students, that would be an example of a/an _____.
a) CRM b) Intranet
c) ERP d) Extranet

3) DBMS have a data definition language to do all of the following except _____.
a) Define the characteristics of the fields in each table
b) Add, change, delete, and retrieve data in the database
c) Specify the structure of the content of the database
d) Specify the creation of the database tables

4) Permission given with the knowledge of all the facts needed to make a rational decision is called _____.
a) Informed consent b) Liability
c) Responsibility d) Due process

5) The principles and standards that guide our behaviour toward other people are collectively called _____.
a) Intellectual property b) Copyright
c) Ethics d) Fair Use Doctrine

6) What is a core capability of a Database Management System (DBMS)?
a) Selling hardware b) Managing data access
c) Translating languages d) Replacing managers

7) How do databases support business decisions?
a) By hiding data
b) By providing analytical insights
c) By deleting old records
d) By restricting user access

8) Which of the following is a key security management tool?
a) Firewalls
b) Paper logs
c) Public passwords
d) Open cables

9) What is the goal of defending against a Denial of Service (DoS) attack?
a) Increasing traffic
b) Maintaining availability
c) Encrypting databases
d) Monitoring emails

10) What is the main goal of social business tools?
a) Replace meetings
b) Enhance collaboration
c) Automate payroll
d) Reduce staff

11) How do information systems transform business processes?
a) By increasing paperwork
b) By automating workflows
c) By stopping data growth
d) By removing all software

12) What is a major challenge when implementing strategic information systems?
a) Lowering costs
b) System integration
c) Faster decisions
d) Increasing revenue

13) EBay is an example of _____.
a) click-and-mortar business
b) C2C electronic commerce
c) B2C electronic commerce
d) an online exchange

14) An enterprise is a group of people with _____.
a) common goal
b) separate goal for each department
c) multiple goals
d) two or more goal

Seat No.	

Set **S**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Management Information System (CSEMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt the following. (Any Four) **16**

a) Explain how information systems are transforming contemporary business operations and changing the overall competitive landscape.

b) What is Management Information System? What is the role of Information System in business?

c) Discuss the economic and behavioural theories that explain how information systems change organizational structures and flatten traditional hierarchies.

d) Explain the structure of an organization.

e) What are the Ethical, Social, political issues raised by information systems?

Q.3 Attempt the following. (Any Two) **12**

a) Discuss how advanced data profiling and analytics pose severe challenges to the protection of individual privacy and intellectual property rights today.

b) Explain the challenges to protection of individual's privacy and intellectual property.

c) What are different features of an organization? And explain each feature in detail.

SECTION – II

Q.4 Attempt the following. (Any Four) **16**

a) Define IT infrastructure and describe the major hardware and software components required to build an enterprise-level computing environment.

b) Discuss the primary management issues and governance challenges involved in scaling and handling technological obsolescence in infrastructure investments.

c) What are the issues related to building e-commerce?

d) Explain Management Issues related to Information system.

e) How to improve business performance & decision making?

Q.5 Attempt the following. (Any Two) **12**

a) Detail the role of security monitors and formal security codes of conduct in establishing comprehensive monitoring and regulatory safety inside an organization.

b) Explain the Role of M-commerce in business & its applications.

c) Discuss the function of firewalls and encryption mechanisms as essential network tools for defending digital enterprise assets.

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Seat No.	

Set P

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Electric Vehicle Battery Systems (EEMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.
4) Assume suitable data if required.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) A key environmental benefit of electric vehicles is _____.
a) Increased fuel consumption b) Zero tailpipe emissions
c) Higher noise levels d) Use of fossil fuels

2) One major challenge limiting widespread EV adoption is _____.
a) Excessive vehicle noise b) Long refueling times
c) Limited driving range d) High exhaust emissions

3) Which battery type is most commonly used in modern electric vehicles?
a) Lead-acid b) Nickel-cadmium
c) Lithium-ion d) Zinc-air

4) Many governments support EV adoption by offering _____.
a) Higher vehicle taxes b) Fuel subsidies
c) Tax incentives and rebates d) Import restrictions

5) In a battery, the anode is where _____.
a) Reduction occurs
b) Oxidation occurs
c) Electrons are absorbed
d) Energy is generated mechanically

6) The electrolyte in a battery _____.
a) Stores electrical energy permanently
b) Conducts ions between electrodes
c) Produces fuel for combustion
d) Absorbs heat from the environment

7) A major limitation of lead-acid batteries is _____.
   a) High toxicity and heavy weight
   b) Fast charging capability
   c) Long cycle life
   d) High energy density

8) Among lead-acid, NiMH, and Li-ion batteries, the one with the highest energy density is _____.
   a) Lead-acid
   b) NiMH
   c) Li-ion
   d) All are the same

9) Connecting battery cells in series results in _____.
   a) Increased voltage, same capacity
   b) Increased capacity, same voltage
   c) Increased both voltage and capacity
   d) Decreased voltage and capacity

10) A hybrid battery configuration combines _____.
   a) Series and parallel connections
   b) Only series connections
   c) Only parallel connections
   d) Lithium and lead-acid cells in one pack

11) Which of the following is a key component of a BMS?
   a) Cooling fan
   b) Voltage, current, and temperature sensors
   c) Fuel pump
   d) Gearbox

12) The main function of a TMS in an EV battery pack is to _____.
   a) Reduce battery voltage
   b) Maintain optimal operating temperature
   c) Increase battery size
   d) Generate electricity

13) Which of the following is a risk of mechanical damage to EV batteries?
   a) Improved energy efficiency
   b) Increased capacity
   c) Loss of structural integrity and short circuits
   d) Lower weight

14) Durability testing of EV batteries typically includes _____.
   a) Cycle life testing, thermal cycling, and vibration tests
   b) Only visual inspection
   c) Ignoring environmental conditions
   d) Only cost analysis

Seat No.	

Set **P**

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Electric Vehicle Battery Systems (EEMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt the following. (Any Four) **16**

a) Explain the different types of batteries used in electric vehicles.

b) Discuss the basic Principle of Battery Chemistry & explain the Key Materials used in Batteries.

c) Describe the characteristics, advantages, and limitations of lead-acid batteries.

d) Identify and explain the major challenges faced by electric vehicles in mass adoption.

e) Explain how Key Performance Parameters Affected by electrochemistry.

Q.3 Attempt the following. (Any Two) **12**

a) Describe the industry outlook, government policies, and technological advancements for electric vehicles.

b) Compare lead-acid, NiMH, and Li-ion batteries based on different battery chemistries?

c) Describe the characteristics, advantages, and limitations of Nickel-metal hydride (NiMH) batteries.

Section – II

Q.4 Attempt the following. (Any Four) **16**

a) Explain Battery system architecture by series battery configuration.

b) Discuss hazards & risks in EV battery systems.

c) Describe the reliability and durability of EV battery systems.

d) Explain the role of wiring and connectors in battery systems.

e) Describe the principles, materials, and applications of Sodium-ion batteries.

Q.5 Attempt the following. (Any Two) **12**

a) Describe the Battery management system in details.

b) Explain Testing and validation of EV battery systems.

c) Discuss modelling & performance testing of EV battery packs.

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Electric Vehicle Battery Systems (EEMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.
4) Assume suitable data if required.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) Among lead-acid, NiMH, and Li-ion batteries, the one with the highest energy density is _____.
a) Lead-acid b) NiMH
c) Li-ion d) All are the same

2) Connecting battery cells in series results in _____.
a) Increased voltage, same capacity
b) Increased capacity, same voltage
c) Increased both voltage and capacity
d) Decreased voltage and capacity

3) A hybrid battery configuration combines _____.
a) Series and parallel connections
b) Only series connections
c) Only parallel connections
d) Lithium and lead-acid cells in one pack

4) Which of the following is a key component of a BMS?
a) Cooling fan
b) Voltage, current, and temperature sensors
c) Fuel pump
d) Gearbox

5) The main function of a TMS in an EV battery pack is to _____.
a) Reduce battery voltage
b) Maintain optimal operating temperature
c) Increase battery size
d) Generate electricity

6) Which of the following is a risk of mechanical damage to EV batteries?
a) Improved energy efficiency
b) Increased capacity
c) Loss of structural integrity and short circuits
d) Lower weight

7) Durability testing of EV batteries typically includes _____.
a) Cycle life testing, thermal cycling, and vibration tests
b) Only visual inspection
c) Ignoring environmental conditions
d) Only cost analysis

8) A key environmental benefit of electric vehicles is _____.
a) Increased fuel consumption
b) Zero tailpipe emissions
c) Higher noise levels
d) Use of fossil fuels

9) One major challenge limiting widespread EV adoption is _____.
a) Excessive vehicle noise
b) Long refueling times
c) Limited driving range
d) High exhaust emissions

10) Which battery type is most commonly used in modern electric vehicles?
a) Lead-acid
b) Nickel-cadmium
c) Lithium-ion
d) Zinc-air

11) Many governments support EV adoption by offering _____.
a) Higher vehicle taxes
b) Fuel subsidies
c) Tax incentives and rebates
d) Import restrictions

12) In a battery, the anode is where _____.
a) Reduction occurs
b) Oxidation occurs
c) Electrons are absorbed
d) Energy is generated mechanically

13) The electrolyte in a battery _____.
a) Stores electrical energy permanently
b) Conducts ions between electrodes
c) Produces fuel for combustion
d) Absorbs heat from the environment

14) A major limitation of lead-acid batteries is _____.
a) High toxicity and heavy weight
b) Fast charging capability
c) Long cycle life
d) High energy density

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Electric Vehicle Battery Systems (EEMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt the following. (Any Four) **16**

a) Explain the different types of batteries used in electric vehicles.

b) Discuss the basic Principle of Battery Chemistry & explain the Key Materials used in Batteries.

c) Describe the characteristics, advantages, and limitations of lead-acid batteries.

d) Identify and explain the major challenges faced by electric vehicles in mass adoption.

e) Explain how Key Performance Parameters Affected by electrochemistry.

Q.3 Attempt the following. (Any Two) **12**

a) Describe the industry outlook, government policies, and technological advancements for electric vehicles.

b) Compare lead-acid, NiMH, and Li-ion batteries based on different battery chemistries?

c) Describe the characteristics, advantages, and limitations of Nickel-metal hydride (NiMH) batteries.

Section – II

Q.4 Attempt the following. (Any Four) **16**

a) Explain Battery system architecture by series battery configuration.

b) Discuss hazards & risks in EV battery systems.

c) Describe the reliability and durability of EV battery systems.

d) Explain the role of wiring and connectors in battery systems.

e) Describe the principles, materials, and applications of Sodium-ion batteries.

Q.5 Attempt the following. (Any Two) **12**

a) Describe the Battery management system in details.

b) Explain Testing and validation of EV battery systems.

c) Discuss modelling & performance testing of EV battery packs.

Seat No.	

Set **R**

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Electric Vehicle Battery Systems (EEMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.
4) Assume suitable data if required.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) Which of the following is a key component of a BMS?
a) Cooling fan
b) Voltage, current, and temperature sensors
c) Fuel pump
d) Gearbox

2) The main function of a TMS in an EV battery pack is to _____.
a) Reduce battery voltage
b) Maintain optimal operating temperature
c) Increase battery size
d) Generate electricity

3) Which of the following is a risk of mechanical damage to EV batteries?
a) Improved energy efficiency
b) Increased capacity
c) Loss of structural integrity and short circuits
d) Lower weight

4) Durability testing of EV batteries typically includes _____.
a) Cycle life testing, thermal cycling, and vibration tests
b) Only visual inspection
c) Ignoring environmental conditions
d) Only cost analysis

5) A key environmental benefit of electric vehicles is _____.
a) Increased fuel consumption b) Zero tailpipe emissions
c) Higher noise levels d) Use of fossil fuels

6) One major challenge limiting widespread EV adoption is _____.
a) Excessive vehicle noise
b) Long refueling times
c) Limited driving range
d) High exhaust emissions

7) Which battery type is most commonly used in modern electric vehicles?
a) Lead-acid
b) Nickel-cadmium
c) Lithium-ion
d) Zinc-air

8) Many governments support EV adoption by offering _____.
a) Higher vehicle taxes
b) Fuel subsidies
c) Tax incentives and rebates
d) Import restrictions

9) In a battery, the anode is where _____.
a) Reduction occurs
b) Oxidation occurs
c) Electrons are absorbed
d) Energy is generated mechanically

10) The electrolyte in a battery _____.
a) Stores electrical energy permanently
b) Conducts ions between electrodes
c) Produces fuel for combustion
d) Absorbs heat from the environment

11) A major limitation of lead-acid batteries is _____.
a) High toxicity and heavy weight
b) Fast charging capability
c) Long cycle life
d) High energy density

12) Among lead-acid, NiMH, and Li-ion batteries, the one with the highest energy density is _____.
a) Lead-acid
b) NiMH
c) Li-ion
d) All are the same

13) Connecting battery cells in series results in _____.
a) Increased voltage, same capacity
b) Increased capacity, same voltage
c) Increased both voltage and capacity
d) Decreased voltage and capacity

14) A hybrid battery configuration combines _____.
a) Series and parallel connections
b) Only series connections
c) Only parallel connections
d) Lithium and lead-acid cells in one pack

Seat No.	

Set **R**

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Electric Vehicle Battery Systems (EEMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt the following. (Any Four) **16**

a) Explain the different types of batteries used in electric vehicles.

b) Discuss the basic Principle of Battery Chemistry & explain the Key Materials used in Batteries.

c) Describe the characteristics, advantages, and limitations of lead-acid batteries.

d) Identify and explain the major challenges faced by electric vehicles in mass adoption.

e) Explain how Key Performance Parameters Affected by electrochemistry.

Q.3 Attempt the following. (Any Two) **12**

a) Describe the industry outlook, government policies, and technological advancements for electric vehicles.

b) Compare lead-acid, NiMH, and Li-ion batteries based on different battery chemistries?

c) Describe the characteristics, advantages, and limitations of Nickel-metal hydride (NiMH) batteries.

Section – II

Q.4 Attempt the following. (Any Four) **16**

a) Explain Battery system architecture by series battery configuration.

b) Discuss hazards & risks in EV battery systems.

c) Describe the reliability and durability of EV battery systems.

d) Explain the role of wiring and connectors in battery systems.

e) Describe the principles, materials, and applications of Sodium-ion batteries.

Q.5 Attempt the following. (Any Two) **12**

a) Describe the Battery management system in details.

b) Explain Testing and validation of EV battery systems.

c) Discuss modelling & performance testing of EV battery packs.

Seat No.	

Set **S**

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Electric Vehicle Battery Systems (EEMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.
4) Assume suitable data if required.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) The electrolyte in a battery _____.
a) Stores electrical energy permanently
b) Conducts ions between electrodes
c) Produces fuel for combustion
d) Absorbs heat from the environment

2) A major limitation of lead-acid batteries is _____.
a) High toxicity and heavy weight
b) Fast charging capability
c) Long cycle life
d) High energy density

3) Among lead-acid, NiMH, and Li-ion batteries, the one with the highest energy density is _____.
a) Lead-acid b) NiMH
c) Li-ion d) All are the same

4) Connecting battery cells in series results in _____.
a) Increased voltage, same capacity
b) Increased capacity, same voltage
c) Increased both voltage and capacity
d) Decreased voltage and capacity

5) A hybrid battery configuration combines _____.
a) Series and parallel connections
b) Only series connections
c) Only parallel connections
d) Lithium and lead-acid cells in one pack

6) Which of the following is a key component of a BMS?
a) Cooling fan
b) Voltage, current, and temperature sensors
c) Fuel pump
d) Gearbox

7) The main function of a TMS in an EV battery pack is to _____.
a) Reduce battery voltage
b) Maintain optimal operating temperature
c) Increase battery size
d) Generate electricity

8) Which of the following is a risk of mechanical damage to EV batteries?
a) Improved energy efficiency
b) Increased capacity
c) Loss of structural integrity and short circuits
d) Lower weight

9) Durability testing of EV batteries typically includes _____.
a) Cycle life testing, thermal cycling, and vibration tests
b) Only visual inspection
c) Ignoring environmental conditions
d) Only cost analysis

10) A key environmental benefit of electric vehicles is _____.
a) Increased fuel consumption
b) Zero tailpipe emissions
c) Higher noise levels
d) Use of fossil fuels

11) One major challenge limiting widespread EV adoption is _____.
a) Excessive vehicle noise
b) Long refueling times
c) Limited driving range
d) High exhaust emissions

12) Which battery type is most commonly used in modern electric vehicles?
a) Lead-acid
b) Nickel-cadmium
c) Lithium-ion
d) Zinc-air

13) Many governments support EV adoption by offering _____.
a) Higher vehicle taxes
b) Fuel subsidies
c) Tax incentives and rebates
d) Import restrictions

14) In a battery, the anode is where _____.
a) Reduction occurs
b) Oxidation occurs
c) Electrons are absorbed
d) Energy is generated mechanically

SLR-QH-654

Seat No.		Set	S

T.Y. (B.Tech.) (Civil Engineering) (Semester - II) (New) (CBCS)
Examination: March/April – 2026
Electric Vehicle Battery Systems (EEMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt the following. (Any Four) **16**

a) Explain the different types of batteries used in electric vehicles.

b) Discuss the basic Principle of Battery Chemistry & explain the Key Materials used in Batteries.

c) Describe the characteristics, advantages, and limitations of lead-acid batteries.

d) Identify and explain the major challenges faced by electric vehicles in mass adoption.

e) Explain how Key Performance Parameters Affected by electrochemistry.

Q.3 Attempt the following. (Any Two) **12**

a) Describe the industry outlook, government policies, and technological advancements for electric vehicles.

b) Compare lead-acid, NiMH, and Li-ion batteries based on different battery chemistries?

c) Describe the characteristics, advantages, and limitations of Nickel-metal hydride (NiMH) batteries.

Section – II

Q.4 Attempt the following. (Any Four) **16**

a) Explain Battery system architecture by series battery configuration.

b) Discuss hazards & risks in EV battery systems.

c) Describe the reliability and durability of EV battery systems.

d) Explain the role of wiring and connectors in battery systems.

e) Describe the principles, materials, and applications of Sodium-ion batteries.

Q.5 Attempt the following. (Any Two) **12**

a) Describe the Battery management system in details.

b) Explain Testing and validation of EV battery systems.

c) Discuss modelling & performance testing of EV battery packs.

SLR-QH-654

Seat No.	

Set P

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Electric Vehicle Battery Systems (EEMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.
4) Assume suitable data if required.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) A key environmental benefit of electric vehicles is _____.
a) Increased fuel consumption b) Zero tailpipe emissions
c) Higher noise levels d) Use of fossil fuels

2) One major challenge limiting widespread EV adoption is _____.
a) Excessive vehicle noise b) Long refueling times
c) Limited driving range d) High exhaust emissions

3) Which battery type is most commonly used in modern electric vehicles?
a) Lead-acid b) Nickel-cadmium
c) Lithium-ion d) Zinc-air

4) Many governments support EV adoption by offering _____.
a) Higher vehicle taxes b) Fuel subsidies
c) Tax incentives and rebates d) Import restrictions

5) In a battery, the anode is where _____.
a) Reduction occurs
b) Oxidation occurs
c) Electrons are absorbed
d) Energy is generated mechanically

6) The electrolyte in a battery _____.
a) Stores electrical energy permanently
b) Conducts ions between electrodes
c) Produces fuel for combustion
d) Absorbs heat from the environment

7) A major limitation of lead-acid batteries is _____.
   a) High toxicity and heavy weight
   b) Fast charging capability
   c) Long cycle life
   d) High energy density

8) Among lead-acid, NiMH, and Li-ion batteries, the one with the highest energy density is _____.
   a) Lead-acid
   b) NiMH
   c) Li-ion
   d) All are the same

9) Connecting battery cells in series results in _____.
   a) Increased voltage, same capacity
   b) Increased capacity, same voltage
   c) Increased both voltage and capacity
   d) Decreased voltage and capacity

10) A hybrid battery configuration combines _____.
   a) Series and parallel connections
   b) Only series connections
   c) Only parallel connections
   d) Lithium and lead-acid cells in one pack

11) Which of the following is a key component of a BMS?
   a) Cooling fan
   b) Voltage, current, and temperature sensors
   c) Fuel pump
   d) Gearbox

12) The main function of a TMS in an EV battery pack is to _____.
   a) Reduce battery voltage
   b) Maintain optimal operating temperature
   c) Increase battery size
   d) Generate electricity

13) Which of the following is a risk of mechanical damage to EV batteries?
   a) Improved energy efficiency
   b) Increased capacity
   c) Loss of structural integrity and short circuits
   d) Lower weight

14) Durability testing of EV batteries typically includes _____.
   a) Cycle life testing, thermal cycling, and vibration tests
   b) Only visual inspection
   c) Ignoring environmental conditions
   d) Only cost analysis

Seat No.	

Set **P**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Electric Vehicle Battery Systems (EEMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt the following. (Any Four) **16**

a) Explain the different types of batteries used in electric vehicles.

b) Discuss the basic Principle of Battery Chemistry & explain the Key Materials used in Batteries.

c) Describe the characteristics, advantages, and limitations of lead-acid batteries.

d) Identify and explain the major challenges faced by electric vehicles in mass adoption.

e) Explain how Key Performance Parameters Affected by electrochemistry.

Q.3 Attempt the following. (Any Two) **12**

a) Describe the industry outlook, government policies, and technological advancements for electric vehicles.

b) Compare lead-acid, NiMH, and Li-ion batteries based on different battery chemistries?

c) Describe the characteristics, advantages, and limitations of Nickel-metal hydride (NiMH) batteries.

Section – II

Q.4 Attempt the following. (Any Four) **16**

a) Explain Battery system architecture by series battery configuration.

b) Discuss hazards & risks in EV battery systems.

c) Describe the reliability and durability of EV battery systems.

d) Explain the role of wiring and connectors in battery systems.

e) Describe the principles, materials, and applications of Sodium-ion batteries.

Q.5 Attempt the following. (Any Two) **12**

a) Describe the Battery management system in details.

b) Explain Testing and validation of EV battery systems.

c) Discuss modelling & performance testing of EV battery packs.

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Electric Vehicle Battery Systems (EEMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.
4) Assume suitable data if required.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) Among lead-acid, NiMH, and Li-ion batteries, the one with the highest energy density is _____.
a) Lead-acid b) NiMH
c) Li-ion d) All are the same

2) Connecting battery cells in series results in _____.
a) Increased voltage, same capacity
b) Increased capacity, same voltage
c) Increased both voltage and capacity
d) Decreased voltage and capacity

3) A hybrid battery configuration combines _____.
a) Series and parallel connections
b) Only series connections
c) Only parallel connections
d) Lithium and lead-acid cells in one pack

4) Which of the following is a key component of a BMS?
a) Cooling fan
b) Voltage, current, and temperature sensors
c) Fuel pump
d) Gearbox

5) The main function of a TMS in an EV battery pack is to _____.
a) Reduce battery voltage
b) Maintain optimal operating temperature
c) Increase battery size
d) Generate electricity

6) Which of the following is a risk of mechanical damage to EV batteries?
a) Improved energy efficiency
b) Increased capacity
c) Loss of structural integrity and short circuits
d) Lower weight

7) Durability testing of EV batteries typically includes _____.
a) Cycle life testing, thermal cycling, and vibration tests
b) Only visual inspection
c) Ignoring environmental conditions
d) Only cost analysis

8) A key environmental benefit of electric vehicles is _____.
a) Increased fuel consumption
b) Zero tailpipe emissions
c) Higher noise levels
d) Use of fossil fuels

9) One major challenge limiting widespread EV adoption is _____.
a) Excessive vehicle noise
b) Long refueling times
c) Limited driving range
d) High exhaust emissions

10) Which battery type is most commonly used in modern electric vehicles?
a) Lead-acid
b) Nickel-cadmium
c) Lithium-ion
d) Zinc-air

11) Many governments support EV adoption by offering _____.
a) Higher vehicle taxes
b) Fuel subsidies
c) Tax incentives and rebates
d) Import restrictions

12) In a battery, the anode is where _____.
a) Reduction occurs
b) Oxidation occurs
c) Electrons are absorbed
d) Energy is generated mechanically

13) The electrolyte in a battery _____.
a) Stores electrical energy permanently
b) Conducts ions between electrodes
c) Produces fuel for combustion
d) Absorbs heat from the environment

14) A major limitation of lead-acid batteries is _____.
a) High toxicity and heavy weight
b) Fast charging capability
c) Long cycle life
d) High energy density

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Electric Vehicle Battery Systems (EEMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt the following. (Any Four) **16**

a) Explain the different types of batteries used in electric vehicles.

b) Discuss the basic Principle of Battery Chemistry & explain the Key Materials used in Batteries.

c) Describe the characteristics, advantages, and limitations of lead-acid batteries.

d) Identify and explain the major challenges faced by electric vehicles in mass adoption.

e) Explain how Key Performance Parameters Affected by electrochemistry.

Q.3 Attempt the following. (Any Two) **12**

a) Describe the industry outlook, government policies, and technological advancements for electric vehicles.

b) Compare lead-acid, NiMH, and Li-ion batteries based on different battery chemistries?

c) Describe the characteristics, advantages, and limitations of Nickel-metal hydride (NiMH) batteries.

Section – II

Q.4 Attempt the following. (Any Four) **16**

a) Explain Battery system architecture by series battery configuration.

b) Discuss hazards & risks in EV battery systems.

c) Describe the reliability and durability of EV battery systems.

d) Explain the role of wiring and connectors in battery systems.

e) Describe the principles, materials, and applications of Sodium-ion batteries.

Q.5 Attempt the following. (Any Two) **12**

a) Describe the Battery management system in details.

b) Explain Testing and validation of EV battery systems.

c) Discuss modelling & performance testing of EV battery packs.

Seat No.	

Set **R**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Electric Vehicle Battery Systems (EEMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.
4) Assume suitable data if required.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) Which of the following is a key component of a BMS?
a) Cooling fan
b) Voltage, current, and temperature sensors
c) Fuel pump
d) Gearbox

2) The main function of a TMS in an EV battery pack is to _____.
a) Reduce battery voltage
b) Maintain optimal operating temperature
c) Increase battery size
d) Generate electricity

3) Which of the following is a risk of mechanical damage to EV batteries?
a) Improved energy efficiency
b) Increased capacity
c) Loss of structural integrity and short circuits
d) Lower weight

4) Durability testing of EV batteries typically includes _____.
a) Cycle life testing, thermal cycling, and vibration tests
b) Only visual inspection
c) Ignoring environmental conditions
d) Only cost analysis

5) A key environmental benefit of electric vehicles is _____.
a) Increased fuel consumption b) Zero tailpipe emissions
c) Higher noise levels d) Use of fossil fuels

6) One major challenge limiting widespread EV adoption is _____.
a) Excessive vehicle noise
b) Long refueling times
c) Limited driving range
d) High exhaust emissions

7) Which battery type is most commonly used in modern electric vehicles?
a) Lead-acid
b) Nickel-cadmium
c) Lithium-ion
d) Zinc-air

8) Many governments support EV adoption by offering _____.
a) Higher vehicle taxes
b) Fuel subsidies
c) Tax incentives and rebates
d) Import restrictions

9) In a battery, the anode is where _____.
a) Reduction occurs
b) Oxidation occurs
c) Electrons are absorbed
d) Energy is generated mechanically

10) The electrolyte in a battery _____.
a) Stores electrical energy permanently
b) Conducts ions between electrodes
c) Produces fuel for combustion
d) Absorbs heat from the environment

11) A major limitation of lead-acid batteries is _____.
a) High toxicity and heavy weight
b) Fast charging capability
c) Long cycle life
d) High energy density

12) Among lead-acid, NiMH, and Li-ion batteries, the one with the highest energy density is _____.
a) Lead-acid
b) NiMH
c) Li-ion
d) All are the same

13) Connecting battery cells in series results in _____.
a) Increased voltage, same capacity
b) Increased capacity, same voltage
c) Increased both voltage and capacity
d) Decreased voltage and capacity

14) A hybrid battery configuration combines _____.
a) Series and parallel connections
b) Only series connections
c) Only parallel connections
d) Lithium and lead-acid cells in one pack

Seat No.	

Set **R**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Electric Vehicle Battery Systems (EEMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt the following. (Any Four) **16**

a) Explain the different types of batteries used in electric vehicles.

b) Discuss the basic Principle of Battery Chemistry & explain the Key Materials used in Batteries.

c) Describe the characteristics, advantages, and limitations of lead-acid batteries.

d) Identify and explain the major challenges faced by electric vehicles in mass adoption.

e) Explain how Key Performance Parameters Affected by electrochemistry.

Q.3 Attempt the following. (Any Two) **12**

a) Describe the industry outlook, government policies, and technological advancements for electric vehicles.

b) Compare lead-acid, NiMH, and Li-ion batteries based on different battery chemistries?

c) Describe the characteristics, advantages, and limitations of Nickel-metal hydride (NiMH) batteries.

Section – II

Q.4 Attempt the following. (Any Four) **16**

a) Explain Battery system architecture by series battery configuration.

b) Discuss hazards & risks in EV battery systems.

c) Describe the reliability and durability of EV battery systems.

d) Explain the role of wiring and connectors in battery systems.

e) Describe the principles, materials, and applications of Sodium-ion batteries.

Q.5 Attempt the following. (Any Two) **12**

a) Describe the Battery management system in details.

b) Explain Testing and validation of EV battery systems.

c) Discuss modelling & performance testing of EV battery packs.

Seat No.	

Set **S**

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Electric Vehicle Battery Systems (EEMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.
4) Assume suitable data if required.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) The electrolyte in a battery _____.
a) Stores electrical energy permanently
b) Conducts ions between electrodes
c) Produces fuel for combustion
d) Absorbs heat from the environment

2) A major limitation of lead-acid batteries is _____.
a) High toxicity and heavy weight
b) Fast charging capability
c) Long cycle life
d) High energy density

3) Among lead-acid, NiMH, and Li-ion batteries, the one with the highest energy density is _____.
a) Lead-acid b) NiMH
c) Li-ion d) All are the same

4) Connecting battery cells in series results in _____.
a) Increased voltage, same capacity
b) Increased capacity, same voltage
c) Increased both voltage and capacity
d) Decreased voltage and capacity

5) A hybrid battery configuration combines _____.
a) Series and parallel connections
b) Only series connections
c) Only parallel connections
d) Lithium and lead-acid cells in one pack

6) Which of the following is a key component of a BMS?
a) Cooling fan
b) Voltage, current, and temperature sensors
c) Fuel pump
d) Gearbox

7) The main function of a TMS in an EV battery pack is to _____.
a) Reduce battery voltage
b) Maintain optimal operating temperature
c) Increase battery size
d) Generate electricity

8) Which of the following is a risk of mechanical damage to EV batteries?
a) Improved energy efficiency
b) Increased capacity
c) Loss of structural integrity and short circuits
d) Lower weight

9) Durability testing of EV batteries typically includes _____.
a) Cycle life testing, thermal cycling, and vibration tests
b) Only visual inspection
c) Ignoring environmental conditions
d) Only cost analysis

10) A key environmental benefit of electric vehicles is _____.
a) Increased fuel consumption
b) Zero tailpipe emissions
c) Higher noise levels
d) Use of fossil fuels

11) One major challenge limiting widespread EV adoption is _____.
a) Excessive vehicle noise
b) Long refueling times
c) Limited driving range
d) High exhaust emissions

12) Which battery type is most commonly used in modern electric vehicles?
a) Lead-acid
b) Nickel-cadmium
c) Lithium-ion
d) Zinc-air

13) Many governments support EV adoption by offering _____.
a) Higher vehicle taxes
b) Fuel subsidies
c) Tax incentives and rebates
d) Import restrictions

14) In a battery, the anode is where _____.
a) Reduction occurs
b) Oxidation occurs
c) Electrons are absorbed
d) Energy is generated mechanically

Seat No.	

Set | S

T.Y. (B.Tech.) (Computer Science & Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Electric Vehicle Battery Systems (EEMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt the following. (Any Four) **16**

a) Explain the different types of batteries used in electric vehicles.

b) Discuss the basic Principle of Battery Chemistry & explain the Key Materials used in Batteries.

c) Describe the characteristics, advantages, and limitations of lead-acid batteries.

d) Identify and explain the major challenges faced by electric vehicles in mass adoption.

e) Explain how Key Performance Parameters Affected by electrochemistry.

Q.3 Attempt the following. (Any Two) **12**

a) Describe the industry outlook, government policies, and technological advancements for electric vehicles.

b) Compare lead-acid, NiMH, and Li-ion batteries based on different battery chemistries?

c) Describe the characteristics, advantages, and limitations of Nickel-metal hydride (NiMH) batteries.

Section – II

Q.4 Attempt the following. (Any Four) **16**

a) Explain Battery system architecture by series battery configuration.

b) Discuss hazards & risks in EV battery systems.

c) Describe the reliability and durability of EV battery systems.

d) Explain the role of wiring and connectors in battery systems.

e) Describe the principles, materials, and applications of Sodium-ion batteries.

Q.5 Attempt the following. (Any Two) **12**

a) Describe the Battery management system in details.

b) Explain Testing and validation of EV battery systems.

c) Discuss modelling & performance testing of EV battery packs.

SLR-QH-654

Seat No.	

Set P

T.Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Electric Vehicle Battery Systems (EEMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.
4) Assume suitable data if required.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) A key environmental benefit of electric vehicles is _____.
a) Increased fuel consumption b) Zero tailpipe emissions
c) Higher noise levels d) Use of fossil fuels

2) One major challenge limiting widespread EV adoption is _____.
a) Excessive vehicle noise b) Long refueling times
c) Limited driving range d) High exhaust emissions

3) Which battery type is most commonly used in modern electric vehicles?
a) Lead-acid b) Nickel-cadmium
c) Lithium-ion d) Zinc-air

4) Many governments support EV adoption by offering _____.
a) Higher vehicle taxes b) Fuel subsidies
c) Tax incentives and rebates d) Import restrictions

5) In a battery, the anode is where _____.
a) Reduction occurs
b) Oxidation occurs
c) Electrons are absorbed
d) Energy is generated mechanically

6) The electrolyte in a battery _____.
a) Stores electrical energy permanently
b) Conducts ions between electrodes
c) Produces fuel for combustion
d) Absorbs heat from the environment

7) A major limitation of lead-acid batteries is _____.
   a) High toxicity and heavy weight
   b) Fast charging capability
   c) Long cycle life
   d) High energy density

8) Among lead-acid, NiMH, and Li-ion batteries, the one with the highest energy density is _____.
   a) Lead-acid
   b) NiMH
   c) Li-ion
   d) All are the same

9) Connecting battery cells in series results in _____.
   a) Increased voltage, same capacity
   b) Increased capacity, same voltage
   c) Increased both voltage and capacity
   d) Decreased voltage and capacity

10) A hybrid battery configuration combines _____.
   a) Series and parallel connections
   b) Only series connections
   c) Only parallel connections
   d) Lithium and lead-acid cells in one pack

11) Which of the following is a key component of a BMS?
   a) Cooling fan
   b) Voltage, current, and temperature sensors
   c) Fuel pump
   d) Gearbox

12) The main function of a TMS in an EV battery pack is to _____.
   a) Reduce battery voltage
   b) Maintain optimal operating temperature
   c) Increase battery size
   d) Generate electricity

13) Which of the following is a risk of mechanical damage to EV batteries?
   a) Improved energy efficiency
   b) Increased capacity
   c) Loss of structural integrity and short circuits
   d) Lower weight

14) Durability testing of EV batteries typically includes _____.
   a) Cycle life testing, thermal cycling, and vibration tests
   b) Only visual inspection
   c) Ignoring environmental conditions
   d) Only cost analysis

Seat No.	

Set **P**

T.Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Electric Vehicle Battery Systems (EEMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt the following. (Any Four) **16**

a) Explain the different types of batteries used in electric vehicles.

b) Discuss the basic Principle of Battery Chemistry & explain the Key Materials used in Batteries.

c) Describe the characteristics, advantages, and limitations of lead-acid batteries.

d) Identify and explain the major challenges faced by electric vehicles in mass adoption.

e) Explain how Key Performance Parameters Affected by electrochemistry.

Q.3 Attempt the following. (Any Two) **12**

a) Describe the industry outlook, government policies, and technological advancements for electric vehicles.

b) Compare lead-acid, NiMH, and Li-ion batteries based on different battery chemistries?

c) Describe the characteristics, advantages, and limitations of Nickel-metal hydride (NiMH) batteries.

Section – II

Q.4 Attempt the following. (Any Four) **16**

a) Explain Battery system architecture by series battery configuration.

b) Discuss hazards & risks in EV battery systems.

c) Describe the reliability and durability of EV battery systems.

d) Explain the role of wiring and connectors in battery systems.

e) Describe the principles, materials, and applications of Sodium-ion batteries.

Q.5 Attempt the following. (Any Two) **12**

a) Describe the Battery management system in details.

b) Explain Testing and validation of EV battery systems.

c) Discuss modelling & performance testing of EV battery packs.

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Electric Vehicle Battery Systems (EEMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.
4) Assume suitable data if required.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) Among lead-acid, NiMH, and Li-ion batteries, the one with the highest energy density is _____.
a) Lead-acid b) NiMH
c) Li-ion d) All are the same

2) Connecting battery cells in series results in _____.
a) Increased voltage, same capacity
b) Increased capacity, same voltage
c) Increased both voltage and capacity
d) Decreased voltage and capacity

3) A hybrid battery configuration combines _____.
a) Series and parallel connections
b) Only series connections
c) Only parallel connections
d) Lithium and lead-acid cells in one pack

4) Which of the following is a key component of a BMS?
a) Cooling fan
b) Voltage, current, and temperature sensors
c) Fuel pump
d) Gearbox

5) The main function of a TMS in an EV battery pack is to _____.
a) Reduce battery voltage
b) Maintain optimal operating temperature
c) Increase battery size
d) Generate electricity

6) Which of the following is a risk of mechanical damage to EV batteries?
a) Improved energy efficiency
b) Increased capacity
c) Loss of structural integrity and short circuits
d) Lower weight

7) Durability testing of EV batteries typically includes _____.
a) Cycle life testing, thermal cycling, and vibration tests
b) Only visual inspection
c) Ignoring environmental conditions
d) Only cost analysis

8) A key environmental benefit of electric vehicles is _____.
a) Increased fuel consumption
b) Zero tailpipe emissions
c) Higher noise levels
d) Use of fossil fuels

9) One major challenge limiting widespread EV adoption is _____.
a) Excessive vehicle noise
b) Long refueling times
c) Limited driving range
d) High exhaust emissions

10) Which battery type is most commonly used in modern electric vehicles?
a) Lead-acid
b) Nickel-cadmium
c) Lithium-ion
d) Zinc-air

11) Many governments support EV adoption by offering _____.
a) Higher vehicle taxes
b) Fuel subsidies
c) Tax incentives and rebates
d) Import restrictions

12) In a battery, the anode is where _____.
a) Reduction occurs
b) Oxidation occurs
c) Electrons are absorbed
d) Energy is generated mechanically

13) The electrolyte in a battery _____.
a) Stores electrical energy permanently
b) Conducts ions between electrodes
c) Produces fuel for combustion
d) Absorbs heat from the environment

14) A major limitation of lead-acid batteries is _____.
a) High toxicity and heavy weight
b) Fast charging capability
c) Long cycle life
d) High energy density

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Electric Vehicle Battery Systems (EEMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt the following. (Any Four) **16**

a) Explain the different types of batteries used in electric vehicles.

b) Discuss the basic Principle of Battery Chemistry & explain the Key Materials used in Batteries.

c) Describe the characteristics, advantages, and limitations of lead-acid batteries.

d) Identify and explain the major challenges faced by electric vehicles in mass adoption.

e) Explain how Key Performance Parameters Affected by electrochemistry.

Q.3 Attempt the following. (Any Two) **12**

a) Describe the industry outlook, government policies, and technological advancements for electric vehicles.

b) Compare lead-acid, NiMH, and Li-ion batteries based on different battery chemistries?

c) Describe the characteristics, advantages, and limitations of Nickel-metal hydride (NiMH) batteries.

Section – II

Q.4 Attempt the following. (Any Four) **16**

a) Explain Battery system architecture by series battery configuration.

b) Discuss hazards & risks in EV battery systems.

c) Describe the reliability and durability of EV battery systems.

d) Explain the role of wiring and connectors in battery systems.

e) Describe the principles, materials, and applications of Sodium-ion batteries.

Q.5 Attempt the following. (Any Two) **12**

a) Describe the Battery management system in details.

b) Explain Testing and validation of EV battery systems.

c) Discuss modelling & performance testing of EV battery packs.

Seat No.	

Set **R**

T.Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Electric Vehicle Battery Systems (EEMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.
4) Assume suitable data if required.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) Which of the following is a key component of a BMS?
a) Cooling fan
b) Voltage, current, and temperature sensors
c) Fuel pump
d) Gearbox

2) The main function of a TMS in an EV battery pack is to _____.
a) Reduce battery voltage
b) Maintain optimal operating temperature
c) Increase battery size
d) Generate electricity

3) Which of the following is a risk of mechanical damage to EV batteries?
a) Improved energy efficiency
b) Increased capacity
c) Loss of structural integrity and short circuits
d) Lower weight

4) Durability testing of EV batteries typically includes _____.
a) Cycle life testing, thermal cycling, and vibration tests
b) Only visual inspection
c) Ignoring environmental conditions
d) Only cost analysis

5) A key environmental benefit of electric vehicles is _____.
a) Increased fuel consumption b) Zero tailpipe emissions
c) Higher noise levels d) Use of fossil fuels

6) One major challenge limiting widespread EV adoption is _____.
a) Excessive vehicle noise
b) Long refueling times
c) Limited driving range
d) High exhaust emissions

7) Which battery type is most commonly used in modern electric vehicles?
a) Lead-acid
b) Nickel-cadmium
c) Lithium-ion
d) Zinc-air

8) Many governments support EV adoption by offering _____.
a) Higher vehicle taxes
b) Fuel subsidies
c) Tax incentives and rebates
d) Import restrictions

9) In a battery, the anode is where _____.
a) Reduction occurs
b) Oxidation occurs
c) Electrons are absorbed
d) Energy is generated mechanically

10) The electrolyte in a battery _____.
a) Stores electrical energy permanently
b) Conducts ions between electrodes
c) Produces fuel for combustion
d) Absorbs heat from the environment

11) A major limitation of lead-acid batteries is _____.
a) High toxicity and heavy weight
b) Fast charging capability
c) Long cycle life
d) High energy density

12) Among lead-acid, NiMH, and Li-ion batteries, the one with the highest energy density is _____.
a) Lead-acid
b) NiMH
c) Li-ion
d) All are the same

13) Connecting battery cells in series results in _____.
a) Increased voltage, same capacity
b) Increased capacity, same voltage
c) Increased both voltage and capacity
d) Decreased voltage and capacity

14) A hybrid battery configuration combines _____.
a) Series and parallel connections
b) Only series connections
c) Only parallel connections
d) Lithium and lead-acid cells in one pack

Seat No.	

Set **R**

T.Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Electric Vehicle Battery Systems (EEMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt the following. (Any Four) **16**

a) Explain the different types of batteries used in electric vehicles.

b) Discuss the basic Principle of Battery Chemistry & explain the Key Materials used in Batteries.

c) Describe the characteristics, advantages, and limitations of lead-acid batteries.

d) Identify and explain the major challenges faced by electric vehicles in mass adoption.

e) Explain how Key Performance Parameters Affected by electrochemistry.

Q.3 Attempt the following. (Any Two) **12**

a) Describe the industry outlook, government policies, and technological advancements for electric vehicles.

b) Compare lead-acid, NiMH, and Li-ion batteries based on different battery chemistries?

c) Describe the characteristics, advantages, and limitations of Nickel-metal hydride (NiMH) batteries.

Section – II

Q.4 Attempt the following. (Any Four) **16**

a) Explain Battery system architecture by series battery configuration.

b) Discuss hazards & risks in EV battery systems.

c) Describe the reliability and durability of EV battery systems.

d) Explain the role of wiring and connectors in battery systems.

e) Describe the principles, materials, and applications of Sodium-ion batteries.

Q.5 Attempt the following. (Any Two) **12**

a) Describe the Battery management system in details.

b) Explain Testing and validation of EV battery systems.

c) Discuss modelling & performance testing of EV battery packs.

Seat No.	

Set **S**

T.Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Electric Vehicle Battery Systems (EEMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.
4) Assume suitable data if required.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) The electrolyte in a battery _____.
a) Stores electrical energy permanently
b) Conducts ions between electrodes
c) Produces fuel for combustion
d) Absorbs heat from the environment

2) A major limitation of lead-acid batteries is _____.
a) High toxicity and heavy weight
b) Fast charging capability
c) Long cycle life
d) High energy density

3) Among lead-acid, NiMH, and Li-ion batteries, the one with the highest energy density is _____.
a) Lead-acid b) NiMH
c) Li-ion d) All are the same

4) Connecting battery cells in series results in _____.
a) Increased voltage, same capacity
b) Increased capacity, same voltage
c) Increased both voltage and capacity
d) Decreased voltage and capacity

5) A hybrid battery configuration combines _____.
a) Series and parallel connections
b) Only series connections
c) Only parallel connections
d) Lithium and lead-acid cells in one pack

6) Which of the following is a key component of a BMS?
a) Cooling fan
b) Voltage, current, and temperature sensors
c) Fuel pump
d) Gearbox

7) The main function of a TMS in an EV battery pack is to _____.
a) Reduce battery voltage
b) Maintain optimal operating temperature
c) Increase battery size
d) Generate electricity

8) Which of the following is a risk of mechanical damage to EV batteries?
a) Improved energy efficiency
b) Increased capacity
c) Loss of structural integrity and short circuits
d) Lower weight

9) Durability testing of EV batteries typically includes _____.
a) Cycle life testing, thermal cycling, and vibration tests
b) Only visual inspection
c) Ignoring environmental conditions
d) Only cost analysis

10) A key environmental benefit of electric vehicles is _____.
a) Increased fuel consumption
b) Zero tailpipe emissions
c) Higher noise levels
d) Use of fossil fuels

11) One major challenge limiting widespread EV adoption is _____.
a) Excessive vehicle noise
b) Long refueling times
c) Limited driving range
d) High exhaust emissions

12) Which battery type is most commonly used in modern electric vehicles?
a) Lead-acid
b) Nickel-cadmium
c) Lithium-ion
d) Zinc-air

13) Many governments support EV adoption by offering _____.
a) Higher vehicle taxes
b) Fuel subsidies
c) Tax incentives and rebates
d) Import restrictions

14) In a battery, the anode is where _____.
a) Reduction occurs
b) Oxidation occurs
c) Electrons are absorbed
d) Energy is generated mechanically

Seat No.	

Set **S**

T.Y. (B.Tech.) (Electrical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Electric Vehicle Battery Systems (EEMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt the following. (Any Four) **16**

a) Explain the different types of batteries used in electric vehicles.

b) Discuss the basic Principle of Battery Chemistry & explain the Key Materials used in Batteries.

c) Describe the characteristics, advantages, and limitations of lead-acid batteries.

d) Identify and explain the major challenges faced by electric vehicles in mass adoption.

e) Explain how Key Performance Parameters Affected by electrochemistry.

Q.3 Attempt the following. (Any Two) **12**

a) Describe the industry outlook, government policies, and technological advancements for electric vehicles.

b) Compare lead-acid, NiMH, and Li-ion batteries based on different battery chemistries?

c) Describe the characteristics, advantages, and limitations of Nickel-metal hydride (NiMH) batteries.

Section – II

Q.4 Attempt the following. (Any Four) **16**

a) Explain Battery system architecture by series battery configuration.

b) Discuss hazards & risks in EV battery systems.

c) Describe the reliability and durability of EV battery systems.

d) Explain the role of wiring and connectors in battery systems.

e) Describe the principles, materials, and applications of Sodium-ion batteries.

Q.5 Attempt the following. (Any Two) **12**

a) Describe the Battery management system in details.

b) Explain Testing and validation of EV battery systems.

c) Discuss modelling & performance testing of EV battery packs.

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Seat No.	

Set P

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Electric Vehicle Battery Systems (EEMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.
4) Assume suitable data if required.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) A key environmental benefit of electric vehicles is _____.
a) Increased fuel consumption b) Zero tailpipe emissions
c) Higher noise levels d) Use of fossil fuels

2) One major challenge limiting widespread EV adoption is _____.
a) Excessive vehicle noise b) Long refueling times
c) Limited driving range d) High exhaust emissions

3) Which battery type is most commonly used in modern electric vehicles?
a) Lead-acid b) Nickel-cadmium
c) Lithium-ion d) Zinc-air

4) Many governments support EV adoption by offering _____.
a) Higher vehicle taxes b) Fuel subsidies
c) Tax incentives and rebates d) Import restrictions

5) In a battery, the anode is where _____.
a) Reduction occurs
b) Oxidation occurs
c) Electrons are absorbed
d) Energy is generated mechanically

6) The electrolyte in a battery _____.
a) Stores electrical energy permanently
b) Conducts ions between electrodes
c) Produces fuel for combustion
d) Absorbs heat from the environment

7) A major limitation of lead-acid batteries is _____.
   a) High toxicity and heavy weight
   b) Fast charging capability
   c) Long cycle life
   d) High energy density

8) Among lead-acid, NiMH, and Li-ion batteries, the one with the highest energy density is _____.
   a) Lead-acid
   b) NiMH
   c) Li-ion
   d) All are the same

9) Connecting battery cells in series results in _____.
   a) Increased voltage, same capacity
   b) Increased capacity, same voltage
   c) Increased both voltage and capacity
   d) Decreased voltage and capacity

10) A hybrid battery configuration combines _____.
   a) Series and parallel connections
   b) Only series connections
   c) Only parallel connections
   d) Lithium and lead-acid cells in one pack

11) Which of the following is a key component of a BMS?
   a) Cooling fan
   b) Voltage, current, and temperature sensors
   c) Fuel pump
   d) Gearbox

12) The main function of a TMS in an EV battery pack is to _____.
   a) Reduce battery voltage
   b) Maintain optimal operating temperature
   c) Increase battery size
   d) Generate electricity

13) Which of the following is a risk of mechanical damage to EV batteries?
   a) Improved energy efficiency
   b) Increased capacity
   c) Loss of structural integrity and short circuits
   d) Lower weight

14) Durability testing of EV batteries typically includes _____.
   a) Cycle life testing, thermal cycling, and vibration tests
   b) Only visual inspection
   c) Ignoring environmental conditions
   d) Only cost analysis

Seat No.	

Set **P**

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Electric Vehicle Battery Systems (EEMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt the following. (Any Four) **16**

a) Explain the different types of batteries used in electric vehicles.

b) Discuss the basic Principle of Battery Chemistry & explain the Key Materials used in Batteries.

c) Describe the characteristics, advantages, and limitations of lead-acid batteries.

d) Identify and explain the major challenges faced by electric vehicles in mass adoption.

e) Explain how Key Performance Parameters Affected by electrochemistry.

Q.3 Attempt the following. (Any Two) **12**

a) Describe the industry outlook, government policies, and technological advancements for electric vehicles.

b) Compare lead-acid, NiMH, and Li-ion batteries based on different battery chemistries?

c) Describe the characteristics, advantages, and limitations of Nickel-metal hydride (NiMH) batteries.

Section – II

Q.4 Attempt the following. (Any Four) **16**

a) Explain Battery system architecture by series battery configuration.

b) Discuss hazards & risks in EV battery systems.

c) Describe the reliability and durability of EV battery systems.

d) Explain the role of wiring and connectors in battery systems.

e) Describe the principles, materials, and applications of Sodium-ion batteries.

Q.5 Attempt the following. (Any Two) **12**

a) Describe the Battery management system in details.

b) Explain Testing and validation of EV battery systems.

c) Discuss modelling & performance testing of EV battery packs.

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Electric Vehicle Battery Systems (EEMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.
4) Assume suitable data if required.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) Among lead-acid, NiMH, and Li-ion batteries, the one with the highest energy density is _____.
a) Lead-acid b) NiMH
c) Li-ion d) All are the same

2) Connecting battery cells in series results in _____.
a) Increased voltage, same capacity
b) Increased capacity, same voltage
c) Increased both voltage and capacity
d) Decreased voltage and capacity

3) A hybrid battery configuration combines _____.
a) Series and parallel connections
b) Only series connections
c) Only parallel connections
d) Lithium and lead-acid cells in one pack

4) Which of the following is a key component of a BMS?
a) Cooling fan
b) Voltage, current, and temperature sensors
c) Fuel pump
d) Gearbox

5) The main function of a TMS in an EV battery pack is to _____.
a) Reduce battery voltage
b) Maintain optimal operating temperature
c) Increase battery size
d) Generate electricity

6) Which of the following is a risk of mechanical damage to EV batteries?
a) Improved energy efficiency
b) Increased capacity
c) Loss of structural integrity and short circuits
d) Lower weight

7) Durability testing of EV batteries typically includes _____.
a) Cycle life testing, thermal cycling, and vibration tests
b) Only visual inspection
c) Ignoring environmental conditions
d) Only cost analysis

8) A key environmental benefit of electric vehicles is _____.
a) Increased fuel consumption
b) Zero tailpipe emissions
c) Higher noise levels
d) Use of fossil fuels

9) One major challenge limiting widespread EV adoption is _____.
a) Excessive vehicle noise
b) Long refueling times
c) Limited driving range
d) High exhaust emissions

10) Which battery type is most commonly used in modern electric vehicles?
a) Lead-acid
b) Nickel-cadmium
c) Lithium-ion
d) Zinc-air

11) Many governments support EV adoption by offering _____.
a) Higher vehicle taxes
b) Fuel subsidies
c) Tax incentives and rebates
d) Import restrictions

12) In a battery, the anode is where _____.
a) Reduction occurs
b) Oxidation occurs
c) Electrons are absorbed
d) Energy is generated mechanically

13) The electrolyte in a battery _____.
a) Stores electrical energy permanently
b) Conducts ions between electrodes
c) Produces fuel for combustion
d) Absorbs heat from the environment

14) A major limitation of lead-acid batteries is _____.
a) High toxicity and heavy weight
b) Fast charging capability
c) Long cycle life
d) High energy density

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Electric Vehicle Battery Systems (EEMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt the following. (Any Four) **16**

a) Explain the different types of batteries used in electric vehicles.

b) Discuss the basic Principle of Battery Chemistry & explain the Key Materials used in Batteries.

c) Describe the characteristics, advantages, and limitations of lead-acid batteries.

d) Identify and explain the major challenges faced by electric vehicles in mass adoption.

e) Explain how Key Performance Parameters Affected by electrochemistry.

Q.3 Attempt the following. (Any Two) **12**

a) Describe the industry outlook, government policies, and technological advancements for electric vehicles.

b) Compare lead-acid, NiMH, and Li-ion batteries based on different battery chemistries?

c) Describe the characteristics, advantages, and limitations of Nickel-metal hydride (NiMH) batteries.

Section – II

Q.4 Attempt the following. (Any Four) **16**

a) Explain Battery system architecture by series battery configuration.

b) Discuss hazards & risks in EV battery systems.

c) Describe the reliability and durability of EV battery systems.

d) Explain the role of wiring and connectors in battery systems.

e) Describe the principles, materials, and applications of Sodium-ion batteries.

Q.5 Attempt the following. (Any Two) **12**

a) Describe the Battery management system in details.

b) Explain Testing and validation of EV battery systems.

c) Discuss modelling & performance testing of EV battery packs.

Seat No.	

Set **R**

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Electric Vehicle Battery Systems (EEMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.
4) Assume suitable data if required.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) Which of the following is a key component of a BMS?
a) Cooling fan
b) Voltage, current, and temperature sensors
c) Fuel pump
d) Gearbox

2) The main function of a TMS in an EV battery pack is to _____.
a) Reduce battery voltage
b) Maintain optimal operating temperature
c) Increase battery size
d) Generate electricity

3) Which of the following is a risk of mechanical damage to EV batteries?
a) Improved energy efficiency
b) Increased capacity
c) Loss of structural integrity and short circuits
d) Lower weight

4) Durability testing of EV batteries typically includes _____.
a) Cycle life testing, thermal cycling, and vibration tests
b) Only visual inspection
c) Ignoring environmental conditions
d) Only cost analysis

5) A key environmental benefit of electric vehicles is _____.
a) Increased fuel consumption b) Zero tailpipe emissions
c) Higher noise levels d) Use of fossil fuels

6) One major challenge limiting widespread EV adoption is _____.
a) Excessive vehicle noise
b) Long refueling times
c) Limited driving range
d) High exhaust emissions

7) Which battery type is most commonly used in modern electric vehicles?
a) Lead-acid
b) Nickel-cadmium
c) Lithium-ion
d) Zinc-air

8) Many governments support EV adoption by offering _____.
a) Higher vehicle taxes
b) Fuel subsidies
c) Tax incentives and rebates
d) Import restrictions

9) In a battery, the anode is where _____.
a) Reduction occurs
b) Oxidation occurs
c) Electrons are absorbed
d) Energy is generated mechanically

10) The electrolyte in a battery _____.
a) Stores electrical energy permanently
b) Conducts ions between electrodes
c) Produces fuel for combustion
d) Absorbs heat from the environment

11) A major limitation of lead-acid batteries is _____.
a) High toxicity and heavy weight
b) Fast charging capability
c) Long cycle life
d) High energy density

12) Among lead-acid, NiMH, and Li-ion batteries, the one with the highest energy density is _____.
a) Lead-acid
b) NiMH
c) Li-ion
d) All are the same

13) Connecting battery cells in series results in _____.
a) Increased voltage, same capacity
b) Increased capacity, same voltage
c) Increased both voltage and capacity
d) Decreased voltage and capacity

14) A hybrid battery configuration combines _____.
a) Series and parallel connections
b) Only series connections
c) Only parallel connections
d) Lithium and lead-acid cells in one pack

Seat No.	

Set **R**

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Electric Vehicle Battery Systems (EEMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt the following. (Any Four) **16**

a) Explain the different types of batteries used in electric vehicles.

b) Discuss the basic Principle of Battery Chemistry & explain the Key Materials used in Batteries.

c) Describe the characteristics, advantages, and limitations of lead-acid batteries.

d) Identify and explain the major challenges faced by electric vehicles in mass adoption.

e) Explain how Key Performance Parameters Affected by electrochemistry.

Q.3 Attempt the following. (Any Two) **12**

a) Describe the industry outlook, government policies, and technological advancements for electric vehicles.

b) Compare lead-acid, NiMH, and Li-ion batteries based on different battery chemistries?

c) Describe the characteristics, advantages, and limitations of Nickel-metal hydride (NiMH) batteries.

Section – II

Q.4 Attempt the following. (Any Four) **16**

a) Explain Battery system architecture by series battery configuration.

b) Discuss hazards & risks in EV battery systems.

c) Describe the reliability and durability of EV battery systems.

d) Explain the role of wiring and connectors in battery systems.

e) Describe the principles, materials, and applications of Sodium-ion batteries.

Q.5 Attempt the following. (Any Two) **12**

a) Describe the Battery management system in details.

b) Explain Testing and validation of EV battery systems.

c) Discuss modelling & performance testing of EV battery packs.

Seat No.	

Set **S**

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Electric Vehicle Battery Systems (EEMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.
4) Assume suitable data if required.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) The electrolyte in a battery _____.
a) Stores electrical energy permanently
b) Conducts ions between electrodes
c) Produces fuel for combustion
d) Absorbs heat from the environment

2) A major limitation of lead-acid batteries is _____.
a) High toxicity and heavy weight
b) Fast charging capability
c) Long cycle life
d) High energy density

3) Among lead-acid, NiMH, and Li-ion batteries, the one with the highest energy density is _____.
a) Lead-acid b) NiMH
c) Li-ion d) All are the same

4) Connecting battery cells in series results in _____.
a) Increased voltage, same capacity
b) Increased capacity, same voltage
c) Increased both voltage and capacity
d) Decreased voltage and capacity

5) A hybrid battery configuration combines _____.
a) Series and parallel connections
b) Only series connections
c) Only parallel connections
d) Lithium and lead-acid cells in one pack

6) Which of the following is a key component of a BMS?
a) Cooling fan
b) Voltage, current, and temperature sensors
c) Fuel pump
d) Gearbox

7) The main function of a TMS in an EV battery pack is to _____.
a) Reduce battery voltage
b) Maintain optimal operating temperature
c) Increase battery size
d) Generate electricity

8) Which of the following is a risk of mechanical damage to EV batteries?
a) Improved energy efficiency
b) Increased capacity
c) Loss of structural integrity and short circuits
d) Lower weight

9) Durability testing of EV batteries typically includes _____.
a) Cycle life testing, thermal cycling, and vibration tests
b) Only visual inspection
c) Ignoring environmental conditions
d) Only cost analysis

10) A key environmental benefit of electric vehicles is _____.
a) Increased fuel consumption
b) Zero tailpipe emissions
c) Higher noise levels
d) Use of fossil fuels

11) One major challenge limiting widespread EV adoption is _____.
a) Excessive vehicle noise
b) Long refueling times
c) Limited driving range
d) High exhaust emissions

12) Which battery type is most commonly used in modern electric vehicles?
a) Lead-acid
b) Nickel-cadmium
c) Lithium-ion
d) Zinc-air

13) Many governments support EV adoption by offering _____.
a) Higher vehicle taxes
b) Fuel subsidies
c) Tax incentives and rebates
d) Import restrictions

14) In a battery, the anode is where _____.
a) Reduction occurs
b) Oxidation occurs
c) Electrons are absorbed
d) Energy is generated mechanically

Seat No.	

Set | S

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Electric Vehicle Battery Systems (EEMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt the following. (Any Four) **16**

a) Explain the different types of batteries used in electric vehicles.

b) Discuss the basic Principle of Battery Chemistry & explain the Key Materials used in Batteries.

c) Describe the characteristics, advantages, and limitations of lead-acid batteries.

d) Identify and explain the major challenges faced by electric vehicles in mass adoption.

e) Explain how Key Performance Parameters Affected by electrochemistry.

Q.3 Attempt the following. (Any Two) **12**

a) Describe the industry outlook, government policies, and technological advancements for electric vehicles.

b) Compare lead-acid, NiMH, and Li-ion batteries based on different battery chemistries?

c) Describe the characteristics, advantages, and limitations of Nickel-metal hydride (NiMH) batteries.

Section – II

Q.4 Attempt the following. (Any Four) **16**

a) Explain Battery system architecture by series battery configuration.

b) Discuss hazards & risks in EV battery systems.

c) Describe the reliability and durability of EV battery systems.

d) Explain the role of wiring and connectors in battery systems.

e) Describe the principles, materials, and applications of Sodium-ion batteries.

Q.5 Attempt the following. (Any Two) **12**

a) Describe the Battery management system in details.

b) Explain Testing and validation of EV battery systems.

c) Discuss modelling & performance testing of EV battery packs.

SLR-QH-654

Seat No.	

Set P

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Electric Vehicle Battery Systems (EEMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.
4) Assume suitable data if required.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) A key environmental benefit of electric vehicles is _____.
a) Increased fuel consumption b) Zero tailpipe emissions
c) Higher noise levels d) Use of fossil fuels

2) One major challenge limiting widespread EV adoption is _____.
a) Excessive vehicle noise b) Long refueling times
c) Limited driving range d) High exhaust emissions

3) Which battery type is most commonly used in modern electric vehicles?
a) Lead-acid b) Nickel-cadmium
c) Lithium-ion d) Zinc-air

4) Many governments support EV adoption by offering _____.
a) Higher vehicle taxes b) Fuel subsidies
c) Tax incentives and rebates d) Import restrictions

5) In a battery, the anode is where _____.
a) Reduction occurs
b) Oxidation occurs
c) Electrons are absorbed
d) Energy is generated mechanically

6) The electrolyte in a battery _____.
a) Stores electrical energy permanently
b) Conducts ions between electrodes
c) Produces fuel for combustion
d) Absorbs heat from the environment

7) A major limitation of lead-acid batteries is _____.
   a) High toxicity and heavy weight
   b) Fast charging capability
   c) Long cycle life
   d) High energy density

8) Among lead-acid, NiMH, and Li-ion batteries, the one with the highest energy density is _____.
   a) Lead-acid
   b) NiMH
   c) Li-ion
   d) All are the same

9) Connecting battery cells in series results in _____.
   a) Increased voltage, same capacity
   b) Increased capacity, same voltage
   c) Increased both voltage and capacity
   d) Decreased voltage and capacity

10) A hybrid battery configuration combines _____.
   a) Series and parallel connections
   b) Only series connections
   c) Only parallel connections
   d) Lithium and lead-acid cells in one pack

11) Which of the following is a key component of a BMS?
   a) Cooling fan
   b) Voltage, current, and temperature sensors
   c) Fuel pump
   d) Gearbox

12) The main function of a TMS in an EV battery pack is to _____.
   a) Reduce battery voltage
   b) Maintain optimal operating temperature
   c) Increase battery size
   d) Generate electricity

13) Which of the following is a risk of mechanical damage to EV batteries?
   a) Improved energy efficiency
   b) Increased capacity
   c) Loss of structural integrity and short circuits
   d) Lower weight

14) Durability testing of EV batteries typically includes _____.
   a) Cycle life testing, thermal cycling, and vibration tests
   b) Only visual inspection
   c) Ignoring environmental conditions
   d) Only cost analysis

Seat No.	

Set **P**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Electric Vehicle Battery Systems (EEMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt the following. (Any Four) **16**

a) Explain the different types of batteries used in electric vehicles.

b) Discuss the basic Principle of Battery Chemistry & explain the Key Materials used in Batteries.

c) Describe the characteristics, advantages, and limitations of lead-acid batteries.

d) Identify and explain the major challenges faced by electric vehicles in mass adoption.

e) Explain how Key Performance Parameters Affected by electrochemistry.

Q.3 Attempt the following. (Any Two) **12**

a) Describe the industry outlook, government policies, and technological advancements for electric vehicles.

b) Compare lead-acid, NiMH, and Li-ion batteries based on different battery chemistries?

c) Describe the characteristics, advantages, and limitations of Nickel-metal hydride (NiMH) batteries.

Section – II

Q.4 Attempt the following. (Any Four) **16**

a) Explain Battery system architecture by series battery configuration.

b) Discuss hazards & risks in EV battery systems.

c) Describe the reliability and durability of EV battery systems.

d) Explain the role of wiring and connectors in battery systems.

e) Describe the principles, materials, and applications of Sodium-ion batteries.

Q.5 Attempt the following. (Any Two) **12**

a) Describe the Battery management system in details.

b) Explain Testing and validation of EV battery systems.

c) Discuss modelling & performance testing of EV battery packs.

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Electric Vehicle Battery Systems (EEMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.
4) Assume suitable data if required.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) Among lead-acid, NiMH, and Li-ion batteries, the one with the highest energy density is _____.
a) Lead-acid b) NiMH
c) Li-ion d) All are the same

2) Connecting battery cells in series results in _____.
a) Increased voltage, same capacity
b) Increased capacity, same voltage
c) Increased both voltage and capacity
d) Decreased voltage and capacity

3) A hybrid battery configuration combines _____.
a) Series and parallel connections
b) Only series connections
c) Only parallel connections
d) Lithium and lead-acid cells in one pack

4) Which of the following is a key component of a BMS?
a) Cooling fan
b) Voltage, current, and temperature sensors
c) Fuel pump
d) Gearbox

5) The main function of a TMS in an EV battery pack is to _____.
a) Reduce battery voltage
b) Maintain optimal operating temperature
c) Increase battery size
d) Generate electricity

6) Which of the following is a risk of mechanical damage to EV batteries?
a) Improved energy efficiency
b) Increased capacity
c) Loss of structural integrity and short circuits
d) Lower weight

7) Durability testing of EV batteries typically includes _____.
a) Cycle life testing, thermal cycling, and vibration tests
b) Only visual inspection
c) Ignoring environmental conditions
d) Only cost analysis

8) A key environmental benefit of electric vehicles is _____.
a) Increased fuel consumption
b) Zero tailpipe emissions
c) Higher noise levels
d) Use of fossil fuels

9) One major challenge limiting widespread EV adoption is _____.
a) Excessive vehicle noise
b) Long refueling times
c) Limited driving range
d) High exhaust emissions

10) Which battery type is most commonly used in modern electric vehicles?
a) Lead-acid
b) Nickel-cadmium
c) Lithium-ion
d) Zinc-air

11) Many governments support EV adoption by offering _____.
a) Higher vehicle taxes
b) Fuel subsidies
c) Tax incentives and rebates
d) Import restrictions

12) In a battery, the anode is where _____.
a) Reduction occurs
b) Oxidation occurs
c) Electrons are absorbed
d) Energy is generated mechanically

13) The electrolyte in a battery _____.
a) Stores electrical energy permanently
b) Conducts ions between electrodes
c) Produces fuel for combustion
d) Absorbs heat from the environment

14) A major limitation of lead-acid batteries is _____.
a) High toxicity and heavy weight
b) Fast charging capability
c) Long cycle life
d) High energy density

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Electric Vehicle Battery Systems (EEMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt the following. (Any Four) **16**

a) Explain the different types of batteries used in electric vehicles.

b) Discuss the basic Principle of Battery Chemistry & explain the Key Materials used in Batteries.

c) Describe the characteristics, advantages, and limitations of lead-acid batteries.

d) Identify and explain the major challenges faced by electric vehicles in mass adoption.

e) Explain how Key Performance Parameters Affected by electrochemistry.

Q.3 Attempt the following. (Any Two) **12**

a) Describe the industry outlook, government policies, and technological advancements for electric vehicles.

b) Compare lead-acid, NiMH, and Li-ion batteries based on different battery chemistries?

c) Describe the characteristics, advantages, and limitations of Nickel-metal hydride (NiMH) batteries.

Section – II

Q.4 Attempt the following. (Any Four) **16**

a) Explain Battery system architecture by series battery configuration.

b) Discuss hazards & risks in EV battery systems.

c) Describe the reliability and durability of EV battery systems.

d) Explain the role of wiring and connectors in battery systems.

e) Describe the principles, materials, and applications of Sodium-ion batteries.

Q.5 Attempt the following. (Any Two) **12**

a) Describe the Battery management system in details.

b) Explain Testing and validation of EV battery systems.

c) Discuss modelling & performance testing of EV battery packs.

Seat No.	

Set **R**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Electric Vehicle Battery Systems (EEMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.
4) Assume suitable data if required.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) Which of the following is a key component of a BMS?
a) Cooling fan
b) Voltage, current, and temperature sensors
c) Fuel pump
d) Gearbox

2) The main function of a TMS in an EV battery pack is to _____.
a) Reduce battery voltage
b) Maintain optimal operating temperature
c) Increase battery size
d) Generate electricity

3) Which of the following is a risk of mechanical damage to EV batteries?
a) Improved energy efficiency
b) Increased capacity
c) Loss of structural integrity and short circuits
d) Lower weight

4) Durability testing of EV batteries typically includes _____.
a) Cycle life testing, thermal cycling, and vibration tests
b) Only visual inspection
c) Ignoring environmental conditions
d) Only cost analysis

5) A key environmental benefit of electric vehicles is _____.
a) Increased fuel consumption b) Zero tailpipe emissions
c) Higher noise levels d) Use of fossil fuels

6) One major challenge limiting widespread EV adoption is _____.
a) Excessive vehicle noise
b) Long refueling times
c) Limited driving range
d) High exhaust emissions

7) Which battery type is most commonly used in modern electric vehicles?
a) Lead-acid
b) Nickel-cadmium
c) Lithium-ion
d) Zinc-air

8) Many governments support EV adoption by offering _____.
a) Higher vehicle taxes
b) Fuel subsidies
c) Tax incentives and rebates
d) Import restrictions

9) In a battery, the anode is where _____.
a) Reduction occurs
b) Oxidation occurs
c) Electrons are absorbed
d) Energy is generated mechanically

10) The electrolyte in a battery _____.
a) Stores electrical energy permanently
b) Conducts ions between electrodes
c) Produces fuel for combustion
d) Absorbs heat from the environment

11) A major limitation of lead-acid batteries is _____.
a) High toxicity and heavy weight
b) Fast charging capability
c) Long cycle life
d) High energy density

12) Among lead-acid, NiMH, and Li-ion batteries, the one with the highest energy density is _____.
a) Lead-acid
b) NiMH
c) Li-ion
d) All are the same

13) Connecting battery cells in series results in _____.
a) Increased voltage, same capacity
b) Increased capacity, same voltage
c) Increased both voltage and capacity
d) Decreased voltage and capacity

14) A hybrid battery configuration combines _____.
a) Series and parallel connections
b) Only series connections
c) Only parallel connections
d) Lithium and lead-acid cells in one pack

Seat No.	

Set **R**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Electric Vehicle Battery Systems (EEMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt the following. (Any Four) **16**

a) Explain the different types of batteries used in electric vehicles.

b) Discuss the basic Principle of Battery Chemistry & explain the Key Materials used in Batteries.

c) Describe the characteristics, advantages, and limitations of lead-acid batteries.

d) Identify and explain the major challenges faced by electric vehicles in mass adoption.

e) Explain how Key Performance Parameters Affected by electrochemistry.

Q.3 Attempt the following. (Any Two) **12**

a) Describe the industry outlook, government policies, and technological advancements for electric vehicles.

b) Compare lead-acid, NiMH, and Li-ion batteries based on different battery chemistries?

c) Describe the characteristics, advantages, and limitations of Nickel-metal hydride (NiMH) batteries.

Section – II

Q.4 Attempt the following. (Any Four) **16**

a) Explain Battery system architecture by series battery configuration.

b) Discuss hazards & risks in EV battery systems.

c) Describe the reliability and durability of EV battery systems.

d) Explain the role of wiring and connectors in battery systems.

e) Describe the principles, materials, and applications of Sodium-ion batteries.

Q.5 Attempt the following. (Any Two) **12**

a) Describe the Battery management system in details.

b) Explain Testing and validation of EV battery systems.

c) Discuss modelling & performance testing of EV battery packs.

Seat No.	

Set **S**

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Electric Vehicle Battery Systems (EEMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.
4) Assume suitable data if required.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. **14**

1) The electrolyte in a battery _____.
a) Stores electrical energy permanently
b) Conducts ions between electrodes
c) Produces fuel for combustion
d) Absorbs heat from the environment

2) A major limitation of lead-acid batteries is _____.
a) High toxicity and heavy weight
b) Fast charging capability
c) Long cycle life
d) High energy density

3) Among lead-acid, NiMH, and Li-ion batteries, the one with the highest energy density is _____.
a) Lead-acid b) NiMH
c) Li-ion d) All are the same

4) Connecting battery cells in series results in _____.
a) Increased voltage, same capacity
b) Increased capacity, same voltage
c) Increased both voltage and capacity
d) Decreased voltage and capacity

5) A hybrid battery configuration combines _____.
a) Series and parallel connections
b) Only series connections
c) Only parallel connections
d) Lithium and lead-acid cells in one pack

6) Which of the following is a key component of a BMS?
a) Cooling fan
b) Voltage, current, and temperature sensors
c) Fuel pump
d) Gearbox

7) The main function of a TMS in an EV battery pack is to _____.
a) Reduce battery voltage
b) Maintain optimal operating temperature
c) Increase battery size
d) Generate electricity

8) Which of the following is a risk of mechanical damage to EV batteries?
a) Improved energy efficiency
b) Increased capacity
c) Loss of structural integrity and short circuits
d) Lower weight

9) Durability testing of EV batteries typically includes _____.
a) Cycle life testing, thermal cycling, and vibration tests
b) Only visual inspection
c) Ignoring environmental conditions
d) Only cost analysis

10) A key environmental benefit of electric vehicles is _____.
a) Increased fuel consumption
b) Zero tailpipe emissions
c) Higher noise levels
d) Use of fossil fuels

11) One major challenge limiting widespread EV adoption is _____.
a) Excessive vehicle noise
b) Long refueling times
c) Limited driving range
d) High exhaust emissions

12) Which battery type is most commonly used in modern electric vehicles?
a) Lead-acid
b) Nickel-cadmium
c) Lithium-ion
d) Zinc-air

13) Many governments support EV adoption by offering _____.
a) Higher vehicle taxes
b) Fuel subsidies
c) Tax incentives and rebates
d) Import restrictions

14) In a battery, the anode is where _____.
a) Reduction occurs
b) Oxidation occurs
c) Electrons are absorbed
d) Energy is generated mechanically

Seat No.	

Set | S

T.Y. (B.Tech.) (Mechanical Engineering) (Semester - II) (New) (CBCS) Examination: March/April – 2026
Electric Vehicle Battery Systems (EEMDM-04B)

Day & Date: Saturday, 30-05-2026 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt the following. (Any Four) **16**

a) Explain the different types of batteries used in electric vehicles.

b) Discuss the basic Principle of Battery Chemistry & explain the Key Materials used in Batteries.

c) Describe the characteristics, advantages, and limitations of lead-acid batteries.

d) Identify and explain the major challenges faced by electric vehicles in mass adoption.

e) Explain how Key Performance Parameters Affected by electrochemistry.

Q.3 Attempt the following. (Any Two) **12**

a) Describe the industry outlook, government policies, and technological advancements for electric vehicles.

b) Compare lead-acid, NiMH, and Li-ion batteries based on different battery chemistries?

c) Describe the characteristics, advantages, and limitations of Nickel-metal hydride (NiMH) batteries.

Section – II

Q.4 Attempt the following. (Any Four) **16**

a) Explain Battery system architecture by series battery configuration.

b) Discuss hazards & risks in EV battery systems.

c) Describe the reliability and durability of EV battery systems.

d) Explain the role of wiring and connectors in battery systems.

e) Describe the principles, materials, and applications of Sodium-ion batteries.

Q.5 Attempt the following. (Any Two) **12**

a) Describe the Battery management system in details.

b) Explain Testing and validation of EV battery systems.

c) Discuss modelling & performance testing of EV battery packs.

SLR-QH-655

Seat No.	

Set P

T.Y. (B.Tech.) (Electronics &Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026 Honors in Applications of IT and Control Engineering in Railway (ENTHON-03)

Day & Date: Thursday, 14-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) In the railway, the yellow light indicates _____.
a) Stop b) Proceed
c) Proceed cautiously d) Proceed at high speed

2) Which of the following is the most important strategic reason for the construction of a new railway line?
a) For creating jobs
b) Because of absence of a railway line
c) To increase tourists
d) To make movement of defense forces easier in case of emergency

3) Which of the following is not the feature of a modern control system?
a) Correct power level b) No oscillation
c) Quick response d) Accuracy

4) IT tools and business systems in IR are _____.
a) Mobile Ticketing b) Web Ticketing
c) Kiosk-based Ticketing d) All of above

5) Which of following is NOT the function of Event loggers?
a) train speed, time, distance record
b) direction of motion
c) brake applications and operations
d) Display of Data

6) What is the characteristic of a good control system?
   a) Insensitive to the parameter variation but sensitive to the input commands
   b) Neither sensitive to parameter variations nor sensitive to input commands
   c) Insensitive to the input command
   d) Sensitive to parameter variation

7) The safety in Railway in India is looked after by _____.
   a) Ministry of Railways
   b) Commission of Railway Safety
   c) Railway Board
   d) Headquarter Office

8) In a stable control system backlash can cause which of the following?
   a) Overdamping
   b) Low-level oscillations
   c) Underdamping
   d) Poor stability at reduced values of open loop gain

9) Which channel or mode of communication is used in Railway traffic?
   a) OFC
   b) Wired
   c) Wireless
   d) Public Address System

10) IoT in railways implies establishing connections between sensors that are present _____.
   a) In trains
   b) At tracks
   c) Platforms
   d) All of the Above

11) In a temperature control system, what conversion in signal takes place?
   a) Error to Digital
   b) Error to Analog
   c) Digital to Analog
   d) Analog to Digital

12) The output of the feedback control system must be a function of _____.
   a) Output and feedback signal
   b) Input and feedback signal
   c) Reference input
   d) Reference

13) What should be the nature of bandwidth for a good control system?
   a) Small
   b) Medium
   c) Large
   d) All of the mentioned

14) In a control system the output of the controller is given to _____.
   a) Amplifier
   b) Sensor
   c) Final control element
   d) Comparator

SLR-QH-655

Seat No.	

Set P

T.Y. (B.Tech.) (Electronics &Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Honors in Applications of IT and Control Engineering in Railway (ENTHON-03)

Day & Date: Thursday, 14-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt. (Any Four) **16**

a) What is FOIS? Explain.

b) Differentiate between PRS and UTS in terms of scope and functionality.

c) What are the Basic requirements of UTS Network.

d) Give the benefits of Freight Operations Information System.

e) How does PRS ensure passenger convenience and ticket availability across the country?

Q.3 Attempt. (Any Two) **12**

a) Explain. Write a note on Public Address System.

b) Give Details Explain Introduction of IOT in Indian Railways.

c) What are Data Loggers and Event Loggers?

SECTION – II

Q.4 Attempt. (Any Four) **16**

a) Give difference between closed loop and open loop control system.

b) What is Linear control system and Non-linear control system? Explain.

c) What are Sensors? Give types of sensors used in railway.

d) Explain Liquid level control system.

e) Give the transfer function of a closed-loop system with proper equation.

Q.5 Attempt. (Any Two) **12**

a) Compare Microprocessors and Micro-controllers.

b) Write note on Telephones Used in Control Working in railways.

c) What is Train Protection & Warning System? Explain.

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Electronics &Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026 Honors in Applications of IT and Control Engineering in Railway (ENTHON-03)

Day & Date: Thursday, 14-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) In a stable control system backlash can cause which of the following?
a) Overdamping
b) Low-level oscillations
c) Underdamping
d) Poor stability at reduced values of open loop gain

2) Which channel or mode of communication is used in Railway traffic?
a) OFC b) Wired
c) Wireless d) Public Address System

3) IoT in railways implies establishing connections between sensors that are present _____.
a) In trains b) At tracks
c) Platforms d) All of the Above

4) In a temperature control system, what conversion in signal takes place?
a) Error to Digital b) Error to Analog
c) Digital to Analog d) Analog to Digital

5) The output of the feedback control system must be a function of _____.
a) Output and feedback signal b) Input and feedback signal
c) Reference input d) Reference

6) What should be the nature of bandwidth for a good control system?
a) Small b) Medium
c) Large d) All of the mentioned

7) In a control system the output of the controller is given to _____.
   a) Amplifier
   b) Sensor
   c) Final control element
   d) Comparator

8) In the railway, the yellow light indicates _____.
   a) Stop
   b) Proceed
   c) Proceed cautiously
   d) Proceed at high speed

9) Which of the following is the most important strategic reason for the construction of a new railway line?
   a) For creating jobs
   b) Because of absence of a railway line
   c) To increase tourists
   d) To make movement of defense forces easier in case of emergency

10) Which of the following is not the feature of a modern control system?
   a) Correct power level
   b) No oscillation
   c) Quick response
   d) Accuracy

11) IT tools and business systems in IR are _____.
   a) Mobile Ticketing
   b) Web Ticketing
   c) Kiosk-based Ticketing
   d) All of above

12) Which of following is NOT the function of Event loggers?
   a) train speed, time, distance record
   b) direction of motion
   c) brake applications and operations
   d) Display of Data

13) What is the characteristic of a good control system?
   a) Insensitive to the parameter variation but sensitive to the input commands
   b) Neither sensitive to parameter variations nor sensitive to input commands
   c) Insensitive to the input command
   d) Sensitive to parameter variation

14) The safety in Railway in India is looked after by _____.
   a) Ministry of Railways
   b) Commission of Railway Safety
   c) Railway Board
   d) Headquarter Office

SLR-QH-655

Seat No.	

Set Q

T.Y. (B.Tech.) (Electronics &Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Honors in Applications of IT and Control Engineering in Railway (ENTHON-03)

Day & Date: Thursday, 14-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt. (Any Four) **16**

a) What is FOIS? Explain.

b) Differentiate between PRS and UTS in terms of scope and functionality.

c) What are the Basic requirements of UTS Network.

d) Give the benefits of Freight Operations Information System.

e) How does PRS ensure passenger convenience and ticket availability across the country?

Q.3 Attempt. (Any Two) **12**

a) Explain. Write a note on Public Address System.

b) Give Details Explain Introduction of IOT in Indian Railways.

c) What are Data Loggers and Event Loggers?

SECTION – II

Q.4 Attempt. (Any Four) **16**

a) Give difference between closed loop and open loop control system.

b) What is Linear control system and Non-linear control system? Explain.

c) What are Sensors? Give types of sensors used in railway.

d) Explain Liquid level control system.

e) Give the transfer function of a closed-loop system with proper equation.

Q.5 Attempt. (Any Two) **12**

a) Compare Microprocessors and Micro-controllers.

b) Write note on Telephones Used in Control Working in railways.

c) What is Train Protection & Warning System? Explain.

SLR-QH-655

Seat No.	

Set R

T.Y. (B.Tech.) (Electronics &Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Honors in Applications of IT and Control Engineering in Railway (ENTHON-03)

Day & Date: Thursday, 14-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) In a temperature control system, what conversion in signal takes place?
a) Error to Digital b) Error to Analog
c) Digital to Analog d) Analog to Digital

2) The output of the feedback control system must be a function of _____.
a) Output and feedback signal b) Input and feedback signal
c) Reference input d) Reference

3) What should be the nature of bandwidth for a good control system?
a) Small b) Medium
c) Large d) All of the mentioned

4) In a control system the output of the controller is given to _____.
a) Amplifier b) Sensor
c) Final control element d) Comparator

5) In the railway, the yellow light indicates _____.
a) Stop b) Proceed
c) Proceed cautiously d) Proceed at high speed

6) Which of the following is the most important strategic reason for the construction of a new railway line?
a) For creating jobs
b) Because of absence of a railway line
c) To increase tourists
d) To make movement of defense forces easier in case of emergency

7) Which of the following is not the feature of a modern control system?
a) Correct power level
b) No oscillation
c) Quick response
d) Accuracy

8) IT tools and business systems in IR are _____.
a) Mobile Ticketing
b) Web Ticketing
c) Kiosk-based Ticketing
d) All of above

9) Which of following is NOT the function of Event loggers?
a) train speed, time, distance record
b) direction of motion
c) brake applications and operations
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10) What is the characteristic of a good control system?
a) Insensitive to the parameter variation but sensitive to the input commands
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11) The safety in Railway in India is looked after by _____.
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c) Railway Board
d) Headquarter Office

12) In a stable control system backlash can cause which of the following?
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b) Low-level oscillations
c) Underdamping
d) Poor stability at reduced values of open loop gain

13) Which channel or mode of communication is used in Railway traffic?
a) OFC
b) Wired
c) Wireless
d) Public Address System

14) IoT in railways implies establishing connections between sensors that are present _____.
a) In trains
b) At tracks
c) Platforms
d) All of the Above

SLR-QH-655

Seat No.	

Set R

T.Y. (B.Tech.) (Electronics &Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026
Honors in Applications of IT and Control Engineering in Railway (ENTHON-03)

Day & Date: Thursday, 14-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt. (Any Four) **16**

a) What is FOIS? Explain.

b) Differentiate between PRS and UTS in terms of scope and functionality.

c) What are the Basic requirements of UTS Network.

d) Give the benefits of Freight Operations Information System.

e) How does PRS ensure passenger convenience and ticket availability across the country?

Q.3 Attempt. (Any Two) **12**

a) Explain. Write a note on Public Address System.

b) Give Details Explain Introduction of IOT in Indian Railways.

c) What are Data Loggers and Event Loggers?

SECTION – II

Q.4 Attempt. (Any Four) **16**

a) Give difference between closed loop and open loop control system.

b) What is Linear control system and Non-linear control system? Explain.

c) What are Sensors? Give types of sensors used in railway.

d) Explain Liquid level control system.

e) Give the transfer function of a closed-loop system with proper equation.

Q.5 Attempt. (Any Two) **12**

a) Compare Microprocessors and Micro-controllers.

b) Write note on Telephones Used in Control Working in railways.

c) What is Train Protection & Warning System? Explain.

SLR-QH-655

Seat No.	

Set S

T.Y. (B.Tech.) (Electronics &Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026 Honors in Applications of IT and Control Engineering in Railway (ENTHON-03)

Day & Date: Thursday, 14-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) What is the characteristic of a good control system?
a) Insensitive to the parameter variation but sensitive to the input commands
b) Neither sensitive to parameter variations nor sensitive to input commands
c) Insensitive to the input command
d) Sensitive to parameter variation

2) The safety in Railway in India is looked after by _____.
a) Ministry of Railways b) Commission of Railway Safety
c) Railway Board d) Headquarter Office

3) In a stable control system backlash can cause which of the following?
a) Overdamping
b) Low-level oscillations
c) Underdamping
d) Poor stability at reduced values of open loop gain

4) Which channel or mode of communication is used in Railway traffic?
a) OFC b) Wired
c) Wireless d) Public Address System

5) IoT in railways implies establishing connections between sensors that are present _____.
a) In trains b) At tracks
c) Platforms d) All of the Above

6) In a temperature control system, what conversion in signal takes place?
a) Error to Digital
b) Error to Analog
c) Digital to Analog
d) Analog to Digital

7) The output of the feedback control system must be a function of _____.
a) Output and feedback signal
b) Input and feedback signal
c) Reference input
d) Reference

8) What should be the nature of bandwidth for a good control system?
a) Small
b) Medium
c) Large
d) All of the mentioned

9) In a control system the output of the controller is given to _____.
a) Amplifier
b) Sensor
c) Final control element
d) Comparator

10) In the railway, the yellow light indicates _____.
a) Stop
b) Proceed
c) Proceed cautiously
d) Proceed at high speed

11) Which of the following is the most important strategic reason for the construction of a new railway line?
a) For creating jobs
b) Because of absence of a railway line
c) To increase tourists
d) To make movement of defense forces easier in case of emergency

12) Which of the following is not the feature of a modern control system?
a) Correct power level
b) No oscillation
c) Quick response
d) Accuracy

13) IT tools and business systems in IR are _____.
a) Mobile Ticketing
b) Web Ticketing
c) Kiosk-based Ticketing
d) All of above

14) Which of following is NOT the function of Event loggers?
a) train speed, time, distance record
b) direction of motion
c) brake applications and operations
d) Display of Data

SLR-QH-655

Seat No.	

Set S

T.Y. (B.Tech.) (Electronics &Telecommunication Engineering) (Semester - I) (New) (CBCS) Examination: March/April - 2026 Honors in Applications of IT and Control Engineering in Railway (ENTHON-03)

Day & Date: Thursday, 14-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Attempt. (Any Four) **16**

a) What is FOIS? Explain.

b) Differentiate between PRS and UTS in terms of scope and functionality.

c) What are the Basic requirements of UTS Network.

d) Give the benefits of Freight Operations Information System.

e) How does PRS ensure passenger convenience and ticket availability across the country?

Q.3 Attempt. (Any Two) **12**

a) Explain. Write a note on Public Address System.

b) Give Details Explain Introduction of IOT in Indian Railways.

c) What are Data Loggers and Event Loggers?

SECTION – II

Q.4 Attempt. (Any Four) **16**

a) Give difference between closed loop and open loop control system.

b) What is Linear control system and Non-linear control system? Explain.

c) What are Sensors? Give types of sensors used in railway.

d) Explain Liquid level control system.

e) Give the transfer function of a closed-loop system with proper equation.

Q.5 Attempt. (Any Two) **12**

a) Compare Microprocessors and Micro-controllers.

b) Write note on Telephones Used in Control Working in railways.

c) What is Train Protection & Warning System? Explain.

SLR-QH-656

Seat No.	

Set P

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026
Honors in Railway Engineering
Advanced Communication and Modern Signaling in Railway (ENTHON-04D)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.
4) Assume suitable data if necessary and mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct option from the following. 14

1) FRMCS is intended to replace which existing railway communication system?
a) Wi-Fi b) GSM-R
c) ISDN d) Satellite Communication

2) FRMCS is primarily based on which technology?
a) 2G b) 3G
c) LTE / 5G d) WiMAX

3) The main objective of FRMCS is to provide _____.
a) Entertainment services
b) Voice-only communication
c) Integrated voice and data communication
d) Satellite navigation

4) Which satellite orbit provides lower latency for broadband services?
a) GEO b) MEO
c) LEO d) HEO

5) VoIP based TCCS primarily uses _____.
a) Circuit switching b) Packet switching
c) Manual switching d) Analog switching

6) The main advantage of IP-based VSS over analog CCTV is _____.
a) Lower video quality
b) No need of storage
c) Remote monitoring and scalability
d) Higher power consumption

7) A network PA system in railways mainly uses _____.
a) Analog amplifiers only
b) IP-based audio transmission
c) Satellite communication
d) GSM SMS alerts

8) IoT in railways mainly helps in _____.
a) Manual signaling
b) Predictive maintenance and monitoring
c) Reducing train speed
d) Increasing paperwork

9) UHF handheld radios are mainly used for _____.
a) Long-distance data transmission
b) Voice communication among staff
c) Video streaming
d) Train control

10) ATP stands for _____.
a) Automatic Traction Power
b) Advanced Train Processor
c) Automatic Train Protection
d) Automatic Track Position

11) Which signaling system is commonly associated with NextGen ATP?
a) Mechanical signaling
b) ETCS Level-2 / CBTC
c) Token block
d) Absolute block

12) ETCS Level-2 mainly uses which communication technology?
a) Optical fiber
b) GSM-R / LTE based radio communication
c) Satellite communication
d) Microwave link

13) LTE based communication in railways mainly provides _____.
a) Voice only
b) Data only
c) High speed data and voice communication
d) Telegraph communication

14) Intermediate Block Signaling is introduced to _____.
a) Increase train speed only
b) Increase line capacity
c) Reduce ticket price
d) Improve station building

Seat No.	

Set **P**

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026
Honors in Railway Engineering
Advanced Communication and Modern Signaling in Railway (ENTHON-04D)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt the following. (Any Four) **16**

a) Give Interlocking - Importance and Types

b) Explain LTE for Railways (LTE-R).

c) What is the importance of railway signaling?

d) What is Future Railway Mobile Communications System? Give details.

e) Write note on trains through two-way satellite communication.

Q.3 Attempt the following. (Any Two) **12**

a) Explain the IP based Video Surveillance System (VSS).

b) Give importance of IoT (Internet of Things) in Railways.

c) What is Networked PA System in Railways?

Section – II

Q.4 Attempt the following. (Any Four) **16**

a) What is VoIP based Train Control Communication System (TCCS)? Give details.

b) Give Safety Slogans for Signal Department.

c) Explain the role of the Signaling & Telecommunications Department.

d) What is UHF Digital (License free band radio) Handheld Trans-receivers? Explain.

e) Give Interlocking - Importance and Types.

Q.5 Attempt the following. (Any Two) **12**

a) Explain Technologies and processes to meet the challenges of signaling system maintenance.

b) What is Software based Embedded Systems for Railway Signaling Applications? Explain.

c) What is NextGen ATP for Automatic Train Operations?

SLR-QH-656

Seat No.	

Set Q

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026
Honors in Railway Engineering
Advanced Communication and Modern Signaling in Railway (ENTHON-04D)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.
4) Assume suitable data if necessary and mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct option from the following. **14**

1) IoT in railways mainly helps in _____.
a) Manual signaling
b) Predictive maintenance and monitoring
c) Reducing train speed
d) Increasing paperwork

2) UHF handheld radios are mainly used for _____.
a) Long-distance data transmission
b) Voice communication among staff
c) Video streaming
d) Train control

3) ATP stands for _____.
a) Automatic Traction Power
b) Advanced Train Processor
c) Automatic Train Protection
d) Automatic Track Position

4) Which signaling system is commonly associated with NextGen ATP?
a) Mechanical signaling
b) ETCS Level-2 / CBTC
c) Token block
d) Absolute block

5) ETCS Level-2 mainly uses which communication technology?
a) Optical fiber
b) GSM-R / LTE based radio communication
c) Satellite communication
d) Microwave link

6) LTE based communication in railways mainly provides _____.
a) Voice only
b) Data only
c) High speed data and voice communication
d) Telegraph communication

7) Intermediate Block Signaling is introduced to _____.
a) Increase train speed only
b) Increase line capacity
c) Reduce ticket price
d) Improve station building

8) FRMCS is intended to replace which existing railway communication system?
a) Wi-Fi
b) GSM-R
c) ISDN
d) Satellite Communication

9) FRMCS is primarily based on which technology?
a) 2G
b) 3G
c) LTE / 5G
d) WiMAX

10) The main objective of FRMCS is to provide _____.
a) Entertainment services
b) Voice-only communication
c) Integrated voice and data communication
d) Satellite navigation

11) Which satellite orbit provides lower latency for broadband services?
a) GEO
b) MEO
c) LEO
d) HEO

12) VoIP based TCCS primarily uses _____.
a) Circuit switching
b) Packet switching
c) Manual switching
d) Analog switching

13) The main advantage of IP-based VSS over analog CCTV is _____.
a) Lower video quality
b) No need of storage
c) Remote monitoring and scalability
d) Higher power consumption

14) A network PA system in railways mainly uses _____.
a) Analog amplifiers only
b) IP-based audio transmission
c) Satellite communication
d) GSM SMS alerts

Seat No.	

Set **Q**

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026
Honors in Railway Engineering
Advanced Communication and Modern Signaling in Railway (ENTHON-04D)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt the following. (Any Four) **16**

a) Give Interlocking - Importance and Types

b) Explain LTE for Railways (LTE-R).

c) What is the importance of railway signaling?

d) What is Future Railway Mobile Communications System? Give details.

e) Write note on trains through two-way satellite communication.

Q.3 Attempt the following. (Any Two) **12**

a) Explain the IP based Video Surveillance System (VSS).

b) Give importance of IoT (Internet of Things) in Railways.

c) What is Networked PA System in Railways?

Section – II

Q.4 Attempt the following. (Any Four) **16**

a) What is VoIP based Train Control Communication System (TCCS)? Give details.

b) Give Safety Slogans for Signal Department.

c) Explain the role of the Signaling & Telecommunications Department.

d) What is UHF Digital (License free band radio) Handheld Trans-receivers? Explain.

e) Give Interlocking - Importance and Types.

Q.5 Attempt the following. (Any Two) **12**

a) Explain Technologies and processes to meet the challenges of signaling system maintenance.

b) What is Software based Embedded Systems for Railway Signaling Applications? Explain.

c) What is NextGen ATP for Automatic Train Operations?

SLR-QH-656

Seat No.	

Set R

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026
Honors in Railway Engineering
Advanced Communication and Modern Signaling in Railway (ENTHON-04D)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.
4) Assume suitable data if necessary and mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct option from the following. 14

1) Which signaling system is commonly associated with NextGen ATP?
a) Mechanical signaling b) ETCS Level-2 / CBTC
c) Token block d) Absolute block

2) ETCS Level-2 mainly uses which communication technology?
a) Optical fiber
b) GSM-R / LTE based radio communication
c) Satellite communication
d) Microwave link

3) LTE based communication in railways mainly provides _____.
a) Voice only
b) Data only
c) High speed data and voice communication
d) Telegraph communication

4) Intermediate Block Signaling is introduced to _____.
a) Increase train speed only b) Increase line capacity
c) Reduce ticket price d) Improve station building

5) FRMCS is intended to replace which existing railway communication system?
a) Wi-Fi b) GSM-R
c) ISDN d) Satellite Communication

6) FRMCS is primarily based on which technology?
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7) The main objective of FRMCS is to provide _____.
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c) Integrated voice and data communication
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8) Which satellite orbit provides lower latency for broadband services?
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9) VoIP based TCCS primarily uses _____.
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10) The main advantage of IP-based VSS over analog CCTV is _____.
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b) No need of storage
c) Remote monitoring and scalability
d) Higher power consumption

11) A network PA system in railways mainly uses _____.
a) Analog amplifiers only b) IP-based audio transmission
c) Satellite communication d) GSM SMS alerts

12) IoT in railways mainly helps in _____.
a) Manual signaling
b) Predictive maintenance and monitoring
c) Reducing train speed
d) Increasing paperwork

13) UHF handheld radios are mainly used for _____.
a) Long-distance data transmission
b) Voice communication among staff
c) Video streaming
d) Train control

14) ATP stands for _____.
a) Automatic Traction Power b) Advanced Train Processor
c) Automatic Train Protection d) Automatic Track Position

Seat No.	

Set **R**

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026
Honors in Railway Engineering
Advanced Communication and Modern Signaling in Railway (ENTHON-04D)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt the following. (Any Four) **16**

a) Give Interlocking - Importance and Types

b) Explain LTE for Railways (LTE-R).

c) What is the importance of railway signaling?

d) What is Future Railway Mobile Communications System? Give details.

e) Write note on trains through two-way satellite communication.

Q.3 Attempt the following. (Any Two) **12**

a) Explain the IP based Video Surveillance System (VSS).

b) Give importance of IoT (Internet of Things) in Railways.

c) What is Networked PA System in Railways?

Section – II

Q.4 Attempt the following. (Any Four) **16**

a) What is VoIP based Train Control Communication System (TCCS)? Give details.

b) Give Safety Slogans for Signal Department.

c) Explain the role of the Signaling & Telecommunications Department.

d) What is UHF Digital (License free band radio) Handheld Trans-receivers? Explain.

e) Give Interlocking - Importance and Types.

Q.5 Attempt the following. (Any Two) **12**

a) Explain Technologies and processes to meet the challenges of signaling system maintenance.

b) What is Software based Embedded Systems for Railway Signaling Applications? Explain.

c) What is NextGen ATP for Automatic Train Operations?

SLR-QH-656

Seat No.	

Set S

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026
Honors in Railway Engineering
Advanced Communication and Modern Signaling in Railway (ENTHON-04D)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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3) Figures to the right indicate full marks.
4) Assume suitable data if necessary and mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct option from the following. 14

1) The main advantage of IP-based VSS over analog CCTV is _____.
a) Lower video quality
b) No need of storage
c) Remote monitoring and scalability
d) Higher power consumption

2) A network PA system in railways mainly uses _____.
a) Analog amplifiers only b) IP-based audio transmission
c) Satellite communication d) GSM SMS alerts

3) IoT in railways mainly helps in _____.
a) Manual signaling
b) Predictive maintenance and monitoring
c) Reducing train speed
d) Increasing paperwork

4) UHF handheld radios are mainly used for _____.
a) Long-distance data transmission
b) Voice communication among staff
c) Video streaming
d) Train control

5) ATP stands for _____.
a) Automatic Traction Power b) Advanced Train Processor
c) Automatic Train Protection d) Automatic Track Position

6) Which signaling system is commonly associated with NextGen ATP?
a) Mechanical signaling
b) ETCS Level-2 / CBTC
c) Token block
d) Absolute block

7) ETCS Level-2 mainly uses which communication technology?
a) Optical fiber
b) GSM-R / LTE based radio communication
c) Satellite communication
d) Microwave link

8) LTE based communication in railways mainly provides _____.
a) Voice only
b) Data only
c) High speed data and voice communication
d) Telegraph communication

9) Intermediate Block Signaling is introduced to _____.
a) Increase train speed only
b) Increase line capacity
c) Reduce ticket price
d) Improve station building

10) FRMCS is intended to replace which existing railway communication system?
a) Wi-Fi
b) GSM-R
c) ISDN
d) Satellite Communication

11) FRMCS is primarily based on which technology?
a) 2G
b) 3G
c) LTE / 5G
d) WiMAX

12) The main objective of FRMCS is to provide _____.
a) Entertainment services
b) Voice-only communication
c) Integrated voice and data communication
d) Satellite navigation

13) Which satellite orbit provides lower latency for broadband services?
a) GEO
b) MEO
c) LEO
d) HEO

14) VoIP based TCCS primarily uses _____.
a) Circuit switching
b) Packet switching
c) Manual switching
d) Analog switching

Seat No.	

Set **S**

T.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Semester - II) (New) (CBCS) Examination: March/April - 2026
Honors in Railway Engineering
Advanced Communication and Modern Signaling in Railway (ENTHON-04D)

Day & Date: Wednesday, 27-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt the following. (Any Four) **16**

a) Give Interlocking - Importance and Types

b) Explain LTE for Railways (LTE-R).

c) What is the importance of railway signaling?

d) What is Future Railway Mobile Communications System? Give details.

e) Write note on trains through two-way satellite communication.

Q.3 Attempt the following. (Any Two) **12**

a) Explain the IP based Video Surveillance System (VSS).

b) Give importance of IoT (Internet of Things) in Railways.

c) What is Networked PA System in Railways?

Section – II

Q.4 Attempt the following. (Any Four) **16**

a) What is VoIP based Train Control Communication System (TCCS)? Give details.

b) Give Safety Slogans for Signal Department.

c) Explain the role of the Signaling & Telecommunications Department.

d) What is UHF Digital (License free band radio) Handheld Trans-receivers? Explain.

e) Give Interlocking - Importance and Types.

Q.5 Attempt the following. (Any Two) **12**

a) Explain Technologies and processes to meet the challenges of signaling system maintenance.

b) What is Software based Embedded Systems for Railway Signaling Applications? Explain.

c) What is NextGen ATP for Automatic Train Operations?

SLR-QH-657

Seat No.	

Set P

Fourth. Y. (B.Tech.) (Mechanical Engineering) (Sem - I) (New) (CBCS)
Examination: March/April – 2026
Robotics and Artificial Intelligence (197041703)

Day & Date: Wednesday, 13-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Objective Question. **14**

1) The term AGV stands for _____.
a) Automatic Guided Vehicle
b) Autonomous Guided Vehicle
c) Automated Guided Vehicle
d) Alternative Guided Vehicle

2) What is the function of frame grabber?
a) Sensing the object b) digitizing
c) storing d) none of these

3) The term "Robotics" was coined by _____.
a) Karel Capek b) Aurther C. Clarke
c) Leonardo Da Vinci d) none of these

4) Which are the following external state sensor?
a) Strain gauge b) ultrasonic sensor
c) potentiometer d) all the above

5) Work envelope generated by SCARA arm robot is _____.
a) Sphere b) cylinder
c) rectangular box d) triangle

6) What is the function of an Artificial Intelligence "Agent"?
a) Mapping of goal sequence to an action
b) Work without the direct interference of the people
c) Mapping of precept sequence to an action
d) Mapping of environment sequence to an action

7) Which one of the following statements is TRUE?
   a) Dextrous workspace of a manipulator is a subset of its reachable workspace
   b) Reachable workspace of a manipulator is a subset of its dextrous workspace
   c) No relationship exists between dextrous and reachable workspaces
   d) Summation of dextrous and reachable workspaces of a manipulator gives rise to its total workspace

8) Degree(s) of freedom of a four - bar mechanism is/are found to be equal to _____.
   a) 1 b) 2
   c) 3 d) none of these

9) The total number of recognition in artificial intelligence are _____.
   a) 3 b) 4
   c) 2 d) 1

10) The outline boundary of an object within an image is equivalent to identify image is known as _____.
   a) smoothing b) region growing
   c) edge detection d) none of these

11) On which Artificial Neural Network is based on which type of approach?
   a) Cognitive approach b) Applied approach
   c) Weak approach d) Strong approach

12) Which of the following drives used for control the robots?
   a) Hydraulic b) pneumatic
   c) electrical d) solenoid

13) Which of the following are tactile sensors?
   a) Magnetic sensor b) piezoelectric
   c) encoder d) range sensor

14) Which of the following is an advantage of artificial intelligence?
   a) Reduces the time taken to solve the problem
   b) Helps in providing security
   c) Have the ability to think hence makes the work easier
   d) All of the above

Seat No.	

Set **P**

Fourth. Y. (B.Tech.) (Mechanical Engineering) (Sem - I) (New) (CBCS)
Examination: March/April – 2026
Robotics and Artificial Intelligence (197041703)

Day & Date: Wednesday, 13-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) In Section – I, Q. 5 is compulsory and attempt any two questions from the remaining questions.
2) In Section – II, Q. 6 is compulsory and attempt any two questions from the remaining questions.
3) Figures to the right indicate full marks.

Section - I

Q.2 **a)** Explain following industrial automation. **05**
i) Fixed automation
ii) Programmable automation
iii) Flexible automation

b) What are the different configurations of robot? Which of these would be the most suitable for the following? **04**
i) Spray painting
ii) Welding
iii) Inserting peg into hole
Explain your choice

Q.3 **a)** What is an AGV? Discuss are the different navigation techniques used for industrial AGVs. **05**

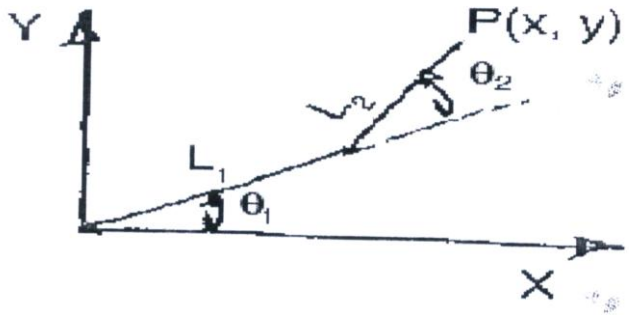
b) Name five different types of robots end effectors. Explain any two **04**

Q.4 **a)** Define the following. **04**
i) Work envelope
ii) Work cell
iii) Degrees of freedom
iv) Servomechanism

b) What are the tactile sensors? Explain how they are operated? **05**

Q.5 **a)** What do you understand by DH conversion Explain in detail **04**

b) Consider the forward transformation of the three joint manipulator as shown in the fig. **06**
Given that the length of joint - 1 L1 = 12 inch, the length of joint 2, L2 = 10 inch, the angle $\ominus 1 = 30°$ and angle $\ominus 2 = 45°$ compute the coordinate position (x, & y co-ordinate) for the end of the arm P.



Section – II

Q.6	**a)**	Distinguish between CCD & CMOS cameras.	**06**
	b)	What is thresholding? Why is it necessary?	**04**
Q.7	**a)**	Explain segmentation process of image processing with neat sketch.	**05**
	b)	Explain Genetic Algorithm (GA). With neat sketch.	**04**
Q.8	**a)**	Discuss the construction and working of stepper motors. List its advantages, disadvantages and applications.	**05**
	b)	What are the different robot programming languages.	**04**
Q.9	**a)**	Compare online and offline programming.	**05**
	b)	Discuss the application of the wheeled robot.	**04**

Seat No.	

Set **Q**

Fourth. Y. (B.Tech.) (Mechanical Engineering) (Sem - I) (New) (CBCS)
Examination: March/April – 2026
Robotics and Artificial Intelligence (197041703)

Day & Date: Wednesday, 13-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Objective Question. **14**

1) Degree(s) of freedom of a four - bar mechanism is/are found to be equal to _____.
a) 1 b) 2
c) 3 d) none of these

2) The total number of recognition in artificial intelligence are _____.
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c) 2 d) 1

3) The outline boundary of an object within an image is equivalent to identify image is known as _____.
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c) edge detection d) none of these

4) On which Artificial Neural Network is based on which type of approach?
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5) Which of the following drives used for control the robots?
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9) What is the function of frame grabber?
   a) Sensing the object b) digitizing
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11) Which are the following external state sensor?
   a) Strain gauge b) ultrasonic sensor
   c) potentiometer d) all the above

12) Work envelope generated by SCARA arm robot is _____.
   a) Sphere b) cylinder
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13) What is the function of an Artificial Intelligence “Agent”?
   a) Mapping of goal sequence to an action
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14) Which one of the following statements is TRUE?
   a) Dextrous workspace of a manipulator is a subset of its reachable workspace
   b) Reachable workspace of a manipulator is a subset of its dextrous workspace
   c) No relationship exists between dextrous and reachable workspaces
   d) Summation of dextrous and reachable workspaces of a manipulator gives rise to its total workspace

Seat No.	

Set **Q**

Fourth. Y. (B.Tech.) (Mechanical Engineering) (Sem - I) (New) (CBCS)
Examination: March/April – 2026
Robotics and Artificial Intelligence (197041703)

Day & Date: Wednesday, 13-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) In Section – I, Q. 5 is compulsory and attempt any two questions from the remaining questions.
2) In Section – II, Q. 6 is compulsory and attempt any two questions from the remaining questions.
3) Figures to the right indicate full marks.

Section - I

Q.2 **a)** Explain following industrial automation. **05**
i) Fixed automation
ii) Programmable automation
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i) Spray painting
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Explain your choice

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ii) Work cell
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iv) Servomechanism

b) What are the tactile sensors? Explain how they are operated? **05**

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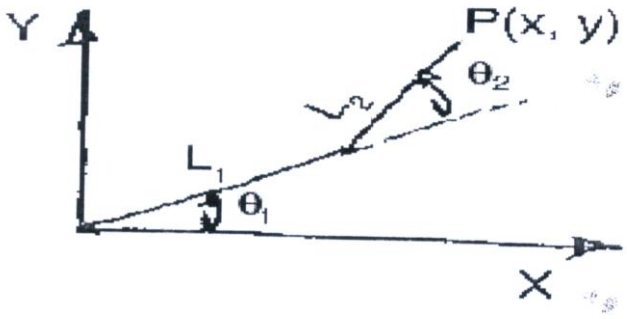
b) Consider the forward transformation of the three joint manipulator as shown in the fig. **06**
Given that the length of joint - 1 L1 = 12 inch, the length of joint 2, L2 = 10 inch, the angle $\ominus 1 = 30°$ and angle $\ominus 2 = 45°$ compute the coordinate position (x, & y co-ordinate) for the end of the arm P.



Section – II

Q.6	**a)**	Distinguish between CCD & CMOS cameras.	**06**
	b)	What is thresholding? Why is it necessary?	**04**
Q.7	**a)**	Explain segmentation process of image processing with neat sketch.	**05**
	b)	Explain Genetic Algorithm (GA). With neat sketch.	**04**
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Q.9	**a)**	Compare online and offline programming.	**05**
	b)	Discuss the application of the wheeled robot.	**04**

Seat No.	

Set **R**

Fourth. Y. (B.Tech.) (Mechanical Engineering) (Sem - I) (New) (CBCS)
Examination: March/April – 2026
Robotics and Artificial Intelligence (197041703)

Day & Date: Wednesday, 13-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Objective Question. **14**

1) On which Artificial Neural Network is based on which type of approach?
a) Cognitive approach b) Applied approach
c) Weak approach d) Strong approach

2) Which of the following drives used for control the robots?
a) Hydraulic b) pneumatic
c) electrical d) solenoid

3) Which of the following are tactile sensors?
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c) encoder d) range sensor

4) Which of the following is an advantage of artificial intelligence?
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6) What is the function of frame grabber?
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a) 1 b) 2
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13) The total number of recognition in artificial intelligence are _____.
a) 3 b) 4
c) 2 d) 1

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a) smoothing b) region growing
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Seat No.	

Set **R**

Fourth. Y. (B.Tech.) (Mechanical Engineering) (Sem - I) (New) (CBCS)
Examination: March/April – 2026
Robotics and Artificial Intelligence (197041703)

Day & Date: Wednesday, 13-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) In Section – I, Q. 5 is compulsory and attempt any two questions from the remaining questions.
2) In Section – II, Q. 6 is compulsory and attempt any two questions from the remaining questions.
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Section - I

Q.2 **a)** Explain following industrial automation. **05**
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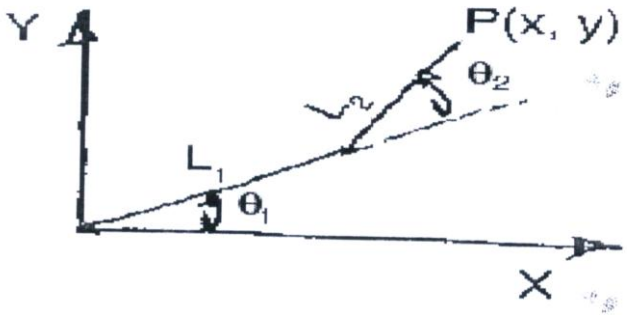

Section – II

Q.6	**a)**	Distinguish between CCD & CMOS cameras.	**06**
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	b)	Discuss the application of the wheeled robot.	**04**

Seat No.	

Set | S

Fourth. Y. (B.Tech.) (Mechanical Engineering) (Sem - I) (New) (CBCS)
Examination: March/April – 2026
Robotics and Artificial Intelligence (197041703)

Day & Date: Wednesday, 13-05-2026 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
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MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Objective Question. **14**

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2) Which one of the following statements is TRUE?
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Seat No.	

Set **S**

Fourth. Y. (B.Tech.) (Mechanical Engineering) (Sem - I) (New) (CBCS)
Examination: March/April – 2026
Robotics and Artificial Intelligence (197041703)

Day & Date: Wednesday, 13-05-2026 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) In Section – I, Q. 5 is compulsory and attempt any two questions from the remaining questions.
2) In Section – II, Q. 6 is compulsory and attempt any two questions from the remaining questions.
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Section - I

Q.2 **a)** Explain following industrial automation. **05**
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Explain your choice

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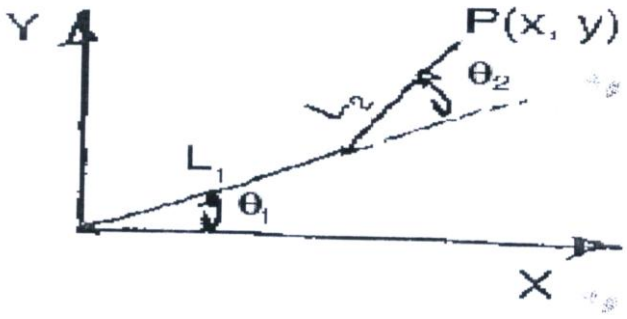

Section – II

Q.6	**a)**	Distinguish between CCD & CMOS cameras.	**06**
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