Seat No.	

Set **P**

S.E. (Part - I) (Old) (CBCS) Examination Nov/Dec-2019
Electrical & Electronics Engineering
D.C. MACHINES AND TRANSFORMERS

Day & Date: Tuesday, 10-12-2019 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
2) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) The dc armature winding in which coil sides are a pole pitch apart called _____ is winding.
   a) Multiplex b) Fractional pitch
   c) Full pitch d) Pole pitch

2) For a 4 pole, 2 layer dc lap winding with 20 slots & one conductor per layer the number of commutator for bars is _____.
   a) 80 b) 20
   c) 40 d) 160

3) The main function of inter poles is to minimize _____ between the brushes & the commutator when the d.c. machine is loaded.
   a) armature reaction b) Sparking
   c) mechanical losses d) none of the above

4) In a dc generator the effect of armature reaction the main pole flux is to _____.
   a) reduce it b) distort it
   c) reverse it d) both a and b

5) In a clockwise rotating loaded dc generator brushes have to shifted _____.
   a) clockwise b) Anticlockwise
   c) either a or b d) neither a nor b

6) The most likely causes of sparking at the brushes in d.c. machines is _____.
   a) Open coil in the armature
   b) Defective inter poles
   c) Incorrect brush spring pressure
   d) All of the above

7) The most efficient method of increasing the speed of a 3.75KW dc shunt motor would be the _____ method.
   a) Armature control b) flux control
   c) Ward-learned d) tapper field control

8) The most usual test for determining the efficiency of a traction motor is the _____ test.
   a) Field's b) Retardation
   c) Hopkinson's d) Swinburne's

9) Which of the following is not basic element of a transformer?
   a) Core
   b) Primary winding
   c) Secondary winding
   d) Mutual flux

10) A 200 KVA transformer has an iron loss of 1KW & full load cu. loss of 2KW its load KVA corresponding to maximum efficiency is _____ KVA.
   a) 100
   b) 141.4
   c) 50
   d) 200

11) The essential condition for parallel operation of two 1ø transformers is that they should have the same _____.
   a) Polarity
   b) KVA rating
   c) Voltage ratio
   d) Percentage impedance

12) If the load p.f. is 0.866 then the average p.f. of the V-V bank is _____.
   a) 0.866
   b) 0.75
   c) 0.51
   d) 0.65

13) Out of the following given choices for poly phase transformer connections which one will you select for three to two phase conversion.0?
   a) Scott
   b) Star/Star
   c) double scott
   d) star/double delta

14) For supplying a balanced 3ø load of 40KVA rating of each transformer in v-v bank should be nearly _____ KVA.
   a) 20
   b) 23
   c) 34.6
   d) 25

Seat No.		Set	P

S.E. (Part - I) (Old) (CBCS) Examination Nov/Dec-2019
Electrical & Electronics Engineering
D.C. MACHINES AND TRANSFORMERS

Day & Date: Tuesday, 10-12-2019 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figure to the right indicates full marks.

Section – I

Q.2 Answer any four questions. **12**

a) With neat sketch explain the different characteristics of dc series motor.
b) With a neat diagram explain the open circuit characteristics of a dc generator to find the critical field resistance.
c) With a neat sketch explain the Swinburne's test for dc motor.
d) A 22.38 KW 440 V, 4 pole wave wound dc shunt motor has 840 armature conductors & 140 commutator segments its full load efficiency is 88% & the shunt field current is 1.8A. If brushes are shifted backward through 1.5 segments from the geometrical neutral axis the demagnetizing & distorting amp. Turns/pole.
e) A dc series motor having a resistance of 1Ω drives a fan for which the torque varies as the square of the speed at 220V the set runs at 350 r.p.m. & takes 25A. The speed is to be raised to 500 r.p.m. by increasing the voltage determine the necessary voltage & the corresponding current assuming the field to be unsaturated.

Q.3 Answer any two questions. **16**

a) With a neat sketch explain the commutation process of a dc generator.
b) With a neat diagram explain the break test for finding the efficiency of DC machine.
c) A 200V shunt motor develops an output of 17.158 KW when taking 20.2 KW. The field resistance is 50Ω & armature resistance 0.06Ω. What is the efficiency & power input when the output is 7.46 KW.

Section – II

Q.4 Answer any four questions. **12**

a) With neat sketch explain how the mutual flux remains constant at any desired load in transformer.
b) Draw a equivalent circuit diagram of a 1ø transformer and explain.
c) With a neat sketch explain star-delta connection of 3ø transformer.
d) Two transformers connected in open delta supply a 400KVA balanced load operating at 0.866 p.f. lag the load voltage is 440V. What is the
1) KVA supplied by each transformer
2) KW supplied by each transformer
e) A 200 KVA transformer has an efficiency of 98% at full load, if the maximum efficiency occurs at three quarters of full load calculate the efficiency at half load. Assume negligible magnetizing current and p.f. 0.8 at all loads.

Q.5 Attempt any two **16**

a) Draw a vector diagram of 1ø transformer at full load considering resistance, reactance & losses.

b) With a neat sketch explain the scott connection of a 3ø transformer.

c) The parameters of a 2300/230 V, 50 Hz transformer are given below. $R_1 = 0.286\Omega\ R_2 = 0.319\Omega\ R_0 = 250\Omega\ X_1 = 0.73\Omega\ X_2{}^1 = 0.73\Omega\ X_0 = 1250\Omega$, the secondary load impedance. $Z_L = 0.387 + j0.29$ Solve the exact equivalent circuit with normal voltage across the primary.

Seat No.	

Set **Q**

S.E. (Part - I) (Old) (CBCS) Examination Nov/Dec-2019
Electrical & Electronics Engineering
D.C. MACHINES AND TRANSFORMERS

Day & Date: Tuesday, 10-12-2019 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
2) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) The most usual test for determining the efficiency of a traction motor is the _____ test.
   a) Field's b) Retardation
   c) Hopkinson's d) Swinburne's

2) Which of the following is not basic element of a transformer?
   a) Core b) Primary winding
   c) Secondary winding d) Mutual flux

3) A 200 KVA transformer has an iron loss of 1KW & full load cu. loss of 2KW its load KVA corresponding to maximum efficiency is _____ KVA.
   a) 100 b) 141.4
   c) 50 d) 200

4) The essential condition for parallel operation of two 1ø transformers is that they should have the same _____.
   a) Polarity b) KVA rating
   c) Voltage ratio d) Percentage impedance

5) If the load p.f. is 0.866 then the average p.f. of the V-V bank is _____.
   a) 0.866 b) 0.75
   c) 0.51 d) 0.65

6) Out of the following given choices for poly phase transformer connections which one will you select for three to two phase conversion.0?
   a) Scott b) Star/Star
   c) double scott d) star/double delta

7) For supplying a balanced 3ø load of 40KVA rating of each transformer in v-v bank should be nearly _____ KVA.
   a) 20 b) 23
   c) 34.6 d) 25

8) The dc armature winding in which coil sides are a pole pitch apart called _____ is winding.
   a) Multiplex b) Fractional pitch
   c) Full pitch d) Pole pitch

9) For a 4 pole, 2 layer dc lap winding with 20 slots & one conductor per layer the number of commutator for bars is _____.
   a) 80 b) 20
   c) 40 d) 160

10) The main function of inter poles is to minimize _____ between the brushes & the commutator when the d.c. machine is loaded.
   a) armature reaction b) Sparking
   c) mechanical losses d) none of the above

11) In a dc generator the effect of armature reaction the main pole flux is to _____.
   a) reduce it b) distort it
   c) reverse it d) both a and b

12) In a clockwise rotating loaded dc generator brushes have to shifted _____.
   a) clockwise b) Anticlockwise
   c) either a or b d) neither a nor b

13) The most likely causes of sparking at the brushes in d.c. machines is _____.
   a) Open coil in the armature
   b) Defective inter poles
   c) Incorrect brush spring pressure
   d) All of the above

14) The most efficient method of increasing the speed of a 3.75KW dc shunt motor would be the _____ method.
   a) Armature control b) flux control
   c) Ward-learned d) tapper field control

Seat No.	

Set | Q

S.E. (Part - I) (Old) (CBCS) Examination Nov/Dec-2019
Electrical & Electronics Engineering
D.C. MACHINES AND TRANSFORMERS

Day & Date: Tuesday, 10-12-2019 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figure to the right indicates full marks.

Section – I

Q.2 Answer any four questions. **12**

a) With neat sketch explain the different characteristics of dc series motor.
b) With a neat diagram explain the open circuit characteristics of a dc generator to find the critical field resistance.
c) With a neat sketch explain the Swinburne's test for dc motor.
d) A 22.38 KW 440 V, 4 pole wave wound dc shunt motor has 840 armature conductors & 140 commutator segments its full load efficiency is 88% & the shunt field current is 1.8A. If brushes are shifted backward through 1.5 segments from the geometrical neutral axis the demagnetizing & distorting amp. Turns/pole.
e) A dc series motor having a resistance of 1Ω drives a fan for which the torque varies as the square of the speed at 220V the set runs at 350 r.p.m. & takes 25A. The speed is to be raised to 500 r.p.m. by increasing the voltage determine the necessary voltage & the corresponding current assuming the field to be unsaturated.

Q.3 Answer any two questions. **16**

a) With a neat sketch explain the commutation process of a dc generator.
b) With a neat diagram explain the break test for finding the efficiency of DC machine.
c) A 200V shunt motor develops an output of 17.158 KW when taking 20.2 KW. The field resistance is 50Ω & armature resistance 0.06Ω. What is the efficiency & power input when the output is 7.46 KW.

Section – II

Q.4 Answer any four questions. **12**

a) With neat sketch explain how the mutual flux remains constant at any desired load in transformer.
b) Draw a equivalent circuit diagram of a 1ø transformer and explain.
c) With a neat sketch explain star-delta connection of 3ø transformer.
d) Two transformers connected in open delta supply a 400KVA balanced load operating at 0.866 p.f. lag the load voltage is 440V. What is the
1) KVA supplied by each transformer
2) KW supplied by each transformer
e) A 200 KVA transformer has an efficiency of 98% at full load, if the maximum efficiency occurs at three quarters of full load calculate the efficiency at half load. Assume negligible magnetizing current and p.f. 0.8 at all loads.

Q.5 Attempt any two **16**

a) Draw a vector diagram of 1ø transformer at full load considering resistance, reactance & losses.

b) With a neat sketch explain the scott connection of a 3ø transformer.

c) The parameters of a 2300/230 V, 50 Hz transformer are given below. $R_1 = 0.286\Omega\ R_2 = 0.319\Omega\ R_0 = 250\Omega\ X_1 = 0.73\Omega\ X_2{}^1 = 0.73\Omega\ X_0 = 1250\Omega$, the secondary load impedance. $Z_L = 0.387 + j0.29$ Solve the exact equivalent circuit with normal voltage across the primary.

Seat No.	

Set **R**

S.E. (Part - I) (Old) (CBCS) Examination Nov/Dec-2019
Electrical & Electronics Engineering
D.C. MACHINES AND TRANSFORMERS

Day & Date: Tuesday, 10-12-2019 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
2) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) In a clockwise rotating loaded dc generator brushes have to shifted _____.
   a) clockwise b) Anticlockwise
   c) either a or b d) neither a nor b

2) The most likely causes of sparking at the brushes in d.c. machines is _____.
   a) Open coil in the armature
   b) Defective inter poles
   c) Incorrect brush spring pressure
   d) All of the above

3) The most efficient method of increasing the speed of a 3.75KW dc shunt motor would be the _____ method.
   a) Armature control b) flux control
   c) Ward-learned d) tapper field control

4) The most usual test for determining the efficiency of a traction motor is the _____ test.
   a) Field's b) Retardation
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5) Which of the following is not basic element of a transformer?
   a) Core b) Primary winding
   c) Secondary winding d) Mutual flux

6) A 200 KVA transformer has an iron loss of 1KW & full load cu. loss of 2KW its load KVA corresponding to maximum efficiency is _____ KVA.
   a) 100 b) 141.4
   c) 50 d) 200

7) The essential condition for parallel operation of two 1ø transformers is that they should have the same _____.
   a) Polarity b) KVA rating
   c) Voltage ratio d) Percentage impedance

8) If the load p.f. is 0.866 then the average p.f. of the V-V bank is _____.
   a) 0.866 b) 0.75
   c) 0.51 d) 0.65

9) Out of the following given choices for poly phase transformer connections which one will you select for three to two phase conversion.0?
   a) Scott
   b) Star/Star
   c) double scott
   d) star／double delta

10) For supplying a balanced 3ø load of 40KVA rating of each transformer in v-v bank should be nearly _____ KVA.
   a) 20
   b) 23
   c) 34.6
   d) 25

11) The dc armature winding in which coil sides are a pole pitch apart called _____ is winding.
   a) Multiplex
   b) Fractional pitch
   c) Full pitch
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12) For a 4 pole, 2 layer dc lap winding with 20 slots & one conductor per layer the number of commutator for bars is _____.
   a) 80
   b) 20
   c) 40
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13) The main function of inter poles is to minimize _____ between the brushes & the commutator when the d.c. machine is loaded.
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14) In a dc generator the effect of armature reaction the main pole flux is to _____.
   a) reduce it
   b) distort it
   c) reverse it
   d) both a and b

SLR-FM-505

Seat No.	

Set R

S.E. (Part - I) (Old) (CBCS) Examination Nov/Dec-2019
Electrical & Electronics Engineering
D.C. MACHINES AND TRANSFORMERS

Day & Date: Tuesday, 10-12-2019 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figure to the right indicates full marks.

Section – I

Q.2 Answer any four questions. **12**

a) With neat sketch explain the different characteristics of dc series motor.
b) With a neat diagram explain the open circuit characteristics of a dc generator to find the critical field resistance.
c) With a neat sketch explain the Swinburne's test for dc motor.
d) A 22.38 KW 440 V, 4 pole wave wound dc shunt motor has 840 armature conductors & 140 commutator segments its full load efficiency is 88% & the shunt field current is 1.8A. If brushes are shifted backward through 1.5 segments from the geometrical neutral axis the demagnetizing & distorting amp. Turns/pole.
e) A dc series motor having a resistance of 1Ω drives a fan for which the torque varies as the square of the speed at 220V the set runs at 350 r.p.m. & takes 25A. The speed is to be raised to 500 r.p.m. by increasing the voltage determine the necessary voltage & the corresponding current assuming the field to be unsaturated.

Q.3 Answer any two questions. **16**

a) With a neat sketch explain the commutation process of a dc generator.
b) With a neat diagram explain the break test for finding the efficiency of DC machine.
c) A 200V shunt motor develops an output of 17.158 KW when taking 20.2 KW. The field resistance is 50Ω & armature resistance 0.06Ω. What is the efficiency & power input when the output is 7.46 KW.

Section – II

Q.4 Answer any four questions. **12**

a) With neat sketch explain how the mutual flux remains constant at any desired load in transformer.
b) Draw a equivalent circuit diagram of a 1ø transformer and explain.
c) With a neat sketch explain star-delta connection of 3ø transformer.
d) Two transformers connected in open delta supply a 400KVA balanced load operating at 0.866 p.f. lag the load voltage is 440V. What is the
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e) A 200 KVA transformer has an efficiency of 98% at full load, if the maximum efficiency occurs at three quarters of full load calculate the efficiency at half load. Assume negligible magnetizing current and p.f. 0.8 at all loads.

Q.5 Attempt any two **16**

a) Draw a vector diagram of 1ø transformer at full load considering resistance, reactance & losses.

b) With a neat sketch explain the scott connection of a 3ø transformer.

c) The parameters of a 2300/230 V, 50 Hz transformer are given below. $R_1 = 0.286\Omega\ R_2 = 0.319\Omega\ R_0 = 250\Omega\ X_1 = 0.73\Omega\ X_2{}^1 = 0.73\Omega\ X_0 = 1250\Omega$, the secondary load impedance. $Z_L = 0.387 + j0.29$ Solve the exact equivalent circuit with normal voltage across the primary.

Seat No.	

Set **S**

S.E. (Part - I) (Old) (CBCS) Examination Nov/Dec-2019
Electrical & Electronics Engineering
D.C. MACHINES AND TRANSFORMERS

Day & Date: Tuesday, 10-12-2019 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
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MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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   a) 100 b) 141.4
   c) 50 d) 200

2) The essential condition for parallel operation of two 1ø transformers is that they should have the same _____.
   a) Polarity b) KVA rating
   c) Voltage ratio d) Percentage impedance

3) If the load p.f. is 0.866 then the average p.f. of the V-V bank is _____.
   a) 0.866 b) 0.75
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4) Out of the following given choices for poly phase transformer connections which one will you select for three to two phase conversion.0?
   a) Scott b) Star/Star
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5) For supplying a balanced 3ø load of 40KVA rating of each transformer in v-v bank should be nearly _____ KVA.
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14) Which of the following is not basic element of a transformer?
   a) Core
   b) Primary winding
   c) Secondary winding
   d) Mutual flux

SLR-FM-505

Seat No.		Set	S

S.E. (Part - I) (Old) (CBCS) Examination Nov/Dec-2019
Electrical & Electronics Engineering
D.C. MACHINES AND TRANSFORMERS

Day & Date: Tuesday, 10-12-2019 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figure to the right indicates full marks.

Section – I

Q.2 Answer any four questions. **12**

a) With neat sketch explain the different characteristics of dc series motor.
b) With a neat diagram explain the open circuit characteristics of a dc generator to find the critical field resistance.
c) With a neat sketch explain the Swinburne's test for dc motor.
d) A 22.38 KW 440 V, 4 pole wave wound dc shunt motor has 840 armature conductors & 140 commutator segments its full load efficiency is 88% & the shunt field current is 1.8A. If brushes are shifted backward through 1.5 segments from the geometrical neutral axis the demagnetizing & distorting amp. Turns/pole.
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Q.3 Answer any two questions. **16**

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c) A 200V shunt motor develops an output of 17.158 KW when taking 20.2 KW. The field resistance is 50Ω & armature resistance 0.06Ω. What is the efficiency & power input when the output is 7.46 KW.

Section – II

Q.4 Answer any four questions. **12**

a) With neat sketch explain how the mutual flux remains constant at any desired load in transformer.
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c) With a neat sketch explain star-delta connection of 3ø transformer.
d) Two transformers connected in open delta supply a 400KVA balanced load operating at 0.866 p.f. lag the load voltage is 440V. What is the
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c) The parameters of a 2300/230 V, 50 Hz transformer are given below. $R_1 = 0.286\Omega\ R_2 = 0.319\Omega\ R_0 = 250\Omega\ X_1 = 0.73\Omega\ X_2{}^1 = 0.73\Omega\ X_0 = 1250\Omega$, the secondary load impedance. $Z_L = 0.387 + j0.29$ Solve the exact equivalent circuit with normal voltage across the primary.

Seat No.	

Set **P**

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
POWER ELECTRONICS

Day & Date: Friday, 22-11-2019 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
2) Assume the suitable data whenever necessary.
3) Non-programmable calculators are permitted.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Solve the following **14**

1) For similar carrier and modulating signals, the line current used in CSI is _____.
   a) Identical to line voltage in a VSI
   b) Identical to line current in VSI
   c) Identical to phase voltage in VSI
   d) Identical to phase voltage in CSI

2) Under harmonic free load voltages, the 3 phase VSI _____.
   a) Does not contains second harmonic
   b) Does not contains third harmonic
   c) Does not contains fifth harmonic
   d) Does not contains seventh harmonic

3) The square wave operation of 3 phase VSI lines contains the harmonics. The amplitudes are _____.
   a) Directly proportional to their harmonic order
   b) Inversely proportional to their harmonic order
   c) Not related to their harmonic order
   d) None of these

4) Double fourier series analysis of PWM is _____.
   a) Two dimensional functions b) Three dimensional functions
   c) One dimensional functions d) All of these

5) In single phase VSI, the harmonic which is not present is _____.
   a) 2^{nd} b) 3^{rd}
   c) 5^{th} d) 7^{th}

6) Very large values of modulation index (greater than 3.24) lead to _____.
   a) Square AC output voltage b) Sine AC output voltage
   c) Triangular AC output voltage d) Trapezoidal AC output voltage

7) Single phase VSI are mainly used in _____.
   a) Power supplies b) Ups
   c) Multilevel configuration d) All of these

8) For bidirectional operation of converters _____.
   a) A parallel combination of controllable switch and a diode is used
   b) A parallel combination of controllable switch and capacitor is used
   c) A series combination of controllable switch and diode is used
   d) A series combination of controllable switch and a capacitor is used

9) For a buck converter to reduce the conduction losses in diode _____.
   a) A high on - resistance switch can be added in parallel
   b) A low on - resistance switch can be added in parallel
   c) A high on - resistance switch can be added in series
   d) A low on - resistance switch can be added in series

10) The conduction losses in IGBT is _____.
   a) More than that of MOSFET b) Lower than that of MOSFET
   c) Equal to that of MOSFET d) Equal to that of BJT

11) The power MOSFET device is a _____.
   a) Current controlled unipolar device
   b) Voltage controlled unipolar device
   c) Current controlled bipolar device
   d) Voltage controlled bipolar device

12) With increase in firing angle, _____.
   a) Both harmonic distortion and quality of input current increases
   b) Harmonic distortion increases and quality of input current decreases
   c) Harmonic distortion decreases and quality of input current increases
   d) Both harmonic distortion and quality of input current decreases

13) The most suited gate pulses given to the AC regulator with R – L load can be in the form of _____.
   a) Continuous signal
   b) Large isolating pulse transformer
   c) A train of pulses
   d) None of these

14) Harmonics in 3 phase inverters can be reduced by using _____.
   a) Passive filter b) Active filter
   c) Both passive and active filters d) None of these

Seat No.	

Set **P**

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
POWER ELECTRONICS

Day & Date: Friday, 22-11-2019 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q.1 is compulsory.
2) Assume the suitable data whenever necessary.
3) Non-programmable calculators are permitted.

Section – I

Q.2 Solve any three. **12**

a) Explain Dynamic characteristics of SCR.
b) Draw the block diagram of Switched mode Power supply and explain each block.
c) Explain Over Voltage protection in detail.
d) Explain construction and working of MOSFET.
e) With the help of neat diagram and waveform explain Single phase half wave controlled rectifier with R load.

Q.3 Solve any two **16**

a) Draw circuit for Single phase Full bridge controlled rectifier with RL load. Draw necessary waveforms and derive the expression for average load voltage and average load current.
b) A Single phase half wave controlled converter is operated from 120V, 50HZ supply. Load resistance R is 10ohm. If the average output voltage is 25% of maximum possible average Output voltage. Determine:
i) Firing angle
ii) Average Output current
iii) Average SCR current.
c) Describe UPS system with block diagrams in detail. Explain its types with Block diagram.

Section – II

Q.4 Solve any three. **12**

a) Explain working principle of Step Up Chopper with necessary Diagrams.
b) Explain working principle of Three phase to single phase cycloconverter with necessary Diagrams.
c) State applications of cycloconverter.
d) Write short note on Voltage source Inverter.
e) Explain working principle of Jones Chopper with necessary Diagrams.

Q.5 Solve any two **16**

a) Explain Three phase full bridge inverter with 180^{o} conduction with suitable waveforms in detail.
b) Explain circuit diagram and waveforms for Morgans chopper Circuit.
c) Explain three phase to three phase, 6 pulse cycloconverter.

Seat No.	

Set | Q

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
POWER ELECTRONICS

Day & Date: Friday, 22-11-2019 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
2) Assume the suitable data whenever necessary.
3) Non-programmable calculators are permitted.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Solve the following **14**

1) For bidirectional operation of converters _____.
   a) A parallel combination of controllable switch and a diode is used
   b) A parallel combination of controllable switch and capacitor is used
   c) A series combination of controllable switch and diode is used
   d) A series combination of controllable switch and a capacitor is used

2) For a buck converter to reduce the conduction losses in diode _____.
   a) A high on - resistance switch can be added in parallel
   b) A low on - resistance switch can be added in parallel
   c) A high on - resistance switch can be added in series
   d) A low on - resistance switch can be added in series

3) The conduction losses in IGBT is _____.
   a) More than that of MOSFET b) Lower than that of MOSFET
   c) Equal to that of MOSFET d) Equal to that of BJT

4) The power MOSFET device is a _____.
   a) Current controlled unipolar device
   b) Voltage controlled unipolar device
   c) Current controlled bipolar device
   d) Voltage controlled bipolar device

5) With increase in firing angle, _____.
   a) Both harmonic distortion and quality of input current increases
   b) Harmonic distortion increases and quality of input current decreases
   c) Harmonic distortion decreases and quality of input current increases
   d) Both harmonic distortion and quality of input current decreases

6) The most suited gate pulses given to the AC regulator with R – L load can be in the form of _____.
   a) Continuous signal
   b) Large isolating pulse transformer
   c) A train of pulses
   d) None of these

7) Harmonics in 3 phase inverters can be reduced by using _____.
   a) Passive filter b) Active filter
   c) Both passive and active filters d) None of these

8) For similar carrier and modulating signals, the line current used in CSI is _____.
   a) Identical to line voltage in a VSI
   b) Identical to line current in VSI
   c) Identical to phase voltage in VSI
   d) Identical to phase voltage in CSI

9) Under harmonic free load voltages, the 3 phase VSI _____.
   a) Does not contains second harmonic
   b) Does not contains third harmonic
   c) Does not contains fifth harmonic
   d) Does not contains seventh harmonic

10) The square wave operation of 3 phase VSI lines contains the harmonics. The amplitudes are _____.
   a) Directly proportional to their harmonic order
   b) Inversely proportional to their harmonic order
   c) Not related to their harmonic order
   d) None of these

11) Double fourier series analysis of PWM is _____.
   a) Two dimensional functions b) Three dimensional functions
   c) One dimensional functions d) All of these

12) In single phase VSI, the harmonic which is not present is _____.
   a) 2^{nd} b) 3^{rd}
   c) 5^{th} d) 7^{th}

13) Very large values of modulation index (greater than 3.24) lead to _____.
   a) Square AC output voltage b) Sine AC output voltage
   c) Triangular AC output voltage d) Trapezoidal AC output voltage

14) Single phase VSI are mainly used in _____.
   a) Power supplies b) Ups
   c) Multilevel configuration d) All of these

Seat No.	

Set **Q**

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
POWER ELECTRONICS

Day & Date: Friday, 22-11-2019 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q.1 is compulsory.
2) Assume the suitable data whenever necessary.
3) Non-programmable calculators are permitted.

Section – I

Q.2 Solve any three. **12**

a) Explain Dynamic characteristics of SCR.
b) Draw the block diagram of Switched mode Power supply and explain each block.
c) Explain Over Voltage protection in detail.
d) Explain construction and working of MOSFET.
e) With the help of neat diagram and waveform explain Single phase half wave controlled rectifier with R load.

Q.3 Solve any two **16**

a) Draw circuit for Single phase Full bridge controlled rectifier with RL load. Draw necessary waveforms and derive the expression for average load voltage and average load current.
b) A Single phase half wave controlled converter is operated from 120V, 50HZ supply. Load resistance R is 10ohm. If the average output voltage is 25% of maximum possible average Output voltage. Determine:
i) Firing angle
ii) Average Output current
iii) Average SCR current.
c) Describe UPS system with block diagrams in detail. Explain its types with Block diagram.

Section – II

Q.4 Solve any three. **12**

a) Explain working principle of Step Up Chopper with necessary Diagrams.
b) Explain working principle of Three phase to single phase cycloconverter with necessary Diagrams.
c) State applications of cycloconverter.
d) Write short note on Voltage source Inverter.
e) Explain working principle of Jones Chopper with necessary Diagrams.

Q.5 Solve any two **16**

a) Explain Three phase full bridge inverter with 180^{o} conduction with suitable waveforms in detail.
b) Explain circuit diagram and waveforms for Morgans chopper Circuit.
c) Explain three phase to three phase, 6 pulse cycloconverter.

Seat No.	

Set **R**

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
POWER ELECTRONICS

Day & Date: Friday, 22-11-2019 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
2) Assume the suitable data whenever necessary.
3) Non-programmable calculators are permitted.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Solve the following **14**

1) In single phase VSI, the harmonic which is not present is _____.
   a) 2^{nd} b) 3^{rd}
   c) 5^{th} d) 7^{th}

2) Very large values of modulation index (greater than 3.24) lead to _____.
   a) Square AC output voltage b) Sine AC output voltage
   c) Triangular AC output voltage d) Trapezoidal AC output voltage

3) Single phase VSI are mainly used in _____.
   a) Power supplies b) Ups
   c) Multilevel configuration d) All of these

4) For bidirectional operation of converters _____.
   a) A parallel combination of controllable switch and a diode is used
   b) A parallel combination of controllable switch and capacitor is used
   c) A series combination of controllable switch and diode is used
   d) A series combination of controllable switch and a capacitor is used

5) For a buck converter to reduce the conduction losses in diode _____.
   a) A high on - resistance switch can be added in parallel
   b) A low on - resistance switch can be added in parallel
   c) A high on - resistance switch can be added in series
   d) A low on - resistance switch can be added in series

6) The conduction losses in IGBT is _____.
   a) More than that of MOSFET b) Lower than that of MOSFET
   c) Equal to that of MOSFET d) Equal to that of BJT

7) The power MOSFET device is a _____.
   a) Current controlled unipolar device
   b) Voltage controlled unipolar device
   c) Current controlled bipolar device
   d) Voltage controlled bipolar device

8) With increase in firing angle, _____.
   a) Both harmonic distortion and quality of input current increases
   b) Harmonic distortion increases and quality of input current decreases
   c) Harmonic distortion decreases and quality of input current increases
   d) Both harmonic distortion and quality of input current decreases

9) The most suited gate pulses given to the AC regulator with R – L load can be in the form of _____.
   a) Continuous signal
   b) Large isolating pulse transformer
   c) A train of pulses
   d) None of these

10) Harmonics in 3 phase inverters can be reduced by using _____.
   a) Passive filter b) Active filter
   c) Both passive and active filters d) None of these

11) For similar carrier and modulating signals, the line current used in CSI is _____.
   a) Identical to line voltage in a VSI
   b) Identical to line current in VSI
   c) Identical to phase voltage in VSI
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12) Under harmonic free load voltages, the 3 phase VSI _____.
   a) Does not contains second harmonic
   b) Does not contains third harmonic
   c) Does not contains fifth harmonic
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13) The square wave operation of 3 phase VSI lines contains the harmonics. The amplitudes are _____.
   a) Directly proportional to their harmonic order
   b) Inversely proportional to their harmonic order
   c) Not related to their harmonic order
   d) None of these

14) Double fourier series analysis of PWM is _____.
   a) Two dimensional functions b) Three dimensional functions
   c) One dimensional functions d) All of these

Seat No.	

Set **R**

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
POWER ELECTRONICS

Day & Date: Friday, 22-11-2019 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q.1 is compulsory.
2) Assume the suitable data whenever necessary.
3) Non-programmable calculators are permitted.

Section – I

Q.2 Solve any three. **12**

a) Explain Dynamic characteristics of SCR.
b) Draw the block diagram of Switched mode Power supply and explain each block.
c) Explain Over Voltage protection in detail.
d) Explain construction and working of MOSFET.
e) With the help of neat diagram and waveform explain Single phase half wave controlled rectifier with R load.

Q.3 Solve any two **16**

a) Draw circuit for Single phase Full bridge controlled rectifier with RL load. Draw necessary waveforms and derive the expression for average load voltage and average load current.
b) A Single phase half wave controlled converter is operated from 120V, 50HZ supply. Load resistance R is 10ohm. If the average output voltage is 25% of maximum possible average Output voltage. Determine:
i) Firing angle
ii) Average Output current
iii) Average SCR current.
c) Describe UPS system with block diagrams in detail. Explain its types with Block diagram.

Section – II

Q.4 Solve any three. **12**

a) Explain working principle of Step Up Chopper with necessary Diagrams.
b) Explain working principle of Three phase to single phase cycloconverter with necessary Diagrams.
c) State applications of cycloconverter.
d) Write short note on Voltage source Inverter.
e) Explain working principle of Jones Chopper with necessary Diagrams.

Q.5 Solve any two **16**

a) Explain Three phase full bridge inverter with 180^{o} conduction with suitable waveforms in detail.
b) Explain circuit diagram and waveforms for Morgans chopper Circuit.
c) Explain three phase to three phase, 6 pulse cycloconverter.

Seat No.	

Set **S**

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
POWER ELECTRONICS

Day & Date: Friday, 22-11-2019 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
2) Assume the suitable data whenever necessary.
3) Non-programmable calculators are permitted.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Solve the following **14**

1) The conduction losses in IGBT is _____.
   a) More than that of MOSFET b) Lower than that of MOSFET
   c) Equal to that of MOSFET d) Equal to that of BJT

2) The power MOSFET device is a _____.
   a) Current controlled unipolar device
   b) Voltage controlled unipolar device
   c) Current controlled bipolar device
   d) Voltage controlled bipolar device

3) With increase in firing angle, _____.
   a) Both harmonic distortion and quality of input current increases
   b) Harmonic distortion increases and quality of input current decreases
   c) Harmonic distortion decreases and quality of input current increases
   d) Both harmonic distortion and quality of input current decreases

4) The most suited gate pulses given to the AC regulator with R – L load can be in the form of _____.
   a) Continuous signal
   b) Large isolating pulse transformer
   c) A train of pulses
   d) None of these

5) Harmonics in 3 phase inverters can be reduced by using _____.
   a) Passive filter b) Active filter
   c) Both passive and active filters d) None of these

6) For similar carrier and modulating signals, the line current used in CSI is _____.
   a) Identical to line voltage in a VSI
   b) Identical to line current in VSI
   c) Identical to phase voltage in VSI
   d) Identical to phase voltage in CSI

7) Under harmonic free load voltages, the 3 phase VSI _____.
   a) Does not contains second harmonic
   b) Does not contains third harmonic
   c) Does not contains fifth harmonic
   d) Does not contains seventh harmonic

8) The square wave operation of 3 phase VSI lines contains the harmonics. The amplitudes are _____.
   a) Directly proportional to their harmonic order
   b) Inversely proportional to their harmonic order
   c) Not related to their harmonic order
   d) None of these

9) Double fourier series analysis of PWM is _____.
   a) Two dimensional functions b) Three dimensional functions
   c) One dimensional functions d) All of these

10) In single phase VSI, the harmonic which is not present is _____.
   a) 2^{nd} b) 3^{rd}
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11) Very large values of modulation index (greater than 3.24) lead to _____.
   a) Square AC output voltage b) Sine AC output voltage
   c) Triangular AC output voltage d) Trapezoidal AC output voltage

12) Single phase VSI are mainly used in _____.
   a) Power supplies b) Ups
   c) Multilevel configuration d) All of these

13) For bidirectional operation of converters _____.
   a) A parallel combination of controllable switch and a diode is used
   b) A parallel combination of controllable switch and capacitor is used
   c) A series combination of controllable switch and diode is used
   d) A series combination of controllable switch and a capacitor is used

14) For a buck converter to reduce the conduction losses in diode _____.
   a) A high on - resistance switch can be added in parallel
   b) A low on - resistance switch can be added in parallel
   c) A high on - resistance switch can be added in series
   d) A low on - resistance switch can be added in series

Seat No.	

Set **S**

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
POWER ELECTRONICS

Day & Date: Friday, 22-11-2019 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q.1 is compulsory.
2) Assume the suitable data whenever necessary.
3) Non-programmable calculators are permitted.

Section – I

Q.2 Solve any three. **12**

a) Explain Dynamic characteristics of SCR.
b) Draw the block diagram of Switched mode Power supply and explain each block.
c) Explain Over Voltage protection in detail.
d) Explain construction and working of MOSFET.
e) With the help of neat diagram and waveform explain Single phase half wave controlled rectifier with R load.

Q.3 Solve any two **16**

a) Draw circuit for Single phase Full bridge controlled rectifier with RL load. Draw necessary waveforms and derive the expression for average load voltage and average load current.
b) A Single phase half wave controlled converter is operated from 120V, 50HZ supply. Load resistance R is 10ohm. If the average output voltage is 25% of maximum possible average Output voltage. Determine:
i) Firing angle
ii) Average Output current
iii) Average SCR current.
c) Describe UPS system with block diagrams in detail. Explain its types with Block diagram.

Section – II

Q.4 Solve any three. **12**

a) Explain working principle of Step Up Chopper with necessary Diagrams.
b) Explain working principle of Three phase to single phase cycloconverter with necessary Diagrams.
c) State applications of cycloconverter.
d) Write short note on Voltage source Inverter.
e) Explain working principle of Jones Chopper with necessary Diagrams.

Q.5 Solve any two **16**

a) Explain Three phase full bridge inverter with 180^{o} conduction with suitable waveforms in detail.
b) Explain circuit diagram and waveforms for Morgans chopper Circuit.
c) Explain three phase to three phase, 6 pulse cycloconverter.

SLR-FM-529

Seat No.	

Set P

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
Electrical and Electronics Engineering
ELECTRONIC COMMUNICATION ENGINEERING

Day & Date: Saturday, 23-11-2019 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in first 30 minutes in Answer Book.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) The minimum antenna height required for transmission in reference to wavelength λ is _____.
   a) λ b) $\lambda/4$
   c) $\lambda/2$ d) 4λ

2) AM wave may be represented as $E(t)\cos\omega_c t$ where $E(t)$ is _____.
   a) Envelope of the AM wave
   b) Carrier signal
   c) Amplitude of modulating signal
   d) None of the above

3) Calculate the modulation index when the un modulated carrier power is 15KW, and after modulation, carrier power is 17KW.
   a) 68% b) 51.63%
   c) 82.58% d) 34.66%

4) TRF receiver and super heterodyne receiver are used for _____.
   a) Detection of modulating signal b) Removal of unwanted signal
   c) Both a and b d) None of the above

5) Carson's rule is used to calculate _____.
   a) Bandwidth of FM signal b) Signal to noise ratio
   c) Modulation index d) Noise figure

6) Frequency deviation in FM is _____.
   a) Change in carrier frequency to the frequency above and below the center frequency
   b) Formation of side bands
   c) The variation of the instantaneous carrier frequency in proportion to the modulating signal
   d) All of the above

7) The modulation index of FM is given by _____.
   a) μ = frequency deviation / modulating frequency
   b) μ = modulating frequency / frequency deviation
   c) μ = modulating frequency / carrier frequency
   d) μ = carrier frequency / modulating frequency

8) Aliasing refers to _____.
   a) Sampling of signals less than at Nyquist rate
   b) Sampling of signals greater than at Nyquist rate
   c) Sampling of signals at Nyquist rate
   d) None of the above

9) Analog signal may be converted into digital signal by _____.
   a) Amplitude modulation b) Sampling
   c) Filtering d) Mixing

10) Spectrum Efficiency of a cellular network is _____.
   a) The traffic carried by whole network
   b) The traffic carried per cell divided by the bandwidth of system & the area of a cell
   c) Expressed in Erlang/MHz /km^2
   d) Both b and c
   e) Both a and c

11) In a fixed channel assignment strategy, if all the assigned channels are occupied, the call _____.
   a) Gets transferred to another cell
   b) Gets blocked
   c) Is kept on waiting
   d) All of the above

12) In uniform quantization process _____.
   a) The step size remains same
   b) Step size varies according to the values of the input signal
   c) The quantizer has linear characteristics
   d) Both a and c are correct

13) The sequence of operations in which PCM is done is _____.
   a) Sampling, quantizing, encoding
   b) Quantizing, encoding, sampling
   c) Quantizing, sampling, encoding
   d) None of the above

14) Granular noise occurs when _____.
   a) Step size is too small
   b) Step size is too large
   c) There is interference from the adjacent channel
   d) Bandwidth is too large

SLR-FM-529

Seat No.	

Set P

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
Electrical and Electronics Engineering
ELECTRONIC COMMUNICATION ENGINEERING

Day & Date: Saturday, 23-11-2019 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicates full marks.
3) Assume suitable data if necessary.

Section – I

Q.2 Attempt any three of the following questions. **12**

a) Draw and explain super-heterodyne receiver.
b) What is modulation? Explain necessity of modulation.
c) Differentiate DSBFC, DSBSC and SSBSC with the help of waveform (in time domain and frequency domain) and bandwidth requirement.
d) Explain simple dual-slope detector method with advantages.

Q.3 Attempt any two of the following questions. **16**

a) Draw and explain phase detector in detail. Discuss its advantages and drawbacks.
b) A 107.6 MHz carrier signal is frequency modulated by 7 KHz sine wave. The resultant FM has frequency deviation of 50 KHz. Determine,
1) Carrie swing of FM signal
2) Highest and lowest frequency attended by modulated signal
3) Modulation index of FM wave
c) What is the frequency modulation? State the advantages and disadvantages of FM.

Section – II

Q.4 Attempt any three of the following questions. **12**

a) Explain the operation of a digital TDM system.
b) Elaborate pulse shaping and hamming code with example.
c) With the help of block diagram, explain Pulse Code Modulation.
d) Write a short note on Linear block code.

Q.5 a) Attempt any two of the following questions. **12**

1) Explain the concept of Errors in delta modulation. How is it overcome in adaptive delta modulation system?
2) Draw and explain Scrambler and descrambler in detail.
3) Briefly explain frequency reuse, channel assignment, hand-off.

b) A signal that has the highest frequency component of 4.2MHz and a peak to peak value of 4 volts is transmitted using a binary PCM. The number of quantization levels is 512 and P=0.04W calculate: **04**
1) Code word length
2) Bite rate
3) output signal to quantization noise ratio

SLR-FM-529

Seat No.	

Set Q

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
Electrical and Electronics Engineering
ELECTRONIC COMMUNICATION ENGINEERING

Day & Date: Saturday, 23-11-2019 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in first 30 minutes in Answer Book.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

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   a) Sampling of signals less than at Nyquist rate
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7) Granular noise occurs when _____.
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13) Frequency deviation in FM is _____.
   a) Change in carrier frequency to the frequency above and below the center frequency
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   c) The variation of the instantaneous carrier frequency in proportion to the modulating signal
   d) All of the above

14) The modulation index of FM is given by _____.
   a) μ = frequency deviation / modulating frequency
   b) μ = modulating frequency / frequency deviation
   c) μ = modulating frequency / carrier frequency
   d) μ = carrier frequency / modulating frequency

Seat No.	

Set **Q**

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
Electrical and Electronics Engineering
ELECTRONIC COMMUNICATION ENGINEERING

Day & Date: Saturday, 23-11-2019 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicates full marks.
3) Assume suitable data if necessary.

Section – I

Q.2 Attempt any three of the following questions. **12**

a) Draw and explain super-heterodyne receiver.
b) What is modulation? Explain necessity of modulation.
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1) Carrie swing of FM signal
2) Highest and lowest frequency attended by modulated signal
3) Modulation index of FM wave
c) What is the frequency modulation? State the advantages and disadvantages of FM.

Section – II

Q.4 Attempt any three of the following questions. **12**

a) Explain the operation of a digital TDM system.
b) Elaborate pulse shaping and hamming code with example.
c) With the help of block diagram, explain Pulse Code Modulation.
d) Write a short note on Linear block code.

Q.5 a) Attempt any two of the following questions. **12**

1) Explain the concept of Errors in delta modulation. How is it overcome in adaptive delta modulation system?
2) Draw and explain Scrambler and descrambler in detail.
3) Briefly explain frequency reuse, channel assignment, hand-off.

b) A signal that has the highest frequency component of 4.2MHz and a peak to peak value of 4 volts is transmitted using a binary PCM. The number of quantization levels is 512 and P=0.04W calculate: **04**
1) Code word length
2) Bite rate
3) output signal to quantization noise ratio

Seat No.	

Set **R**

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
Electrical and Electronics Engineering
ELECTRONIC COMMUNICATION ENGINEERING

Day & Date: Saturday, 23-11-2019 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in first 30 minutes in Answer Book.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) Carson's rule is used to calculate _____.
   a) Bandwidth of FM signal b) Signal to noise ratio
   c) Modulation index d) Noise figure

2) Frequency deviation in FM is _____.
   a) Change in carrier frequency to the frequency above and below the center frequency
   b) Formation of side bands
   c) The variation of the instantaneous carrier frequency in proportion to the modulating signal
   d) All of the above

3) The modulation index of FM is given by _____.
   a) μ = frequency deviation / modulating frequency
   b) μ = modulating frequency / frequency deviation
   c) μ = modulating frequency / carrier frequency
   d) μ = carrier frequency / modulating frequency

4) Aliasing refers to _____.
   a) Sampling of signals less than at Nyquist rate
   b) Sampling of signals greater than at Nyquist rate
   c) Sampling of signals at Nyquist rate
   d) None of the above

5) Analog signal may be converted into digital signal by _____.
   a) Amplitude modulation b) Sampling
   c) Filtering d) Mixing

6) Spectrum Efficiency of a cellular network is _____.
   a) The traffic carried by whole network
   b) The traffic carried per cell divided by the bandwidth of system & the area of a cell
   c) Expressed in Erlang/MHz /km^2
   d) Both b and c
   e) Both a and c

7) In a fixed channel assignment strategy, if all the assigned channels are occupied, the call _____.
   a) Gets transferred to another cell
   b) Gets blocked
   c) Is kept on waiting
   d) All of the above

8) In uniform quantization process _____.
   a) The step size remains same
   b) Step size varies according to the values of the input signal
   c) The quantizer has linear characteristics
   d) Both a and c are correct

9) The sequence of operations in which PCM is done is _____.
   a) Sampling, quantizing, encoding
   b) Quantizing, encoding, sampling
   c) Quantizing, sampling, encoding
   d) None of the above

10) Granular noise occurs when _____.
   a) Step size is too small
   b) Step size is too large
   c) There is interference from the adjacent channel
   d) Bandwidth is too large

11) The minimum antenna height required for transmission in reference to wavelength λ is _____.
   a) λ b) $\lambda/4$
   c) $\lambda/2$ d) 4λ

12) AM wave may be represented as $\mathrm{E(t)}\cos\omega_c \mathrm{t}$ where $\mathrm{E(t)}$ is _____.
   a) Envelope of the AM wave
   b) Carrier signal
   c) Amplitude of modulating signal
   d) None of the above

13) Calculate the modulation index when the un modulated carrier power is 15KW, and after modulation, carrier power is 17KW.
   a) 68% b) 51.63%
   c) 82.58% d) 34.66%

14) TRF receiver and super heterodyne receiver are used for _____.
   a) Detection of modulating signal b) Removal of unwanted signal
   c) Both a and b d) None of the above

Seat No.	

Set **R**

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
Electrical and Electronics Engineering
ELECTRONIC COMMUNICATION ENGINEERING

Day & Date: Saturday, 23-11-2019 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicates full marks.
3) Assume suitable data if necessary.

Section – I

Q.2 Attempt any three of the following questions. **12**

a) Draw and explain super-heterodyne receiver.
b) What is modulation? Explain necessity of modulation.
c) Differentiate DSBFC, DSBSC and SSBSC with the help of waveform (in time domain and frequency domain) and bandwidth requirement.
d) Explain simple dual-slope detector method with advantages.

Q.3 Attempt any two of the following questions. **16**

a) Draw and explain phase detector in detail. Discuss its advantages and drawbacks.
b) A 107.6 MHz carrier signal is frequency modulated by 7 KHz sine wave. The resultant FM has frequency deviation of 50 KHz. Determine,
1) Carrie swing of FM signal
2) Highest and lowest frequency attended by modulated signal
3) Modulation index of FM wave
c) What is the frequency modulation? State the advantages and disadvantages of FM.

Section – II

Q.4 Attempt any three of the following questions. **12**

a) Explain the operation of a digital TDM system.
b) Elaborate pulse shaping and hamming code with example.
c) With the help of block diagram, explain Pulse Code Modulation.
d) Write a short note on Linear block code.

Q.5 a) Attempt any two of the following questions. **12**

1) Explain the concept of Errors in delta modulation. How is it overcome in adaptive delta modulation system?
2) Draw and explain Scrambler and descrambler in detail.
3) Briefly explain frequency reuse, channel assignment, hand-off.

b) A signal that has the highest frequency component of 4.2MHz and a peak to peak value of 4 volts is transmitted using a binary PCM. The number of quantization levels is 512 and P=0.04W calculate: **04**
1) Code word length
2) Bite rate
3) output signal to quantization noise ratio

Seat No.	

Set **S**

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
Electrical and Electronics Engineering
ELECTRONIC COMMUNICATION ENGINEERING

Day & Date: Saturday, 23-11-2019 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in first 30 minutes in Answer Book.
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MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) Spectrum Efficiency of a cellular network is _____.
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2) In a fixed channel assignment strategy, if all the assigned channels are occupied, the call _____.
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7) AM wave may be represented as $E(t)\cos\omega_c t$ where $E(t)$ is _____.
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13) Aliasing refers to _____.
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   b) Sampling of signals greater than at Nyquist rate
   c) Sampling of signals at Nyquist rate
   d) None of the above

14) Analog signal may be converted into digital signal by _____.
   a) Amplitude modulation b) Sampling
   c) Filtering d) Mixing

SLR-FM-529

Seat No.	

Set S

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
Electrical and Electronics Engineering
ELECTRONIC COMMUNICATION ENGINEERING

Day & Date: Saturday, 23-11-2019 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicates full marks.
3) Assume suitable data if necessary.

Section – I

Q.2 Attempt any three of the following questions. **12**

a) Draw and explain super-heterodyne receiver.
b) What is modulation? Explain necessity of modulation.
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d) Explain simple dual-slope detector method with advantages.

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b) A 107.6 MHz carrier signal is frequency modulated by 7 KHz sine wave. The resultant FM has frequency deviation of 50 KHz. Determine,
1) Carrie swing of FM signal
2) Highest and lowest frequency attended by modulated signal
3) Modulation index of FM wave
c) What is the frequency modulation? State the advantages and disadvantages of FM.

Section – II

Q.4 Attempt any three of the following questions. **12**

a) Explain the operation of a digital TDM system.
b) Elaborate pulse shaping and hamming code with example.
c) With the help of block diagram, explain Pulse Code Modulation.
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Q.5 a) Attempt any two of the following questions. **12**

1) Explain the concept of Errors in delta modulation. How is it overcome in adaptive delta modulation system?
2) Draw and explain Scrambler and descrambler in detail.
3) Briefly explain frequency reuse, channel assignment, hand-off.

b) A signal that has the highest frequency component of 4.2MHz and a peak to peak value of 4 volts is transmitted using a binary PCM. The number of quantization levels is 512 and P=0.04W calculate: **04**
1) Code word length
2) Bite rate
3) output signal to quantization noise ratio

Seat No.	

Set **P**

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
POWER SYSTEM ANALYSIS

Day & Date: Monday, 25-11-2019 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
2) Figures to right indicate full marks.
3) Assume suitable data if necessary

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) The Gauss Seidel load flow method has following disadvantages, the incorrect statement is _____.
   a) Unreliable convergence
   b) Slow convergence
   c) Choice of slack bus affects convergence
   d) A good initial guess for voltages is essential for convergence

2) For limiting short circuits we use _____.
   a) Reactors b) resistors
   c) Capacitors d) any of these

3) For a fixed value of complex power flow in a transmission line having a sending end voltage V, the real loss will be proportional to _____.
   a) V b) V^2
   c) $1/V^2$ d) $1/V$

4) An acceleration factor is used in load flow studies using G-S method to _____.
   a) to increase the number of iterations
   b) to increase the speed of calculations
   c) both a and b
   d) none of above

5) The sequence components of the fault current are as follows: $I_{\text{positive}} = j1.5$ pu, $I_{\text{negative}} = -j0.5$ pu, $I_{\text{zero}} = -j1$ pu.
   a) LG b) LL
   c) LLG d) LLLG

6) The complex conjugate of α is _____.
   a) α^2 b) $1/\alpha$
   c) both a and b d) none of the above

7) A 500 MW, 21 kV, 50 Hz, 3-phase, 2-pole synchronous generator having a rated p.f = 0.9, has a moment of inertia of 27.5×10^3kg-m^2 .The inertia constant H will be _____.
   a) 2.44s b) 2.71 s
   c) 4.88 s d) 5.42 s

8) For a stable operation the normal value of δ lies between _____.
   a) 0-30 b) 0-90
   c) 0-60 d) 0-180

9) Negative sequence reactance of a transformer is _____.
   a) equal to the positive sequence reactance
   b) smaller than positive sequence reactance
   c) larger than the positive sequence reactance
   d) none of the above

10) Instead of the three phase fault, if a single line to ground fault occurs on phase 'a' at point 'F' with zero fault impedance, then the rms of the ac component of fault current (I_x) for phase 'a' will be _____.
   a) 4.97 p.u b) 7.0 p.u
   c) 14.93 p.u d) 29.85 p.u

11) The zero sequence fault currents are absent when the fault is _____.
   a) single line to ground b) line to line
   c) double line to ground d) none of above

12) A three-phase, 33 kV oil circuit breaker is rated 1200 A, 2000 MVA, 3 s. The symmetrical breaking current is _____.
   a) 1200 A b) 3600 A
   c) 35 KA d) 104.8 kA

13) In G-S method the number of iterations of the load flow study depend upon _____.
   a) number of buses b) Tolerance factor ϵ
   c) Slack bus d) none of above

14) For a power system network with n nodes, Z_{33} of its bus impedance matrix is $j0.5$ per unit. The voltage at node 3 is 1.3<10 per unit. If a capacitor having reactance of $-j3.5$ per unit is now added to the network between node 3 and the reference node, the current drawn by the capacitor per unit is _____.
   a) 0.325<100 b) 0.325<80
   c) 0.371<100 d) 0.433<80

Seat No.	

Set **P**

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
POWER SYSTEM ANALYSIS

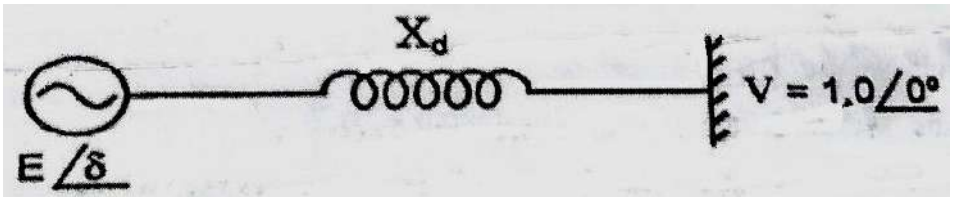
Day & Date: Monday, 25-11-2019 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figure to the right indicates full marks.
3) Assume suitable data if necessary

Section – I

Q.2 Attempt any four of the following questions. **16**

a) An alternator is connected to infinite bus as shown in fig. it delivers 1 pu current at 0.8 pf lagging at V=1 pu. The reactance is 1.2 pu. Determine the active power output and steady state power limit.

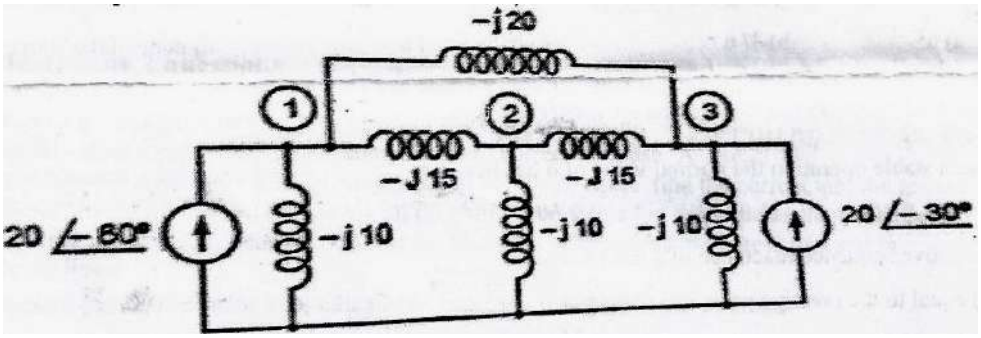


b) With the help of suitable example explain process obtaining nodal admittance matrix.

c) A single phase transformer is rated 100 KVA, 11/0.4 KV, 50 Hz have leakage reactance of 0.15 ohm referred to low voltage side. Determine its leakage reactance in percent and per unit.

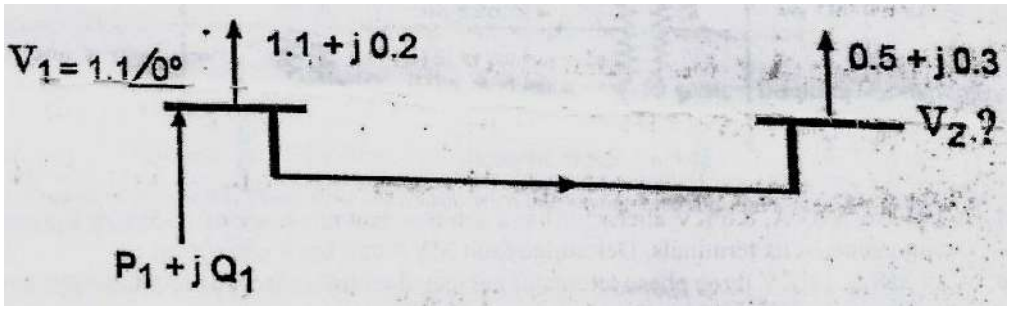
d) Derive static load flow equations. Write it in the complex form and real form.

e) For the sample network shown in fig determine bus admittance matrix.



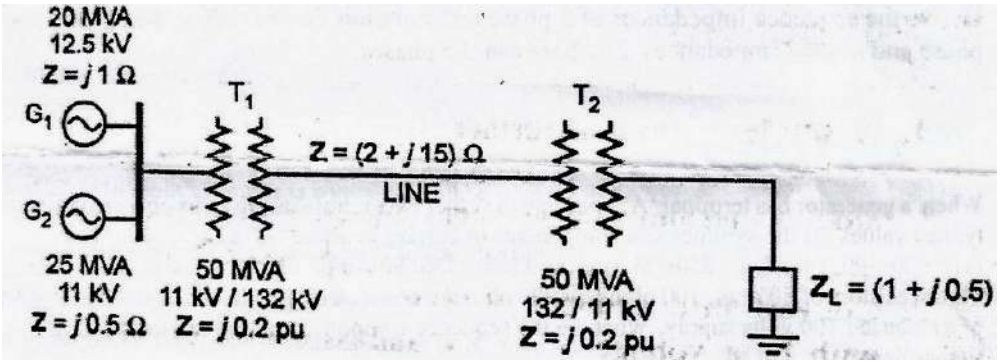
f) State and derive equal area criterion of power system stability.

Q.3 **a)** A two bus system is shown in fig. $Y11 = Y22 = 1.6 < -80\ pu$ and $Y12 = Y21 = 1.9 < 100\ pu$. Determine the voltages at bus two by gauss seidal method after two iterations. **12**



OR

Redraw the power system shown in fig. showing all the values of each component on a common base of 100 MVA, 11KV at generator bus. All impedances are given in their own base.



b) Explain algorithm for solution of load flow load flow problem using Newton Raphson method when the system consists of all types of buses.

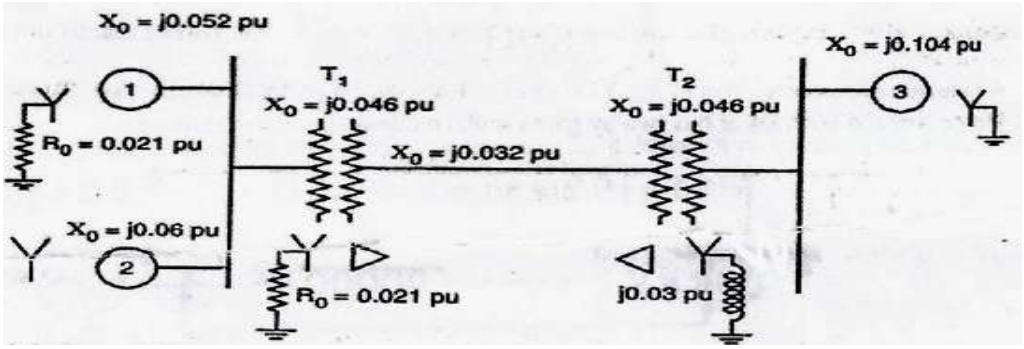
Section – II

Q.4 **Attempt any four of the following questions.** **16**

a) A3 phase, 20 MVA, 10 KV alternator has internal resistance of 5% and negligible resistance. Find the external resistance per phase to be connected in series with the alternator so that steady current on short circuit does not exceed 8 times the full load current.

b) Derive the necessary equation to determine the fault current for LL fault. Draw a diagram showing the interconnection of sequence network.

c) For the power system shown below draw zero sequence network.



d) A 3 phase, 5MVA, 6.6 KV alternator has a sub transient reactance of 12.5%. A 3 phase short circuit occurs at its terminals. Determine fault MVA and Fault current.

e) A 50 MVA, 11 KV three phase alternator subjected to different types of faults. The fault currents are as under:
3 phase fault= 2000 A, LL Fault= 2600 A, LG Fault = 4200 A.
The Generator is solidly grounded find the values of the three sequence reactance in pu of the alternator. Ignore resistances.

f) Derive the sequence impedances of 3 phase transmission line having self-impedances 'Zs' per phase and mutual impedances 'Zm' between the phases.

Q.5 Attempt any two of the following questions. **12**

a) When a generator has terminal ‘A’ open and the other two terminals are short circuited to ground typical values for the symmetrical components of current in phase ‘A’ are:
Ial= 600<-90 Amp, Ia2= 250<90 Amp, and Ia0 = 350<90 Amp. find the current into the ground.

b) Three resistors of 50 ohm, 100 ohm and 200 ohm are connected in delta across the three phases of a balanced 100 volts supply. What are the sequence components in the resistors and in supply lines?

c) Explain the short circuit of synchronous machine on.
1) No load
2) Load

Seat No.	

Set **Q**

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
POWER SYSTEM ANALYSIS

Day & Date: Monday, 25-11-2019 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
2) Figures to right indicate full marks.
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MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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   a) 0-30 b) 0-90
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3) Instead of the three phase fault, if a single line to ground fault occurs on phase 'a' at point 'F' with zero fault impedance, then the rms of the ac component of fault current (I_x) for phase 'a' will be _____.
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Seat No.	

Set **Q**

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
POWER SYSTEM ANALYSIS

Day & Date: Monday, 25-11-2019 Max. Marks: 56
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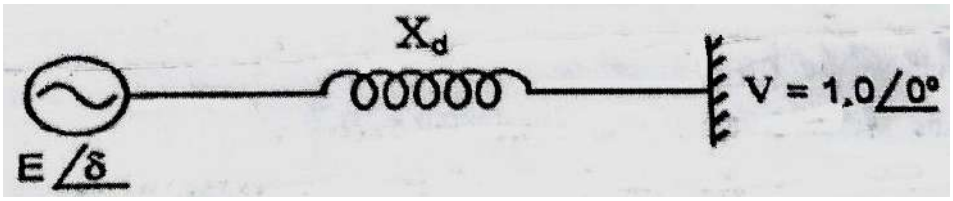

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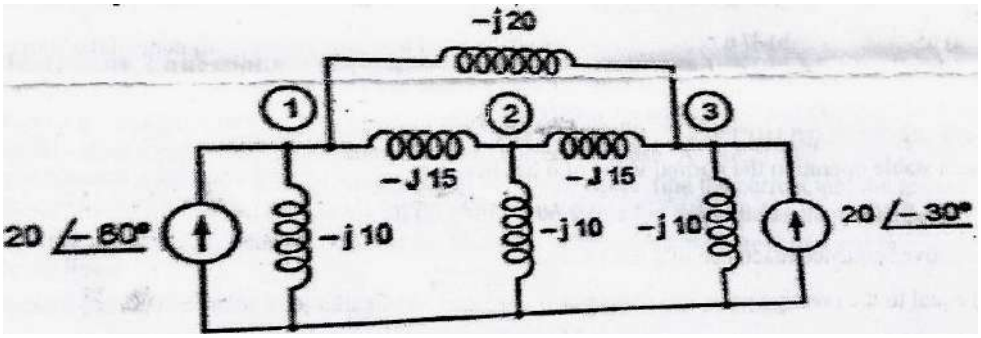

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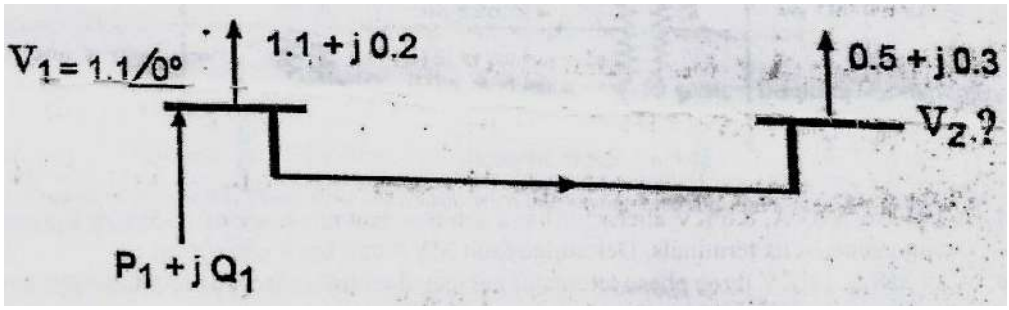

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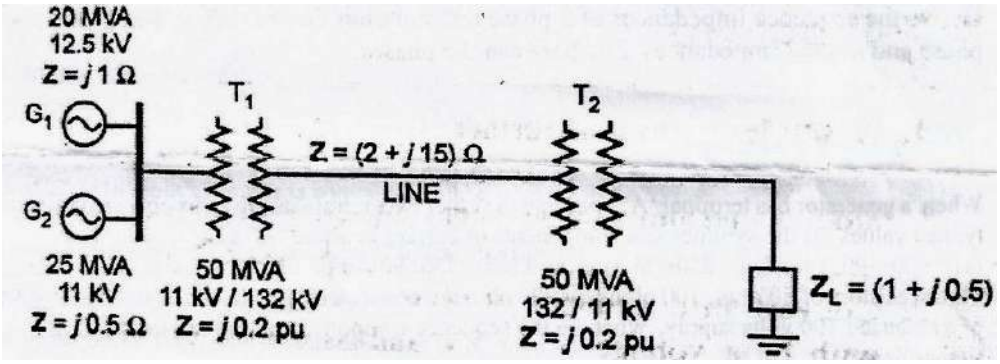

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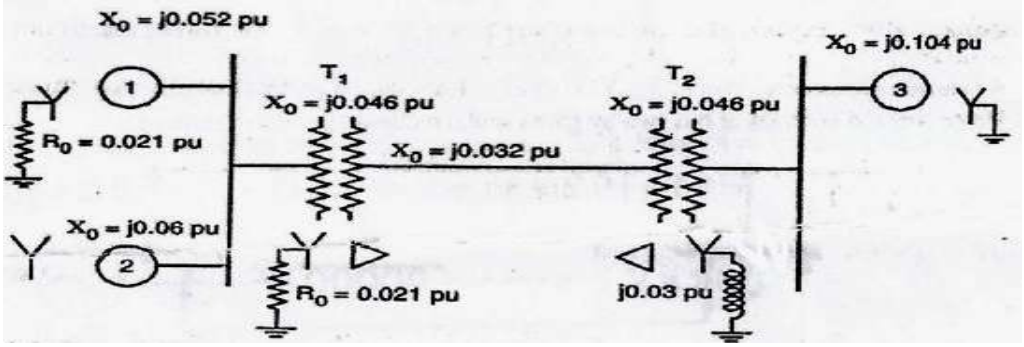

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f) Derive the sequence impedances of 3 phase transmission line having self-impedances 'Zs' per phase and mutual impedances 'Zm' between the phases.

Q.5 Attempt any two of the following questions. **12**

a) When a generator has terminal ‘A’ open and the other two terminals are short circuited to ground typical values for the symmetrical components of current in phase ‘A’ are:
Ial= 600<-90 Amp, Ia2= 250<90 Amp, and Ia0 = 350<90 Amp. find the current into the ground.

b) Three resistors of 50 ohm, 100 ohm and 200 ohm are connected in delta across the three phases of a balanced 100 volts supply. What are the sequence components in the resistors and in supply lines?

c) Explain the short circuit of synchronous machine on.
1) No load
2) Load

Seat No.	

Set **R**

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
POWER SYSTEM ANALYSIS

Day & Date: Monday, 25-11-2019 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
2) Figures to right indicate full marks.
3) Assume suitable data if necessary

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) The sequence components of the fault current are as follows:
$I_{\text{positive}} = j1.5$ pu, $I_{\text{negative}} = -j0.5$ pu, $I_{\text{zero}} = -j1$ pu.
a) LG b) LL
c) LLG d) LLLG

2) The complex conjugate of α is _____.
a) α^2 b) $1/\alpha$
c) both a and b d) none of the above

3) A 500 MW, 21 kV, 50 Hz, 3-phase, 2-pole synchronous generator having a rated p.f = 0.9, has a moment of inertia of 27.5×10^3kg-m^2 .The inertia constant H will be _____.
a) 2.44s b) 2.71 s
c) 4.88 s d) 5.42 s

4) For a stable operation the normal value of δ lies between _____.
a) 0-30 b) 0-90
c) 0-60 d) 0-180

5) Negative sequence reactance of a transformer is _____.
a) equal to the positive sequence reactance
b) smaller than positive sequence reactance
c) larger than the positive sequence reactance
d) none of the above

6) Instead of the three phase fault, if a single line to ground fault occurs on phase 'a' at point 'F' with zero fault impedance, then the rms of the ac component of fault current (I_x) for phase 'a' will be _____.
a) 4.97 p.u b) 7.0 p.u
c) 14.93 p.u d) 29.85 p.u

7) The zero sequence fault currents are absent when the fault is _____.
a) single line to ground b) line to line
c) double line to ground d) none of above

8) A three-phase, 33 kV oil circuit breaker is rated 1200 A, 2000 MVA, 3 s. The symmetrical breaking current is _____.
a) 1200 A b) 3600 A
c) 35 KA d) 104.8 kA

9) In G-S method the number of iterations of the load flow study depend upon _____.
   a) number of buses
   b) Tolerance factor €
   c) Slack bus
   d) none of above

10) For a power system network with n nodes, Z_{33} of its bus impedance matrix is $j0.5$ per unit. The voltage at node 3 is 1.3<10 per unit. If a capacitor having reactance of $-j3.5$ per unit is now added to the network between node 3 and the reference node, the current drawn by the capacitor per unit is _____.
   a) 0.325<100
   b) 0.325<80
   c) 0.371<100
   d) 0.433<80

11) The Gauss Seidel load flow method has following disadvantages, the incorrect statement is _____.
   a) Unreliable convergence
   b) Slow convergence
   c) Choice of slack bus affects convergence
   d) A good initial guess for voltages is essential for convergence

12) For limiting short circuits we use _____.
   a) Reactors
   b) resistors
   c) Capacitors
   d) any of these

13) For a fixed value of complex power flow in a transmission line having a sending end voltage V, the real loss will be proportional to _____.
   a) V
   b) V^2
   c) $1/V^2$
   d) $1/V$

14) An acceleration factor is used in load flow studies using G-S method to _____.
   a) to increase the number of iterations
   b) to increase the speed of calculations
   c) both a and b
   d) none of above

Seat No.	

Set **R**

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
POWER SYSTEM ANALYSIS

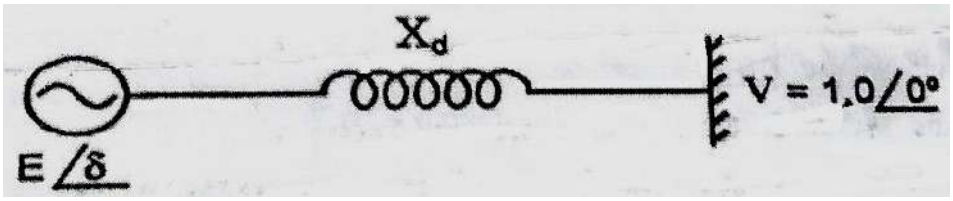
Day & Date: Monday, 25-11-2019 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figure to the right indicates full marks.
3) Assume suitable data if necessary

Section – I

Q.2 Attempt any four of the following questions. **16**

a) An alternator is connected to infinite bus as shown in fig. it delivers 1 pu current at 0.8 pf lagging at V=1 pu. The reactance is 1.2 pu. Determine the active power output and steady state power limit.

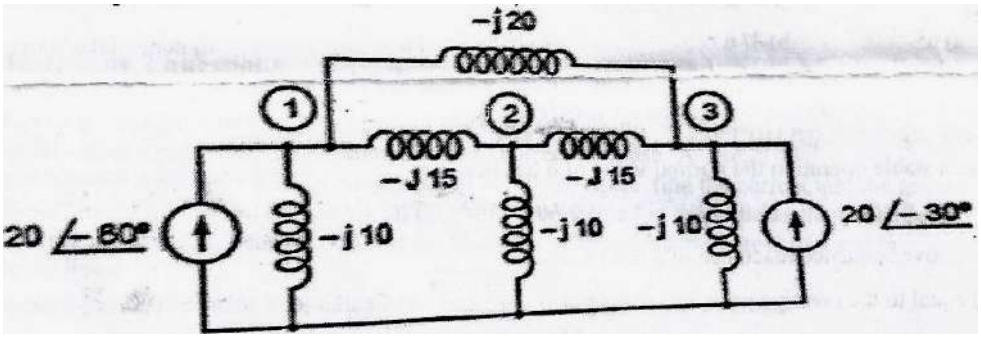


b) With the help of suitable example explain process obtaining nodal admittance matrix.

c) A single phase transformer is rated 100 KVA, 11/0.4 KV, 50 Hz have leakage reactance of 0.15 ohm referred to low voltage side. Determine its leakage reactance in percent and per unit.

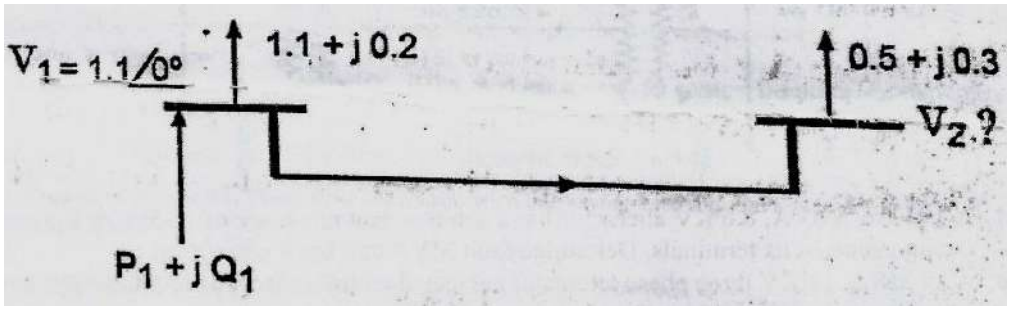
d) Derive static load flow equations. Write it in the complex form and real form.

e) For the sample network shown in fig determine bus admittance matrix.



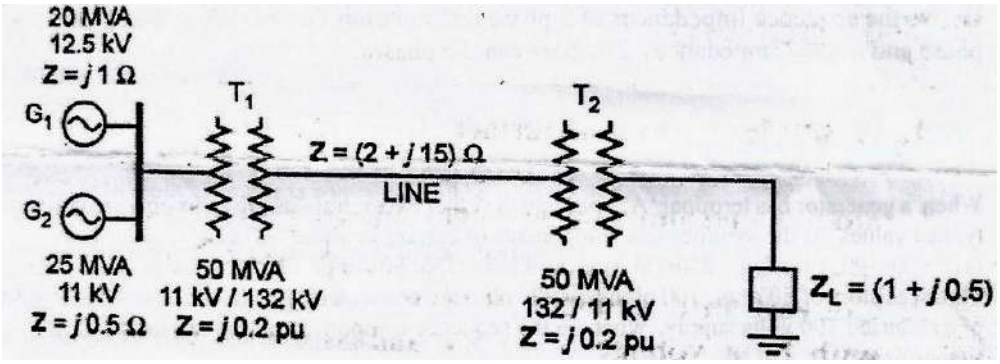
f) State and derive equal area criterion of power system stability.

Q.3 **a)** A two bus system is shown in fig. $Y11 = Y22 = 1.6 < -80\ pu$ and $Y12 = Y21 = 1.9 < 100\ pu$. Determine the voltages at bus two by gauss seidal method after two iterations. **12**



OR

Redraw the power system shown in fig. showing all the values of each component on a common base of 100 MVA, 11KV at generator bus. All impedances are given in their own base.



b) Explain algorithm for solution of load flow load flow problem using Newton Raphson method when the system consists of all types of buses.

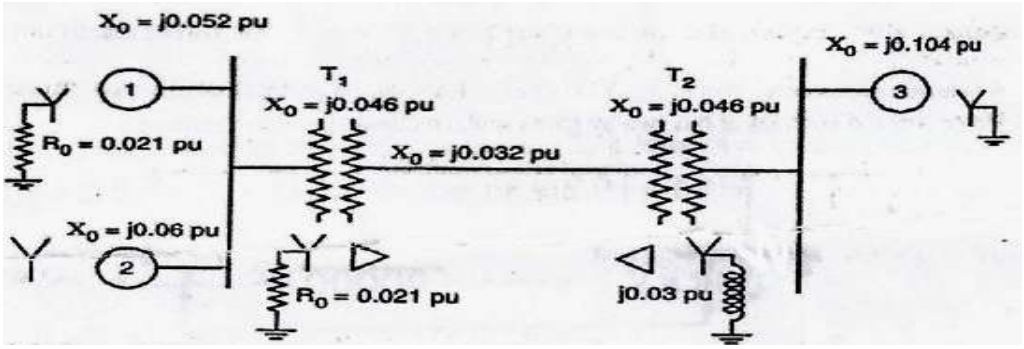
Section – II

Q.4 **Attempt any four of the following questions.** **16**

a) A3 phase, 20 MVA, 10 KV alternator has internal resistance of 5% and negligible resistance. Find the external resistance per phase to be connected in series with the alternator so that steady current on short circuit does not exceed 8 times the full load current.

b) Derive the necessary equation to determine the fault current for LL fault. Draw a diagram showing the interconnection of sequence network.

c) For the power system shown below draw zero sequence network.



d) A 3 phase, 5MVA, 6.6 KV alternator has a sub transient reactance of 12.5%. A 3 phase short circuit occurs at its terminals. Determine fault MVA and Fault current.

e) A 50 MVA, 11 KV three phase alternator subjected to different types of faults. The fault currents are as under:
3 phase fault= 2000 A, LL Fault= 2600 A, LG Fault = 4200 A.
The Generator is solidly grounded find the values of the three sequence reactance in pu of the alternator. Ignore resistances.

f) Derive the sequence impedances of 3 phase transmission line having self-impedances 'Zs' per phase and mutual impedances 'Zm' between the phases.

Q.5 Attempt any two of the following questions. **12**

a) When a generator has terminal ‘A’ open and the other two terminals are short circuited to ground typical values for the symmetrical components of current in phase ‘A’ are:
Ial= 600<-90 Amp, Ia2= 250<90 Amp, and Ia0 = 350<90 Amp. find the current into the ground.

b) Three resistors of 50 ohm, 100 ohm and 200 ohm are connected in delta across the three phases of a balanced 100 volts supply. What are the sequence components in the resistors and in supply lines?

c) Explain the short circuit of synchronous machine on.
1) No load
2) Load

Seat No.	

Set **S**

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
POWER SYSTEM ANALYSIS

Day & Date: Monday, 25-11-2019 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
2) Figures to right indicate full marks.
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MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) Instead of the three phase fault, if a single line to ground fault occurs on phase 'a' at point 'F' with zero fault impedance, then the rms of the ac component of fault current (I_x) for phase 'a' will be _____.
   a) 4.97 p.u b) 7.0 p.u
   c) 14.93 p.u d) 29.85 p.u

2) The zero sequence fault currents are absent when the fault is _____.
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   c) double line to ground d) none of above

3) A three-phase, 33 kV oil circuit breaker is rated 1200 A, 2000 MVA, 3 s. The symmetrical breaking current is _____.
   a) 1200 A b) 3600 A
   c) 35 KA d) 104.8 kA

4) In G-S method the number of iterations of the load flow study depend upon _____.
   a) number of buses b) Tolerance factor ϵ
   c) Slack bus d) none of above

5) For a power system network with n nodes, Z_{33} of its bus impedance matrix is $j0.5$ per unit. The voltage at node 3 is 1.3<10 per unit. If a capacitor having reactance of $-j3.5$ per unit is now added to the network between node 3 and the reference node, the current drawn by the capacitor per unit is _____.
   a) 0.325<100 b) 0.325<80
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7) For limiting short circuits we use _____.
   a) Reactors b) resistors
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8) For a fixed value of complex power flow in a transmission line having a sending end voltage V, the real loss will be proportional to _____.
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9) An acceleration factor is used in load flow studies using G-S method to _____.
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11) The complex conjugate of α is _____.
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12) A 500 MW, 21 kV, 50 Hz, 3-phase, 2-pole synchronous generator having a rated p.f = 0.9, has a moment of inertia of 27.5×10^3kg-m^2 .The inertia constant H will be _____.
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13) For a stable operation the normal value of δ lies between _____.
   a) 0-30 b) 0-90
   c) 0-60 d) 0-180

14) Negative sequence reactance of a transformer is _____.
   a) equal to the positive sequence reactance
   b) smaller than positive sequence reactance
   c) larger than the positive sequence reactance
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Seat No.	

Set **S**

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
POWER SYSTEM ANALYSIS

Day & Date: Monday, 25-11-2019 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figure to the right indicates full marks.
3) Assume suitable data if necessary

Section – I

Q.2 Attempt any four of the following questions. **16**

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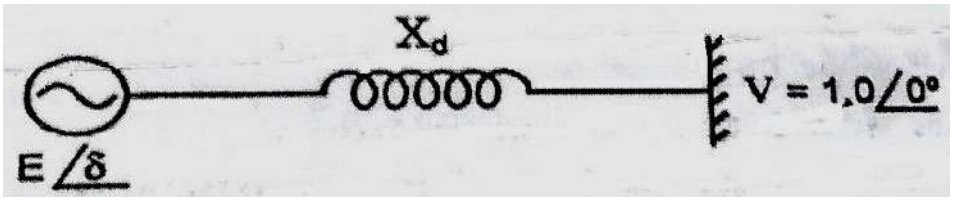

b) With the help of suitable example explain process obtaining nodal admittance matrix.

c) A single phase transformer is rated 100 KVA, 11/0.4 KV, 50 Hz have leakage reactance of 0.15 ohm referred to low voltage side. Determine its leakage reactance in percent and per unit.

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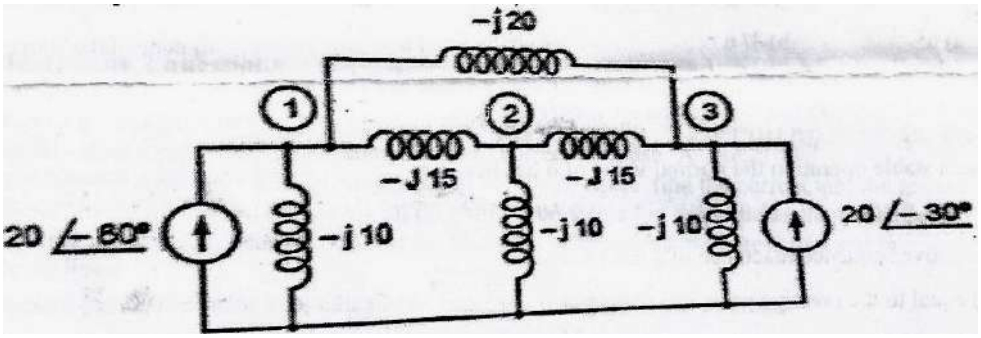

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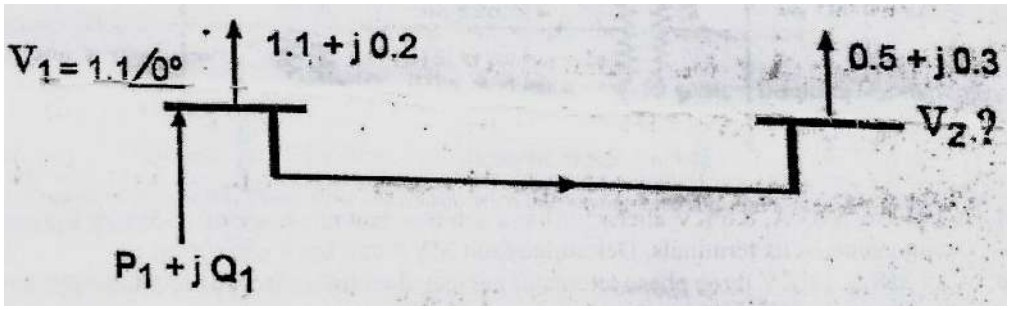

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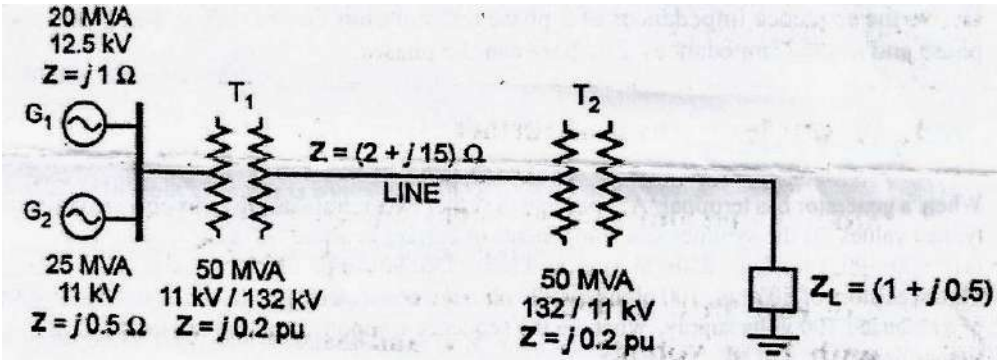

b) Explain algorithm for solution of load flow load flow problem using Newton Raphson method when the system consists of all types of buses.

Section – II

Q.4 **Attempt any four of the following questions.** **16**

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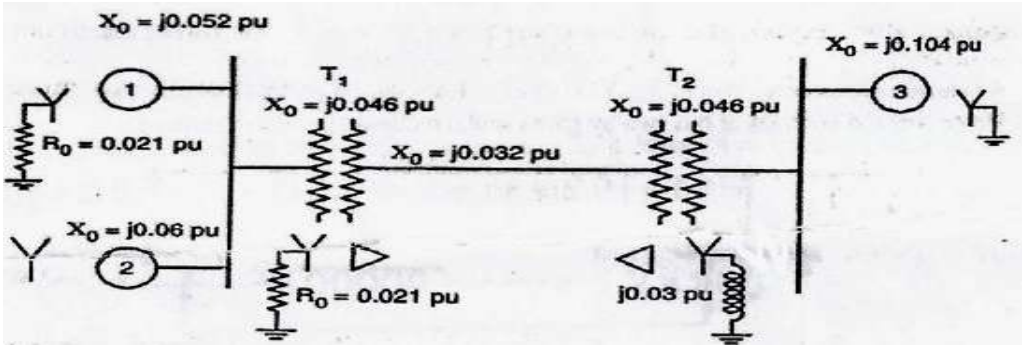

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f) Derive the sequence impedances of 3 phase transmission line having self-impedances 'Zs' per phase and mutual impedances 'Zm' between the phases.

Q.5 Attempt any two of the following questions. **12**

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Ial= 600<-90 Amp, Ia2= 250<90 Amp, and Ia0 = 350<90 Amp. find the current into the ground.

b) Three resistors of 50 ohm, 100 ohm and 200 ohm are connected in delta across the three phases of a balanced 100 volts supply. What are the sequence components in the resistors and in supply lines?

c) Explain the short circuit of synchronous machine on.
1) No load
2) Load

Seat No.	

Set **P**

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
CONTROL SYSTEM – II

Day & Date: Tuesday, 26-11-2019 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) The eigen values of the system are represented by _____.
   a) 0,0,0,0 b) 1,1,1,1
   c) 0,0,0,-1 d) 1,0,0,0

2) $x(t) = A\,x(t) + Bu(t)$ is called as _____.
   a) System equation b) State Equation
   c) State transition equation d) None

3) State space analysis is applicable even if the initial conditions are _____.
   a) Zero b) Non-zero
   c) Equal d) Not equal

4) A system with gain margin close to unity or a phase margin close to zero is _____.
   a) Highly stable b) Oscillatory
   c) Relatively stable d) Unstable

5) Slope of factor K in plotting bode magnitude plot is _____.
   a) 0^o b) ∞
   c) 90^o d) None of these

6) _____ increases the transient response.
   a) Integrator b) Differentiator
   c) Phase lead compensator d) Phase lag Compensator

7) For the state transition matrix $\emptyset(t)$ _____.
   a) $\emptyset^{-1}(t) = \emptyset(-t)$ b) $\emptyset^{-1}(t) = -\emptyset(-t)$
   c) $\emptyset^{-1}(t) = \emptyset(t)$ d) $\emptyset^{-1}(t) = -\emptyset(t)$

8) The state transition matrix for the system $X^{\circ} = AX$ with initial state $X(0)$ is _____.
   a) $(sI - A)^{-1}$
   b) $e^{At}X(0)$
   c) Laplace inverse of $[(sI - A)^{-1}]$
   d) Laplace inverse of $[(sI - A)^{-1}X(0)]$

9) A state variable approach can be applied to _____ Systems.
   a) Time Variant b) Non-Linear
   c) Linear & time invariant d) All of the above

10) The Singular points around which the state trajectories are concentric circles or ellipses, are called _____.

a) Focus Point
b) Centreor vortex
c) Saddle Point
d) Nodal Point

11) The transfer function of the zero order hold is _____.

a) $1 - e^{TS}$
b) $(1 - e^{TS})/s$
c) $1 - e^{-/TS}$
d) $(1 - e^{-TS})/s$

12) For an n^{th} order system state equations will be _____.

a) n
b) 1
c) $\frac{n}{2}$
d) $\frac{n+1}{2}$

13) The Limit cycles are the self sustained oscillations of _____.

a) fixed amplitude
b) variable frequency
c) variable amplitude
d) fixed amplitude and frequency

14) The term backlash is associated with _____.

a) servomotors
b) induction relays
c) gear trains
d) any of above

Seat No.	

Set **P**

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
CONTROL SYSTEMS – II

Day & Date: Tuesday, 26-11-2019 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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

Q.2 Solve any four: **16**

a) Explain procedure to design lag compensator by using frequency response.

b) Give steps to design lag compensator using Root Locus Method.

c) Define :
1) State variable 2) State space
3) State vector 4) State trajectory

d) What are the different methods to obtain state feedback gain matrix? Explain any one.

e) Find the eigenvectors of the matrix $\mathrm{A} = \begin{bmatrix} -3 & 1 \\ 1 & -3 \end{bmatrix}$

Q.3 Solve any two: **12**

a) Design a suitable compensator for the system whose OLTF is $\mathrm{G(s)} = \frac{16}{\mathrm{s}(s+4)}$ so that the static velocity error constant $\mathrm{K_V} = 20sec^{-1}$.

b) Check the observability and controllability of the system, described by following differential equation.

$$\frac{\mathrm{d\hat{}3y(t)}}{\mathrm{dt\hat{}3}} = \mathrm{u(t)}$$

where y(t) is the output and u(t) is input.

c) Derive pulse transfer of cascaded element

Section – II

Q.4 Solve any four. **16**

a) Explain in detail Basic elements of discrete data control system.

b) Determine the kind of singularity for the following differential equation.

$$\ddot{y} + 0.3\dot{y} + y = 0$$

c) Explain in short limit cycle.

d) Explain types of D to A converter.

e) Explain delta method for phase trajectories.

f) Explain Pulse Transfer Function of closed loop system

Q.5 Solve any two. **12**

a) Derive describing function of saturation and deadzone

b) Examine the stability of the system given by equation by Jury's stability test.

$$Z^3 - 1.1Z^2 - 0.1\,Z + 0.2 = 0$$

c) Examine the stability of the system by using Bilinear transformation coupled with Routh's criteria.

$5Z^2 - 2Z + 2 = 0$

Seat No.	

Set **Q**

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
CONTROL SYSTEM – II

Day & Date: Tuesday, 26-11-2019 Max. Marks: 70
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MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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   c) $1 - \mathrm{e}^{-/\mathrm{TS}}$ d) $(1 - \mathrm{e}^{-\mathrm{TS}})/\mathrm{s}$

5) For an n^{th} order system state equations will be _____.
   a) n b) 1
   c) $\frac{\mathrm{n}}{2}$ d) $\frac{\mathrm{n}+1}{2}$

6) The Limit cycles are the self sustained oscillations of _____.
   a) fixed amplitude b) variable frequency
   c) variable amplitude d) fixed amplitude and frequency

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Seat No.	

Set **Q**

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
CONTROL SYSTEMS – II

Day & Date: Tuesday, 26-11-2019 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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

Q.2 Solve any four: **16**

a) Explain procedure to design lag compensator by using frequency response.

b) Give steps to design lag compensator using Root Locus Method.

c) Define :
1) State variable 2) State space
3) State vector 4) State trajectory

d) What are the different methods to obtain state feedback gain matrix? Explain any one.

e) Find the eigenvectors of the matrix $\mathrm{A} = \begin{bmatrix} -3 & 1 \\ 1 & -3 \end{bmatrix}$

Q.3 Solve any two: **12**

a) Design a suitable compensator for the system whose OLTF is $\mathrm{G(s)} = \frac{16}{\mathrm{s}(s+4)}$ so that the static velocity error constant $\mathrm{K_V} = 20sec^{-1}$.

b) Check the observability and controllability of the system, described by following differential equation.

$$\frac{\mathrm{d\hat{}3y(t)}}{\mathrm{dt\hat{}3}} = \mathrm{u(t)}$$

where y(t) is the output and u(t) is input.

c) Derive pulse transfer of cascaded element

Section – II

Q.4 Solve any four. **16**

a) Explain in detail Basic elements of discrete data control system.

b) Determine the kind of singularity for the following differential equation.

$$\ddot{y} + 0.3\dot{y} + y = 0$$

c) Explain in short limit cycle.

d) Explain types of D to A converter.

e) Explain delta method for phase trajectories.

f) Explain Pulse Transfer Function of closed loop system

Q.5 Solve any two. **12**

a) Derive describing function of saturation and deadzone

b) Examine the stability of the system given by equation by Jury's stability test.

$$Z^3 - 1.1Z^2 - 0.1\,Z + 0.2 = 0$$

c) Examine the stability of the system by using Bilinear transformation coupled with Routh's criteria.

$5Z^2 - 2Z + 2 = 0$

Seat No.	

Set **R**

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
CONTROL SYSTEM – II

Day & Date: Tuesday, 26-11-2019 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) Slope of factor K in plotting bode magnitude plot is _____.
   a) 0^{o} b) ∞
   c) 90^{o} d) None of these

2) _____ increases the transient response.
   a) Integrator b) Differentiator
   c) Phase lead compensator d) Phase lag Compensator

3) For the state transition matrix $\emptyset(t)$ _____.
   a) $\emptyset^{-1}(t) = \emptyset(-t)$ b) $\emptyset^{-1}(t) = -\emptyset(-t)$
   c) $\emptyset^{-1}(t) = \emptyset(t)$ d) $\emptyset^{-1}(t) = -\emptyset(t)$

4) The state transition matrix for the system $X^{\circ} = AX$ with initial state $X(0)$ is _____.
   a) $(sI - A)^{-1}$
   b) $e^{At}X(0)$
   c) Laplace inverse of $[(sI - A)^{-1}]$
   d) Laplace inverse of $[(sI - A)^{-1} X(0)]$

5) A state variable approach can be applied to _____ Systems.
   a) Time Variant b) Non-Linear
   c) Linear & time invariant d) All of the above

6) The Singular points around which the state trajectories are concentric circles or ellipses, are called _____.
   a) Focus Point b) Centreor vortex
   c) Saddle Point d) Nodal Point

7) The transfer function of the zero order hold is _____.
   a) $1 - e^{TS}$ b) $(1 - e^{TS})/s$
   c) $1 - e^{-/TS}$ d) $(1 - e^{-TS})/s$

8) For an n^{th} order system state equations will be _____.
   a) n b) 1
   c) $\frac{n}{2}$ d) $\frac{n+1}{2}$

9) The Limit cycles are the self sustained oscillations of _____.
   a) fixed amplitude
   b) variable frequency
   c) variable amplitude
   d) fixed amplitude and frequency

10) The term backlash is associated with _____.
   a) servomotors
   b) induction relays
   c) gear trains
   d) any of above

11) The eigen values of the system are represented by _____.
   a) 0,0,0,0
   b) 1,1,1,1
   c) 0,0,0,-1
   d) 1,0,0,0

12) $\mathrm{x(t)} = \mathrm{A\,x(t)} + \mathrm{Bu(t)}$ is called as _____.
   a) System equation
   b) State Equation
   c) State transition equation
   d) None

13) State space analysis is applicable even if the initial conditions are _____.
   a) Zero
   b) Non-zero
   c) Equal
   d) Not equal

14) A system with gain margin close to unity or a phase margin close to zero is _____.
   a) Highly stable
   b) Oscillatory
   c) Relatively stable
   d) Unstable

Seat No.	

Set **R**

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
CONTROL SYSTEMS – II

Day & Date: Tuesday, 26-11-2019 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever necessary.

Section – I

Q.2 Solve any four: **16**

a) Explain procedure to design lag compensator by using frequency response.

b) Give steps to design lag compensator using Root Locus Method.

c) Define :
1) State variable 2) State space
3) State vector 4) State trajectory

d) What are the different methods to obtain state feedback gain matrix? Explain any one.

e) Find the eigenvectors of the matrix $\mathrm{A} = \begin{bmatrix} -3 & 1 \\ 1 & -3 \end{bmatrix}$

Q.3 Solve any two: **12**

a) Design a suitable compensator for the system whose OLTF is $\mathrm{G(s)} = \frac{16}{\mathrm{s}(s+4)}$ so that the static velocity error constant $\mathrm{K_V} = 20sec^{-1}$.

b) Check the observability and controllability of the system, described by following differential equation.

$$\frac{\mathrm{d\hat{}3y(t)}}{\mathrm{dt\hat{}3}} = \mathrm{u(t)}$$

where y(t) is the output and u(t) is input.

c) Derive pulse transfer of cascaded element

Section – II

Q.4 Solve any four. **16**

a) Explain in detail Basic elements of discrete data control system.

b) Determine the kind of singularity for the following differential equation.

$$\ddot{y} + 0.3\dot{y} + y = 0$$

c) Explain in short limit cycle.

d) Explain types of D to A converter.

e) Explain delta method for phase trajectories.

f) Explain Pulse Transfer Function of closed loop system

Q.5 Solve any two. **12**

a) Derive describing function of saturation and deadzone

b) Examine the stability of the system given by equation by Jury's stability test.

$$Z^3 - 1.1Z^2 - 0.1\,Z + 0.2 = 0$$

c) Examine the stability of the system by using Bilinear transformation coupled with Routh's criteria.

$5Z^2 - 2Z + 2 = 0$

Seat No.	

Set **S**

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
CONTROL SYSTEM – II

Day & Date: Tuesday, 26-11-2019 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) The Singular points around which the state trajectories are concentric circles or ellipses, are called _____.
   a) Focus Point b) Centreor vortex
   c) Saddle Point d) Nodal Point

2) The transfer function of the zero order hold is _____.
   a) $1 - e^{TS}$ b) $(1 - e^{TS})/s$
   c) $1 - e^{-/TS}$ d) $(1 - e^{-TS})/s$

3) For an n[th] order system state equations will be _____.
   a) n b) 1
   c) $\frac{n}{2}$ d) $\frac{n+1}{2}$

4) The Limit cycles are the self sustained oscillations of _____.
   a) fixed amplitude b) variable frequency
   c) variable amplitude d) fixed amplitude and frequency

5) The term backlash is associated with _____.
   a) servomotors b) induction relays
   c) gear trains d) any of above

6) The eigen values of the system are represented by _____.
   a) 0,0,0,0 b) 1,1,1,1
   c) 0,0,0,-1 d) 1,0,0,0

7) $x(t) = A\,x(t) + Bu(t)$ is called as _____.
   a) System equation b) State Equation
   c) State transition equation d) None

8) State space analysis is applicable even if the initial conditions are _____.
   a) Zero b) Non-zero
   c) Equal d) Not equal

9) A system with gain margin close to unity or a phase margin close to zero is _____.
   a) Highly stable b) Oscillatory
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10) Slope of factor K in plotting bode magnitude plot is _____.
   a) 0^o b) ∞
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   c) Phase lead compensator d) Phase lag Compensator

12) For the state transition matrix $\emptyset(t)$ _____.
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14) A state variable approach can be applied to _____ Systems.
   a) Time Variant b) Non-Linear
   c) Linear & time invariant d) All of the above

Seat No.	

Set **S**

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
CONTROL SYSTEMS – II

Day & Date: Tuesday, 26-11-2019 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever necessary.

Section – I

Q.2 Solve any four: **16**

a) Explain procedure to design lag compensator by using frequency response.

b) Give steps to design lag compensator using Root Locus Method.

c) Define :
1) State variable 2) State space
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d) What are the different methods to obtain state feedback gain matrix? Explain any one.

e) Find the eigenvectors of the matrix $\mathrm{A} = \begin{bmatrix} -3 & 1 \\ 1 & -3 \end{bmatrix}$

Q.3 Solve any two: **12**

a) Design a suitable compensator for the system whose OLTF is $\mathrm{G(s)} = \frac{16}{\mathrm{s}(s+4)}$ so that the static velocity error constant $\mathrm{K_V} = 20sec^{-1}$.

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$$\frac{\mathrm{d\hat{}3y(t)}}{\mathrm{dt\hat{}3}} = \mathrm{u(t)}$$

where y(t) is the output and u(t) is input.

c) Derive pulse transfer of cascaded element

Section – II

Q.4 Solve any four. **16**

a) Explain in detail Basic elements of discrete data control system.

b) Determine the kind of singularity for the following differential equation.

$$\ddot{y} + 0.3\dot{y} + y = 0$$

c) Explain in short limit cycle.

d) Explain types of D to A converter.

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Q.5 Solve any two. **12**

a) Derive describing function of saturation and deadzone

b) Examine the stability of the system given by equation by Jury's stability test.

$$Z^3 - 1.1Z^2 - 0.1\,Z + 0.2 = 0$$

c) Examine the stability of the system by using Bilinear transformation coupled with Routh's criteria.

$5Z^2 - 2Z + 2 = 0$

SLR-FM-533

Seat No.	

Set P

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
Electrical And Electronics Engineering
INDUSTRIAL MANAGEMENT

Day & Date: Thursday,28-11-2019 Max. Marks: 50
Time: 10:00 AM To 12:00 PM

Instructions: 1) Q. No. 1 is compulsory and it should be solved in first 20 minutes in answer book.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 20 Minutes Marks: 10

Q.1 Choose the correct alternatives from the options and rewrite the sentence. **10**

1) Falling interest rates are an example of what external force?
   a) Market place
   b) Government laws and regulations
   c) Labour market
   d) Economic change

2) Managing change is an integral part of
   a) Top management's job b) middle level management
   c) The first line manager's job d) Every manager's job

3) The founder of scientific management was
   a) F. W. Taylor b) F. Gilbreth
   c) H. Gantt d) H. Simon

4) The time elapsed between the placing of an order and its arrival is called as _____.
   a) cycle time b) lead time
   c) work station process time d) none of the above

5) Manufacturing a number of identical articles in lots either to meet specific order or to meet continuous demand is known as:
   a) Job production b) Batch production
   c) Continuous production d) Flow production

6) The appellate authority for any industrial dispute is
   a) Management b) Labour Court
   c) High Court d) Board of directors

7) Indirect expense includes
   a) factory expenses b) selling expenses
   c) Administrative expenses d) All of the above

8) Functional responsibilities of system management is _____.
   a) Organizational analysis
   b) Development of written policies and procedures
   c) Work measurement
   d) All of the above

9) Matrix organization includes _____.
   a) Focusing of undivided efforts on two or more essential organizational tasks simultaneously
   b) Formality of structure
   c) Time orientation
   d) Confrontation

10) One of the decisional role of a manager is _____.
   a) Monitor
   b) disseminator
   c) Knowledge team builder
   d) disturbance handler

Seat No.	

Set **P**

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
Electrical And Electronics Engineering
INDUSTRIAL MANAGEMENT

Day & Date: Thursday,28-11-2019 Max. Marks: 40
Time: 10:00 AM To 12:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

Q.2 Attempt any four. **20**

a) Describe the function “planning” for industrial growth.

b) Explain Indian and global economy.

c) Brief the Principles of modern Management.

d) What is the impact of liberalization policy on Indian economy?

e) Brief the procedure for selection and recruitment.

Q.3 Attempt any two. **20**

a) Explain all the functions of management related to medium scale industry.

b) What are the different types of production process? Explain in detail.

c) Describe the techniques of investment analysis related to
1) Pay back period
2) Rate of return

SLR-FM-533

Seat No.	

Set Q

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
Electrical And Electronics Engineering
INDUSTRIAL MANAGEMENT

Day & Date: Thursday,28-11-2019 Max. Marks: 50
Time: 10:00 AM To 12:00 PM

Instructions: 1) Q. No. 1 is compulsory and it should be solved in first 20 minutes in answer book.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 20 Minutes Marks: 10

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9) The time elapsed between the placing of an order and its arrival is called as _____.
   a) cycle time
   b) lead time
   c) work station process time
   d) none of the above

10) Manufacturing a number of identical articles in lots either to meet specific order or to meet continuous demand is known as:
   a) Job production
   b) Batch production
   c) Continuous production
   d) Flow production

Seat No.	

Set **Q**

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
Electrical And Electronics Engineering
INDUSTRIAL MANAGEMENT

Day & Date: Thursday,28-11-2019 Max. Marks: 40
Time: 10:00 AM To 12:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

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d) What is the impact of liberalization policy on Indian economy?

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c) Describe the techniques of investment analysis related to
1) Pay back period
2) Rate of return

SLR-FM-533

Seat No.	

Set R

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
Electrical And Electronics Engineering
INDUSTRIAL MANAGEMENT

Day & Date: Thursday,28-11-2019 Max. Marks: 50
Time: 10:00 AM To 12:00 PM

Instructions: 1) Q. No. 1 is compulsory and it should be solved in first 20 minutes in answer book.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 20 Minutes Marks: 10

Q.1 Choose the correct alternatives from the options and rewrite the sentence. **10**

1) Matrix organization includes _____.
   a) Focusing of undivided efforts on two or more essential organizational tasks simultaneously
   b) Formality of structure
   c) Time orientation
   d) Confrontation

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   c) Administrative expenses
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   a) Organizational analysis
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   c) Work measurement
   d) All of the above

Seat No.	

Set **R**

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
Electrical And Electronics Engineering
INDUSTRIAL MANAGEMENT

Day & Date: Thursday,28-11-2019 Max. Marks: 40
Time: 10:00 AM To 12:00 PM

Instructions: 1) All questions are compulsory.
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3) Assume suitable data if necessary.

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a) Describe the function “planning” for industrial growth.

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c) Describe the techniques of investment analysis related to
1) Pay back period
2) Rate of return

SLR-FM-533

Seat No.		Set	S

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
Electrical And Electronics Engineering
INDUSTRIAL MANAGEMENT

Day & Date: Thursday,28-11-2019 Max. Marks: 50
Time: 10:00 AM To 12:00 PM

Instructions: 1) Q. No. 1 is compulsory and it should be solved in first 20 minutes in answer book.
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MCQ/Objective Type Questions

Duration: 20 Minutes Marks: 10

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   c) The first line manager's job
   d) Every manager's job

SLR-FM-533

Seat No.	

Set S

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
Electrical And Electronics Engineering
INDUSTRIAL MANAGEMENT

Day & Date: Thursday,28-11-2019 Max. Marks: 40
Time: 10:00 AM To 12:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

Q.2 Attempt any four. **20**

a) Describe the function “planning” for industrial growth.

b) Explain Indian and global economy.

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c) Describe the techniques of investment analysis related to
1) Pay back period
2) Rate of return

SLR-FM-537

Seat No.	

Set P

B.E. (Part – I) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
INDUSTRIAL DRIVES AND CONTROL

Day & Date: Saturday, 07-12-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and it should be solved in first 30 minutes in answer book.
2) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) The number of sets used in pole changing type squirrel cage motors for derricks and winches, is _____.
   a) 2 b) 3
   c) 4 d) 6

2) The _____ motors, because of their inherent characteristics, are best suited for the rolling mills.
   a) dc motors b) slip ring induction motors
   c) squirrel cage induction motors d) single phase motors

3) Which of the following motor is preferred for blowers?
   a) wound rotor induction motor
   b) squirrel cage induction motor
   c) dc shunt motor
   d) dc series motor

4) Reluctance motor is a _____.
   a) self-starting type synchronous motors
   b) low torque variable speed motor
   c) variable torque motor
   d) low noise, slow speed motor

5) The traveling speed of cranes varies from _____.
   a) 1 to 2.5 m/s b) 5 to 15 m/s
   c) 20 to 22.5 m/s d) 25 to 40 m/s

6) Motors preferred for rolling mill drive is _____.
   a) dc motors
   b) ac slip ring motors with speed control
   c) any of the above
   d) none of the above

7) The capacity of a crane is expressed in terms of _____.
   a) Span b) Type of drive
   c) Tonnes d) Any of the above

8) Pole changing method of speed control is used in _____.
   a) slip ring induction motor b) dc shunt motor
   c) dc series motor d) squirrel cage induction motor

9) To save the energy during braking _____.
   a) dynamic braking is used
   b) plugging is used
   c) regeneration braking is used
   d) mechanical braking is used

10) Most commonly used ac motor is _____.
   a) Synchronous motor
   b) Squirrel cage induction motor
   c) Slip ring induction motor
   d) ac commutator induction motor

11) The motor commonly used in computers and digital systems is _____.
   a) dc shunt motor
   b) Stepper motor
   c) Induction motor
   d) Synchronous motor

12) Which of the following is preferred for automatic drives?
   a) Synchronous motors
   b) Ward Leonard controlled de motors
   c) Squirrel cage induction motor
   d) Any of the above

13) The characteristics of drive for. crane hoisting and lowering is _____.
   a) smooth movement
   b) precise control
   c) fast speed control
   d) all of the above

14) A pole changing type squirrel cage motor used in derricks has four, eight and twenty four poles. In this the medium speed is used for _____.
   a) lifting
   b) Lowering
   c) hoisting
   d) landing the load

Seat No.	

Set **P**

B.E. (Part – I) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
INDUSTRIAL DRIVES AND CONTROL

Day & Date: Saturday, 07-12-2019 Max. Marks: 56
Time: 02:30 PM To 05:30 PM

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

Section – I

Q.2 Write Short notes. (Any Three) **12**

a) State advantages and disadvantages of Electrical Drives.
b) Derive the fundamental torque equation of electrical drives.
c) Give criteria for selection of Electrical drives.
d) Explain the multi quadrant operation of hoist with neat diagram.

Q.3 Solve any Two. **16**

a) Draw neat Block diagram of electrical drives & briefly describe each block.
b) A 220 V, 1500 RPM, 50 Amp D.C. separately excited motor has an armature resistance of 0.5 ohms is fed from 3 phase fully controlled rectifier. Available source has line voltage of 440v, 50Hz. A star-delta transformer used to feed armature so motor terminal voltage equals rated voltage when firing angle is zero.
1) Calculate transformer turns ratio
2) Determine firing angle when motor running at 1200 rpm and rated torque.
c) Derive the expression for torque and moment of inertia for loads with rotational motion and translation motion.

Section – II

Q.4 Write short notes. (Any Three) **12**

a) Write the comparison between VSI and CSI.
b) Explain current regulated voltage source inverter control with block diagram.
c) Explain static krammer drive with block diagram and waveform.
d) Explain the speed torque and power angle characteristics of synchronous motor drive.

Q.5 Solve any Two. **16**

a) Draw & explain V/F control method of induction motor.
b) A 400 V, star connected, 3-phase, 6-pole, 50 Hz IM has following parameters referred to the stator : $Rs = Rr' = 1\Omega, Xs = Xr' = 2\Omega$. For regenerative braking operation of this motor determine :
1) Maximum overhauling torque it can hold and range of speed for safe operation
2) Speed at which it will hold an overhauling load with a torque of 100 N-m.
c) Explain conventional methods of rotor resistance control.

Seat No.	

Set **Q**

B.E. (Part – I) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
INDUSTRIAL DRIVES AND CONTROL

Day & Date: Saturday, 07-12-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and it should be solved in first 30 minutes in answer book.
2) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) Pole changing method of speed control is used in _____.
   a) slip ring induction motor b) dc shunt motor
   c) dc series motor d) squirrel cage induction motor

2) To save the energy during braking _____.
   a) dynamic braking is used b) plugging is used
   c) regeneration braking is used d) mechanical braking is used

3) Most commonly used ac motor is _____.
   a) Synchronous motor b) Squirrel cage induction motor
   c) Slip ring induction motor d) ac commutator induction motor

4) The motor commonly used in computers and digital systems is _____.
   a) dc shunt motor b) Stepper motor
   c) Induction motor d) Synchronous motor

5) Which of the following is preferred for automatic drives?
   a) Synchronous motors
   b) Ward Leonard controlled de motors
   c) Squirrel cage induction motor
   d) Any of the above

6) The characteristics of drive for. crane hoisting and lowering is _____.
   a) smooth movement b) precise control
   c) fast speed control d) all of the above

7) A pole changing type squirrel cage motor used in derricks has four, eight and twenty four poles. In this the medium speed is used for _____.
   a) lifting b) Lowering
   c) hoisting d) landing the load

8) The number of sets used in pole changing type squirrel cage motors for derricks and winches, is _____.
   a) 2 b) 3
   c) 4 d) 6

9) The _____ motors, because of their inherent characteristics, are best suited for the rolling mills.
   a) dc motors b) slip ring induction motors
   c) squirrel cage induction motors d) single phase motors

10) Which of the following motor is preferred for blowers?
   a) wound rotor induction motor
   b) squirrel cage induction motor
   c) dc shunt motor
   d) dc series motor

11) Reluctance motor is a _____.
   a) self-starting type synchronous motors
   b) low torque variable speed motor
   c) variable torque motor
   d) low noise, slow speed motor

12) The traveling speed of cranes varies from _____.
   a) 1 to 2.5 m/s
   b) 5 to 15 m/s
   c) 20 to 22.5 m/s
   d) 25 to 40 m/s

13) Motors preferred for rolling mill drive is _____.
   a) dc motors
   b) ac slip ring motors with speed control
   c) any of the above
   d) none of the above

14) The capacity of a crane is expressed in terms of _____.
   a) Span
   b) Type of drive
   c) Tonnes
   d) Any of the above

Seat No.	

Set **Q**

B.E. (Part – I) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
INDUSTRIAL DRIVES AND CONTROL

Day & Date: Saturday, 07-12-2019 Max. Marks: 56
Time: 02:30 PM To 05:30 PM

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

Section – I

Q.2 Write Short notes. (Any Three) **12**

a) State advantages and disadvantages of Electrical Drives.
b) Derive the fundamental torque equation of electrical drives.
c) Give criteria for selection of Electrical drives.
d) Explain the multi quadrant operation of hoist with neat diagram.

Q.3 Solve any Two. **16**

a) Draw neat Block diagram of electrical drives & briefly describe each block.
b) A 220 V, 1500 RPM, 50 Amp D.C. separately excited motor has an armature resistance of 0.5 ohms is fed from 3 phase fully controlled rectifier. Available source has line voltage of 440v, 50Hz. A star-delta transformer used to feed armature so motor terminal voltage equals rated voltage when firing angle is zero.
1) Calculate transformer turns ratio
2) Determine firing angle when motor running at 1200 rpm and rated torque.
c) Derive the expression for torque and moment of inertia for loads with rotational motion and translation motion.

Section – II

Q.4 Write short notes. (Any Three) **12**

a) Write the comparison between VSI and CSI.
b) Explain current regulated voltage source inverter control with block diagram.
c) Explain static krammer drive with block diagram and waveform.
d) Explain the speed torque and power angle characteristics of synchronous motor drive.

Q.5 Solve any Two. **16**

a) Draw & explain V/F control method of induction motor.
b) A 400 V, star connected, 3-phase, 6-pole, 50 Hz IM has following parameters referred to the stator : $Rs = Rr' = 1\Omega, Xs = Xr' = 2\Omega$. For regenerative braking operation of this motor determine :
1) Maximum overhauling torque it can hold and range of speed for safe operation
2) Speed at which it will hold an overhauling load with a torque of 100 N-m.
c) Explain conventional methods of rotor resistance control.

Seat No.	

Set **R**

B.E. (Part – I) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
INDUSTRIAL DRIVES AND CONTROL

Day & Date: Saturday, 07-12-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and it should be solved in first 30 minutes in answer book.
2) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) The traveling speed of cranes varies from _____.
   a) 1 to 2.5 m/s b) 5 to 15 m/s
   c) 20 to 22.5 m/s d) 25 to 40 m/s

2) Motors preferred for rolling mill drive is _____.
   a) dc motors
   b) ac slip ring motors with speed control
   c) any of the above
   d) none of the above

3) The capacity of a crane is expressed in terms of _____.
   a) Span b) Type of drive
   c) Tonnes d) Any of the above

4) Pole changing method of speed control is used in _____.
   a) slip ring induction motor b) dc shunt motor
   c) dc series motor d) squirrel cage induction motor

5) To save the energy during braking _____.
   a) dynamic braking is used b) plugging is used
   c) regeneration braking is used d) mechanical braking is used

6) Most commonly used ac motor is _____.
   a) Synchronous motor b) Squirrel cage induction motor
   c) Slip ring induction motor d) ac commutator induction motor

7) The motor commonly used in computers and digital systems is _____.
   a) dc shunt motor b) Stepper motor
   c) Induction motor d) Synchronous motor

8) Which of the following is preferred for automatic drives?
   a) Synchronous motors
   b) Ward Leonard controlled de motors
   c) Squirrel cage induction motor
   d) Any of the above

9) The characteristics of drive for. crane hoisting and lowering is _____.
   a) smooth movement b) precise control
   c) fast speed control d) all of the above

10) A pole changing type squirrel cage motor used in derricks has four, eight and twenty four poles. In this the medium speed is used for _____.
   a) lifting
   b) Lowering
   c) hoisting
   d) landing the load

11) The number of sets used in pole changing type squirrel cage motors for derricks and winches, is _____.
   a) 2
   b) 3
   c) 4
   d) 6

12) The _____ motors, because of their inherent characteristics, are best suited for the rolling mills.
   a) dc motors
   b) slip ring induction motors
   c) squirrel cage induction motors
   d) single phase motors

13) Which of the following motor is preferred for blowers?
   a) wound rotor induction motor
   b) squirrel cage induction motor
   c) dc shunt motor
   d) dc series motor

14) Reluctance motor is a _____.
   a) self-starting type synchronous motors
   b) low torque variable speed motor
   c) variable torque motor
   d) low noise, slow speed motor

Seat No.	

Set **R**

B.E. (Part – I) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
INDUSTRIAL DRIVES AND CONTROL

Day & Date: Saturday, 07-12-2019 Max. Marks: 56
Time: 02:30 PM To 05:30 PM

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

Section – I

Q.2 Write Short notes. (Any Three) **12**

a) State advantages and disadvantages of Electrical Drives.
b) Derive the fundamental torque equation of electrical drives.
c) Give criteria for selection of Electrical drives.
d) Explain the multi quadrant operation of hoist with neat diagram.

Q.3 Solve any Two. **16**

a) Draw neat Block diagram of electrical drives & briefly describe each block.
b) A 220 V, 1500 RPM, 50 Amp D.C. separately excited motor has an armature resistance of 0.5 ohms is fed from 3 phase fully controlled rectifier. Available source has line voltage of 440v, 50Hz. A star-delta transformer used to feed armature so motor terminal voltage equals rated voltage when firing angle is zero.
1) Calculate transformer turns ratio
2) Determine firing angle when motor running at 1200 rpm and rated torque.
c) Derive the expression for torque and moment of inertia for loads with rotational motion and translation motion.

Section – II

Q.4 Write short notes. (Any Three) **12**

a) Write the comparison between VSI and CSI.
b) Explain current regulated voltage source inverter control with block diagram.
c) Explain static krammer drive with block diagram and waveform.
d) Explain the speed torque and power angle characteristics of synchronous motor drive.

Q.5 Solve any Two. **16**

a) Draw & explain V/F control method of induction motor.
b) A 400 V, star connected, 3-phase, 6-pole, 50 Hz IM has following parameters referred to the stator : $Rs = Rr' = 1\Omega, Xs = Xr' = 2\Omega$. For regenerative braking operation of this motor determine :
1) Maximum overhauling torque it can hold and range of speed for safe operation
2) Speed at which it will hold an overhauling load with a torque of 100 N-m.
c) Explain conventional methods of rotor resistance control.

Seat No.	

Set **S**

B.E. (Part – I) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
INDUSTRIAL DRIVES AND CONTROL

Day & Date: Saturday, 07-12-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and it should be solved in first 30 minutes in answer book.
2) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) Most commonly used ac motor is _____.
   a) Synchronous motor b) Squirrel cage induction motor
   c) Slip ring induction motor d) ac commutator induction motor

2) The motor commonly used in computers and digital systems is _____.
   a) dc shunt motor b) Stepper motor
   c) Induction motor d) Synchronous motor

3) Which of the following is preferred for automatic drives?
   a) Synchronous motors
   b) Ward Leonard controlled de motors
   c) Squirrel cage induction motor
   d) Any of the above

4) The characteristics of drive for. crane hoisting and lowering is _____.
   a) smooth movement b) precise control
   c) fast speed control d) all of the above

5) A pole changing type squirrel cage motor used in derricks has four, eight and twenty four poles. In this the medium speed is used for _____.
   a) lifting b) Lowering
   c) hoisting d) landing the load

6) The number of sets used in pole changing type squirrel cage motors for derricks and winches, is _____.
   a) 2 b) 3
   c) 4 d) 6

7) The _____ motors, because of their inherent characteristics, are best suited for the rolling mills.
   a) dc motors b) slip ring induction motors
   c) squirrel cage induction motors d) single phase motors

8) Which of the following motor is preferred for blowers?
   a) wound rotor induction motor
   b) squirrel cage induction motor
   c) dc shunt motor
   d) dc series motor

9) Reluctance motor is a _____.
   a) self-starting type synchronous motors
   b) low torque variable speed motor
   c) variable torque motor
   d) low noise, slow speed motor

10) The traveling speed of cranes varies from _____.
   a) 1 to 2.5 m/s
   b) 5 to 15 m/s
   c) 20 to 22.5 m/s
   d) 25 to 40 m/s

11) Motors preferred for rolling mill drive is _____.
   a) dc motors
   b) ac slip ring motors with speed control
   c) any of the above
   d) none of the above

12) The capacity of a crane is expressed in terms of _____.
   a) Span
   b) Type of drive
   c) Tonnes
   d) Any of the above

13) Pole changing method of speed control is used in _____.
   a) slip ring induction motor
   b) dc shunt motor
   c) dc series motor
   d) squirrel cage induction motor

14) To save the energy during braking _____.
   a) dynamic braking is used
   b) plugging is used
   c) regeneration braking is used
   d) mechanical braking is used

Seat No.	

Set **S**

B.E. (Part – I) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
INDUSTRIAL DRIVES AND CONTROL

Day & Date: Saturday, 07-12-2019 Max. Marks: 56
Time: 02:30 PM To 05:30 PM

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

Section – I

Q.2 Write Short notes. (Any Three) **12**

a) State advantages and disadvantages of Electrical Drives.
b) Derive the fundamental torque equation of electrical drives.
c) Give criteria for selection of Electrical drives.
d) Explain the multi quadrant operation of hoist with neat diagram.

Q.3 Solve any Two. **16**

a) Draw neat Block diagram of electrical drives & briefly describe each block.
b) A 220 V, 1500 RPM, 50 Amp D.C. separately excited motor has an armature resistance of 0.5 ohms is fed from 3 phase fully controlled rectifier. Available source has line voltage of 440v, 50Hz. A star-delta transformer used to feed armature so motor terminal voltage equals rated voltage when firing angle is zero.
1) Calculate transformer turns ratio
2) Determine firing angle when motor running at 1200 rpm and rated torque.
c) Derive the expression for torque and moment of inertia for loads with rotational motion and translation motion.

Section – II

Q.4 Write short notes. (Any Three) **12**

a) Write the comparison between VSI and CSI.
b) Explain current regulated voltage source inverter control with block diagram.
c) Explain static krammer drive with block diagram and waveform.
d) Explain the speed torque and power angle characteristics of synchronous motor drive.

Q.5 Solve any Two. **16**

a) Draw & explain V/F control method of induction motor.
b) A 400 V, star connected, 3-phase, 6-pole, 50 Hz IM has following parameters referred to the stator : $Rs = Rr' = 1\Omega, Xs = Xr' = 2\Omega$. For regenerative braking operation of this motor determine :
1) Maximum overhauling torque it can hold and range of speed for safe operation
2) Speed at which it will hold an overhauling load with a torque of 100 N-m.
c) Explain conventional methods of rotor resistance control.

Seat No.	

Set **P**

B.E. (Part – I) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
ELECTRICAL ENERGY UTILIZATION AND TRACTION

Day & Date: Tuesday, 10-12-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
2) Assume the suitable data whenever necessary.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) Lumen/watt is the unit of _____.
   a) Light flux b) Luminous intensity
   c) Brightness d) Luminous efficiency

2) A good refrigerant should have _____.
   a) High latent heat of vaporization and low freezing point
   b) High operating pressures and low freezing point
   c) High specific volume and high latent heat of vaporisation
   d) Low C.O.P. and low freezing point

3) For the transmission of heat from one body to another _____.
   a) Temperature of the two bodies must be different
   b) Both bodies must be solids
   c) Both bodies must be in contact
   d) None of the above

4) Long distance railways use _____.
   a) 200 V DC b) 25 kV Single phase AC
   c) 25 kV Two phase AC d) 25 kV Three phase AC

5) A vapour absorption refrigerator uses _____ as a refrigerant.
   a) Water b) Ammonia
   c) Freon d) Aqua-ammonia

6) Solid angle is expressed in terms of _____.
   a) radians/meter b) steredian
   c) radians d) degree

7) Candela is-the unit for _____.
   a) Light flux b) Luminous intensity
   c) Brightness d) Luminous efficiency

8) Which gas is sometimes used in filament lamps?
   a) Argon b) Krypton
   c) Nitrogen d) Carbon dioxide

9) Radiant efficiency of the luminous source depends on _____.
   a) Shape of the source b) Wavelength of light rays
   c) Temperature of the source d) all of the above

10) Illumination can be expressed in _____.
   a) radians b) lux
   c) lumens d) candela

11) When a body reflects entire radiation incident on it, then it is known as ____.
   a) white body b) grey body
   c) black body d) transparent body

12) Which bulb operates on lowest power?
   a) Night bulb b) Neon bulb
   c) GLS bulb d) Torch bulb

13) Which locomotive has the highest operational availability?
   a) Diesel b) Electric
   c) Steam d) all has same availability

14) The condition of refrigerant after passing through the condenser in a vapour compression system is _____.
   a) Saturated liquid b) Wet vapour
   c) Dry saturated vapour d) Superheated vapour

Seat No.	

Set **P**

B.E. (Part – I) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
ELECTRICAL ENERGY UTILIZATION AND TRACTION

Day & Date: Tuesday, 10-12-2019 Max. Marks: 56
Time: 02:30 PM To 05:30 PM

Instructions: 1) All questions are compulsory.
2) Assume the suitable data whenever necessary.
3) Figures to the right indicate full marks.

Section – I

Q.2 Solve any Four. **16**

a) What are the factors to be considered while designing the lighting scheme?
b) Describe Vapour absorption Refrigeration System.
c) Explain the following terms,
Candle Power, Space height ratio, utilization factor, maintenance factor.
d) Describe the construction & operation of Ajax watt furnace.
e) Differentiate between Tungsten lamp & fluorescent tube.

Q.3 Solve any Two. **12**

a) What is Air conditioning? Describe room air conditioner.
b) Write short note on Photometry and Radiometry.
c) Draw & Explain circuit of High pressure mercury vapour discharge lamp.

Section – II

Q.4 Attempt any Four. **16**

a) Explain Architectures of Hybrid Electric Vehicle.
b) The speed-time curve of train consist of
1) uniform acceleration of 6 kmphps for 25sec
2) Free run for 10 minutes
3) Retardation of 6 kmphps to stop
4) Stop time is 5 minute. Find distance between station, average and schedule speed.
c) Explain different system of track electrification.
d) Explain Dead weight, Accelerating weight and Adhesive weight.
e) Draw and explain characteristics of AC series motor for traction work.

Q.5 Attempt any Two. **12**

a) Draw & Explain characteristics of DC series motor for traction work. Also Explain Suitability of DC series motor for traction work.
b) An electric train is weighing 100 tonnes has a rotational inertia 10 %. Distance between two Stop is 2.5km & trains have an average speed of 50 kmph. The acceleration and retardation are 1kmphps and 2kmphps respectively. Track has an up gradient of 1%, train resistance is 40 N/tonne and efficiency of gearing & motor system is 60%. Determine.
1) maximum power at driving axle
2) total energy consumption
3) specific energy consumption
Assume Trapezoidal speed-time curve.
c) Explain signalling system used in Electric traction.

Seat No.	

Set **Q**

B.E. (Part – I) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
ELECTRICAL ENERGY UTILIZATION AND TRACTION

Day & Date: Tuesday, 10-12-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
2) Assume the suitable data whenever necessary.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) Which gas is sometimes used in filament lamps?
   a) Argon b) Krypton
   c) Nitrogen d) Carbon dioxide

2) Radiant efficiency of the luminous source depends on _____.
   a) Shape of the source b) Wavelength of light rays
   c) Temperature of the source d) all of the above

3) Illumination can be expressed in _____.
   a) radians b) lux
   c) lumens d) candela

4) When a body reflects entire radiation incident on it, then it is known as ____.
   a) white body b) grey body
   c) black body d) transparent body

5) Which bulb operates on lowest power?
   a) Night bulb b) Neon bulb
   c) GLS bulb d) Torch bulb

6) Which locomotive has the highest operational availability?
   a) Diesel b) Electric
   c) Steam d) all has same availability

7) The condition of refrigerant after passing through the condenser in a vapour compression system is _____.
   a) Saturated liquid b) Wet vapour
   c) Dry saturated vapour d) Superheated vapour

8) Lumen/watt is the unit of _____.
   a) Light flux b) Luminous intensity
   c) Brightness d) Luminous efficiency

9) A good refrigerant should have _____.
   a) High latent heat of vaporization and low freezing point
   b) High operating pressures and low freezing point
   c) High specific volume and high latent heat of vaporisation
   d) Low C.O.P. and low freezing point

10) For the transmission of heat from one body to another _____.
   a) Temperature of the two bodies must be different
   b) Both bodies must be solids
   c) Both bodies must be in contact
   d) None of the above

11) Long distance railways use _____.
   a) 200 V DC
   b) 25 kV Single phase AC
   c) 25 kV Two phase AC
   d) 25 kV Three phase AC

12) A vapour absorption refrigerator uses _____ as a refrigerant.
   a) Water
   b) Ammonia
   c) Freon
   d) Aqua-ammonia

13) Solid angle is expressed in terms of _____.
   a) radians/meter
   b) steredian
   c) radians
   d) degree

14) Candela is-the unit for _____.
   a) Light flux
   b) Luminous intensity
   c) Brightness
   d) Luminous efficiency

Seat No.	

Set **Q**

B.E. (Part – I) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
ELECTRICAL ENERGY UTILIZATION AND TRACTION

Day & Date: Tuesday, 10-12-2019 Max. Marks: 56
Time: 02:30 PM To 05:30 PM

Instructions: 1) All questions are compulsory.
2) Assume the suitable data whenever necessary.
3) Figures to the right indicate full marks.

Section – I

Q.2 Solve any Four. **16**

a) What are the factors to be considered while designing the lighting scheme?
b) Describe Vapour absorption Refrigeration System.
c) Explain the following terms,
Candle Power, Space height ratio, utilization factor, maintenance factor.
d) Describe the construction & operation of Ajax watt furnace.
e) Differentiate between Tungsten lamp & fluorescent tube.

Q.3 Solve any Two. **12**

a) What is Air conditioning? Describe room air conditioner.
b) Write short note on Photometry and Radiometry.
c) Draw & Explain circuit of High pressure mercury vapour discharge lamp.

Section – II

Q.4 Attempt any Four. **16**

a) Explain Architectures of Hybrid Electric Vehicle.
b) The speed-time curve of train consist of
1) uniform acceleration of 6 kmphps for 25sec
2) Free run for 10 minutes
3) Retardation of 6 kmphps to stop
4) Stop time is 5 minute. Find distance between station, average and schedule speed.
c) Explain different system of track electrification.
d) Explain Dead weight, Accelerating weight and Adhesive weight.
e) Draw and explain characteristics of AC series motor for traction work.

Q.5 Attempt any Two. **12**

a) Draw & Explain characteristics of DC series motor for traction work. Also Explain Suitability of DC series motor for traction work.
b) An electric train is weighing 100 tonnes has a rotational inertia 10 %. Distance between two Stop is 2.5km & trains have an average speed of 50 kmph. The acceleration and retardation are 1kmphps and 2kmphps respectively. Track has an up gradient of 1%, train resistance is 40 N/tonne and efficiency of gearing & motor system is 60%. Determine.
1) maximum power at driving axle
2) total energy consumption
3) specific energy consumption
Assume Trapezoidal speed-time curve.
c) Explain signalling system used in Electric traction.

Seat No.	

Set **R**

B.E. (Part – I) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
ELECTRICAL ENERGY UTILIZATION AND TRACTION

Day & Date: Tuesday, 10-12-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
2) Assume the suitable data whenever necessary.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) A vapour absorption refrigerator uses _____ as a refrigerant.
   a) Water b) Ammonia
   c) Freon d) Aqua-ammonia

2) Solid angle is expressed in terms of _____.
   a) radians/meter b) steredian
   c) radians d) degree

3) Candela is-the unit for _____.
   a) Light flux b) Luminous intensity
   c) Brightness d) Luminous efficiency

4) Which gas is sometimes used in filament lamps?
   a) Argon b) Krypton
   c) Nitrogen d) Carbon dioxide

5) Radiant efficiency of the luminous source depends on _____.
   a) Shape of the source b) Wavelength of light rays
   c) Temperature of the source d) all of the above

6) Illumination can be expressed in _____.
   a) radians b) lux
   c) lumens d) candela

7) When a body reflects entire radiation incident on it, then it is known as ____.
   a) white body b) grey body
   c) black body d) transparent body

8) Which bulb operates on lowest power?
   a) Night bulb b) Neon bulb
   c) GLS bulb d) Torch bulb

9) Which locomotive has the highest operational availability?
   a) Diesel b) Electric
   c) Steam d) all has same availability

10) The condition of refrigerant after passing through the condenser in a vapour compression system is _____.
   a) Saturated liquid b) Wet vapour
   c) Dry saturated vapour d) Superheated vapour

11) Lumen/watt is the unit of _____.
   a) Light flux
   b) Luminous intensity
   c) Brightness
   d) Luminous efficiency

12) A good refrigerant should have _____.
   a) High latent heat of vaporization and low freezing point
   b) High operating pressures and low freezing point
   c) High specific volume and high latent heat of vaporisation
   d) Low C.O.P. and low freezing point

13) For the transmission of heat from one body to another _____.
   a) Temperature of the two bodies must be different
   b) Both bodies must be solids
   c) Both bodies must be in contact
   d) None of the above

14) Long distance railways use _____.
   a) 200 V DC
   b) 25 kV Single phase AC
   c) 25 kV Two phase AC
   d) 25 kV Three phase AC

Seat No.	

Set **R**

B.E. (Part – I) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
ELECTRICAL ENERGY UTILIZATION AND TRACTION

Day & Date: Tuesday, 10-12-2019 Max. Marks: 56
Time: 02:30 PM To 05:30 PM

Instructions: 1) All questions are compulsory.
2) Assume the suitable data whenever necessary.
3) Figures to the right indicate full marks.

Section – I

Q.2 Solve any Four. **16**

a) What are the factors to be considered while designing the lighting scheme?
b) Describe Vapour absorption Refrigeration System.
c) Explain the following terms,
Candle Power, Space height ratio, utilization factor, maintenance factor.
d) Describe the construction & operation of Ajax watt furnace.
e) Differentiate between Tungsten lamp & fluorescent tube.

Q.3 Solve any Two. **12**

a) What is Air conditioning? Describe room air conditioner.
b) Write short note on Photometry and Radiometry.
c) Draw & Explain circuit of High pressure mercury vapour discharge lamp.

Section – II

Q.4 Attempt any Four. **16**

a) Explain Architectures of Hybrid Electric Vehicle.
b) The speed-time curve of train consist of
1) uniform acceleration of 6 kmphps for 25sec
2) Free run for 10 minutes
3) Retardation of 6 kmphps to stop
4) Stop time is 5 minute. Find distance between station, average and schedule speed.
c) Explain different system of track electrification.
d) Explain Dead weight, Accelerating weight and Adhesive weight.
e) Draw and explain characteristics of AC series motor for traction work.

Q.5 Attempt any Two. **12**

a) Draw & Explain characteristics of DC series motor for traction work. Also Explain Suitability of DC series motor for traction work.
b) An electric train is weighing 100 tonnes has a rotational inertia 10 %. Distance between two Stop is 2.5km & trains have an average speed of 50 kmph. The acceleration and retardation are 1kmphps and 2kmphps respectively. Track has an up gradient of 1%, train resistance is 40 N/tonne and efficiency of gearing & motor system is 60%. Determine.
1) maximum power at driving axle
2) total energy consumption
3) specific energy consumption
Assume Trapezoidal speed-time curve.
c) Explain signalling system used in Electric traction.

Seat No.	

Set **S**

B.E. (Part – I) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
ELECTRICAL ENERGY UTILIZATION AND TRACTION

Day & Date: Tuesday, 10-12-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
2) Assume the suitable data whenever necessary.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) Illumination can be expressed in _____.
   a) radians b) lux
   c) lumens d) candela

2) When a body reflects entire radiation incident on it, then it is known as ____.
   a) white body b) grey body
   c) black body d) transparent body

3) Which bulb operates on lowest power?
   a) Night bulb b) Neon bulb
   c) GLS bulb d) Torch bulb

4) Which locomotive has the highest operational availability?
   a) Diesel b) Electric
   c) Steam d) all has same availability

5) The condition of refrigerant after passing through the condenser in a vapour compression system is _____.
   a) Saturated liquid b) Wet vapour
   c) Dry saturated vapour d) Superheated vapour

6) Lumen/watt is the unit of _____.
   a) Light flux b) Luminous intensity
   c) Brightness d) Luminous efficiency

7) A good refrigerant should have _____.
   a) High latent heat of vaporization and low freezing point
   b) High operating pressures and low freezing point
   c) High specific volume and high latent heat of vaporisation
   d) Low C.O.P. and low freezing point

8) For the transmission of heat from one body to another _____.
   a) Temperature of the two bodies must be different
   b) Both bodies must be solids
   c) Both bodies must be in contact
   d) None of the above

9) Long distance railways use _____.
   a) 200 V DC b) 25 kV Single phase AC
   c) 25 kV Two phase AC d) 25 kV Three phase AC

10) A vapour absorption refrigerator uses _____ as a refrigerant.
   a) Water b) Ammonia
   c) Freon d) Aqua-ammonia

11) Solid angle is expressed in terms of _____.
   a) radians/meter b) steredian
   c) radians d) degree

12) Candela is-the unit for _____.
   a) Light flux b) Luminous intensity
   c) Brightness d) Luminous efficiency

13) Which gas is sometimes used in filament lamps?
   a) Argon b) Krypton
   c) Nitrogen d) Carbon dioxide

14) Radiant efficiency of the luminous source depends on _____.
   a) Shape of the source b) Wavelength of light rays
   c) Temperature of the source d) all of the above

SLR-FM-538

Seat No.	

Set S

B.E. (Part – I) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
ELECTRICAL ENERGY UTILIZATION AND TRACTION

Day & Date: Tuesday, 10-12-2019 Max. Marks: 56
Time: 02:30 PM To 05:30 PM

Instructions: 1) All questions are compulsory.
2) Assume the suitable data whenever necessary.
3) Figures to the right indicate full marks.

Section – I

Q.2 Solve any Four. **16**

a) What are the factors to be considered while designing the lighting scheme?
b) Describe Vapour absorption Refrigeration System.
c) Explain the following terms,
Candle Power, Space height ratio, utilization factor, maintenance factor.
d) Describe the construction & operation of Ajax watt furnace.
e) Differentiate between Tungsten lamp & fluorescent tube.

Q.3 Solve any Two. **12**

a) What is Air conditioning? Describe room air conditioner.
b) Write short note on Photometry and Radiometry.
c) Draw & Explain circuit of High pressure mercury vapour discharge lamp.

Section – II

Q.4 Attempt any Four. **16**

a) Explain Architectures of Hybrid Electric Vehicle.
b) The speed-time curve of train consist of
1) uniform acceleration of 6 kmphps for 25sec
2) Free run for 10 minutes
3) Retardation of 6 kmphps to stop
4) Stop time is 5 minute. Find distance between station, average and schedule speed.
c) Explain different system of track electrification.
d) Explain Dead weight, Accelerating weight and Adhesive weight.
e) Draw and explain characteristics of AC series motor for traction work.

Q.5 Attempt any Two. **12**

a) Draw & Explain characteristics of DC series motor for traction work. Also Explain Suitability of DC series motor for traction work.
b) An electric train is weighing 100 tonnes has a rotational inertia 10 %. Distance between two Stop is 2.5km & trains have an average speed of 50 kmph. The acceleration and retardation are 1kmphps and 2kmphps respectively. Track has an up gradient of 1%, train resistance is 40 N/tonne and efficiency of gearing & motor system is 60%. Determine.
1) maximum power at driving axle
2) total energy consumption
3) specific energy consumption
Assume Trapezoidal speed-time curve.
c) Explain signalling system used in Electric traction.

SLR-FM-539

Seat No.	

Set P

B.E. (Part - I) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
ELECTRICAL INSTALLATION, TESTING & MAINTENANCE

Day & Date: Thursday,12-12-2019 Max. Marks: 70
Time: 02.30 PM To 05.30 PM

Instructions: 1) Q.No.1 is compulsory and should be solved in first 30 Minutes in answer Book.
2) Figures to the right indicate full mark.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) Which of the following fire extinguisher are toxic _____.
   a) Carbon tetrachloride b) Sulphur hexachloride
   c) Carbon hexachloride d) Sulphur tetrachloride

2) Buchholz relay is _____.
   a) Located in the conservator tank
   b) Located in the transformer tank itself
   c) Connected in the pipe connecting main tank of transformer and conservator
   d) Installed in the circuit breaker

3) The arc voltage in C.B. is _____.
   a) In the phase of arc current b) Lagging the arc current by 90^o
   c) Leading the arc current by 90^o d) Legging the arc current by 180^o

4) Which of the following method used for measuring temperature of insulation?
   a) Embedded detector method b) Voltmeter method
   c) Megger d) None of these

5) For good transformer oil, as per IS density should be equal to _____.
   a) 0.5 gm/cm^3 b) 0.65 gm/cm^3
   c) 0.89 gm/cm^3 d) 1.15 gm/cm^3

6) Copper losses in a rotating machine is _____.
   a) Variable losses b) Constant losses
   c) Either (a) or (b) d) None of these

7) Stray losses are the losses which vary with the load but their relationship with load current cannot be identified. Stay losses is maximum in _____.
   a) Synchronous machines b) D.C. Machines
   c) Induction machines d) Equal in all types of machines

8) Electrical power output in a d.c. generator is equal to _____.
   a) Electrical power developed in armature - copper losses
   b) Mechanical power input - iron and friction losses
   c) Electrical power developed in armature - iron and copper losses
   d) Mechanical power input - iron and friction losses - copper losses

9) The speed in d.c. machine can be measured by using _____.
   a) Anemometer b) Tachometer
   c) Voltmeter d) Ammeter

10) Which of the following factors affects on life of insulating material?
   a) Temperature b) Deposition of oust
   c) Impurities d) All of these

11) Severity of electric shock is mainly depends on _____.
   a) Voltage b) Current
   c) Type of supply d) all of these

12) In fire extinguisher we use _____.
   a) CO_2 b) SO_2
   c) O_2 d) H_2O

13) The most common method of artificial respiration is _____.
   a) Schafer's method b) Silvester's method
   c) Neilson's method d) Mouth to mouth method

14) The rotational losses in d.c. machines is equal to the _____.
   a) Kinetic energy of armature
   b) Half of the kinetic energy of armature
   c) Square of the kinetic energy of armature
   d) Rate of change of kinetic energy

Seat No.	

Set **P**

B.E. (Part - I) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
ELECTRICAL INSTALLATION, TESTING & MAINTENANCE

Day & Date: Thursday,12-12-2019 Max. Marks: 56
Time: 02.30 PM To 05.30 PM

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

Section – I

Q.2 Attempt any three. **12**

a) Distinguish between major and minor repair work.
b) Explain the back to back test on transformer.
c) What precautions should be taken to avoid the electric accidents?
d) Explain the procedure of testing the BDV of oil.

Q.3 Attempt any Two. **16**

a) Explain the significance of maintenance of a power transformer and explain repair Work of medium power transformer.
b) Explain the procedure for rescuing the person who has got the electric shock.
c) Explain the difference between Type tests, Routine tests, Special tests, Commissioning tests on power transformers.

Section – II

Q.4 Attempt any three. **12**

a) State the requirements of type-test and routine tests on synchronous machines.
b) Explain the various tests of transformer oil.
c) State the various type tests performed on high voltage A. C. circuit breakers.
d) Explain the commissioning test for induction motor.

Q.5 Attempt any two. **16**

a) What are the requirements of foundations for installing induction motor?
b) Explain the following tests on a 3-phase induction motor.
1) Starting test
2) Load test
3) Temperature rise test
c) Explain the measurement of sequence impedances of synchronous machines.

Seat No.	

Set **Q**

B.E. (Part - I) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
ELECTRICAL INSTALLATION, TESTING & MAINTENANCE

Day & Date: Thursday,12-12-2019 Max. Marks: 70
Time: 02.30 PM To 05.30 PM

Instructions: 1) Q.No.1 is compulsory and should be solved in first 30 Minutes in answer Book.
2) Figures to the right indicate full mark.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) Electrical power output in a d.c. generator is equal to _____.
   a) Electrical power developed in armature - copper losses
   b) Mechanical power input - iron and friction losses
   c) Electrical power developed in armature - iron and copper losses
   d) Mechanical power input - iron and friction losses - copper losses

2) The speed in d.c. machine can be measured by using _____.
   a) Anemometer b) Tachometer
   c) Voltmeter d) Ammeter

3) Which of the following factors affects on life of insulating material?
   a) Temperature b) Deposition of oust
   c) Impurities d) All of these

4) Severity of electric shock is mainly depends on _____.
   a) Voltage b) Current
   c) Type of supply d) all of these

5) In fire extinguisher we use _____.
   a) CO_2 b) SO_2
   c) O_2 d) H_2O

6) The most common method of artificial respiration is _____.
   a) Schafer's method b) Silvester's method
   c) Neilson's method d) Mouth to mouth method

7) The rotational losses in d.c. machines is equal to the _____.
   a) Kinetic energy of armature
   b) Half of the kinetic energy of armature
   c) Square of the kinetic energy of armature
   d) Rate of change of kinetic energy

8) Which of the following fire extinguisher are toxic _____.
   a) Carbon tetrachloride b) Sulphur hexachloride
   c) Carbon hexachloride d) Sulphur tetrachloride

9) Buchholz relay is _____.
   a) Located in the conservator tank
   b) Located in the transformer tank itself
   c) Connected in the pipe connecting main tank of transformer and conservator
   d) Installed in the circuit breaker

10) The arc voltage in C.B. is _____.
   a) In the phase of arc current
   b) Lagging the arc current by 90^o
   c) Leading the arc current by 90^o
   d) Legging the arc current by 180^o

11) Which of the following method used for measuring temperature of insulation?
   a) Embedded detector method
   b) Voltmeter method
   c) Megger
   d) None of these

12) For good transformer oil, as per IS density should be equal to _____.
   a) 0.5 gm/cm^3
   b) 0.65 gm/cm^3
   c) 0.89 gm/cm^3
   d) 1.15 gm/cm^3

13) Copper losses in a rotating machine is _____.
   a) Variable losses
   b) Constant losses
   c) Either (a) or (b)
   d) None of these

14) Stray losses are the losses which vary with the load but their relationship with load current cannot be identified. Stay losses is maximum in _____.
   a) Synchronous machines
   b) D.C. Machines
   c) Induction machines
   d) Equal in all types of machines

Seat No.	

Set **Q**

B.E. (Part - I) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
ELECTRICAL INSTALLATION, TESTING & MAINTENANCE

Day & Date: Thursday,12-12-2019 Max. Marks: 56
Time: 02.30 PM To 05.30 PM

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

Section – I

Q.2 Attempt any three. **12**

a) Distinguish between major and minor repair work.
b) Explain the back to back test on transformer.
c) What precautions should be taken to avoid the electric accidents?
d) Explain the procedure of testing the BDV of oil.

Q.3 Attempt any Two. **16**

a) Explain the significance of maintenance of a power transformer and explain repair Work of medium power transformer.
b) Explain the procedure for rescuing the person who has got the electric shock.
c) Explain the difference between Type tests, Routine tests, Special tests, Commissioning tests on power transformers.

Section – II

Q.4 Attempt any three. **12**

a) State the requirements of type-test and routine tests on synchronous machines.
b) Explain the various tests of transformer oil.
c) State the various type tests performed on high voltage A. C. circuit breakers.
d) Explain the commissioning test for induction motor.

Q.5 Attempt any two. **16**

a) What are the requirements of foundations for installing induction motor?
b) Explain the following tests on a 3-phase induction motor.
1) Starting test
2) Load test
3) Temperature rise test
c) Explain the measurement of sequence impedances of synchronous machines.

Seat No.	

Set **R**

B.E. (Part - I) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
ELECTRICAL INSTALLATION, TESTING & MAINTENANCE

Day & Date: Thursday,12-12-2019 Max. Marks: 70
Time: 02.30 PM To 05.30 PM

Instructions: 1) Q.No.1 is compulsory and should be solved in first 30 Minutes in answer Book.
2) Figures to the right indicate full mark.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) For good transformer oil, as per IS density should be equal to _____.
   a) 0.5 gm/cm^3 b) 0.65 gm/cm^3
   c) 0.89 gm/cm^3 d) 1.15 gm/cm^3

2) Copper losses in a rotating machine is _____.
   a) Variable losses b) Constant losses
   c) Either (a) or (b) d) None of these

3) Stray losses are the losses which vary with the load but their relationship with load current cannot be identified. Stay losses is maximum in _____.
   a) Synchronous machines b) D.C. Machines
   c) Induction machines d) Equal in all types of machines

4) Electrical power output in a d.c. generator is equal to _____.
   a) Electrical power developed in armature - copper losses
   b) Mechanical power input - iron and friction losses
   c) Electrical power developed in armature - iron and copper losses
   d) Mechanical power input - iron and friction losses - copper losses

5) The speed in d.c. machine can be measured by using _____.
   a) Anemometer b) Tachometer
   c) Voltmeter d) Ammeter

6) Which of the following factors affects on life of insulating material?
   a) Temperature b) Deposition of oust
   c) Impurities d) All of these

7) Severity of electric shock is mainly depends on _____.
   a) Voltage b) Current
   c) Type of supply d) all of these

8) In fire extinguisher we use _____.
   a) CO_2 b) SO_2
   c) O_2 d) H_2O

9) The most common method of artificial respiration is _____.
   a) Schafer's method b) Silvester's method
   c) Neilson's method d) Mouth to mouth method

10) The rotational losses in d.c. machines is equal to the _____.
   a) Kinetic energy of armature
   b) Half of the kinetic energy of armature
   c) Square of the kinetic energy of armature
   d) Rate of change of kinetic energy

11) Which of the following fire extinguisher are toxic _____.
   a) Carbon tetrachloride
   b) Sulphur hexachloride
   c) Carbon hexachloride
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12) Buchholz relay is _____.
   a) Located in the conservator tank
   b) Located in the transformer tank itself
   c) Connected in the pipe connecting main tank of transformer and conservator
   d) Installed in the circuit breaker

13) The arc voltage in C.B. is _____.
   a) In the phase of arc current
   b) Lagging the arc current by 90^o
   c) Leading the arc current by 90^o
   d) Legging the arc current by 180^o

14) Which of the following method used for measuring temperature of insulation?
   a) Embedded detector method
   b) Voltmeter method
   c) Megger
   d) None of these

Seat No.	

Set **R**

B.E. (Part - I) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
ELECTRICAL INSTALLATION, TESTING & MAINTENANCE

Day & Date: Thursday,12-12-2019 Max. Marks: 56
Time: 02.30 PM To 05.30 PM

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

Section – I

Q.2 Attempt any three. **12**

a) Distinguish between major and minor repair work.
b) Explain the back to back test on transformer.
c) What precautions should be taken to avoid the electric accidents?
d) Explain the procedure of testing the BDV of oil.

Q.3 Attempt any Two. **16**

a) Explain the significance of maintenance of a power transformer and explain repair Work of medium power transformer.
b) Explain the procedure for rescuing the person who has got the electric shock.
c) Explain the difference between Type tests, Routine tests, Special tests, Commissioning tests on power transformers.

Section – II

Q.4 Attempt any three. **12**

a) State the requirements of type-test and routine tests on synchronous machines.
b) Explain the various tests of transformer oil.
c) State the various type tests performed on high voltage A. C. circuit breakers.
d) Explain the commissioning test for induction motor.

Q.5 Attempt any two. **16**

a) What are the requirements of foundations for installing induction motor?
b) Explain the following tests on a 3-phase induction motor.
1) Starting test
2) Load test
3) Temperature rise test
c) Explain the measurement of sequence impedances of synchronous machines.

Seat No.	

Set **S**

B.E. (Part - I) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
ELECTRICAL INSTALLATION, TESTING & MAINTENANCE

Day & Date: Thursday,12-12-2019 Max. Marks: 70
Time: 02.30 PM To 05.30 PM

Instructions: 1) Q.No.1 is compulsory and should be solved in first 30 Minutes in answer Book.
2) Figures to the right indicate full mark.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) Which of the following factors affects on life of insulating material?
   a) Temperature b) Deposition of oust
   c) Impurities d) All of these

2) Severity of electric shock is mainly depends on _____.
   a) Voltage b) Current
   c) Type of supply d) all of these

3) In fire extinguisher we use _____.
   a) CO_2 b) SO_2
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4) The most common method of artificial respiration is _____.
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5) The rotational losses in d.c. machines is equal to the _____.
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   d) Rate of change of kinetic energy

6) Which of the following fire extinguisher are toxic _____.
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7) Buchholz relay is _____.
   a) Located in the conservator tank
   b) Located in the transformer tank itself
   c) Connected in the pipe connecting main tank of transformer and conservator
   d) Installed in the circuit breaker

8) The arc voltage in C.B. is _____.
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   c) Leading the arc current by 90^o d) Legging the arc current by 180^o

9) Which of the following method used for measuring temperature of insulation?
   a) Embedded detector method
   b) Voltmeter method
   c) Megger
   d) None of these

10) For good transformer oil, as per IS density should be equal to _____.
   a) 0.5 gm/cm^3
   b) 0.65 gm/cm^3
   c) 0.89 gm/cm^3
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11) Copper losses in a rotating machine is _____.
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   b) Constant losses
   c) Either (a) or (b)
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12) Stray losses are the losses which vary with the load but their relationship with load current cannot be identified. Stay losses is maximum in _____.
   a) Synchronous machines
   b) D.C. Machines
   c) Induction machines
   d) Equal in all types of machines

13) Electrical power output in a d.c. generator is equal to _____.
   a) Electrical power developed in armature - copper losses
   b) Mechanical power input - iron and friction losses
   c) Electrical power developed in armature - iron and copper losses
   d) Mechanical power input - iron and friction losses - copper losses

14) The speed in d.c. machine can be measured by using _____.
   a) Anemometer
   b) Tachometer
   c) Voltmeter
   d) Ammeter

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Seat No.	

Set S

B.E. (Part - I) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
ELECTRICAL INSTALLATION, TESTING & MAINTENANCE

Day & Date: Thursday,12-12-2019 Max. Marks: 56
Time: 02.30 PM To 05.30 PM

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

Section – I

Q.2 Attempt any three. **12**

a) Distinguish between major and minor repair work.
b) Explain the back to back test on transformer.
c) What precautions should be taken to avoid the electric accidents?
d) Explain the procedure of testing the BDV of oil.

Q.3 Attempt any Two. **16**

a) Explain the significance of maintenance of a power transformer and explain repair Work of medium power transformer.
b) Explain the procedure for rescuing the person who has got the electric shock.
c) Explain the difference between Type tests, Routine tests, Special tests, Commissioning tests on power transformers.

Section – II

Q.4 Attempt any three. **12**

a) State the requirements of type-test and routine tests on synchronous machines.
b) Explain the various tests of transformer oil.
c) State the various type tests performed on high voltage A. C. circuit breakers.
d) Explain the commissioning test for induction motor.

Q.5 Attempt any two. **16**

a) What are the requirements of foundations for installing induction motor?
b) Explain the following tests on a 3-phase induction motor.
1) Starting test
2) Load test
3) Temperature rise test
c) Explain the measurement of sequence impedances of synchronous machines.

Seat No.	

Set **P**

B.E. (Part – I) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
SWITCHGEAR & PROTECTION

Day & Date: Saturday, 14-12-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer Book.
2) Figures to the right indicates full marks.
3) Make suitable assumption if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) What is the primary principle of a fuse?
   a) Open the circuit
   b) Protect the appliance
   c) Protect the line
   d) Prevent excess current from flowing into the line.

2) What is the making capacity of the circuit breaker?
   a) Less than the asymmetrical breaking capacity of the breaker
   b) Greater than the asymmetrical breaking capacity of the breaker
   c) Equal to the asymmetrical breaking capacity of the breaker
   d) Equal to the symmetrical breaking capacity of the breaker

3) What is switchgear?
   a) An apparatus used for switching, controlling and protecting the electrical circuit and equipments.
   b) It detects the faults only
   c) It corrects the fault only
   d) All of the above

4) Which among these are the main characteristics of a fuse element?
   a) Low melting point
   b) High conductivity
   c) Least deterioration due to oxidation
   d) All of the above

5) In a circuit breaker the contact space is ionized by what?
   a) Field emission from the contact surface
   b) Thermal emission from the contact surface
   c) Thermal ionization of gas
   d) All of above

6) Which of the following circuit breaker is highly reliable and has a least maintenance?
   a) Oil circuit breakers
   b) Air blast
   c) Vacuum circuit breakers
   d) SF_6 circuit breakers

7) Why is an isolator installed?
   a) To isolate one portion of the circuit from another
   b) As a substitute for the circuit breaker
   c) It used on either sides of the circuit breaker
   d) None of these

8) Which device sends the information to the circuit breaker to interrupt the circuit in case of fault?
   a) Switch
   b) Relay
   c) Circuit breaker itself does this function
   d) Fuse

9) Main purpose of oil in oil circuit breaker is to _____.
   a) provide insulation
   b) provide cooling of contacts
   c) quenching arc
   d) none of the above

10) Directional relays work on the bases of flow of _____.
   a) frequency
   b) power
   c) current
   d) voltage wave

11) IDMT relays are used to protect the power transformers against _____.
   a) external short-circuits
   b) overloads
   c) internal short-circuits
   d) external short-circuits and overload

12) In HRC Fuse, the fuse element is mainly made up of _____.
   a) Copper
   b) Aluminium
   c) Silver
   d) lead tin alloy

13) H.R.C. fuses provide best protection against _____.
   a) overload
   b) reverse current
   c) open-circuits
   d) short-circuits

14) When a fault occurs in a high voltage transmission line, what happens first?
   a) Circuit breaker operates then the relay
   b) Relay operates and then the circuit breaker
   c) Relay operates, then successively the isolator and the circuit breaker
   d) Isolator operates, then successively the relay and the circuit breaker

Seat No.	

Set **P**

B.E. (Part – I) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
SWITCHGEAR & PROTECTION

Day & Date: Saturday, 14-12-2019 Max. Marks: 56
Time: 02:30 PM To 05:30 PM

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

Section – I

Q.2 Solve any three. **12**

a) Explain Phenomenon of Current Chopping.
b) Draw and explain Minimum oil circuit breaker.
c) What is mean by fuse and briefly explain types of fuses?
d) State types of isolator. Explain any one of them.

Q.3 Solve any two. **16**

a) Draw & Explain principle of arc quenching in air blast circuit breaker.
b) Explain the terms
1) Restriking voltage
2) Recovery voltage
3) RRRV
4) Derive expression for RRRV
c) Give the merits and demerits of Vacuum circuit breaker.

Section – II

Q.4 Solve any three. **12**

a) Write a short note on directional over current relay.
b) Write a short on metal oxide arrestor.
c) Derive generalized mechanical expression for distance relay.
d) Define potential transformer, relay time, trip circuit, auxiliary switch.

Q.5 Solve any two. **16**

a) What is the principle of distance protection relay and explain any one type of distance relay.
b) Describe the principle of operation and working of IDMT relay.
c) Describe microprocessor based MHO and off set MHO relay with its block diagram.

Seat No.	

Set **Q**

B.E. (Part – I) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
SWITCHGEAR & PROTECTION

Day & Date: Saturday, 14-12-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer Book.
2) Figures to the right indicates full marks.
3) Make suitable assumption if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) Which device sends the information to the circuit breaker to interrupt the circuit in case of fault?
   a) Switch
   b) Relay
   c) Circuit breaker itself does this function
   d) Fuse

2) Main purpose of oil in oil circuit breaker is to _____.
   a) provide insulation b) provide cooling of contacts
   c) quenching arc d) none of the above

3) Directional relays work on the bases of flow of _____.
   a) frequency b) power
   c) current d) voltage wave

4) IDMT relays are used to protect the power transformers against _____.
   a) external short-circuits
   b) overloads
   c) internal short-circuits
   d) external short-circuits and overload

5) In HRC Fuse, the fuse element is mainly made up of _____.
   a) Copper b) Aluminium
   c) Silver d) lead tin alloy

6) H.R.C. fuses provide best protection against _____.
   a) overload b) reverse current
   c) open-circuits d) short-circuits

7) When a fault occurs in a high voltage transmission line, what happens first?
   a) Circuit breaker operates then the relay
   b) Relay operates and then the circuit breaker
   c) Relay operates, then successively the isolator and the circuit breaker
   d) Isolator operates, then successively the relay and the circuit breaker

8) What is the primary principle of a fuse?
   a) Open the circuit
   b) Protect the appliance
   c) Protect the line
   d) Prevent excess current from flowing into the line.

9) What is the making capacity of the circuit breaker?
   a) Less than the asymmetrical breaking capacity of the breaker
   b) Greater than the asymmetrical breaking capacity of the breaker
   c) Equal to the asymmetrical breaking capacity of the breaker
   d) Equal to the symmetrical breaking capacity of the breaker

10) What is switchgear?
   a) An apparatus used for switching, controlling and protecting the electrical circuit and equipments.
   b) It detects the faults only
   c) It corrects the fault only
   d) All of the above

11) Which among these are the main characteristics of a fuse element?
   a) Low melting point
   b) High conductivity
   c) Least deterioration due to oxidation
   d) All of the above

12) In a circuit breaker the contact space is ionized by what?
   a) Field emission from the contact surface
   b) Thermal emission from the contact surface
   c) Thermal ionization of gas
   d) All of above

13) Which of the following circuit breaker is highly reliable and has a least maintenance?
   a) Oil circuit breakers
   b) Air blast
   c) Vacuum circuit breakers
   d) SF_6 circuit breakers

14) Why is an isolator installed?
   a) To isolate one portion of the circuit from another
   b) As a substitute for the circuit breaker
   c) It used on either sides of the circuit breaker
   d) None of these

Seat No.	

Set **Q**

B.E. (Part – I) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
SWITCHGEAR & PROTECTION

Day & Date: Saturday, 14-12-2019 Max. Marks: 56
Time: 02:30 PM To 05:30 PM

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

Section – I

Q.2 Solve any three. **12**

a) Explain Phenomenon of Current Chopping.
b) Draw and explain Minimum oil circuit breaker.
c) What is mean by fuse and briefly explain types of fuses?
d) State types of isolator. Explain any one of them.

Q.3 Solve any two. **16**

a) Draw & Explain principle of arc quenching in air blast circuit breaker.
b) Explain the terms
1) Restriking voltage
2) Recovery voltage
3) RRRV
4) Derive expression for RRRV
c) Give the merits and demerits of Vacuum circuit breaker.

Section – II

Q.4 Solve any three. **12**

a) Write a short note on directional over current relay.
b) Write a short on metal oxide arrestor.
c) Derive generalized mechanical expression for distance relay.
d) Define potential transformer, relay time, trip circuit, auxiliary switch.

Q.5 Solve any two. **16**

a) What is the principle of distance protection relay and explain any one type of distance relay.
b) Describe the principle of operation and working of IDMT relay.
c) Describe microprocessor based MHO and off set MHO relay with its block diagram.

Seat No.	

Set **R**

B.E. (Part – I) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
SWITCHGEAR & PROTECTION

Day & Date: Saturday, 14-12-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer Book.
2) Figures to the right indicates full marks.
3) Make suitable assumption if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) In a circuit breaker the contact space is ionized by what?
   a) Field emission from the contact surface
   b) Thermal emission from the contact surface
   c) Thermal ionization of gas
   d) All of above

2) Which of the following circuit breaker is highly reliable and has a least maintenance?
   a) Oil circuit breakers b) Air blast
   c) Vacuum circuit breakers d) SF_6 circuit breakers

3) Why is an isolator installed?
   a) To isolate one portion of the circuit from another
   b) As a substitute for the circuit breaker
   c) It used on either sides of the circuit breaker
   d) None of these

4) Which device sends the information to the circuit breaker to interrupt the circuit in case of fault?
   a) Switch
   b) Relay
   c) Circuit breaker itself does this function
   d) Fuse

5) Main purpose of oil in oil circuit breaker is to _____.
   a) provide insulation b) provide cooling of contacts
   c) quenching arc d) none of the above

6) Directional relays work on the bases of flow of _____.
   a) frequency b) power
   c) current d) voltage wave

7) IDMT relays are used to protect the power transformers against _____.
   a) external short-circuits
   b) overloads
   c) internal short-circuits
   d) external short-circuits and overload

8) In HRC Fuse, the fuse element is mainly made up of _____.
   a) Copper
   b) Aluminium
   c) Silver
   d) lead tin alloy

9) H.R.C. fuses provide best protection against _____.
   a) overload
   b) reverse current
   c) open-circuits
   d) short-circuits

10) When a fault occurs in a high voltage transmission line, what happens first?
   a) Circuit breaker operates then the relay
   b) Relay operates and then the circuit breaker
   c) Relay operates, then successively the isolator and the circuit breaker
   d) Isolator operates, then successively the relay and the circuit breaker

11) What is the primary principle of a fuse?
   a) Open the circuit
   b) Protect the appliance
   c) Protect the line
   d) Prevent excess current from flowing into the line.

12) What is the making capacity of the circuit breaker?
   a) Less than the asymmetrical breaking capacity of the breaker
   b) Greater than the asymmetrical breaking capacity of the breaker
   c) Equal to the asymmetrical breaking capacity of the breaker
   d) Equal to the symmetrical breaking capacity of the breaker

13) What is switchgear?
   a) An apparatus used for switching, controlling and protecting the electrical circuit and equipments.
   b) It detects the faults only
   c) It corrects the fault only
   d) All of the above

14) Which among these are the main characteristics of a fuse element?
   a) Low melting point
   b) High conductivity
   c) Least deterioration due to oxidation
   d) All of the above

Seat No.	

Set **R**

B.E. (Part – I) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
SWITCHGEAR & PROTECTION

Day & Date: Saturday, 14-12-2019 Max. Marks: 56
Time: 02:30 PM To 05:30 PM

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

Section – I

Q.2 Solve any three. **12**

a) Explain Phenomenon of Current Chopping.
b) Draw and explain Minimum oil circuit breaker.
c) What is mean by fuse and briefly explain types of fuses?
d) State types of isolator. Explain any one of them.

Q.3 Solve any two. **16**

a) Draw & Explain principle of arc quenching in air blast circuit breaker.
b) Explain the terms
1) Restriking voltage
2) Recovery voltage
3) RRRV
4) Derive expression for RRRV
c) Give the merits and demerits of Vacuum circuit breaker.

Section – II

Q.4 Solve any three. **12**

a) Write a short note on directional over current relay.
b) Write a short on metal oxide arrestor.
c) Derive generalized mechanical expression for distance relay.
d) Define potential transformer, relay time, trip circuit, auxiliary switch.

Q.5 Solve any two. **16**

a) What is the principle of distance protection relay and explain any one type of distance relay.
b) Describe the principle of operation and working of IDMT relay.
c) Describe microprocessor based MHO and off set MHO relay with its block diagram.

Seat No.	

Set **S**

B.E. (Part – I) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
SWITCHGEAR & PROTECTION

Day & Date: Saturday, 14-12-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer Book.
2) Figures to the right indicates full marks.
3) Make suitable assumption if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) Directional relays work on the bases of flow of _____.
   a) frequency b) power
   c) current d) voltage wave

2) IDMT relays are used to protect the power transformers against _____.
   a) external short-circuits
   b) overloads
   c) internal short-circuits
   d) external short-circuits and overload

3) In HRC Fuse, the fuse element is mainly made up of _____.
   a) Copper b) Aluminium
   c) Silver d) lead tin alloy

4) H.R.C. fuses provide best protection against _____.
   a) overload b) reverse current
   c) open-circuits d) short-circuits

5) When a fault occurs in a high voltage transmission line, what happens first?
   a) Circuit breaker operates then the relay
   b) Relay operates and then the circuit breaker
   c) Relay operates, then successively the isolator and the circuit breaker
   d) Isolator operates, then successively the relay and the circuit breaker

6) What is the primary principle of a fuse?
   a) Open the circuit
   b) Protect the appliance
   c) Protect the line
   d) Prevent excess current from flowing into the line.

7) What is the making capacity of the circuit breaker?
   a) Less than the asymmetrical breaking capacity of the breaker
   b) Greater than the asymmetrical breaking capacity of the breaker
   c) Equal to the asymmetrical breaking capacity of the breaker
   d) Equal to the symmetrical breaking capacity of the breaker

8) What is switchgear?
   a) An apparatus used for switching, controlling and protecting the electrical circuit and equipments.
   b) It detects the faults only
   c) It corrects the fault only
   d) All of the above

9) Which among these are the main characteristics of a fuse element?
   a) Low melting point
   b) High conductivity
   c) Least deterioration due to oxidation
   d) All of the above

10) In a circuit breaker the contact space is ionized by what?
   a) Field emission from the contact surface
   b) Thermal emission from the contact surface
   c) Thermal ionization of gas
   d) All of above

11) Which of the following circuit breaker is highly reliable and has a least maintenance?
   a) Oil circuit breakers
   b) Air blast
   c) Vacuum circuit breakers
   d) SF_6 circuit breakers

12) Why is an isolator installed?
   a) To isolate one portion of the circuit from another
   b) As a substitute for the circuit breaker
   c) It used on either sides of the circuit breaker
   d) None of these

13) Which device sends the information to the circuit breaker to interrupt the circuit in case of fault?
   a) Switch
   b) Relay
   c) Circuit breaker itself does this function
   d) Fuse

14) Main purpose of oil in oil circuit breaker is to _____.
   a) provide insulation
   b) provide cooling of contacts
   c) quenching arc
   d) none of the above

Seat No.	

Set **S**

B.E. (Part – I) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
SWITCHGEAR & PROTECTION

Day & Date: Saturday, 14-12-2019 Max. Marks: 56
Time: 02:30 PM To 05:30 PM

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

Section – I

Q.2 Solve any three. **12**

a) Explain Phenomenon of Current Chopping.
b) Draw and explain Minimum oil circuit breaker.
c) What is mean by fuse and briefly explain types of fuses?
d) State types of isolator. Explain any one of them.

Q.3 Solve any two. **16**

a) Draw & Explain principle of arc quenching in air blast circuit breaker.
b) Explain the terms
1) Restriking voltage
2) Recovery voltage
3) RRRV
4) Derive expression for RRRV
c) Give the merits and demerits of Vacuum circuit breaker.

Section – II

Q.4 Solve any three. **12**

a) Write a short note on directional over current relay.
b) Write a short on metal oxide arrestor.
c) Derive generalized mechanical expression for distance relay.
d) Define potential transformer, relay time, trip circuit, auxiliary switch.

Q.5 Solve any two. **16**

a) What is the principle of distance protection relay and explain any one type of distance relay.
b) Describe the principle of operation and working of IDMT relay.
c) Describe microprocessor based MHO and off set MHO relay with its block diagram.

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Seat No.	

Set P

B.E. (Part – I) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
RENEWABLE ENERGY SOURCES

Day & Date: Tuesday, 17-12-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer Book.
2) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) Multi blade type wind mill is used for pumping the water because of _____.
   a) High starting characteristic b) Low cost
   c) Easily available d) All of the above

2) Lower speed wind turbine is mainly driven by _____.
   a) Drag factor b) Lift forces
   c) Plash forces d) None of the above

3) The retention period ranges from _____ days.
   a) 5 to 10 days b) 20 to 40 days
   c) 30 to 50 days d) 10 to 20 days

4) The biogas generation is not affected by which of the foiling factors _____.
   a) Temperature b) Type of plant
   c) loading rate d) Solid concentration

5) Fixed done type biogas plant is also called as _____.
   a) Pragati plant b) Janata modal biogas plant
   c) KVIC plant d) None of these

6) HDR is _____.
   a) Heavy depth rock b) Hot dry rock
   c) Hard dry rock d) High density rock

7) The binary cycle system is basically an _____.
   a) Rankin cycle b) Claude cycle
   c) Hybrid system d) Bar jot cycle

8) The close cycle is called as _____.
   a) Steam cycle b) Claude cycle
   c) Anderson cycle d) Rankin cycle

9) In a solid storage the hydrogen is stored in the steam of _____.
   a) Non -metal hydrogen b) Metal hydride
   c) Non metal hydrides d) Metal mixture

10) _____ can be used to extract hydrogen and use it to power fuel cells.
   a) Nitrogen b) Methane
   c) Ethane d) Carbon

11) Which of the following system is an application of solar thermal energy?
   a) I.C engine
   b) Biogas generation
   c) Solar water heating
   d) Solar lighting

12) Fill factor (FF) for a good silicon cell is about _____.
   a) 1
   b) 0.8
   c) 0.5
   d) 10

13) The following material can be used to fabricate the solar cell _____.
   a) Carbon
   b) Cadmium sulphide
   c) Chlorine sulphide
   d) Potassium sulphide

14) Energy pattern factor is always _____.
   a) Less than one
   b) Equal to one
   c) Greater than one
   d) None of these

Seat No.	

Set **P**

B.E. (Part – I) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
RENEWABLE ENERGY SOURCES

Day & Date: Tuesday, 17-12-2019 Max. Marks: 56
Time: 02:30 PM To 05:30 PM

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

Section – I

Q.2 Answer any three questions:- **12**

a) Compare the Renewable & Non-Renewable Energy Source, with example. Mention the advantages of Renewable Energy Sources.
b) With neat figure explain the solar distillation. What are its applications?
c) With a neat block diagram explain the Photo Voltaic System (PVS).
d) With a neat block diagram explain the wind energy generation (WEG) system.

Q.3 Answer any two questions:- **16**

a) What are the applications of photo voltaic system? Explain PV hybrid system.
b) With neat figure explain the solar space heating & cooling.
c) What are the design considerations of horizontal axis wind machines? Explain Yaw control & blade design in brief.

Section – II

Q.4 Answer any three questions. **12**

a) What are the factors which affect the bio-digestion or bio-gas production?
b) With neat figure explain the Binary cycle system.
c) What are the factors to be considered for site selection of bio gas plants?
d) Explain various methods of Hydrogen transportation.

Q.5 Answer any two questions. **16**

a) With neat figure explain the operation of fixed dome type bio gas plant. Mention its advantages and disadvantages.
b) With neat figure explain the open cycle OTEC system. List the advantages & disadvantages of tidal power plant.
c) What is Geo-thermal energy? List the sources & re-sources of geo-thermal energy; also mention advantages & disadvantages of geo thermal energy.

Seat No.	

Set **Q**

B.E. (Part – I) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
RENEWABLE ENERGY SOURCES

Day & Date: Tuesday, 17-12-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer Book.
2) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) The close cycle is called as _____.
   a) Steam cycle b) Claude cycle
   c) Anderson cycle d) Rankin cycle

2) In a solid storage the hydrogen is stored in the steam of _____.
   a) Non -metal hydrogen b) Metal hydride
   c) Non metal hydrides d) Metal mixture

3) _____ can be used to extract hydrogen and use it to power fuel cells.
   a) Nitrogen b) Methane
   c) Ethane d) Carbon

4) Which of the following system is an application of solar thermal energy?
   a) I.C engine b) Biogas generation
   c) Solar water heating d) Solar lighting

5) Fill factor (FF) for a good silicon cell is about _____.
   a) 1 b) 0.8
   c) 0.5 d) 10

6) The following material can be used to fabricate the solar cell _____.
   a) Carbon b) Cadmium sulphide
   c) Chlorine sulphide d) Potassium sulphide

7) Energy pattern factor is always _____.
   a) Less than one b) Equal to one
   c) Greater than one d) None of these

8) Multi blade type wind mill is used for pumping the water because of _____.
   a) High starting characteristic b) Low cost
   c) Easily available d) All of the above

9) Lower speed wind turbine is mainly driven by _____.
   a) Drag factor b) Lift forces
   c) Plash forces d) None of the above

10) The retention period ranges from _____ days.
   a) 5 to 10 days b) 20 to 40 days
   c) 30 to 50 days d) 10 to 20 days

11) The biogas generation is not affected by which of the foiling factors _____.
   a) Temperature
   b) Type of plant
   c) loading rate
   d) Solid concentration

12) Fixed done type biogas plant is also called as _____.
   a) Pragati plant
   b) Janata modal biogas plant
   c) KVIC plant
   d) None of these

13) HDR is _____.
   a) Heavy depth rock
   b) Hot dry rock
   c) Hard dry rock
   d) High density rock

14) The binary cycle system is basically an _____.
   a) Rankin cycle
   b) Claude cycle
   c) Hybrid system
   d) Bar jot cycle

Seat No.	

Set **Q**

B.E. (Part – I) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
RENEWABLE ENERGY SOURCES

Day & Date: Tuesday, 17-12-2019 Max. Marks: 56
Time: 02:30 PM To 05:30 PM

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

Section – I

Q.2 Answer any three questions:- **12**

a) Compare the Renewable & Non-Renewable Energy Source, with example. Mention the advantages of Renewable Energy Sources.
b) With neat figure explain the solar distillation. What are its applications?
c) With a neat block diagram explain the Photo Voltaic System (PVS).
d) With a neat block diagram explain the wind energy generation (WEG) system.

Q.3 Answer any two questions:- **16**

a) What are the applications of photo voltaic system? Explain PV hybrid system.
b) With neat figure explain the solar space heating & cooling.
c) What are the design considerations of horizontal axis wind machines? Explain Yaw control & blade design in brief.

Section – II

Q.4 Answer any three questions. **12**

a) What are the factors which affect the bio-digestion or bio-gas production?
b) With neat figure explain the Binary cycle system.
c) What are the factors to be considered for site selection of bio gas plants?
d) Explain various methods of Hydrogen transportation.

Q.5 Answer any two questions. **16**

a) With neat figure explain the operation of fixed dome type bio gas plant. Mention its advantages and disadvantages.
b) With neat figure explain the open cycle OTEC system. List the advantages & disadvantages of tidal power plant.
c) What is Geo-thermal energy? List the sources & re-sources of geo-thermal energy; also mention advantages & disadvantages of geo thermal energy.

Seat No.	

Set **R**

B.E. (Part – I) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
RENEWABLE ENERGY SOURCES

Day & Date: Tuesday, 17-12-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer Book.
2) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) Fixed done type biogas plant is also called as _____.
   a) Pragati plant b) Janata modal biogas plant
   c) KVIC plant d) None of these

2) HDR is _____.
   a) Heavy depth rock b) Hot dry rock
   c) Hard dry rock d) High density rock

3) The binary cycle system is basically an _____.
   a) Rankin cycle b) Claude cycle
   c) Hybrid system d) Bar jot cycle

4) The close cycle is called as _____.
   a) Steam cycle b) Claude cycle
   c) Anderson cycle d) Rankin cycle

5) In a solid storage the hydrogen is stored in the steam of _____.
   a) Non -metal hydrogen b) Metal hydride
   c) Non metal hydrides d) Metal mixture

6) _____ can be used to extract hydrogen and use it to power fuel cells.
   a) Nitrogen b) Methane
   c) Ethane d) Carbon

7) Which of the following system is an application of solar thermal energy?
   a) I.C engine b) Biogas generation
   c) Solar water heating d) Solar lighting

8) Fill factor (FF) for a good silicon cell is about _____.
   a) 1 b) 0.8
   c) 0.5 d) 10

9) The following material can be used to fabricate the solar cell _____.
   a) Carbon b) Cadmium sulphide
   c) Chlorine sulphide d) Potassium sulphide

10) Energy pattern factor is always _____.
   a) Less than one b) Equal to one
   c) Greater than one d) None of these

11) Multi blade type wind mill is used for pumping the water because of _____.
   a) High starting characteristic b) Low cost
   c) Easily available d) All of the above

12) Lower speed wind turbine is mainly driven by _____.
   a) Drag factor b) Lift forces
   c) Plash forces d) None of the above

13) The retention period ranges from _____ days.
   a) 5 to 10 days b) 20 to 40 days
   c) 30 to 50 days d) 10 to 20 days

14) The biogas generation is not affected by which of the foiling factors _____.
   a) Temperature b) Type of plant
   c) loading rate d) Solid concentration

Seat No.	

Set **R**

B.E. (Part – I) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
RENEWABLE ENERGY SOURCES

Day & Date: Tuesday, 17-12-2019 Max. Marks: 56
Time: 02:30 PM To 05:30 PM

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

Section – I

Q.2 Answer any three questions:- **12**

a) Compare the Renewable & Non-Renewable Energy Source, with example. Mention the advantages of Renewable Energy Sources.
b) With neat figure explain the solar distillation. What are its applications?
c) With a neat block diagram explain the Photo Voltaic System (PVS).
d) With a neat block diagram explain the wind energy generation (WEG) system.

Q.3 Answer any two questions:- **16**

a) What are the applications of photo voltaic system? Explain PV hybrid system.
b) With neat figure explain the solar space heating & cooling.
c) What are the design considerations of horizontal axis wind machines? Explain Yaw control & blade design in brief.

Section – II

Q.4 Answer any three questions. **12**

a) What are the factors which affect the bio-digestion or bio-gas production?
b) With neat figure explain the Binary cycle system.
c) What are the factors to be considered for site selection of bio gas plants?
d) Explain various methods of Hydrogen transportation.

Q.5 Answer any two questions. **16**

a) With neat figure explain the operation of fixed dome type bio gas plant. Mention its advantages and disadvantages.
b) With neat figure explain the open cycle OTEC system. List the advantages & disadvantages of tidal power plant.
c) What is Geo-thermal energy? List the sources & re-sources of geo-thermal energy; also mention advantages & disadvantages of geo thermal energy.

Seat No.	

Set **S**

B.E. (Part – I) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
RENEWABLE ENERGY SOURCES

Day & Date: Tuesday, 17-12-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer Book.
2) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) _____ can be used to extract hydrogen and use it to power fuel cells.
   a) Nitrogen b) Methane
   c) Ethane d) Carbon

2) Which of the following system is an application of solar thermal energy?
   a) I.C engine b) Biogas generation
   c) Solar water heating d) Solar lighting

3) Fill factor (FF) for a good silicon cell is about _____.
   a) 1 b) 0.8
   c) 0.5 d) 10

4) The following material can be used to fabricate the solar cell _____.
   a) Carbon b) Cadmium sulphide
   c) Chlorine sulphide d) Potassium sulphide

5) Energy pattern factor is always _____.
   a) Less than one b) Equal to one
   c) Greater than one d) None of these

6) Multi blade type wind mill is used for pumping the water because of _____.
   a) High starting characteristic b) Low cost
   c) Easily available d) All of the above

7) Lower speed wind turbine is mainly driven by _____.
   a) Drag factor b) Lift forces
   c) Plash forces d) None of the above

8) The retention period ranges from _____ days.
   a) 5 to 10 days b) 20 to 40 days
   c) 30 to 50 days d) 10 to 20 days

9) The biogas generation is not affected by which of the foiling factors _____.
   a) Temperature b) Type of plant
   c) loading rate d) Solid concentration

10) Fixed done type biogas plant is also called as _____.
   a) Pragati plant b) Janata modal biogas plant
   c) KVIC plant d) None of these

11) HDR is _____.
   a) Heavy depth rock
   b) Hot dry rock
   c) Hard dry rock
   d) High density rock

12) The binary cycle system is basically an _____.
   a) Rankin cycle
   b) Claude cycle
   c) Hybrid system
   d) Bar jot cycle

13) The close cycle is called as _____.
   a) Steam cycle
   b) Claude cycle
   c) Anderson cycle
   d) Rankin cycle

14) In a solid storage the hydrogen is stored in the steam of _____.
   a) Non -metal hydrogen
   b) Metal hydride
   c) Non metal hydrides
   d) Metal mixture

Seat No.	

Set **S**

B.E. (Part – I) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
RENEWABLE ENERGY SOURCES

Day & Date: Tuesday, 17-12-2019 Max. Marks: 56
Time: 02:30 PM To 05:30 PM

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

Section – I

Q.2 Answer any three questions:- **12**

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b) With neat figure explain the solar distillation. What are its applications?
c) With a neat block diagram explain the Photo Voltaic System (PVS).
d) With a neat block diagram explain the wind energy generation (WEG) system.

Q.3 Answer any two questions:- **16**

a) What are the applications of photo voltaic system? Explain PV hybrid system.
b) With neat figure explain the solar space heating & cooling.
c) What are the design considerations of horizontal axis wind machines? Explain Yaw control & blade design in brief.

Section – II

Q.4 Answer any three questions. **12**

a) What are the factors which affect the bio-digestion or bio-gas production?
b) With neat figure explain the Binary cycle system.
c) What are the factors to be considered for site selection of bio gas plants?
d) Explain various methods of Hydrogen transportation.

Q.5 Answer any two questions. **16**

a) With neat figure explain the operation of fixed dome type bio gas plant. Mention its advantages and disadvantages.
b) With neat figure explain the open cycle OTEC system. List the advantages & disadvantages of tidal power plant.
c) What is Geo-thermal energy? List the sources & re-sources of geo-thermal energy; also mention advantages & disadvantages of geo thermal energy.

Seat No.	

Set **P**

B.E. (Part – II) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
HVDC & FACTS

Day & Date: Friday, 22-11-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q.1 is compulsory; it should be solved in first 30 minutes in Answer book.
2) Figures to the right indicate maximum marks.
3) Assume the suitable data whenever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) FACTS provides _____.
   a) Power Transfer capability & controllability
   b) Phase sequence & comparability
   c) a & b
   d) None

2) The power flow increased with increased in _____.
   a) α b) X (transmission line reactance)
   c) δ d) All the above

3) Transient stability improvement can be conveniently evaluated by _____.
   a) Static VAR compensation b) Midpoint compensation
   c) a & b d) Equal area criteria

4) The voltage injection in transmission line is the method of _____.
   a) Series compensator b) Shunt compensator
   c) a + b d) None of above

5) The best location for use of a booster transformer in a transmission line is _.
   a) At the sending end b) At the receiving end
   c) At the intermediate point d) Anywhere in the line

6) A combination of different _____ Compensator whose outputs are co-ordinate.
   a) Static & mechanically coupled b) Static & mechanically switched
   c) Static & dynamically coupled d) None of above

7) As the degree of series compensation increases, the _____ increase.
   a) Voltage stability b) Power factor
   c) Transmission line reactance d) All of above

8) Individual operation of firing pulses for each valve is the feature of _____.
   a) IPC b) EPC
   c) CCC d) VGC

9) A commutation group is defined as, group of valves in which only _____ valves conducts.
   a) One b) Two
   c) Three d) Four

10) Reactive power to HVDC system may be supplied from _____.
   a) AC filters
   b) shunt capacitors
   c) SVS
   d) all of the above

11) As compared to HVAC line, the corona and radio interference on a HVDC line are _____.
   a) Lower
   b) More
   c) The same
   d) All of the above

12) A 12-pulse bridge is preferred in HVDC because _____.
   a) It eliminates certain harmonics
   b) It results in better power factor
   c) Series connection of converters on D.C. side is better
   d) All of above

13) The bypassing of the bridge can be done with the help of _____.
   a) Replacing a single valve in the arm
   b) Replacing both valve in same arm
   c) Activating a bypass pair in the bridge
   d) Deactivating same arm from converter set

14) The first commercially used HVDC link was built in.
   a) 2006
   b) 1954
   c) 1986
   d) yet to the built

Seat No.	

Set **P**

B.E. (Part – II) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
HVDC & FACTS

Day & Date: Friday, 22-11-2019 Max. Marks: 56
Time: 02:30 PM To 05:30 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate maximum marks.
3) Assume the suitable data whenever necessary.

Section – I

Q.2 Attempt any four: **16**

a) What are the control parameters of transmission line?
b) Explain basic principle of shunt compensator.
c) Explain variable impedance type series compensator.
d) With neat sketch explain fixed capacitor thyristor controller reactor.
e) Explain objective of a series compensator.

Q.3 Attempt any two: **12**

a) Explain how stability margin is increased when series compensator is used for transmission line.
b) Give the detail comparison between STATCOM and SVC.
c) With neat sketch explain GTO Thyristor Controlled Series Compensator.

Section – II

Q.4 Attempt any four: **16**

a) Explain the EPC scheme of firing angle generation.
b) Explain with neat diagram the different types of DC links.
c) Explain limitations of HVDC transmission over EHVAC.
d) Explain converter control characteristics with neat diagram.
e) Explain power control in HVDC system with neat block diagram.

Q.5 Attempt any two: **12**

a) Explain Find the expression of DC output for 6 pulse converter in HVDC system considering overlap angle more than 60^{o}.
b) Explain capacitor commutated converter in detail.
c) Give detailed comparison between HVDC and AC transmission.

Seat No.	

Set **Q**

B.E. (Part – II) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
HVDC & FACTS

Day & Date: Friday, 22-11-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q.1 is compulsory; it should be solved in first 30 minutes in Answer book.
2) Figures to the right indicate maximum marks.
3) Assume the suitable data whenever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) Individual operation of firing pulses for each valve is the feature of _____.
   a) IPC b) EPC
   c) CCC d) VGC

2) A commutation group is defined as, group of valves in which only _____ valves conducts.
   a) One b) Two
   c) Three d) Four

3) Reactive power to HVDC system may be supplied from _____.
   a) AC filters b) shunt capacitors
   c) SVS d) all of the above

4) As compared to HVAC line, the corona and radio interference on a HVDC line are _____.
   a) Lower b) More
   c) The same d) All of the above

5) A 12-pulse bridge is preferred in HVDC because _____.
   a) It eliminates certain harmonics
   b) It results in better power factor
   c) Series connection of converters on D.C. side is better
   d) All of above

6) The bypassing of the bridge can be done with the help of _____.
   a) Replacing a single valve in the arm
   b) Replacing both valve in same arm
   c) Activating a bypass pair in the bridge
   d) Deactivating same arm from converter set

7) The first commercially used HVDC link was built in.
   a) 2006 b) 1954
   c) 1986 d) yet to the built

8) FACTS provides _____.
   a) Power Transfer capability & controllability
   b) Phase sequence & comparability
   c) a & b
   d) None

9) The power flow increased with increased in _____.
   a) α b) X (transmission line reactance)
   c) δ d) All the above

10) Transient stability improvement can be conveniently evaluated by _____.
   a) Static VAR compensation b) Midpoint compensation
   c) a & b d) Equal area criteria

11) The voltage injection in transmission line is the method of _____.
   a) Series compensator b) Shunt compensator
   c) a + b d) None of above

12) The best location for use of a booster transformer in a transmission line is _.
   a) At the sending end b) At the receiving end
   c) At the intermediate point d) Anywhere in the line

13) A combination of different _____ Compensator whose outputs are co-ordinate.
   a) Static & mechanically coupled b) Static & mechanically switched
   c) Static & dynamically coupled d) None of above

14) As the degree of series compensation increases, the _____ increase.
   a) Voltage stability b) Power factor
   c) Transmission line reactance d) All of above

Seat No.	

Set **Q**

B.E. (Part – II) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
HVDC & FACTS

Day & Date: Friday, 22-11-2019 Max. Marks: 56
Time: 02:30 PM To 05:30 PM

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

Q.2 Attempt any four: **16**

a) What are the control parameters of transmission line?
b) Explain basic principle of shunt compensator.
c) Explain variable impedance type series compensator.
d) With neat sketch explain fixed capacitor thyristor controller reactor.
e) Explain objective of a series compensator.

Q.3 Attempt any two: **12**

a) Explain how stability margin is increased when series compensator is used for transmission line.
b) Give the detail comparison between STATCOM and SVC.
c) With neat sketch explain GTO Thyristor Controlled Series Compensator.

Section – II

Q.4 Attempt any four: **16**

a) Explain the EPC scheme of firing angle generation.
b) Explain with neat diagram the different types of DC links.
c) Explain limitations of HVDC transmission over EHVAC.
d) Explain converter control characteristics with neat diagram.
e) Explain power control in HVDC system with neat block diagram.

Q.5 Attempt any two: **12**

a) Explain Find the expression of DC output for 6 pulse converter in HVDC system considering overlap angle more than 60^{o}.
b) Explain capacitor commutated converter in detail.
c) Give detailed comparison between HVDC and AC transmission.

Seat No.	

Set **R**

B.E. (Part – II) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
HVDC & FACTS

Day & Date: Friday, 22-11-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q.1 is compulsory; it should be solved in first 30 minutes in Answer book.
2) Figures to the right indicate maximum marks.
3) Assume the suitable data whenever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) The best location for use of a booster transformer in a transmission line is _.
   a) At the sending end b) At the receiving end
   c) At the intermediate point d) Anywhere in the line

2) A combination of different _____ Compensator whose outputs are co-ordinate.
   a) Static & mechanically coupled b) Static & mechanically switched
   c) Static & dynamically coupled d) None of above

3) As the degree of series compensation increases, the _____ increase.
   a) Voltage stability b) Power factor
   c) Transmission line reactance d) All of above

4) Individual operation of firing pulses for each valve is the feature of _____.
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5) A commutation group is defined as, group of valves in which only _____ valves conducts.
   a) One b) Two
   c) Three d) Four

6) Reactive power to HVDC system may be supplied from _____.
   a) AC filters b) shunt capacitors
   c) SVS d) all of the above

7) As compared to HVAC line, the corona and radio interference on a HVDC line are _____.
   a) Lower b) More
   c) The same d) All of the above

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13) Transient stability improvement can be conveniently evaluated by _____.
   a) Static VAR compensation b) Midpoint compensation
   c) a & b d) Equal area criteria

14) The voltage injection in transmission line is the method of _____.
   a) Series compensator b) Shunt compensator
   c) a + b d) None of above

Seat No.	

Set **R**

B.E. (Part – II) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
HVDC & FACTS

Day & Date: Friday, 22-11-2019 Max. Marks: 56
Time: 02:30 PM To 05:30 PM

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

Q.2 Attempt any four: **16**

a) What are the control parameters of transmission line?
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d) With neat sketch explain fixed capacitor thyristor controller reactor.
e) Explain objective of a series compensator.

Q.3 Attempt any two: **12**

a) Explain how stability margin is increased when series compensator is used for transmission line.
b) Give the detail comparison between STATCOM and SVC.
c) With neat sketch explain GTO Thyristor Controlled Series Compensator.

Section – II

Q.4 Attempt any four: **16**

a) Explain the EPC scheme of firing angle generation.
b) Explain with neat diagram the different types of DC links.
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Seat No.	

Set **S**

B.E. (Part – II) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
HVDC & FACTS

Day & Date: Friday, 22-11-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q.1 is compulsory; it should be solved in first 30 minutes in Answer book.
2) Figures to the right indicate maximum marks.
3) Assume the suitable data whenever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) Reactive power to HVDC system may be supplied from _____.
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   c) SVS d) all of the above

2) As compared to HVAC line, the corona and radio interference on a HVDC line are _____.
   a) Lower b) More
   c) The same d) All of the above

3) A 12-pulse bridge is preferred in HVDC because _____.
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   c) Three d) Four

Seat No.	

Set **S**

B.E. (Part – II) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
HVDC & FACTS

Day & Date: Friday, 22-11-2019 Max. Marks: 56
Time: 02:30 PM To 05:30 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate maximum marks.
3) Assume the suitable data whenever necessary.

Section – I

Q.2 Attempt any four: **16**

a) What are the control parameters of transmission line?
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d) With neat sketch explain fixed capacitor thyristor controller reactor.
e) Explain objective of a series compensator.

Q.3 Attempt any two: **12**

a) Explain how stability margin is increased when series compensator is used for transmission line.
b) Give the detail comparison between STATCOM and SVC.
c) With neat sketch explain GTO Thyristor Controlled Series Compensator.

Section – II

Q.4 Attempt any four: **16**

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e) Explain power control in HVDC system with neat block diagram.

Q.5 Attempt any two: **12**

a) Explain Find the expression of DC output for 6 pulse converter in HVDC system considering overlap angle more than 60^{o}.
b) Explain capacitor commutated converter in detail.
c) Give detailed comparison between HVDC and AC transmission.

Seat No.	

Set **P**

B.E. (Part – II) (CGPA) Examination Nov/Dec-2019
Electrical and Electronics Engineering
ELECTRICAL MACHINE DESIGN

Day & Date: Saturday, 23-11-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and it should be solved in first 30 minutes in answer book.
2) Figures to the right indicates full marks.
3) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) The two windings of a transformer is _____.
   a) Conductively linked b) Inductively linked
   c) Not linked at all d) Electrically linked

2) A salient pole synchronous motor is running at no load. If field current is cut-off, the motor will _____.
   a) come to stop
   b) Continue to run at synchronous speed
   c) Continue to run at a speed slightly more than the synchronous speed
   d) Continue to run at a speed slightly less than the synchronous speed

3) When a synchronous motor is running at synchronous speed, the damper winding produces _____.
   a) Damping torque
   b) Eddy current torque
   c) Torque aiding the developed torque
   d) No torque

4) If a transformer primary is energised from square wave, its output voltage will be _____.
   a) Square wave b) A sine wave
   c) A triangular wave d) A pulse wave

5) In a 3-phase induction motor the maximum torque _____.
   a) is proportional to rotor resistance r_2
   b) Does not depend on r_2
   c) is proportional to r^2_2
   d) None of the above

6) In induction motors, length of air gap in kept as small as mechanically possible is order to have _____.
   a) Low power factor b) high power factor
   c) High over load capacity d) any of the above

7) In _____ machines, the size of the shaft is decided by the critical speed which depends on the deflection of the shaft.
   a) small b) Medium
   c) large d) any of the above

8) The length of air gap to be provided in _____ is primarily determined by power factor consideration.
   a) d.c. series motor b) d.c. shunt motor
   c) induction motor d) synchronous motor

9) Electrical machines having a power output upto about 750 W may be called _____ machines.
   a) small size b) medium size
   c) large size d) any of the above

10) The design of mechanical parts is particularly important in case of _____ speed machines.
   a) low b) Medium
   c) high d) any of the above

11) Transformer-core laminations are made of _____.
   a) cast iron b) wrought iron
   c) silicon steel d) cast steel

12) Skewing of rotor slots helps in _____.
   a) improving beat transfer
   b) reducing noise
   c) suppressing undesirable harmonics
   d) all of the above

13) The critical speed of the shaft for an electric motor should be _____.
   a) away from the operating speed
   b) exactly the same as operating speed
   c) half the operating speed
   d) double of the operating speed

14) _____ are always double layer type.
   a) Closed windings b) Open windings
   c) Either of the above d) None of the above

Seat No.	

Set **P**

B.E. (Part – II) (CGPA) Examination Nov/Dec-2019
Electrical and Electronics Engineering
ELECTRICAL MACHINE DESIGN

Day & Date: Saturday, 23-11-2019 Max. Marks: 56
Time: 02:30 PM To 05:30 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicates full marks.
3) Assume suitable data if necessary.

Section – I

Q.2 Attempt any three of the following questions. **12**

a) Derive an output equation of a single phase core type transformer.

b) A 3 phase, 50 Hz, oil cooled core type transformer has the following dimensions: distance between Core center = 0.2m, height of window=0.24m, diameter of circumscribing circle = 0.14m. The flux density in the core is 1.25 Wb/m^2 and current density in the conductor is 2.5A/mm^2.
Estimate the area of window & net iron area. Assume a window space factor of 0.2 and a core area factor = 0.56 the core is 2 stepped.

c) Explain the principles of design of electromagnetic machines.

d) Distinguish between core transformer and shell transformer.

Q.3 Attempt any two of the following questions. **16**

a) Calculate the KVA output of single phase transformer from following data.
$\frac{\text{core height}}{\text{distance between core centers}} = 2.8$ $\frac{\text{diameter of Circumcribing circle}}{\text{distance between core centers}} = 0.56$
$\frac{\text{net iron area}}{\text{area of Circumcribing circle}} = 0.7,$
current density=0.27, frequency=50 Hz, flux density of core=1.2 Wb/m^2
Distance between core centers=0.4 m

b) Explain different cooling methods used in transformer.

c) Calculate the main dimension of A 100 KVA 2000/400 Volt, 50Hz single phase shell type, oil immersed, self-cooled transformer. Assume voltage per turn 10V flux density in core 1.1 Wb/m^2, current density 2 A/mm^2, window space factor 0.33. The ratio of window height to window width is 3 and ratio of core depth to width of central limb =2.5 and stacking factor=0.9

Section – II

Q.4 Attempt any three of the following questions. **12**

a) Find the current in the bars and end rings of a cage rotor of a 6 pole, 3Φ, induction motor having 72 stator slots with 15 conductors in each slot. If the stator current per phase is 20 Amp and rotor slots are 55.

b) Explain the design procedure of damper winding used for alternator.

c) Derive an output equation of $3\emptyset$ induction motor.

d) Find the main dimensions of a 100 MVA, 11 KV, 50 Hz, 40 pole salient pole generator, assuming air gap flux density as 0.65 Wb/m^2 and ampere conductor as 40000 per meter. The peripheral speed should not exceed 60 m/sec.

Q.5 Attempt any two of the following questions. **16**

a) Explain the design procedure of stator of three phase induction motor.

b) The following data for a 1250KVA, 0.8p.f, 50Hz, 3300 V, 300 r.p.m, star connected alternator is available.
Stator turns per phase =150, field turns per pole =60, effective area per pole=0.09m^2, air gap length at pole center=5mm, field current for full load short circuit current=80A, AT_s per pole for iron portion = 20% of air gap. Assume sinusoidal flux distribution, estimate the values of short circuit ratio and synchronous reactance.

c) Discuss the choice of specific electric loading and specific magnetic loading of synchronous motor.

Seat No.	

Set **Q**

B.E. (Part – II) (CGPA) Examination Nov/Dec-2019
Electrical and Electronics Engineering
ELECTRICAL MACHINE DESIGN

Day & Date: Saturday, 23-11-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and it should be solved in first 30 minutes in answer book.
2) Figures to the right indicates full marks.
3) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) The length of air gap to be provided in _____ is primarily determined by power factor consideration.
   a) d.c. series motor b) d.c. shunt motor
   c) induction motor d) synchronous motor

2) Electrical machines having a power output upto about 750 W may be called _____ machines.
   a) small size b) medium size
   c) large size d) any of the above

3) The design of mechanical parts is particularly important in case of _____ speed machines.
   a) low b) Medium
   c) high d) any of the above

4) Transformer-core laminations are made of _____.
   a) cast iron b) wrought iron
   c) silicon steel d) cast steel

5) Skewing of rotor slots helps in _____.
   a) improving beat transfer
   b) reducing noise
   c) suppressing undesirable harmonics
   d) all of the above

6) The critical speed of the shaft for an electric motor should be _____.
   a) away from the operating speed
   b) exactly the same as operating speed
   c) half the operating speed
   d) double of the operating speed

7) _____ are always double layer type.
   a) Closed windings b) Open windings
   c) Either of the above d) None of the above

8) The two windings of a transformer is _____.
   a) Conductively linked b) Inductively linked
   c) Not linked at all d) Electrically linked

9) A salient pole synchronous motor is running at no load. If field current is cut-off, the motor will _____.
   a) come to stop
   b) Continue to run at synchronous speed
   c) Continue to run at a speed slightly more than the synchronous speed
   d) Continue to run at a speed slightly less than the synchronous speed

10) When a synchronous motor is running at synchronous speed, the damper winding produces _____.
   a) Damping torque
   b) Eddy current torque
   c) Torque aiding the developed torque
   d) No torque

11) If a transformer primary is energised from square wave, its output voltage will be _____.
   a) Square wave
   b) A sine wave
   c) A triangular wave
   d) A pulse wave

12) In a 3-phase induction motor the maximum torque _____.
   a) is proportional to rotor resistance r_2
   b) Does not depend on r_2
   c) is proportional to r^2_2
   d) None of the above

13) In induction motors, length of air gap in kept as small as mechanically possible is order to have _____.
   a) Low power factor
   b) high power factor
   c) High over load capacity
   d) any of the above

14) In _____ machines, the size of the shaft is decided by the critical speed which depends on the deflection of the shaft.
   a) small
   b) Medium
   c) large
   d) any of the above

Seat No.	

Set **Q**

B.E. (Part – II) (CGPA) Examination Nov/Dec-2019
Electrical and Electronics Engineering
ELECTRICAL MACHINE DESIGN

Day & Date: Saturday, 23-11-2019 Max. Marks: 56
Time: 02:30 PM To 05:30 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicates full marks.
3) Assume suitable data if necessary.

Section – I

Q.2 Attempt any three of the following questions. **12**

a) Derive an output equation of a single phase core type transformer.

b) A 3 phase, 50 Hz, oil cooled core type transformer has the following dimensions: distance between Core center = 0.2m, height of window=0.24m, diameter of circumscribing circle = 0.14m. The flux density in the core is 1.25 Wb/m^2 and current density in the conductor is 2.5A/mm^2.
Estimate the area of window & net iron area. Assume a window space factor of 0.2 and a core area factor = 0.56 the core is 2 stepped.

c) Explain the principles of design of electromagnetic machines.

d) Distinguish between core transformer and shell transformer.

Q.3 Attempt any two of the following questions. **16**

a) Calculate the KVA output of single phase transformer from following data.
$\frac{\text{core height}}{\text{distance between core centers}} = 2.8$ $\frac{\text{diameter of Circumcribing circle}}{\text{distance between core centers}} = 0.56$
$\frac{\text{net iron area}}{\text{area of Circumcribing circle}} = 0.7,$
current density=0.27, frequency=50 Hz, flux density of core=1.2 Wb/m^2
Distance between core centers=0.4 m

b) Explain different cooling methods used in transformer.

c) Calculate the main dimension of A 100 KVA 2000/400 Volt, 50Hz single phase shell type, oil immersed, self-cooled transformer. Assume voltage per turn 10V flux density in core 1.1 Wb/m^2, current density 2 A/mm^2, window space factor 0.33. The ratio of window height to window width is 3 and ratio of core depth to width of central limb =2.5 and stacking factor=0.9

Section – II

Q.4 Attempt any three of the following questions. **12**

a) Find the current in the bars and end rings of a cage rotor of a 6 pole, 3Φ, induction motor having 72 stator slots with 15 conductors in each slot. If the stator current per phase is 20 Amp and rotor slots are 55.

b) Explain the design procedure of damper winding used for alternator.

c) Derive an output equation of $3\emptyset$ induction motor.

d) Find the main dimensions of a 100 MVA, 11 KV, 50 Hz, 40 pole salient pole generator, assuming air gap flux density as 0.65 Wb/m^2 and ampere conductor as 40000 per meter. The peripheral speed should not exceed 60 m/sec.

Q.5 Attempt any two of the following questions. **16**

a) Explain the design procedure of stator of three phase induction motor.

b) The following data for a 1250KVA, 0.8p.f, 50Hz, 3300 V, 300 r.p.m, star connected alternator is available.
Stator turns per phase =150, field turns per pole =60, effective area per pole=0.09m^2, air gap length at pole center=5mm, field current for full load short circuit current=80A, AT_s per pole for iron portion = 20% of air gap. Assume sinusoidal flux distribution, estimate the values of short circuit ratio and synchronous reactance.

c) Discuss the choice of specific electric loading and specific magnetic loading of synchronous motor.

Seat No.	

Set **R**

B.E. (Part – II) (CGPA) Examination Nov/Dec-2019
Electrical and Electronics Engineering
ELECTRICAL MACHINE DESIGN

Day & Date: Saturday, 23-11-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and it should be solved in first 30 minutes in answer book.
2) Figures to the right indicates full marks.
3) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) In a 3-phase induction motor the maximum torque _____.
   a) is proportional to rotor resistance r_2
   b) Does not depend on r_2
   c) is proportional to r^2_2
   d) None of the above

2) In induction motors, length of air gap in kept as small as mechanically possible is order to have _____.
   a) Low power factor b) high power factor
   c) High over load capacity d) any of the above

3) In _____ machines, the size of the shaft is decided by the critical speed which depends on the deflection of the shaft.
   a) Small b) Medium
   c) Large d) any of the above

4) The length of air gap to be provided in _____ is primarily determined by power factor consideration.
   a) d.c. series motor b) d.c. shunt motor
   c) induction motor d) synchronous motor

5) Electrical machines having a power output upto about 750 W may be called _____ machines.
   a) small size b) medium size
   c) large size d) any of the above

6) The design of mechanical parts is particularly important in case of _____ speed machines.
   a) Low b) Medium
   c) High d) any of the above

7) Transformer-core laminations are made of _____.
   a) cast iron b) wrought iron
   c) silicon steel d) cast steel

8) Skewing of rotor slots helps in _____.
   a) improving beat transfer
   b) reducing noise
   c) suppressing undesirable harmonics
   d) all of the above

9) The critical speed of the shaft for an electric motor should be _____.
   a) away from the operating speed
   b) exactly the same as operating speed
   c) half the operating speed
   d) double of the operating speed

10) _____ are always double layer type.
   a) Closed windings
   b) Open windings
   c) Either of the above
   d) None of the above

11) The two windings of a transformer is _____.
   a) Conductively linked
   b) Inductively linked
   c) Not linked at all
   d) Electrically linked

12) A salient pole synchronous motor is running at no load. If field current is cut-off, the motor will _____.
   a) come to stop
   b) Continue to run at synchronous speed
   c) Continue to run at a speed slightly more than the synchronous speed
   d) Continue to run at a speed slightly less than the synchronous speed

13) When a synchronous motor is running at synchronous speed, the damper winding produces _____.
   a) Damping torque
   b) Eddy current torque
   c) Torque aiding the developed torque
   d) No torque

14) If a transformer primary is energised from square wave, its output voltage will be _____.
   a) Square wave
   b) A sine wave
   c) A triangular wave
   d) A pulse wave

Seat No.	

Set **R**

B.E. (Part – II) (CGPA) Examination Nov/Dec-2019
Electrical and Electronics Engineering
ELECTRICAL MACHINE DESIGN

Day & Date: Saturday, 23-11-2019 Max. Marks: 56
Time: 02:30 PM To 05:30 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicates full marks.
3) Assume suitable data if necessary.

Section – I

Q.2 Attempt any three of the following questions. **12**

a) Derive an output equation of a single phase core type transformer.

b) A 3 phase, 50 Hz, oil cooled core type transformer has the following dimensions: distance between Core center = 0.2m, height of window=0.24m, diameter of circumscribing circle = 0.14m. The flux density in the core is 1.25 Wb/m^2 and current density in the conductor is 2.5A/mm^2.
Estimate the area of window & net iron area. Assume a window space factor of 0.2 and a core area factor = 0.56 the core is 2 stepped.

c) Explain the principles of design of electromagnetic machines.

d) Distinguish between core transformer and shell transformer.

Q.3 Attempt any two of the following questions. **16**

a) Calculate the KVA output of single phase transformer from following data.
$\frac{\text{core height}}{\text{distance between core centers}} = 2.8$ $\frac{\text{diameter of Circumcribing circle}}{\text{distance between core centers}} = 0.56$
$\frac{\text{net iron area}}{\text{area of Circumcribing circle}} = 0.7,$
current density=0.27, frequency=50 Hz, flux density of core=1.2 Wb/m^2
Distance between core centers=0.4 m

b) Explain different cooling methods used in transformer.

c) Calculate the main dimension of A 100 KVA 2000/400 Volt, 50Hz single phase shell type, oil immersed, self-cooled transformer. Assume voltage per turn 10V flux density in core 1.1 Wb/m^2, current density 2 A/mm^2, window space factor 0.33. The ratio of window height to window width is 3 and ratio of core depth to width of central limb =2.5 and stacking factor=0.9

Section – II

Q.4 Attempt any three of the following questions. **12**

a) Find the current in the bars and end rings of a cage rotor of a 6 pole, 3Φ, induction motor having 72 stator slots with 15 conductors in each slot. If the stator current per phase is 20 Amp and rotor slots are 55.

b) Explain the design procedure of damper winding used for alternator.

c) Derive an output equation of $3\emptyset$ induction motor.

d) Find the main dimensions of a 100 MVA, 11 KV, 50 Hz, 40 pole salient pole generator, assuming air gap flux density as 0.65 Wb/m^2 and ampere conductor as 40000 per meter. The peripheral speed should not exceed 60 m/sec.

Q.5 Attempt any two of the following questions. **16**

a) Explain the design procedure of stator of three phase induction motor.

b) The following data for a 1250KVA, 0.8p.f, 50Hz, 3300 V, 300 r.p.m, star connected alternator is available.
Stator turns per phase =150, field turns per pole =60, effective area per pole=0.09m^2, air gap length at pole center=5mm, field current for full load short circuit current=80A, AT_s per pole for iron portion = 20% of air gap. Assume sinusoidal flux distribution, estimate the values of short circuit ratio and synchronous reactance.

c) Discuss the choice of specific electric loading and specific magnetic loading of synchronous motor.

Seat No.	

Set **S**

B.E. (Part – II) (CGPA) Examination Nov/Dec-2019
Electrical and Electronics Engineering
ELECTRICAL MACHINE DESIGN

Day & Date: Saturday, 23-11-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and it should be solved in first 30 minutes in answer book.
2) Figures to the right indicates full marks.
3) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) The design of mechanical parts is particularly important in case of _____ speed machines.
   a) low b) Medium
   c) high d) any of the above

2) Transformer-core laminations are made of _____.
   a) cast iron b) wrought iron
   c) silicon steel d) cast steel

3) Skewing of rotor slots helps in _____.
   a) improving beat transfer
   b) reducing noise
   c) suppressing undesirable harmonics
   d) all of the above

4) The critical speed of the shaft for an electric motor should be _____.
   a) away from the operating speed
   b) exactly the same as operating speed
   c) half the operating speed
   d) double of the operating speed

5) _____ are always double layer type.
   a) Closed windings b) Open windings
   c) Either of the above d) None of the above

6) The two windings of a transformer is _____.
   a) Conductively linked b) Inductively linked
   c) Not linked at all d) Electrically linked

7) A salient pole synchronous motor is running at no load. If field current is cut-off, the motor will _____.
   a) come to stop
   b) Continue to run at synchronous speed
   c) Continue to run at a speed slightly more than the synchronous speed
   d) Continue to run at a speed slightly less than the synchronous speed

8) When a synchronous motor is running at synchronous speed, the damper winding produces _____.
   a) Damping torque
   b) Eddy current torque
   c) Torque aiding the developed torque
   d) No torque

9) If a transformer primary is energised from square wave, its output voltage will be _____.
   a) Square wave b) A sine wave
   c) A triangular wave d) A pulse wave

10) In a 3-phase induction motor the maximum torque _____.
   a) is proportional to rotor resistance r_2
   b) Does not depend on r_2
   c) is proportional to r^2_2
   d) None of the above

11) In induction motors, length of air gap in kept as small as mechanically possible is order to have _____.
   a) Low power factor b) high power factor
   c) High over load capacity d) any of the above

12) In _____ machines, the size of the shaft is decided by the critical speed which depends on the deflection of the shaft.
   a) small b) Medium
   c) large d) any of the above

13) The length of air gap to be provided in _____ is primarily determined by power factor consideration.
   a) d.c. series motor b) d.c. shunt motor
   c) induction motor d) synchronous motor

14) Electrical machines having a power output upto about 750 W may be called _____ machines.
   a) small size b) medium size
   c) large size d) any of the above

Seat No.	

Set **S**

B.E. (Part – II) (CGPA) Examination Nov/Dec-2019
Electrical and Electronics Engineering
ELECTRICAL MACHINE DESIGN

Day & Date: Saturday, 23-11-2019 Max. Marks: 56
Time: 02:30 PM To 05:30 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicates full marks.
3) Assume suitable data if necessary.

Section – I

Q.2 Attempt any three of the following questions. **12**

a) Derive an output equation of a single phase core type transformer.

b) A 3 phase, 50 Hz, oil cooled core type transformer has the following dimensions: distance between Core center = 0.2m, height of window=0.24m, diameter of circumscribing circle = 0.14m. The flux density in the core is 1.25 Wb/m^2 and current density in the conductor is 2.5A/mm^2.
Estimate the area of window & net iron area. Assume a window space factor of 0.2 and a core area factor = 0.56 the core is 2 stepped.

c) Explain the principles of design of electromagnetic machines.

d) Distinguish between core transformer and shell transformer.

Q.3 Attempt any two of the following questions. **16**

a) Calculate the KVA output of single phase transformer from following data.
$\frac{\text{core height}}{\text{distance between core centers}} = 2.8$ $\frac{\text{diameter of Circumcribing circle}}{\text{distance between core centers}} = 0.56$
$\frac{\text{net iron area}}{\text{area of Circumcribing circle}} = 0.7,$
current density=0.27, frequency=50 Hz, flux density of core=1.2 Wb/m^2
Distance between core centers=0.4 m

b) Explain different cooling methods used in transformer.

c) Calculate the main dimension of A 100 KVA 2000/400 Volt, 50Hz single phase shell type, oil immersed, self-cooled transformer. Assume voltage per turn 10V flux density in core 1.1 Wb/m^2, current density 2 A/mm^2, window space factor 0.33. The ratio of window height to window width is 3 and ratio of core depth to width of central limb =2.5 and stacking factor=0.9

Section – II

Q.4 Attempt any three of the following questions. **12**

a) Find the current in the bars and end rings of a cage rotor of a 6 pole, 3Φ, induction motor having 72 stator slots with 15 conductors in each slot. If the stator current per phase is 20 Amp and rotor slots are 55.

b) Explain the design procedure of damper winding used for alternator.

c) Derive an output equation of $3\emptyset$ induction motor.

d) Find the main dimensions of a 100 MVA, 11 KV, 50 Hz, 40 pole salient pole generator, assuming air gap flux density as 0.65 Wb/m^2 and ampere conductor as 40000 per meter. The peripheral speed should not exceed 60 m/sec.

Q.5 Attempt any two of the following questions. **16**

a) Explain the design procedure of stator of three phase induction motor.

b) The following data for a 1250KVA, 0.8p.f, 50Hz, 3300 V, 300 r.p.m, star connected alternator is available.
Stator turns per phase =150, field turns per pole =60, effective area per pole=0.09m^2, air gap length at pole center=5mm, field current for full load short circuit current=80A, AT_s per pole for iron portion = 20% of air gap. Assume sinusoidal flux distribution, estimate the values of short circuit ratio and synchronous reactance.

c) Discuss the choice of specific electric loading and specific magnetic loading of synchronous motor.

Seat No.	

Set **P**

B.E. (Part – II) (CGPA) Examination Nov/Dec -2019
Electrical & Electronics Engineering
ENERGY CONSERVATION & AUDITING

Day & Date: Tuesday, 26-11-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
2) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) When the current lags the voltage in an AC system it is caused mainly due to _____.
   a) Resistive load b) Capacitive load
   c) Inductive load d) None of the above

2) Energy conservation act was formed in the year _____.
   a) 1998 b) 1999
   c) 2000 d) 2001

3) The main objective of energy management is to _____.
   a) Minimize energy cost
   b) Minimum environmental effects
   c) Maintain optimum energy procurement and utilization
   d) All of the above.

4) EMIS Stands for _____.
   a) Energy Management Information Systems
   b) Electrical Management Information Systems
   c) Energy Maintains Information Systems
   d) None of the above

5) Which is the major energy source to meet the Indian energy demand?
   a) Coal b) Oil
   c) Natural gas d) Lignite

6) In the given options, the non-commercial source of energy is _____.
   a) Coal b) Lignite
   c) Firewood d) Refined petroleum products

7) The proposed international standard for energy management is _____.
   a) ISO 9001 b) IS014000
   c) ISO 14001 d) ISO 50001

8) Energy monitoring and targeting is built on the principle of _____.
   a) Production can be reduce to achieve reduced energy consumption
   b) Consumption of energy is proportional to production rate
   c) You can't manage what you don't measure
   d) None of the above

9) The ratio of current year's production to the reference year's production is _____.
   a) Demand factor
   b) Production factor
   c) Utilization factor
   d) Load factor

10) What does the concept of true value of money imply _____.
   a) Present value of money
   b) Future value of money
   c) Discounting of cash flows
   d) All of these

11) The major source of electrical power generation in India is _____.
   a) Thermal
   b) Hydel
   c) nuclear
   d) Wind

12) One unit of Electricity is equivalent to ____ Kcal heat units.
   a) 800
   b) 860
   c) 400
   d) 680

13) Investment is the _____.
   a) net additions made to the nation's capital stocks
   b) person's commitment to buy a flat or house
   c) employment of funds on assets to earn returns
   d) employment of funds on goods and services that are used in production process

14) Project performance consists of _____.
   a) Time
   b) Cost
   c) Quality
   d) All of the above

SLR-FM-551

Seat No.	

Set P

B.E. (Part – II) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
ENERGY CONSERVATION & AUDITING

Day & Date: Tuesday, 26-11-2019 Max. Marks: 56
Time: 02:30 PM To 05:30 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

Section – I

Q.2 Solve any Three **12**

a) Explain Difference between standards and labeling.

b) List the 4 forms of energy with example.

c) Give the feature of energy conservation act 2001.

d) Give 4 importance of energy conservation.

Q.3 Solve any two **16**

a) List ten Strategic measures for meeting the future energy requirements in India.

b) What is meant by Energy bench marking? Explain how it is helpful in Energy Auditing.

c) Write short note on:-
1) Thermography.
2) Smart metering.

Section – II

Q.4 Solve any three **12**

a) List the duties and responsibilities of an energy manager.

b) Give comparison between NPV & IRR.

c) Explain briefly the operation of ESCO

d) What is the need for Energy Monitoring? Explain Briefly.

Q.5 Solve any two **16**

a) Explain ways by which employees can be motivated on energy management.

b) Explain Force Field Analysis.

c) What is CUSUM chart? Explain how it is helpful in Energy Monitoring & Targeting.

Seat No.	

Set **Q**

B.E. (Part – II) (CGPA) Examination Nov/Dec -2019
Electrical & Electronics Engineering
ENERGY CONSERVATION & AUDITING

Day & Date: Tuesday, 26-11-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
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Duration: 30 Minutes Marks: 14

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1) Energy monitoring and targeting is built on the principle of _____.
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13) In the given options, the non-commercial source of energy is _____.
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Seat No.	

Set **Q**

B.E. (Part – II) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
ENERGY CONSERVATION & AUDITING

Day & Date: Tuesday, 26-11-2019 Max. Marks: 56
Time: 02:30 PM To 05:30 PM

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

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c) Write short note on:-
1) Thermography.
2) Smart metering.

Section – II

Q.4 Solve any three **12**

a) List the duties and responsibilities of an energy manager.

b) Give comparison between NPV & IRR.

c) Explain briefly the operation of ESCO

d) What is the need for Energy Monitoring? Explain Briefly.

Q.5 Solve any two **16**

a) Explain ways by which employees can be motivated on energy management.

b) Explain Force Field Analysis.

c) What is CUSUM chart? Explain how it is helpful in Energy Monitoring & Targeting.

Seat No.	

Set **R**

B.E. (Part – II) (CGPA) Examination Nov/Dec -2019
Electrical & Electronics Engineering
ENERGY CONSERVATION & AUDITING

Day & Date: Tuesday, 26-11-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
2) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) Which is the major energy source to meet the Indian energy demand?
   a) Coal b) Oil
   c) Natural gas d) Lignite

2) In the given options, the non-commercial source of energy is _____.
   a) Coal b) Lignite
   c) Firewood d) Refined petroleum products

3) The proposed international standard for energy management is _____.
   a) ISO 9001 b) IS014000
   c) ISO 14001 d) ISO 50001

4) Energy monitoring and targeting is built on the principle of _____.
   a) Production can be reduce to achieve reduced energy consumption
   b) Consumption of energy is proportional to production rate
   c) You can't manage what you don't measure
   d) None of the above

5) The ratio of current year's production to the reference year's production is _____.
   a) Demand factor b) Production factor
   c) Utilization factor d) Load factor

6) What does the concept of true value of money imply _____.
   a) Present value of money b) Future value of money
   c) Discounting of cash flows d) All of these

7) The major source of electrical power generation in India is _____.
   a) Thermal b) Hydel
   c) nuclear d) Wind

8) One unit of Electricity is equivalent to ____ Kcal heat units.
   a) 800 b) 860
   c) 400 d) 680

9) Investment is the _____.
   a) net additions made to the nation's capital stocks
   b) person's commitment to buy a flat or house
   c) employment of funds on assets to earn returns
   d) employment of funds on goods and services that are used in production process

10) Project performance consists of _____.
   a) Time
   b) Cost
   c) Quality
   d) All of the above

11) When the current lags the voltage in an AC system it is caused mainly due to _____.
   a) Resistive load
   b) Capacitive load
   c) Inductive load
   d) None of the above

12) Energy conservation act was formed in the year _____.
   a) 1998
   b) 1999
   c) 2000
   d) 2001

13) The main objective of energy management is to _____.
   a) Minimize energy cost
   b) Minimum environmental effects
   c) Maintain optimum energy procurement and utilization
   d) All of the above.

14) EMIS Stands for _____.
   a) Energy Management Information Systems
   b) Electrical Management Information Systems
   c) Energy Maintains Information Systems
   d) None of the above

Seat No.	

Set **R**

B.E. (Part – II) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
ENERGY CONSERVATION & AUDITING

Day & Date: Tuesday, 26-11-2019 Max. Marks: 56
Time: 02:30 PM To 05:30 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

Section – I

Q.2 Solve any Three **12**

a) Explain Difference between standards and labeling.

b) List the 4 forms of energy with example.

c) Give the feature of energy conservation act 2001.

d) Give 4 importance of energy conservation.

Q.3 Solve any two **16**

a) List ten Strategic measures for meeting the future energy requirements in India.

b) What is meant by Energy bench marking? Explain how it is helpful in Energy Auditing.

c) Write short note on:-
1) Thermography.
2) Smart metering.

Section – II

Q.4 Solve any three **12**

a) List the duties and responsibilities of an energy manager.

b) Give comparison between NPV & IRR.

c) Explain briefly the operation of ESCO

d) What is the need for Energy Monitoring? Explain Briefly.

Q.5 Solve any two **16**

a) Explain ways by which employees can be motivated on energy management.

b) Explain Force Field Analysis.

c) What is CUSUM chart? Explain how it is helpful in Energy Monitoring & Targeting.

Seat No.	

Set **S**

B.E. (Part – II) (CGPA) Examination Nov/Dec -2019
Electrical & Electronics Engineering
ENERGY CONSERVATION & AUDITING

Day & Date: Tuesday, 26-11-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
2) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) What does the concept of true value of money imply _____.
   a) Present value of money b) Future value of money
   c) Discounting of cash flows d) All of these

2) The major source of electrical power generation in India is _____.
   a) Thermal b) Hydel
   c) nuclear d) Wind

3) One unit of Electricity is equivalent to ____ Kcal heat units.
   a) 800 b) 860
   c) 400 d) 680

4) Investment is the _____.
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5) Project performance consists of _____.
   a) Time b) Cost
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   c) Inductive load d) None of the above

7) Energy conservation act was formed in the year _____.
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   c) 2000 d) 2001

8) The main objective of energy management is to _____.
   a) Minimize energy cost
   b) Minimum environmental effects
   c) Maintain optimum energy procurement and utilization
   d) All of the above.

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   c) Energy Maintains Information Systems
   d) None of the above

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13) Energy monitoring and targeting is built on the principle of _____.
   a) Production can be reduce to achieve reduced energy consumption
   b) Consumption of energy is proportional to production rate
   c) You can't manage what you don't measure
   d) None of the above

14) The ratio of current year's production to the reference year's production is _____.
   a) Demand factor
   b) Production factor
   c) Utilization factor
   d) Load factor

Seat No.	

Set **S**

B.E. (Part – II) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
ENERGY CONSERVATION & AUDITING

Day & Date: Tuesday, 26-11-2019 Max. Marks: 56
Time: 02:30 PM To 05:30 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

Section – I

Q.2 Solve any Three **12**

a) Explain Difference between standards and labeling.

b) List the 4 forms of energy with example.

c) Give the feature of energy conservation act 2001.

d) Give 4 importance of energy conservation.

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a) List ten Strategic measures for meeting the future energy requirements in India.

b) What is meant by Energy bench marking? Explain how it is helpful in Energy Auditing.

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1) Thermography.
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Section – II

Q.4 Solve any three **12**

a) List the duties and responsibilities of an energy manager.

b) Give comparison between NPV & IRR.

c) Explain briefly the operation of ESCO

d) What is the need for Energy Monitoring? Explain Briefly.

Q.5 Solve any two **16**

a) Explain ways by which employees can be motivated on energy management.

b) Explain Force Field Analysis.

c) What is CUSUM chart? Explain how it is helpful in Energy Monitoring & Targeting.

Seat No.	

Set **P**

S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
ENGINEERING MATHEMATICS-III

Day & Date: Saturday, 07-12-2019 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No 1 is compulsory should be solved in first 30 minutes in answer book.
2) Figures to the right indicate full marks.
3) Use of only on programmable calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) The solution of $P^2q^3 = 1$ is _____.
   a) $x^2y^3 = 1$ b) $x^2 = 1 - y^3$
   c) $z = ax + a^5y + c$ d) None

2) The PI of $(x^2D^2 + 2xD)y = \frac{1}{x^2}$ is _____.
   a) $\frac{1}{5x^2}$ b) $\frac{1}{2x^2}$
   c) $C_1 + C_2\,x^2$ d) None

3) The solution of $2P + 3q = 1$ is _____.
   a) $f(3x + 2y, y + 3z) = 0$ b) $f(3x + 2y, y - 3z) = 0$
   c) $f(3x - 2y, y - 3z) = 0$ d) None

4) If $z\{f(k)\} = F(z)$ then $z\left\{\frac{f(k)}{k}\right\} =$ _____.
   a) $\int_z^\infty \frac{F(z)}{z}dz$ b) $\int_\infty^z F(z)dz$
   c) $\int_z^\infty -F(z)dz$ d) $\int_z^\infty z\,F(z)dz$

5) $\frac{1}{D+a}X =$ _____.
   a) $\int Xe^{ax}\,dx$ b) $\int Xe^{-ax}\,dx$
   c) $e^{-ax}\int e^{ax}\,Xdx$ d) $e^{ax}\int e^{-ax}Xdx$

6) The CF of differential equation $(D^3 - 3D^2 + 3D - 1)\,y = e^x$ is _____.
   a) $(C_1 + C_2x + C_3x^2)e^x$ b) $C_1 + C_2x + C_3x^2$
   c) $(C_1x + C_2x^2 + C_3x^3)\,e^x$ d) $(C_1 + C_2x + C_3x^2)e^{-x}$

7) $Z^{-1}\left[\frac{1}{z-2}\right]$ for $2 < |z|$ is _____.
   a) $2^k \quad k \geq 1$ b) $2^{k-1} \quad k \geq 1$
   c) $2^{-k} \quad k \geq 1$ d) $2^{-k-1}\,k \geq 1$

8) The Laplace transform of $\int_0^\infty e^{-3t}\, t \sin t \, dt$ is _____.

a) $\frac{1}{50}$ b) $\frac{2}{55}$

c) $\frac{3}{50}$ d) $\frac{4}{55}$

9) $L^{-1}\left(\frac{s+3}{s^2+9}\right) =$ _____.

a) $\cos 3t$ b) $\sin 3t$

c) $3t + \cos 3t$ d) $\cos 3t + \sin 3t$

10) Which of the following functions can be expanded in Fourier series in the interval $(-\pi, \pi)$.

a) $\sin^{-1}(x)$ b) $\tan x$

c) $\sin x$ d) $\operatorname{cosec}(x)$

11) In the cosine series expansion of $\sin x$ in $(0, \pi)$ the constant term is _____.

a) $1/2$ b) $2/\pi$

c) π d) $\pi/2$

12) The maximum directional derivative of $\phi = x^2yz^3$ at (2,1,-1) is _____.

a) $\sqrt{20}$ b) $\sqrt{11}$

c) $4\sqrt{11}$ d) $2\sqrt{7}$

13) If $\bar{r} = xi + yj + zk$ and $\bar{a}$ is a constant vector then $\nabla(\bar{a}.\ \bar{r})$= _____.

a) $2\bar{a}$ b) $\bar{a}$

c) $\bar{r}$ d) $2\bar{r}$

14) If $F_c(s)$ is the cosine transform of $f(x)$ then $f(x) =$ _____.

a) $\sqrt{\frac{2}{\pi}} \int_{-\infty}^{\infty} F_c(s) \cos sx \, ds$ b) $\frac{1}{\sqrt{2\pi}} \int_0^\infty F_c(s) \cos sx \, ds$

c) $\sqrt{\frac{2}{\pi}} \int_0^\infty F_c(s) \cos sx \, ds$ d) None of these

Seat No.	

Set P

S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
ENGINEERING MATHEMATICS-III

Day & Date: Saturday, 07-12-2019 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 4 is compulsory and attempt any two of the section – I.
2) Q. No. 9 is compulsory and attempt any two of the section – II.
3) Use of only on programmable calculator is allowed.
4) Figures to the right indicate full marks.

Section – I

Q.2 **a)** Solve $(D^2 - 2D + 1)\, y = \frac{3e^x}{x^2}$ **03**

b) Solve $(D^2 + 4)y = x \sin x$ **03**

c) Solve $(D^3 + 2D^2 + D)y = x^2 + x$ **03**

Q.3 **a)** Solve $(x+2)^2 \frac{d^2y}{dx^2} - (x+2)\frac{dy}{dx} + y = 3x + 4$ **03**

b) Solve $x^2 \frac{d^2y}{dx^2} - x\frac{dy}{dx} + 2y = x \log x$ **03**

c) The differential equation of a circuit is $R\frac{dq}{dt} + \frac{q}{c} = 40\, e^{-3t} + 20\, e^{-6t}$ **03**
If $R = 20$ ohms, $C = 0.01$ farad and $q = 0$ at $t = 0$, show that the minimum charge on the capacitor is 0.25 coulombs.

Q.4 **a)** Find $Z^{-1}\left[\frac{z}{(z-2)(z-3)}\right]\ 2 < |z| < 3$ **04**

b) Find $z\{(k+1)a^k\} \quad k \geq 0$ **03**

c) Find $z\{\sin \alpha\, k\} \qquad k \geq 0$ **03**

OR

Find $z\{2^k \cos(3k+2)\} \quad k \geq 0$ **03**

Q.5 **a)** Solve $\frac{y^2 z\, P}{x} + xzq = y^2$ **03**

b) Solve $z(p^2 - q^2) = x - y$ **03**

c) Solve $\frac{\partial u}{\partial x} = 4\frac{\partial u}{\partial y}$ by using variable separable method. **03**

Section – II

Q.6 **a)** Find half range sine series for $f(x)$ where **05**

$$f(x) = \begin{cases} x, & 0 < x \leq \pi/2 \\ \pi - x, & \pi/2 < x < \pi \end{cases}$$

Hence, deduce that $\frac{\pi^2}{8} = \frac{1}{1^2} + \frac{1}{3^2} + \frac{1}{5^2} + \cdots$

b) Obtain Fourier expansion of $\sin(ax)$ in the interval $-l < x < l$, where 'a' is not an integer. **04**

Q.7 **a)** Find the Fourier integral of $f(x)$ Where **04**

$$f(x) = \begin{cases} 1 - x^2, & |x| < 1 \\ 0, & |x| > 1 \end{cases}$$

b) Find the Fourier sine transform of $f(x) = \frac{e^{-ax}}{x}$ and hence evaluate **05**

$$\int_0^\infty \tan^{-1}\left(\frac{x}{a}\right) . \sin x \, dx$$

Q.8 **a)** Find $L\left[\frac{1-\cos t}{t}\right]$ **03**

b) Find $L^{-1}\left[\frac{s}{s^2+5s+6}\right]$ **03**

c) Find $L^{-1}\left[\log\sqrt{1+\frac{4}{s^2}}\right]$ **03**

Q.9 **a)** Find the tangential and normal component of acceleration of a particle moving on the curve , $x = t^3 + 1, y = t^2, z = t$ at $t = 1$. **04**

b) Prove that $\bar{F} = (x + 2y + az)i + (bx - 3y - z)j + (4x + (y + 2z)k$ is solenoidal and find the a,b,c if $\bar{F}$ is irrotational. **03**

c) Find the directional derivative of $\phi = x^2 + y^2 + z^2$ in the direction of $\frac{x}{3} = \frac{y}{4} = \frac{z}{5}$ at (1,2,3). **03**

OR

Prove that $\nabla.\left(\frac{\bar{r}}{r^3}\right) = 0$ **03**

Seat No.	

Set **Q**

S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
ENGINEERING MATHEMATICS-III

Day & Date: Saturday, 07-12-2019 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No 1 is compulsory should be solved in first 30 minutes in answer book.
2) Figures to the right indicate full marks.
3) Use of only on programmable calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) The Laplace transform of $\int_0^\infty e^{-3t}\, t \sin t\, dt$ is _____.

a) $\frac{1}{50}$ b) $\frac{2}{55}$
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Seat No.	

Set **Q**

S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
ENGINEERING MATHEMATICS-III

Day & Date: Saturday, 07-12-2019 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 4 is compulsory and attempt any two of the section – I.
2) Q. No. 9 is compulsory and attempt any two of the section – II.
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Section – I

Q.2 **a)** Solve $(D^2 - 2D + 1)\, y = \frac{3e^x}{x^2}$ **03**

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If $R = 20$ ohms, $C = 0.01$ farad and $q = 0$ at $t = 0$, show that the minimum charge on the capacitor is 0.25 coulombs.

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c) Find $z\{\sin \alpha\, k\} \qquad k \geq 0$ **03**

OR

Find $z\{2^k \cos(3k+2)\} \quad k \geq 0$ **03**

Q.5 **a)** Solve $\frac{y^2 z\, P}{x} + xzq = y^2$ **03**

b) Solve $z(p^2 - q^2) = x - y$ **03**

c) Solve $\frac{\partial u}{\partial x} = 4\frac{\partial u}{\partial y}$ by using variable separable method. **03**

Section – II

Q.6 **a)** Find half range sine series for $f(x)$ where **05**

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Hence, deduce that $\frac{\pi^2}{8} = \frac{1}{1^2} + \frac{1}{3^2} + \frac{1}{5^2} + \cdots$

b) Obtain Fourier expansion of $\sin(ax)$ in the interval $-l < x < l$, where 'a' is not an integer. **04**

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c) Find $L^{-1}\left[\log\sqrt{1+\frac{4}{s^2}}\right]$ **03**

Q.9 **a)** Find the tangential and normal component of acceleration of a particle moving on the curve , $x = t^3 + 1, y = t^2, z = t$ at $t = 1$. **04**

b) Prove that $\bar{F} = (x + 2y + az)i + (bx - 3y - z)j + (4x + (y + 2z)k$ is solenoidal and find the a,b,c if $\bar{F}$ is irrotational. **03**

c) Find the directional derivative of $\phi = x^2 + y^2 + z^2$ in the direction of $\frac{x}{3} = \frac{y}{4} = \frac{z}{5}$ at (1,2,3). **03**

OR

Prove that $\nabla.\left(\frac{\bar{r}}{r^3}\right) = 0$ **03**

Seat No.	

Set **R**

S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
ENGINEERING MATHEMATICS-III

Day & Date: Saturday, 07-12-2019 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No 1 is compulsory should be solved in first 30 minutes in answer book.
2) Figures to the right indicate full marks.
3) Use of only on programmable calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) $\frac{1}{D+a}X =$ _____.

a) $\int Xe^{ax}\,dx$ b) $\int Xe^{-ax}\,dx$

c) $e^{-ax}\int e^{ax}\,Xdx$ d) $e^{ax}\int e^{-ax}Xdx$

2) The CF of differential equation $(D^3 - 3D^2 + 3D - 1)\,y = e^x$ is _____.

a) $(C_1 + C_2x + C_3x^2)e^x$ b) $C_1 + C_2x + C_3x^2$

c) $(C_1x + C_2x^2 + C_3x^3)\,e^x$ d) $(C_1 + C_2x + C_3x^2)e^{-x}$

3) $Z^{-1}\left[\frac{1}{z-2}\right]$ for $2 < |z|$ is _____.

a) $2^k \quad k \geq 1$ b) $2^{k-1} \quad k \geq 1$

c) $2^{-k} \quad k \geq 1$ d) $2^{-k-1}\,k \geq 1$

4) The Laplace transform of $\int_0^\infty e^{-3t}\,t\sin t\,dt$ is _____.

a) $\frac{1}{50}$ b) $\frac{2}{55}$

c) $\frac{3}{50}$ d) $\frac{4}{55}$

5) $L^{-1}\left(\frac{s+3}{s^2+9}\right) =$ _____.

a) $\cos 3t$ b) $\sin 3t$

c) $3t + \cos 3t$ d) $\cos 3t + \sin 3t$

6) Which of the following functions can be expanded in Fourier series in the interval $(-\pi, \pi)$.

a) $\sin^{-1}(x)$ b) $\tan x$

c) $\sin x$ d) $\operatorname{cosec}(x)$

7) In the cosine series expansion of $\sin x$ in $(0, \pi)$ the constant term is _____.

a) $1/2$ b) $2/\pi$

c) π d) $\pi/2$

8) The maximum directional derivative of $\phi = x^2yz^3$ at (2,1,-1) is _____.

a) $\sqrt{20}$ b) $\sqrt{11}$

c) $4\sqrt{11}$ d) $2\sqrt{7}$

9) If $\bar{r} = xi + yj + zk$ and $\bar{a}$ is a constant vector then $\nabla(\bar{a}.\ \bar{r})$= _____.

a) $2\bar{a}$ b) $\bar{a}$

c) $\bar{r}$ d) $2\bar{r}$

10) If $F_c(s)$ is the cosine transform of $f(x)$ then $f(x) =$ _____.

a) $\sqrt{\frac{2}{\pi}} \int_{-\infty}^{\infty} F_c(s) \cos sx\ ds$ b) $\frac{1}{\sqrt{2\pi}} \int_{0}^{\infty} F_c(s) \cos sx\ ds$

c) $\sqrt{\frac{2}{\pi}} \int_{0}^{\infty} F_c(s) \cos sx\ ds$ d) None of these

11) The solution of $P^2q^3 = 1$ is _____.

a) $x^2y^3 = 1$ b) $x^2 = 1 - y^3$

c) $z = ax + a^5y + c$ d) None

12) The PI of $(x^2D^2 + 2xD)y = \frac{1}{x^2}$ is _____.

a) $\frac{1}{5x^2}$ b) $\frac{1}{2x^2}$

c) $C_1 + C_2\ x^2$ d) None

13) The solution of $2P + 3q = 1$ is _____.

a) $f(3x + 2y, y + 3z) = 0$ b) $f(3x + 2y, y - 3z) = 0$

c) $f(3x - 2y, y - 3z) = 0$ d) None

14) If $z\{f(k)\} = F(z)$ then $z\left\{\frac{f(k)}{k}\right\} =$ _____.

a) $\int_{z}^{\infty} \frac{F(z)}{z} dz$ b) $\int_{\infty}^{z} F(z)dz$

c) $\int_{z}^{\infty} -F(z)dz$ d) $\int_{z}^{\infty} z\ F(z)dz$

Seat No.	

Set **R**

S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
ENGINEERING MATHEMATICS-III

Day & Date: Saturday, 07-12-2019 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 4 is compulsory and attempt any two of the section – I.
2) Q. No. 9 is compulsory and attempt any two of the section – II.
3) Use of only on programmable calculator is allowed.
4) Figures to the right indicate full marks.

Section – I

Q.2 **a)** Solve $(D^2 - 2D + 1)\, y = \frac{3e^x}{x^2}$ **03**

b) Solve $(D^2 + 4)y = x \sin x$ **03**

c) Solve $(D^3 + 2D^2 + D)y = x^2 + x$ **03**

Q.3 **a)** Solve $(x+2)^2 \frac{d^2y}{dx^2} - (x+2)\frac{dy}{dx} + y = 3x + 4$ **03**

b) Solve $x^2 \frac{d^2y}{dx^2} - x\frac{dy}{dx} + 2y = x \log x$ **03**

c) The differential equation of a circuit is $R\frac{dq}{dt} + \frac{q}{c} = 40\, e^{-3t} + 20\, e^{-6t}$ **03**
If $R = 20$ ohms, $C = 0.01$ farad and $q = 0$ at $t = 0$, show that the minimum charge on the capacitor is 0.25 coulombs.

Q.4 **a)** Find $Z^{-1}\left[\frac{z}{(z-2)(z-3)}\right]\ 2 < |z| < 3$ **04**

b) Find $z\{(k+1)a^k\} \quad k \geq 0$ **03**

c) Find $z\{\sin \alpha\, k\} \qquad k \geq 0$ **03**

OR

Find $z\{2^k \cos(3k+2)\} \quad k \geq 0$ **03**

Q.5 **a)** Solve $\frac{y^2 z\, P}{x} + xzq = y^2$ **03**

b) Solve $z(p^2 - q^2) = x - y$ **03**

c) Solve $\frac{\partial u}{\partial x} = 4\frac{\partial u}{\partial y}$ by using variable separable method. **03**

Section – II

Q.6 **a)** Find half range sine series for $f(x)$ where **05**

$$f(x) = \begin{cases} x, & 0 < x \leq \pi/2 \\ \pi - x, & \pi/2 < x < \pi \end{cases}$$

Hence, deduce that $\frac{\pi^2}{8} = \frac{1}{1^2} + \frac{1}{3^2} + \frac{1}{5^2} + \cdots$

b) Obtain Fourier expansion of $\sin(ax)$ in the interval $-l < x < l$, where 'a' is not an integer. **04**

Q.7 **a)** Find the Fourier integral of $f(x)$ Where **04**

$$f(x) = \begin{cases} 1 - x^2, & |x| < 1 \\ 0, & |x| > 1 \end{cases}$$

b) Find the Fourier sine transform of $f(x) = \frac{e^{-ax}}{x}$ and hence evaluate **05**

$$\int_0^\infty \tan^{-1}\left(\frac{x}{a}\right) . \sin x \, dx$$

Q.8 **a)** Find $L\left[\frac{1-\cos t}{t}\right]$ **03**

b) Find $L^{-1}\left[\frac{s}{s^2+5s+6}\right]$ **03**

c) Find $L^{-1}\left[\log\sqrt{1+\frac{4}{s^2}}\right]$ **03**

Q.9 **a)** Find the tangential and normal component of acceleration of a particle moving on the curve , $x = t^3 + 1, y = t^2, z = t$ at $t = 1$. **04**

b) Prove that $\bar{F} = (x + 2y + az)i + (bx - 3y - z)j + (4x + (y + 2z)k$ is solenoidal and find the a,b,c if $\bar{F}$ is irrotational. **03**

c) Find the directional derivative of $\phi = x^2 + y^2 + z^2$ in the direction of $\frac{x}{3} = \frac{y}{4} = \frac{z}{5}$ at (1,2,3). **03**

OR

Prove that $\nabla.\left(\frac{\bar{r}}{r^3}\right) = 0$ **03**

Seat No.	

Set **S**

S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
ENGINEERING MATHEMATICS-III

Day & Date: Saturday, 07-12-2019 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No 1 is compulsory should be solved in first 30 minutes in answer book.
2) Figures to the right indicate full marks.
3) Use of only on programmable calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) Which of the following functions can be expanded in Fourier series in the interval $(-\pi, \pi)$.
   a) $\sin^{-1}(x)$ b) $\tan x$
   c) $\sin x$ d) $\operatorname{cosec}(x)$

2) In the cosine series expansion of $\sin x$ in $(0, \pi)$ the constant term is _____.
   a) $1/2$ b) $2/\pi$
   c) π d) $\pi/2$

3) The maximum directional derivative of $\phi = x^2yz^3$ at (2,1,-1) is _____.
   a) $\sqrt{20}$ b) $\sqrt{11}$
   c) $4\sqrt{11}$ d) $2\sqrt{7}$

4) If $\bar{r} = xi + yj + zk$ and $\bar{a}$ is a constant vector then $\nabla(\bar{a}.\ \bar{r})$= _____.
   a) $2\bar{a}$ b) $\bar{a}$
   c) $\bar{r}$ d) $2\bar{r}$

5) If $F_c(s)$ is the cosine transform of $f(x)$ then $f(x) =$ _____.
   a) $\sqrt{\frac{2}{\pi}} \int_{-\infty}^{\infty} F_c(s) \cos sx\ ds$ b) $\frac{1}{\sqrt{2\pi}} \int_{0}^{\infty} F_c(s) \cos sx\ ds$
   c) $\sqrt{\frac{2}{\pi}} \int_{0}^{\infty} F_c(s) \cos sx\ ds$ d) None of these

6) The solution of $P^2q^3 = 1$ is _____.
   a) $x^2y^3 = 1$ b) $x^2 = 1 - y^3$
   c) $z = ax + a^5y + c$ d) None

7) The PI of $(x^2D^2 + 2xD)y = \frac{1}{x^2}$ is _____.
   a) $\frac{1}{5x^2}$ b) $\frac{1}{2x^2}$
   c) $C_1 + C_2\, x^2$ d) None

8) The solution of $2P + 3q = 1$ is _____.
   a) $f(3x + 2y, y + 3z) = 0$ b) $f(3x + 2y, y - 3z) = 0$
   c) $f(3x - 2y, y - 3z) = 0$ d) None

9) If $z\{f(k)\} = F(z)$ then $z\left\{\frac{f(k)}{k}\right\} =$ _____.

a) $\int_{z}^{\infty} \frac{F(z)}{z} dz$ b) $\int_{\infty}^{z} F(z)dz$

c) $\int_{z}^{\infty} -F(z)dz$ d) $\int_{z}^{\infty} z\,F(z)dz$

10) $\frac{1}{D+a}X =$ _____.

a) $\int Xe^{ax}\,dx$ b) $\int Xe^{-ax}\,dx$

c) $e^{-ax}\int e^{ax}\,Xdx$ d) $e^{ax}\int e^{-ax}Xdx$

11) The CF of differential equation $(D^3 - 3D^2 + 3D - 1)\,y = e^x$ is _____.

a) $(C_1 + C_2x + C_3x^2)e^x$ b) $C_1 + C_2x + C_3x^2$

c) $(C_1x + C_2x^2 + C_3x^3)\,e^x$ d) $(C_1 + C_2x + C_3x^2)e^{-x}$

12) $Z^{-1}\left[\frac{1}{z-2}\right]$ for $2 < |z|$ is _____.

a) $2^k \quad k \geq 1$ b) $2^{k-1} \quad k \geq 1$

c) $2^{-k} \quad k \geq 1$ d) $2^{-k-1}\,k \geq 1$

13) The Laplace transform of $\int_{0}^{\infty} e^{-3t}\,t\sin t\,dt$ is _____.

a) $\frac{1}{50}$ b) $\frac{2}{55}$

c) $\frac{3}{50}$ d) $\frac{4}{55}$

14) $L^{-1}\left(\frac{s+3}{s^2+9}\right) =$ _____.

a) $\cos 3t$ b) $\sin 3t$

c) $3t + \cos 3t$ d) $\cos 3t + \sin 3t$

Seat No.		Set	S

S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
ENGINEERING MATHEMATICS-III

Day & Date: Saturday, 07-12-2019 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 4 is compulsory and attempt any two of the section – I.
2) Q. No. 9 is compulsory and attempt any two of the section – II.
3) Use of only on programmable calculator is allowed.
4) Figures to the right indicate full marks.

Section – I

Q.2 **a)** Solve $(D^2 - 2D + 1)\, y = \frac{3e^x}{x^2}$ **03**

b) Solve $(D^2 + 4)y = x \sin x$ **03**

c) Solve $(D^3 + 2D^2 + D)y = x^2 + x$ **03**

Q.3 **a)** Solve $(x+2)^2 \frac{d^2y}{dx^2} - (x+2)\frac{dy}{dx} + y = 3x + 4$ **03**

b) Solve $x^2 \frac{d^2y}{dx^2} - x\frac{dy}{dx} + 2y = x \log x$ **03**

c) The differential equation of a circuit is $R\frac{dq}{dt} + \frac{q}{c} = 40\, e^{-3t} + 20\, e^{-6t}$ **03**
If $R = 20$ ohms, $C = 0.01$ farad and $q = 0$ at $t = 0$, show that the minimum charge on the capacitor is 0.25 coulombs.

Q.4 **a)** Find $Z^{-1}\left[\frac{z}{(z-2)(z-3)}\right]\ 2 < |z| < 3$ **04**

b) Find $z\{(k+1)a^k\} \quad k \geq 0$ **03**

c) Find $z\{\sin \alpha\, k\} \quad k \geq 0$ **03**

OR

Find $z\{2^k \cos(3k+2)\} \quad k \geq 0$ **03**

Q.5 **a)** Solve $\frac{y^2 z\, P}{x} + xzq = y^2$ **03**

b) Solve $z(p^2 - q^2) = x - y$ **03**

c) Solve $\frac{\partial u}{\partial x} = 4\frac{\partial u}{\partial y}$ by using variable separable method. **03**

Section – II

Q.6 **a)** Find half range sine series for $f(x)$ where **05**

$$f(x) = \begin{cases} x, & 0 < x \leq \pi/2 \\ \pi - x, & \pi/2 < x < \pi \end{cases}$$

Hence, deduce that $\frac{\pi^2}{8} = \frac{1}{1^2} + \frac{1}{3^2} + \frac{1}{5^2} + \cdots$

b) Obtain Fourier expansion of $\sin(ax)$ in the interval $-l < x < l$, where 'a' is not an integer. **04**

Q.7 **a)** Find the Fourier integral of $f(x)$ Where **04**

$$f(x) = \begin{cases} 1 - x^2, & |x| < 1 \\ 0, & |x| > 1 \end{cases}$$

b) Find the Fourier sine transform of $f(x) = \frac{e^{-ax}}{x}$ and hence evaluate $\int_0^\infty \tan^{-1}\left(\frac{x}{a}\right) . \sin x \, dx$ **05**

Q.8 **a)** Find $L\left[\frac{1-\cos t}{t}\right]$ **03**

b) Find $L^{-1}\left[\frac{s}{s^2+5s+6}\right]$ **03**

c) Find $L^{-1}\left[\log\sqrt{1+\frac{4}{s^2}}\right]$ **03**

Q.9 **a)** Find the tangential and normal component of acceleration of a particle moving on the curve , $x = t^3 + 1, y = t^2, z = t$ at $t = 1$. **04**

b) Prove that $\bar{F} = (x + 2y + az)i + (bx - 3y - z)j + (4x + (y + 2z)k$ is solenoidal and find the a,b,c if $\bar{F}$ is irrotational. **03**

c) Find the directional derivative of $\phi = x^2 + y^2 + z^2$ in the direction of $\frac{x}{3} = \frac{y}{4} = \frac{z}{5}$ at (1,2,3). **03**

OR

Prove that $\nabla.\left(\frac{\bar{r}}{r^3}\right) = 0$ **03**

Seat No.	

Set **P**

S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
D.C. MACHINES AND TRANSFORMERS

Day & Date: Tuesday, 10-12-2019 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
2) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) DC series motors are used in those applications where _____ is required.
   a) High starting torque b) Constant speed
   c) Low no load speed d) None of the above

2) The DC armature winding in which coil sides are a pole pitch apart is called _____ winding.
   a) Multiplex b) Fractional pitch
   c) Full pitch d) Pole pitch

3) A wave winding must go at least _____ around the armature before it closes back where it started.
   a) Once b) Twice
   c) Thrice d) Four times

4) Because of _____ losses the shaft torque is always less than armature torque in a DC motor.
   a) Copper b) Mechanical
   c) Iron d) Rotational

5) In DC generator the generated E.M.F. is directly proportional to the _____.
   a) Pole flux
   b) Number of armature parallel paths
   c) Field current
   d) Number of dummy coil

6) The current drawn by 240V DC motor of $\mathrm{Ra} = 0.5\Omega \,\&\, \mathrm{E_b} = 210\mathrm{V}$ is _____ A.
   a) 30 b) 60
   c) 20 d) 15

7) During commutation the coil undergoing communication _____ by the brush.
   a) Remains short circuited b) Remains open circuited
   c) Either a or b d) None of the above

8) Transformer is used to _____.
   a) Increase the voltage b) Decrease the voltage
   c) Both a and b d) None of the above

9) A universal motor is one which has _____.
   a) Constant speed
   b) Constant output
   c) Capability to operate both on AC & DC
   d) Maximum efficiency

10) A step up transformer increases _____ & decreases _____.
   a) Current, Voltage
   b) Voltage, Frequency
   c) Voltage, Current
   d) Voltage, Power

11) The main purpose to carry out back to back test on transformer is to find out.
   a) Efficiency
   b) Temperature rise
   c) Efficiency & Temperature rise
   d) Regulation

12) The maximum efficiency of transformer of 100KVA having iron loss of 900KW & full load Cu loss of 1600KW, occurs at _____ KVA.
   a) 56.3
   b) 133.3
   c) 75
   d) 177.7

13) The S.C. test of the transformer gives _____ losses.
   a) Iron loss
   b) Copper loss
   c) Both a and b
   d) None of the above

14) A transformer has negative voltage regulation when its load power factor is _____.
   a) Zero
   b) Unity
   c) Leading
   d) Lagging

Seat No.	

Set **P**

S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
D.C. MACHINES AND TRANSFORMERS

Day & Date: Tuesday, 10-12-2019 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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

Section – I

Q.2 Solve any Four. **16**

a) What are the advantages of electrical braking over mechanical braking? Explain plugging method of braking.

b) A 250V, 14.9 KW, 8 pole D.C. motor has single turn coils. The armature is wave wound with 94 commutator segments. If the brushes are given a lead of 2 commutator segments at full load, calculate.
1) Total Armature reaction ampere turns per pole
2) Cross magnetizing ampere turns per pole. Assume efficiency of 80%.

c) Draw the neat diagram & Explain three point starter.

d) List out & explain different types of losses in DC motor.

e) A 250V, 4 pole, wave wound series motor has 782 conductors on its armature. It has armature & series field resistance of 0.75Ω. The motor takes a current of 40A. find its speed & gross torque developed if it has a flux per pole of 25 mwb.

Q.3 Solve any Two. **12**

a) A 100KW, 500V shunt generator was run as a motor on no load at its rated voltage and speed. The total current taken was 9.5A including a shunt field current of 2.5A.The resistance of the armature circuit is 0.1Ω. Calculate the efficiency of the generator at.
1) full load
2) half load

b) Explain the speed control methods of DC series motor.

c) The hopkinson's test on two shunt machines gave the following results for full load:
Line voltage=250V; current taken from supply system excluding field currents=50A; motor armature current=380A; field currents=5A and 4.2A. Calculate the efficiency of the machine working as a generator. Armature resistance of each machine is 0.02 Ω.

Section – II

Q.4 Attempt any Four. **16**

a) Write down expression for efficiency of a transformer and then find condition for maximum efficiency.

b) Draw and explain the equivalent circuit diagram of single phase transformer referred to secondary.

c) What is universal motor? Explain its operation in A.C. and D.C.

d) Derive E.M.F. equation for single phase transformer.

e) The primary & secondary windings of a 40 KVA, 6600/250V single phase transformer have resistances of 10Ω & 0.02Ω respectively. The equivalent leakage reactance of the transformer referred to the primary side is 35Ω.Calculate the percentage voltage regulation of the transformer when supplying full load current at a p.f. of 0.8 lagging.

Q.5 Solve the following questions. **12**

a) Explain the operating principles of three phase transformer with neat diagram.

b) A 50KVA,6360/240V transformer gave the following test result:
O.C. test: primary voltage 6360V; primary current 1 A; power input 2KW
S.C. test: voltage across secondary winding 50V current in secondary winding 175A, power input 2KW
Find the efficiency of the transformer when supplying full load at a power factor of 0.8 Lagging.

OR

b) A 150KVA transformer has iron loss of 1.4KW & full load Cu loss of 2.8KW at 0.8 p.f. lagging. Calculate.
1) Efficiency of transformer at full load
2) The maximum efficiency of the transformer
3) The output power at the maximum level of efficiency. Assume unity power factor.

Seat No.	

Set **Q**

S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
D.C. MACHINES AND TRANSFORMERS

Day & Date: Tuesday, 10-12-2019 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
2) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) Transformer is used to _____.
   a) Increase the voltage b) Decrease the voltage
   c) Both a and b d) None of the above

2) A universal motor is one which has _____.
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13) The current drawn by 240V DC motor of $\mathrm{Ra} = 0.5\Omega \ \& \ \mathrm{E_b} = 210\mathrm{V}$ is _____ A.
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   b) 60
   c) 20
   d) 15

14) During commutation the coil undergoing communication _____ by the brush.
   a) Remains short circuited
   b) Remains open circuited
   c) Either a or b
   d) None of the above

Seat No.	

Set **Q**

S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
D.C. MACHINES AND TRANSFORMERS

Day & Date: Tuesday, 10-12-2019 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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

Q.2 Solve any Four. **16**

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1) Total Armature reaction ampere turns per pole
2) Cross magnetizing ampere turns per pole. Assume efficiency of 80%.

c) Draw the neat diagram & Explain three point starter.

d) List out & explain different types of losses in DC motor.

e) A 250V, 4 pole, wave wound series motor has 782 conductors on its armature. It has armature & series field resistance of 0.75Ω. The motor takes a current of 40A. find its speed & gross torque developed if it has a flux per pole of 25 mwb.

Q.3 Solve any Two. **12**

a) A 100KW, 500V shunt generator was run as a motor on no load at its rated voltage and speed. The total current taken was 9.5A including a shunt field current of 2.5A.The resistance of the armature circuit is 0.1Ω. Calculate the efficiency of the generator at.
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2) half load

b) Explain the speed control methods of DC series motor.

c) The hopkinson's test on two shunt machines gave the following results for full load:
Line voltage=250V; current taken from supply system excluding field currents=50A; motor armature current=380A; field currents=5A and 4.2A. Calculate the efficiency of the machine working as a generator. Armature resistance of each machine is 0.02 Ω.

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Q.4 Attempt any Four. **16**

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c) What is universal motor? Explain its operation in A.C. and D.C.

d) Derive E.M.F. equation for single phase transformer.

e) The primary & secondary windings of a 40 KVA, 6600/250V single phase transformer have resistances of 10Ω & 0.02Ω respectively. The equivalent leakage reactance of the transformer referred to the primary side is 35Ω.Calculate the percentage voltage regulation of the transformer when supplying full load current at a p.f. of 0.8 lagging.

Q.5 Solve the following questions. **12**

a) Explain the operating principles of three phase transformer with neat diagram.

b) A 50KVA,6360/240V transformer gave the following test result:
O.C. test: primary voltage 6360V; primary current 1 A; power input 2KW
S.C. test: voltage across secondary winding 50V current in secondary winding 175A, power input 2KW
Find the efficiency of the transformer when supplying full load at a power factor of 0.8 Lagging.

OR

b) A 150KVA transformer has iron loss of 1.4KW & full load Cu loss of 2.8KW at 0.8 p.f. lagging. Calculate.
1) Efficiency of transformer at full load
2) The maximum efficiency of the transformer
3) The output power at the maximum level of efficiency. Assume unity power factor.

Seat No.	

Set **R**

S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
D.C. MACHINES AND TRANSFORMERS

Day & Date: Tuesday, 10-12-2019 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
2) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) In DC generator the generated E.M.F. is directly proportional to the _____.
   a) Pole flux
   b) Number of armature parallel paths
   c) Field current
   d) Number of dummy coil

2) The current drawn by 240V DC motor of $\mathrm{Ra} = 0.5\Omega \,\&\, \mathrm{E_b} = 210\mathrm{V}$ is _____ A.
   a) 30 b) 60
   c) 20 d) 15

3) During commutation the coil undergoing communication _____ by the brush.
   a) Remains short circuited b) Remains open circuited
   c) Either a or b d) None of the above

4) Transformer is used to _____.
   a) Increase the voltage b) Decrease the voltage
   c) Both a and b d) None of the above

5) A universal motor is one which has _____.
   a) Constant speed
   b) Constant output
   c) Capability to operate both on AC & DC
   d) Maximum efficiency

6) A step up transformer increases _____ & decreases _____.
   a) Current, Voltage b) Voltage, Frequency
   c) Voltage, Current d) Voltage, Power

7) The main purpose to carry out back to back test on transformer is to find out.
   a) Efficiency b) Temperature rise
   c) Efficiency & Temperature rise d) Regulation

8) The maximum efficiency of transformer of 100KVA having iron loss of 900KW & full load Cu loss of 1600KW, occurs at _____ KVA.
   a) 56.3 b) 133.3
   c) 75 d) 177.7

9) The S.C. test of the transformer gives _____ losses.
   a) Iron loss b) Copper loss
   c) Both a and b d) None of the above

10) A transformer has negative voltage regulation when its load power factor is _____.
   a) Zero
   b) Unity
   c) Leading
   d) Lagging

11) DC series motors are used in those applications where _____ is required.
   a) High starting torque
   b) Constant speed
   c) Low no load speed
   d) None of the above

12) The DC armature winding in which coil sides are a pole pitch apart is called _____ winding.
   a) Multiplex
   b) Fractional pitch
   c) Full pitch
   d) Pole pitch

13) A wave winding must go at least _____ around the armature before it closes back where it started.
   a) Once
   b) Twice
   c) Thrice
   d) Four times

14) Because of _____ losses the shaft torque is always less than armature torque in a DC motor.
   a) Copper
   b) Mechanical
   c) Iron
   d) Rotational

Seat No.	

Set **R**

S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
D.C. MACHINES AND TRANSFORMERS

Day & Date: Tuesday, 10-12-2019 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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

Section – I

Q.2 Solve any Four. **16**

a) What are the advantages of electrical braking over mechanical braking? Explain plugging method of braking.

b) A 250V, 14.9 KW, 8 pole D.C. motor has single turn coils. The armature is wave wound with 94 commutator segments. If the brushes are given a lead of 2 commutator segments at full load, calculate.
1) Total Armature reaction ampere turns per pole
2) Cross magnetizing ampere turns per pole. Assume efficiency of 80%.

c) Draw the neat diagram & Explain three point starter.

d) List out & explain different types of losses in DC motor.

e) A 250V, 4 pole, wave wound series motor has 782 conductors on its armature. It has armature & series field resistance of 0.75Ω. The motor takes a current of 40A. find its speed & gross torque developed if it has a flux per pole of 25 mwb.

Q.3 Solve any Two. **12**

a) A 100KW, 500V shunt generator was run as a motor on no load at its rated voltage and speed. The total current taken was 9.5A including a shunt field current of 2.5A.The resistance of the armature circuit is 0.1Ω. Calculate the efficiency of the generator at.
1) full load
2) half load

b) Explain the speed control methods of DC series motor.

c) The hopkinson's test on two shunt machines gave the following results for full load:
Line voltage=250V; current taken from supply system excluding field currents=50A; motor armature current=380A; field currents=5A and 4.2A. Calculate the efficiency of the machine working as a generator. Armature resistance of each machine is 0.02 Ω.

Section – II

Q.4 Attempt any Four. **16**

a) Write down expression for efficiency of a transformer and then find condition for maximum efficiency.

b) Draw and explain the equivalent circuit diagram of single phase transformer referred to secondary.

c) What is universal motor? Explain its operation in A.C. and D.C.

d) Derive E.M.F. equation for single phase transformer.

e) The primary & secondary windings of a 40 KVA, 6600/250V single phase transformer have resistances of 10Ω & 0.02Ω respectively. The equivalent leakage reactance of the transformer referred to the primary side is 35Ω.Calculate the percentage voltage regulation of the transformer when supplying full load current at a p.f. of 0.8 lagging.

Q.5 Solve the following questions. **12**

a) Explain the operating principles of three phase transformer with neat diagram.

b) A 50KVA,6360/240V transformer gave the following test result:
O.C. test: primary voltage 6360V; primary current 1 A; power input 2KW
S.C. test: voltage across secondary winding 50V current in secondary winding 175A, power input 2KW
Find the efficiency of the transformer when supplying full load at a power factor of 0.8 Lagging.

OR

b) A 150KVA transformer has iron loss of 1.4KW & full load Cu loss of 2.8KW at 0.8 p.f. lagging. Calculate.
1) Efficiency of transformer at full load
2) The maximum efficiency of the transformer
3) The output power at the maximum level of efficiency. Assume unity power factor.

Seat No.	

Set **S**

S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
D.C. MACHINES AND TRANSFORMERS

Day & Date: Tuesday, 10-12-2019 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
2) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) A step up transformer increases _____ & decreases _____.
   a) Current, Voltage b) Voltage, Frequency
   c) Voltage, Current d) Voltage, Power

2) The main purpose to carry out back to back test on transformer is to find out.
   a) Efficiency b) Temperature rise
   c) Efficiency & Temperature rise d) Regulation

3) The maximum efficiency of transformer of 100KVA having iron loss of 900KW & full load Cu loss of 1600KW, occurs at _____ KVA.
   a) 56.3 b) 133.3
   c) 75 d) 177.7

4) The S.C. test of the transformer gives _____ losses.
   a) Iron loss b) Copper loss
   c) Both a and b d) None of the above

5) A transformer has negative voltage regulation when its load power factor is _____.
   a) Zero b) Unity
   c) Leading d) Lagging

6) DC series motors are used in those applications where _____ is required.
   a) High starting torque b) Constant speed
   c) Low no load speed d) None of the above

7) The DC armature winding in which coil sides are a pole pitch apart is called _____ winding.
   a) Multiplex b) Fractional pitch
   c) Full pitch d) Pole pitch

8) A wave winding must go at least _____ around the armature before it closes back where it started.
   a) Once b) Twice
   c) Thrice d) Four times

9) Because of _____ losses the shaft torque is always less than armature torque in a DC motor.
   a) Copper b) Mechanical
   c) Iron d) Rotational

10) In DC generator the generated E.M.F. is directly proportional to the _____.
   a) Pole flux
   b) Number of armature parallel paths
   c) Field current
   d) Number of dummy coil

11) The current drawn by 240V DC motor of $\mathrm{Ra} = 0.5\Omega \,\&\, \mathrm{E_b} = 210\mathrm{V}$ is _____ A.
   a) 30 b) 60
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12) During commutation the coil undergoing communication _____ by the brush.
   a) Remains short circuited b) Remains open circuited
   c) Either a or b d) None of the above

13) Transformer is used to _____.
   a) Increase the voltage b) Decrease the voltage
   c) Both a and b d) None of the above

14) A universal motor is one which has _____.
   a) Constant speed
   b) Constant output
   c) Capability to operate both on AC & DC
   d) Maximum efficiency

Seat No.	

Set **S**

S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
D.C. MACHINES AND TRANSFORMERS

Day & Date: Tuesday, 10-12-2019 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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

Section – I

Q.2 Solve any Four. **16**

a) What are the advantages of electrical braking over mechanical braking? Explain plugging method of braking.

b) A 250V, 14.9 KW, 8 pole D.C. motor has single turn coils. The armature is wave wound with 94 commutator segments. If the brushes are given a lead of 2 commutator segments at full load, calculate.
1) Total Armature reaction ampere turns per pole
2) Cross magnetizing ampere turns per pole. Assume efficiency of 80%.

c) Draw the neat diagram & Explain three point starter.

d) List out & explain different types of losses in DC motor.

e) A 250V, 4 pole, wave wound series motor has 782 conductors on its armature. It has armature & series field resistance of 0.75Ω. The motor takes a current of 40A. find its speed & gross torque developed if it has a flux per pole of 25 mwb.

Q.3 Solve any Two. **12**

a) A 100KW, 500V shunt generator was run as a motor on no load at its rated voltage and speed. The total current taken was 9.5A including a shunt field current of 2.5A.The resistance of the armature circuit is 0.1Ω. Calculate the efficiency of the generator at.
1) full load
2) half load

b) Explain the speed control methods of DC series motor.

c) The hopkinson's test on two shunt machines gave the following results for full load:
Line voltage=250V; current taken from supply system excluding field currents=50A; motor armature current=380A; field currents=5A and 4.2A. Calculate the efficiency of the machine working as a generator. Armature resistance of each machine is 0.02 Ω.

Section – II

Q.4 Attempt any Four. **16**

a) Write down expression for efficiency of a transformer and then find condition for maximum efficiency.

b) Draw and explain the equivalent circuit diagram of single phase transformer referred to secondary.

c) What is universal motor? Explain its operation in A.C. and D.C.

d) Derive E.M.F. equation for single phase transformer.

e) The primary & secondary windings of a 40 KVA, 6600/250V single phase transformer have resistances of 10Ω & 0.02Ω respectively. The equivalent leakage reactance of the transformer referred to the primary side is 35Ω.Calculate the percentage voltage regulation of the transformer when supplying full load current at a p.f. of 0.8 lagging.

Q.5 Solve the following questions. **12**

a) Explain the operating principles of three phase transformer with neat diagram.

b) A 50KVA,6360/240V transformer gave the following test result:
O.C. test: primary voltage 6360V; primary current 1 A; power input 2KW
S.C. test: voltage across secondary winding 50V current in secondary winding 175A, power input 2KW
Find the efficiency of the transformer when supplying full load at a power factor of 0.8 Lagging.

OR

b) A 150KVA transformer has iron loss of 1.4KW & full load Cu loss of 2.8KW at 0.8 p.f. lagging. Calculate.
1) Efficiency of transformer at full load
2) The maximum efficiency of the transformer
3) The output power at the maximum level of efficiency. Assume unity power factor.

Seat No.	

Set **P**

S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
ELECTRICAL NETWORKS

Day & Date: Thursday,12-12-2019 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) Which law plays a significant role in the mesh analysis of the network?
   a) KCL b) KVL
   c) Law of Superposition Theorem d) None of the above

2) How many number of minimum end nodes or terminal nodes are involved in a tree, according to its properties?
   a) Only one b) Two
   c) Four d) Infinite

3) Which among the following get/s cancelled under the resonance condition in a.c. circuits, if inductive and capacitive reactances are in parallel?
   a) Susceptance b) Reactance
   c) Resistance d) All of the above

4) Three equal resistances of 3Ω are connected in star. What is the resistance in one of the arm in an equivalent delta circuit?
   a) 10Ω b) 3Ω
   c) 9Ω d) $2/3\Omega$

5) With the b no. of branches and possible 1 no. of loops in the graph, the mesh incidence matrix B will have dimensions _____.
   a) 1 x b b) b x 1
   c) b x b d) 1 x 1

6) What would be the nature of 'Z_L', if 'Z_{eq}' reactance is inductive according to 'Maximum power transfer theorem'?
   a) Inductive b) Capacitive
   c) Resistive d) All of the above

7) Identify dual of the Resistor ® _____.
   a) C b) L
   c) H d) G

8) What is the Q (Quality factor) of a series circuit that resonates at 6 kHz, has equal reactance of 4 kilo-ohms each, and a resistor value of 50 ohms?
   a) 0.001 b) 50
   c) 80 d) 4.0

9) When $X_c = X_L$ the circuit?
   a) draws maximum current
   b) applied voltage is zero
   c) is at resonance
   d) draws minimum current

10) Which elements act as an independent variables in Y-parameters?
   a) Current
   b) Voltage
   c) Both a and b
   d) None of the above

11) The transient currents are associated with the _____.
   a) Changes in the stored energy in the inductors and capacitors
   b) Impedance of the circuit
   c) Applied voltage to the circuit
   d) Resistance of the circuit

12) Laplace transform of inductor in Henries is _____.
   a) 1/LS
   b) LS
   c) LS^2
   d) L/S^2

13) Laplace transform changes the ____ domain function to the ____ domain function.
   a) time, time
   b) time, frequency
   c) frequency, time
   d) frequency, frequency

14) Time constant of RC and RL circuit respectively are _____.
   a) RC/R/L
   b) R/C,L/R
   c) RC, L/R
   d) RC,RL

Seat No.	

Set **P**

S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
ELECTRICAL NETWORKS

Day & Date: Thursday,12-12-2019 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

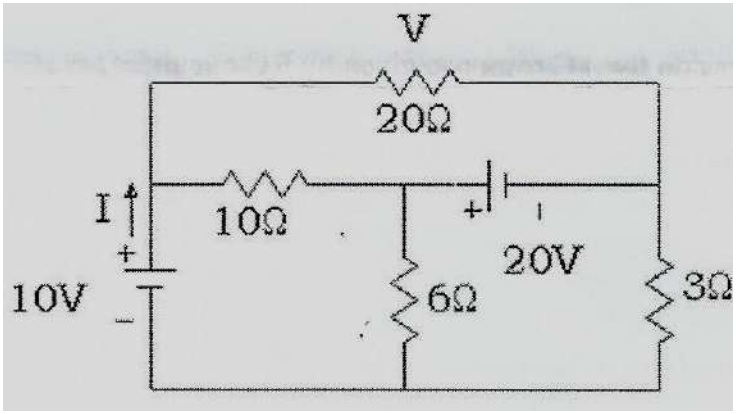
Section – I

Q.2 Solve any four of the following question. **16**

a) State and explain Thevenin's Theorem.

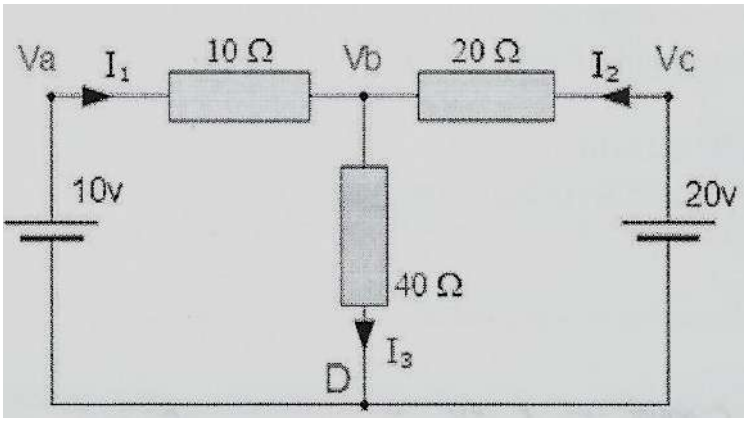
b) Two resistances of 10Ω and 40Ω are connected in parallel. A third resistance of 5Ω is connected in series with the combination and a DC supply of 240V is applied to the end of completed circuit. Calculate current in each resistor.

c) Find the voltage V using superposition.



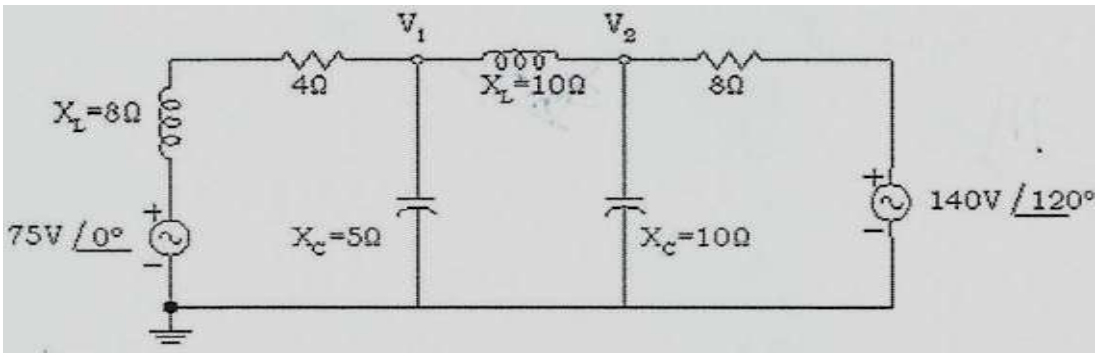
d) Define the terms: Mesh, Tree, link and Degree of node.

e) Find I_3 from the circuit shown in figure.



Q.3 Solve any two of the following. **12**

a) Find the magnitude of V1 by using nodal analysis.



b) Derive necessary and sufficient condition for maximum power transfer condition from a voltage source with source impedance $R_s + JX_s$ to a load $R_L + JX_L$ · What is the value of power transferred in this case?

c) What is dual of a network? Explain the pairs of dual terms along with the steps to draw dual of any network with one example.

Section – II

Q.4 Solve any four of the following question. **16**

a) Derive an expression for AC response given by RC circuit.

b) Compare series and Parallel resonance.

c) Draw and Explain behavior of circuit element under switching condition.

d) Define the terms at series resonance: Impedance, Current, power factor, phaser diagrams.

e) Derive the Z- Parameter in terms of Y, H.

Q.5 Solve any two of the following. **12**

a) Find the response given by RL circuit for DC input.

b) Find h parameter of following data.

1) with output terminal short circuited V_1=25,I_1=1A,I_2 =2A
2) with input terminals are open circuited V_1=10V, V_2=50V, and I_2=2A.

c) Obtain values of R,L and C in a series RLC circuit that resonates at 1.5KHz and consumes 50W from a 50 V AC source operating at resonant frequency . The Bandwidth is 0.75KHz.

Seat No.	

Set **Q**

S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
ELECTRICAL NETWORKS

Day & Date: Thursday,12-12-2019 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) What is the Q (Quality factor) of a series circuit that resonates at 6 kHz, has equal reactance of 4 kilo-ohms each, and a resistor value of 50 ohms?
   a) 0.001 b) 50
   c) 80 d) 4.0

2) When $X_c = X_L$ the circuit?
   a) draws maximum current b) applied voltage is zero
   c) is at resonance d) draws minimum current

3) Which elements act as an independent variables in Y-parameters?
   a) Current b) Voltage
   c) Both a and b d) None of the above

4) The transient currents are associated with the _____.
   a) Changes in the stored energy in the inductors and capacitors
   b) Impedance of the circuit
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5) Laplace transform of inductor in Henries is _____.
   a) 1/LS b) LS
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6) Laplace transform changes the ____ domain function to the ____ domain function.
   a) time, time b) time, frequency
   c) frequency, time d) frequency, frequency

7) Time constant of RC and RL circuit respectively are _____.
   a) RC/R/L b) R/C,L/R
   c) RC, L/R d) RC,RL

8) Which law plays a significant role in the mesh analysis of the network?
   a) KCL b) KVL
   c) Law of Superposition Theorem d) None of the above

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   a) Only one
   b) Two
   c) Four
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10) Which among the following get/s cancelled under the resonance condition in a.c. circuits, if inductive and capacitive reactances are in parallel?
   a) Susceptance
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11) Three equal resistances of 3Ω are connected in star. What is the resistance in one of the arm in an equivalent delta circuit?
   a) 10Ω
   b) 3Ω
   c) 9Ω
   d) 2/3Ω

12) With the b no. of branches and possible 1 no. of loops in the graph, the mesh incidence matrix B will have dimensions _____.
   a) 1 x b
   b) b x 1
   c) b x b
   d) 1 x 1

13) What would be the nature of 'Z_L', if 'Z_{eq}' reactance is inductive according to 'Maximum power transfer theorem'?
   a) Inductive
   b) Capacitive
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   d) All of the above

14) Identify dual of the Resistor ® _____.
   a) C
   b) L
   c) H
   d) G

Seat No.	

Set **Q**

S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
ELECTRICAL NETWORKS

Day & Date: Thursday,12-12-2019 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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

Q.2 Solve any four of the following question. **16**

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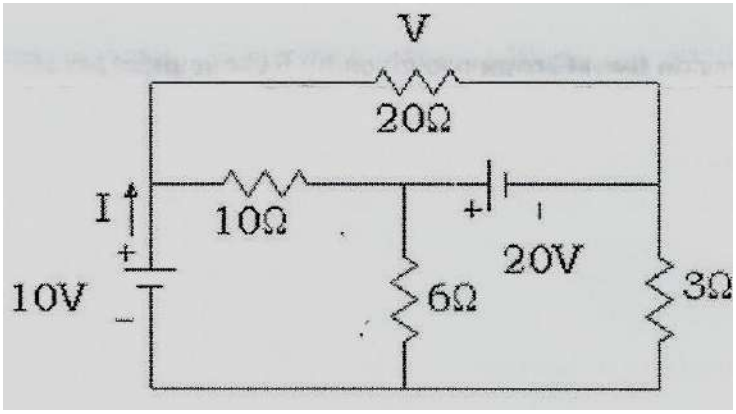
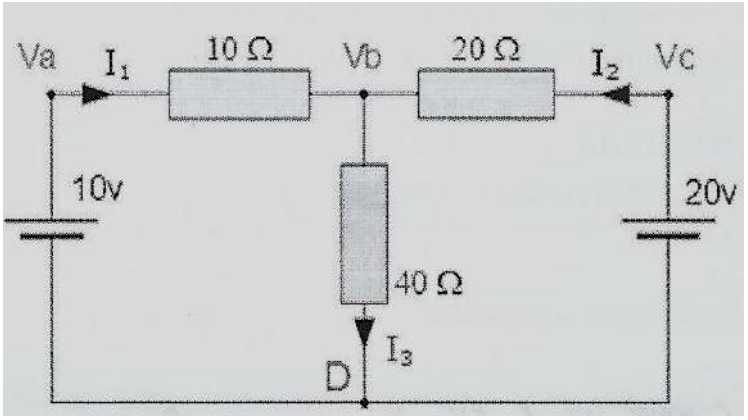
b) Two resistances of 10Ω and 40Ω are connected in parallel. A third resistance of 5Ω is connected in series with the combination and a DC supply of 240V is applied to the end of completed circuit. Calculate current in each resistor.

c) Find the voltage V using superposition.



d) Define the terms: Mesh, Tree, link and Degree of node.

e) Find I_3 from the circuit shown in figure.



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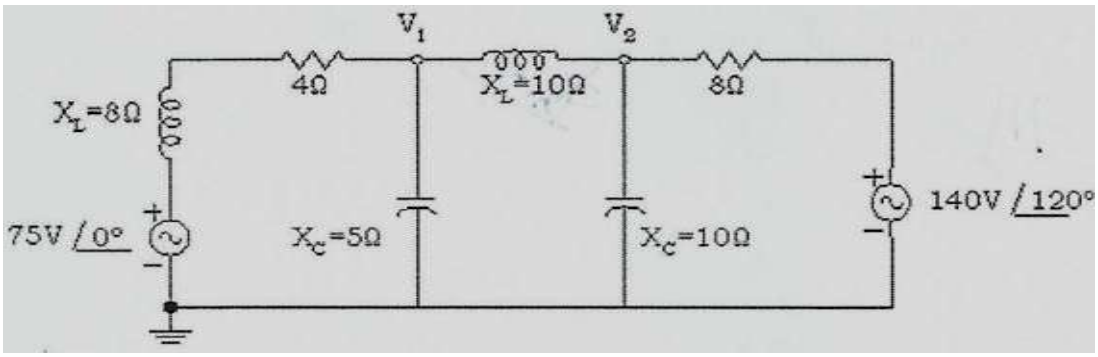

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Section – II

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2) with input terminals are open circuited V_1=10V, V_2=50V, and I_2=2A.

c) Obtain values of R,L and C in a series RLC circuit that resonates at 1.5KHz and consumes 50W from a 50 V AC source operating at resonant frequency . The Bandwidth is 0.75KHz.

Seat No.	

Set **R**

S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
ELECTRICAL NETWORKS

Day & Date: Thursday,12-12-2019 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
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MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) With the b no. of branches and possible 1 no. of loops in the graph, the mesh incidence matrix B will have dimensions _____.
   a) 1 x b b) b x 1
   c) b x b d) 1 x 1

2) What would be the nature of 'Z_L', if 'Z_{eq}' reactance is inductive according to 'Maximum power transfer theorem'?
   a) Inductive b) Capacitive
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3) Identify dual of the Resistor ® _____.
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4) What is the Q (Quality factor) of a series circuit that resonates at 6 kHz, has equal reactance of 4 kilo-ohms each, and a resistor value of 50 ohms?
   a) 0.001 b) 50
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   c) is at resonance d) draws minimum current

6) Which elements act as an independent variables in Y-parameters?
   a) Current b) Voltage
   c) Both a and b d) None of the above

7) The transient currents are associated with the _____.
   a) Changes in the stored energy in the inductors and capacitors
   b) Impedance of the circuit
   c) Applied voltage to the circuit
   d) Resistance of the circuit

8) Laplace transform of inductor in Henries is _____.
   a) 1/LS b) LS
   c) LS^2 d) L/S^2

9) Laplace transform changes the ____ domain function to the ____ domain function.
   a) time, time b) time, frequency
   c) frequency, time d) frequency, frequency

10) Time constant of RC and RL circuit respectively are _____.
   a) RC/R/L b) R/C,L/R
   c) RC, L/R d) RC,RL

11) Which law plays a significant role in the mesh analysis of the network?
   a) KCL b) KVL
   c) Law of Superposition Theorem d) None of the above

12) How many number of minimum end nodes or terminal nodes are involved in a tree, according to its properties?
   a) Only one b) Two
   c) Four d) Infinite

13) Which among the following get/s cancelled under the resonance condition in a.c. circuits, if inductive and capacitive reactances are in parallel?
   a) Susceptance b) Reactance
   c) Resistance d) All of the above

14) Three equal resistances of 3Ω are connected in star. What is the resistance in one of the arm in an equivalent delta circuit?
   a) 10Ω b) 3Ω
   c) 9Ω d) 2/3Ω

Seat No.	

Set **R**

S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
ELECTRICAL NETWORKS

Day & Date: Thursday,12-12-2019 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

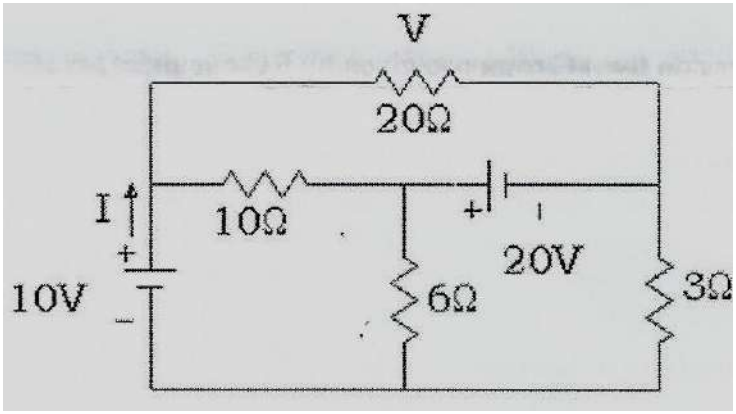
Section – I

Q.2 Solve any four of the following question. **16**

a) State and explain Thevenin's Theorem.

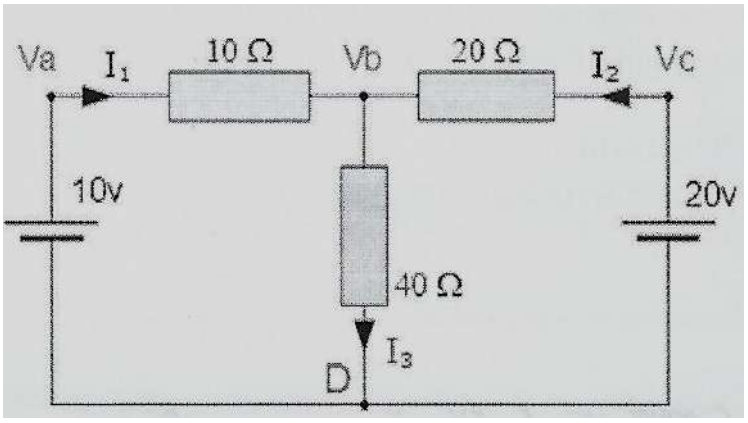
b) Two resistances of 10Ω and 40Ω are connected in parallel. A third resistance of 5Ω is connected in series with the combination and a DC supply of 240V is applied to the end of completed circuit. Calculate current in each resistor.

c) Find the voltage V using superposition.



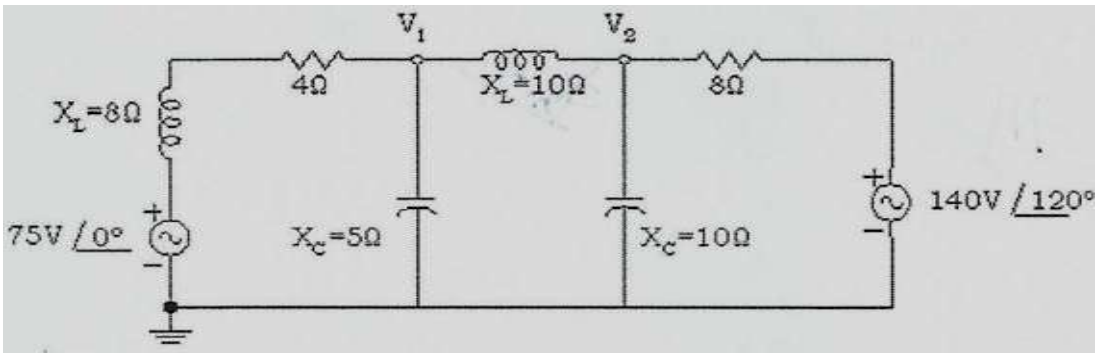
d) Define the terms: Mesh, Tree, link and Degree of node.

e) Find I_3 from the circuit shown in figure.



Q.3 Solve any two of the following. **12**

a) Find the magnitude of V1 by using nodal analysis.



b) Derive necessary and sufficient condition for maximum power transfer condition from a voltage source with source impedance $R_s + JX_s$ to a load $R_L + JX_L$ · What is the value of power transferred in this case?

c) What is dual of a network? Explain the pairs of dual terms along with the steps to draw dual of any network with one example.

Section – II

Q.4 Solve any four of the following question. **16**

a) Derive an expression for AC response given by RC circuit.

b) Compare series and Parallel resonance.

c) Draw and Explain behavior of circuit element under switching condition.

d) Define the terms at series resonance: Impedance, Current, power factor, phaser diagrams.

e) Derive the Z- Parameter in terms of Y, H.

Q.5 Solve any two of the following. **12**

a) Find the response given by RL circuit for DC input.

b) Find h parameter of following data.

1) with output terminal short circuited V_1=25,I_1=1A,I_2 =2A
2) with input terminals are open circuited V_1=10V, V_2=50V, and I_2=2A.

c) Obtain values of R,L and C in a series RLC circuit that resonates at 1.5KHz and consumes 50W from a 50 V AC source operating at resonant frequency . The Bandwidth is 0.75KHz.

Seat No.	

Set **S**

S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
ELECTRICAL NETWORKS

Day & Date: Thursday,12-12-2019 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) Which elements act as an independent variables in Y-parameters?
   a) Current b) Voltage
   c) Both a and b d) None of the above

2) The transient currents are associated with the _____.
   a) Changes in the stored energy in the inductors and capacitors
   b) Impedance of the circuit
   c) Applied voltage to the circuit
   d) Resistance of the circuit

3) Laplace transform of inductor in Henries is _____.
   a) 1/LS b) LS
   c) LS^2 d) L/S^2

4) Laplace transform changes the ____ domain function to the ____ domain function.
   a) time, time b) time, frequency
   c) frequency, time d) frequency, frequency

5) Time constant of RC and RL circuit respectively are _____.
   a) RC/R/L b) R/C,L/R
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6) Which law plays a significant role in the mesh analysis of the network?
   a) KCL b) KVL
   c) Law of Superposition Theorem d) None of the above

7) How many number of minimum end nodes or terminal nodes are involved in a tree, according to its properties?
   a) Only one b) Two
   c) Four d) Infinite

8) Which among the following get/s cancelled under the resonance condition in a.c. circuits, if inductive and capacitive reactances are in parallel?
   a) Susceptance b) Reactance
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9) Three equal resistances of 3Ω are connected in star. What is the resistance in one of the arm in an equivalent delta circuit?
   a) 10Ω b) 3Ω
   c) 9Ω d) 2/3Ω

10) With the b no. of branches and possible 1 no. of loops in the graph, the mesh incidence matrix B will have dimensions _____.
   a) 1 x b b) b x 1
   c) b x b d) 1 x 1

11) What would be the nature of 'Z_L', if 'Z_{eq}' reactance is inductive according to 'Maximum power transfer theorem'?
   a) Inductive b) Capacitive
   c) Resistive d) All of the above

12) Identify dual of the Resistor ® _____.
   a) C b) L
   c) H d) G

13) What is the Q (Quality factor) of a series circuit that resonates at 6 kHz, has equal reactance of 4 kilo-ohms each, and a resistor value of 50 ohms?
   a) 0.001 b) 50
   c) 80 d) 4.0

14) When $X_c = X_L$ the circuit?
   a) draws maximum current b) applied voltage is zero
   c) is at resonance d) draws minimum current

Seat No.	

Set **S**

S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
ELECTRICAL NETWORKS

Day & Date: Thursday,12-12-2019 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

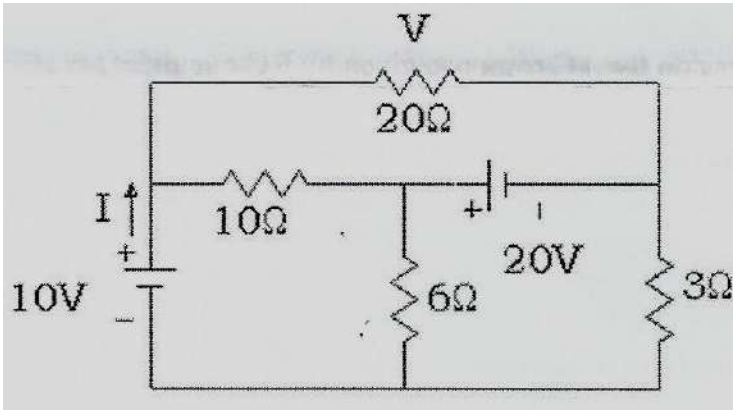
Section – I

Q.2 Solve any four of the following question. **16**

a) State and explain Thevenin's Theorem.

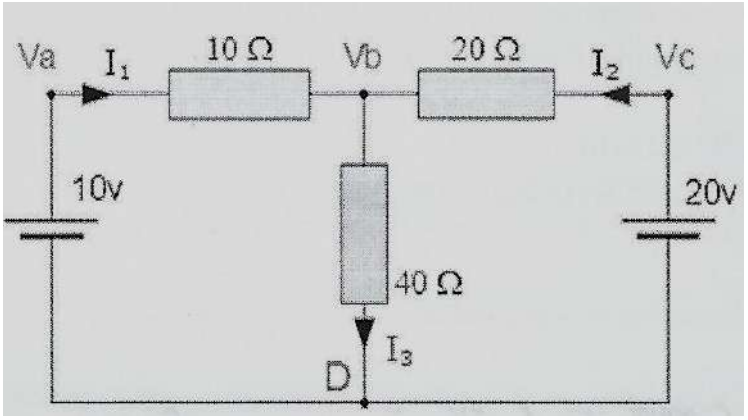
b) Two resistances of 10Ω and 40Ω are connected in parallel. A third resistance of 5Ω is connected in series with the combination and a DC supply of 240V is applied to the end of completed circuit. Calculate current in each resistor.

c) Find the voltage V using superposition.



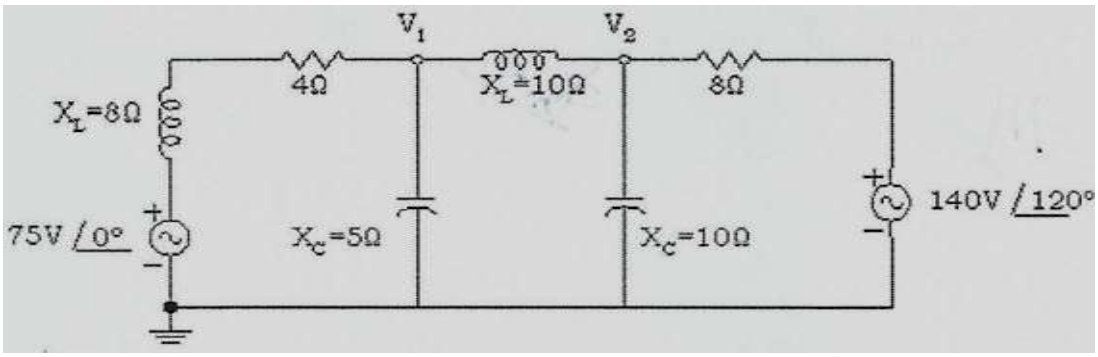
d) Define the terms: Mesh, Tree, link and Degree of node.

e) Find I_3 from the circuit shown in figure.



Q.3 Solve any two of the following. **12**

a) Find the magnitude of V1 by using nodal analysis.



b) Derive necessary and sufficient condition for maximum power transfer condition from a voltage source with source impedance $R_s + JX_s$ to a load $R_L + JX_L$ · What is the value of power transferred in this case?

c) What is dual of a network? Explain the pairs of dual terms along with the steps to draw dual of any network with one example.

Section – II

Q.4 Solve any four of the following question. **16**

a) Derive an expression for AC response given by RC circuit.

b) Compare series and Parallel resonance.

c) Draw and Explain behavior of circuit element under switching condition.

d) Define the terms at series resonance: Impedance, Current, power factor, phaser diagrams.

e) Derive the Z- Parameter in terms of Y, H.

Q.5 Solve any two of the following. **12**

a) Find the response given by RL circuit for DC input.

b) Find h parameter of following data.

1) with output terminal short circuited V_1=25,I_1=1A,I_2 =2A
2) with input terminals are open circuited V_1=10V, V_2=50V, and I_2=2A.

c) Obtain values of R,L and C in a series RLC circuit that resonates at 1.5KHz and consumes 50W from a 50 V AC source operating at resonant frequency . The Bandwidth is 0.75KHz.

Seat No.	

Set **P**

S.E. (Part - I) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
ANALOG ELECTRONICS

Day & Date: Saturday, 14-12-2019 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q.No.1 is compulsory and should be solved in first 30 Minutes in answer Book.
2) Figures to the right indicate full mark.
3) If necessary, assume suitable data.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) The Op-amp can amplify _____.
   a) a.c. signals only
   b) d.c. signals only
   c) Both a.c. signals and d.c. signals
   d) Neither a.c. signals and d.c. signals

2) When a capacitor is used in place of a resistor in an op-amp network, its placement determines _____.
   a) open- or closed-loop gain b) integration or differentiation
   c) saturation or cutoff d) addition or subtraction

3) The input offset current equals the _____.
   a) average of two base currents
   b) collector current divided by the current gain
   c) difference between two base-emitter voltages
   d) difference between two base currents

4) An ideal OP-AMP is has input resistance of _____ and output resistance of _____.
   a) Infinity, Zero b) Infinity,100
   c) 1KΩ, Zero Ro d) All the above

5) The open loop gain of an ideal OP-AMP is _____.
   a) Zero b) 100
   c) ∞ d) None of the above

6) Transistor Biasing is generally provided by a _____.
   a) Biasing circuit b) Bias battery
   c) Diode d) None of the above

7) The Schmitt trigger is a two-state device that is used for _____.
   a) pulse shaping b) peak detection
   c) input noise rejection d) filtering

8) If an op-amp has one input grounded and the other input has a signal feed to it, then it is operating as what?
   a) Common-mode b) Single-ended
   c) Double-ended d) Noninverting mode

9) An ideal operational amplifier has _____.
   a) infinite output impedance
   b) zero input impedance
   c) infinite bandwidth
   d) All of the above

10) The voltage follower has a _____.
   a) closed-loop voltage gain of unity
   b) small open-loop voltage gain
   c) closed-loop bandwidth of zero
   d) large closed-loop output

11) An ideal amplifier should have _____.
   a) high input current
   b) zero offset
   c) high output impedance
   d) moderate gain

12) A non inverting closed-loop op-amp circuit generally as a gain factor _____.
   a) less than one
   b) greater than one
   c) zero
   d) equal to one

13) The closed-loop voltage gain of an inverting amplifier equals _____.
   a) the ratio of the input resistance to the feedback resistance
   b) the open-loop voltage gain
   c) the feedback resistance divided by the input resistance
   d) the input resistance

14) If the input to a comparator is a sine wave, the output is a _____.
   a) ramp voltage
   b) sine wave
   c) rectangular wave
   d) sawtooth wave

Seat No.	

Set **P**

S.E. (Part - I) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
ANALOG ELECTRONICS

Day & Date: Saturday, 14-12-2019 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume the suitable data if necessary.

Section – I

Q.2 Solve Any Three. **12**

a) What is rectifier and Explain in brief?
b) What is load line analysis? Explain Q-point.
c) Explain class A amplifier.
d) Explain the working of depletion type MOSFET.

Q.3 Solve Any Two. **16**

a) Explain operation of bridge rectifier.
b) Explain working of unijunction transistor. Also discuss its Vl characteristics.
c) What is clamper? Explain positive clamper.

Section – II

Q.4 Solve Any Three. **12**

a) Draw general block diagram of op-amp and pin diagram of IC 741.
b) Explain instrumentation amplifier.
c) What are the applications of op-amp?
d) What are closed loop inverting and non-inverting amplifiers?

Q.5 Solve Any Two. **16**

a) Explain op-amp as a integrator.
b) Explain with neat diagram and waveforms of IC 555 as astable multivibrator. Also derive expression for frequency.
c) What are ideal characteristics of op-amp? Explain following terms in op-amp.
1) CMRR
2) PSRR

Seat No.	

Set **Q**

S.E. (Part - I) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
ANALOG ELECTRONICS

Day & Date: Saturday, 14-12-2019 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q.No.1 is compulsory and should be solved in first 30 Minutes in answer Book.
2) Figures to the right indicate full mark.
3) If necessary, assume suitable data.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) If an op-amp has one input grounded and the other input has a signal feed to it, then it is operating as what?
   a) Common-mode b) Single-ended
   c) Double-ended d) Noninverting mode

2) An ideal operational amplifier has _____.
   a) infinite output impedance b) zero input impedance
   c) infinite bandwidth d) All of the above

3) The voltage follower has a _____.
   a) closed-loop voltage gain of unity
   b) small open-loop voltage gain
   c) closed-loop bandwidth of zero
   d) large closed-loop output

4) An ideal amplifier should have _____.
   a) high input current b) zero offset
   c) high output impedance d) moderate gain

5) A non inverting closed-loop op-amp circuit generally as a gain factor _____.
   a) less than one b) greater than one
   c) zero d) equal to one

6) The closed-loop voltage gain of an inverting amplifier equals _____.
   a) the ratio of the input resistance to the feedback resistance
   b) the open-loop voltage gain
   c) the feedback resistance divided by the input resistance
   d) the input resistance

7) If the input to a comparator is a sine wave, the output is a _____.
   a) ramp voltage b) sine wave
   c) rectangular wave d) sawtooth wave

8) The Op-amp can amplify _____.
   a) a.c. signals only
   b) d.c. signals only
   c) Both a.c. signals and d.c. signals
   d) Neither a.c. signals and d.c. signals

9) When a capacitor is used in place of a resistor in an op-amp network, its placement determines _____.
   a) open- or closed-loop gain
   b) integration or differentiation
   c) saturation or cutoff
   d) addition or subtraction

10) The input offset current equals the _____.
   a) average of two base currents
   b) collector current divided by the current gain
   c) difference between two base-emitter voltages
   d) difference between two base currents

11) An ideal OP-AMP is has input resistance of _____ and output resistance of _____.
   a) Infinity, Zero
   b) Infinity,100
   c) 1KΩ, Zero Ro
   d) All the above

12) The open loop gain of an ideal OP-AMP is _____.
   a) Zero
   b) 100
   c) ∞
   d) None of the above

13) Transistor Biasing is generally provided by a _____.
   a) Biasing circuit
   b) Bias battery
   c) Diode
   d) None of the above

14) The Schmitt trigger is a two-state device that is used for _____.
   a) pulse shaping
   b) peak detection
   c) input noise rejection
   d) filtering

Seat No.	

Set **Q**

S.E. (Part - I) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
ANALOG ELECTRONICS

Day & Date: Saturday, 14-12-2019 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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

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a) What is rectifier and Explain in brief?
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a) Explain operation of bridge rectifier.
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Section – II

Q.4 Solve Any Three. **12**

a) Draw general block diagram of op-amp and pin diagram of IC 741.
b) Explain instrumentation amplifier.
c) What are the applications of op-amp?
d) What are closed loop inverting and non-inverting amplifiers?

Q.5 Solve Any Two. **16**

a) Explain op-amp as a integrator.
b) Explain with neat diagram and waveforms of IC 555 as astable multivibrator. Also derive expression for frequency.
c) What are ideal characteristics of op-amp? Explain following terms in op-amp.
1) CMRR
2) PSRR

Seat No.	

Set **R**

S.E. (Part - I) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
ANALOG ELECTRONICS

Day & Date: Saturday, 14-12-2019 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q.No.1 is compulsory and should be solved in first 30 Minutes in answer Book.
2) Figures to the right indicate full mark.
3) If necessary, assume suitable data.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) The open loop gain of an ideal OP-AMP is _____.
   a) Zero b) 100
   c) ∞ d) None of the above

2) Transistor Biasing is generally provided by a _____.
   a) Biasing circuit b) Bias battery
   c) Diode d) None of the above

3) The Schmitt trigger is a two-state device that is used for _____.
   a) pulse shaping b) peak detection
   c) input noise rejection d) filtering

4) If an op-amp has one input grounded and the other input has a signal feed to it, then it is operating as what?
   a) Common-mode b) Single-ended
   c) Double-ended d) Noninverting mode

5) An ideal operational amplifier has _____.
   a) infinite output impedance b) zero input impedance
   c) infinite bandwidth d) All of the above

6) The voltage follower has a _____.
   a) closed-loop voltage gain of unity
   b) small open-loop voltage gain
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   d) large closed-loop output

7) An ideal amplifier should have _____.
   a) high input current b) zero offset
   c) high output impedance d) moderate gain

8) A non inverting closed-loop op-amp circuit generally as a gain factor _____.
   a) less than one b) greater than one
   c) zero d) equal to one

9) The closed-loop voltage gain of an inverting amplifier equals _____.
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   a) Infinity, Zero
   b) Infinity,100
   c) 1KΩ, Zero Ro
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SLR-FM-753

Seat No.	

Set R

S.E. (Part - I) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
ANALOG ELECTRONICS

Day & Date: Saturday, 14-12-2019 Max. Marks: 56
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Section – I

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Seat No.	

Set **S**

S.E. (Part - I) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
ANALOG ELECTRONICS

Day & Date: Saturday, 14-12-2019 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q.No.1 is compulsory and should be solved in first 30 Minutes in answer Book.
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MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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3) A non inverting closed-loop op-amp circuit generally as a gain factor _____.
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   d) Noninverting mode

14) An ideal operational amplifier has _____.
   a) infinite output impedance
   b) zero input impedance
   c) infinite bandwidth
   d) All of the above

SLR-FM-753

Seat No.	

Set S

S.E. (Part - I) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
ANALOG ELECTRONICS

Day & Date: Saturday, 14-12-2019 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume the suitable data if necessary.

Section – I

Q.2 Solve Any Three. **12**

a) What is rectifier and Explain in brief?
b) What is load line analysis? Explain Q-point.
c) Explain class A amplifier.
d) Explain the working of depletion type MOSFET.

Q.3 Solve Any Two. **16**

a) Explain operation of bridge rectifier.
b) Explain working of unijunction transistor. Also discuss its Vl characteristics.
c) What is clamper? Explain positive clamper.

Section – II

Q.4 Solve Any Three. **12**

a) Draw general block diagram of op-amp and pin diagram of IC 741.
b) Explain instrumentation amplifier.
c) What are the applications of op-amp?
d) What are closed loop inverting and non-inverting amplifiers?

Q.5 Solve Any Two. **16**

a) Explain op-amp as a integrator.
b) Explain with neat diagram and waveforms of IC 555 as astable multivibrator. Also derive expression for frequency.
c) What are ideal characteristics of op-amp? Explain following terms in op-amp.
1) CMRR
2) PSRR

Seat No.	

Set **P**

S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
ELECTRICAL POWER GENERATION

Day & Date: Tuesday, 17-12-2019 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
2) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) In a super-heater _____.
   a) Pressure rises, temperature drops
   b) Pressure rises, temperature remains constant
   c) Pressure remains constant and temperature rises
   d) Both pressure and temperature remains constant

2) Photovoltaic solar energy conversion system makes use of _____.
   a) Fuel cell b) Solar cell
   c) Solar pond d) None of the above

3) Solar cells are made of _____.
   a) silicon b) Germanium
   c) silver d) Aluminium

4) A condenser in a thermal power plant condenses steam combing out of _____.
   a) Boiler b) Super-heater
   c) Economizer d) Turbine

5) Which of the following is not the voltage at which power is usually transmitted?
   a) 132 kV b) 66 kV
   c) 33 kV d) 20 kV

6) Which of the following is considered as superior quality of coal?
   a) Bituminous coal b) Peat
   c) Lignite d) Coke

7) Out of the following which one is not a unconventional source of energy?
   a) Tidal power b) Geothermal energy
   c) Nuclear energy d) Wind power

8) Pulverized coal is _____.
   a) Coal free from ash b) Non-smoking coal
   c) Coal which bums for long time d) Coal broken into fine particles

9) Coal used in power plant is also known as _____.
   a) Steam Coal b) Charcoal
   c) Coke d) Soft coal

10) Live storage of coal in a power plant means _____.
   a) Coal ready for combustion
   b) Preheated coal
   c) Storage of coal sufficient to meet 24 hour demand of the plant
   d) Coal in transit

11) In a power plant, coal is carried from storage place to boilers generally by means of _____.
   a) Bucket
   b) V-belts
   c) Trolleys
   d) Manually

12) Advantage of hydro-electric power station is _____.
   a) Low operating cost
   b) Free from pollution problems
   c) No fuel transportation problems
   d) All of the above

13) Which coal will have highest ash content?
   a) Bituminous coal
   b) Grade I steam coal
   c) Coking coal
   d) Lignite

14) Burning of low grade fuel can be improved by _____.
   a) Blending with better quality
   b) Oil assisted ignition
   c) Pulverizing
   d) Any of the above

Seat No.	

Set **P**

S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
ELECTRICAL POWER GENERATION

Day & Date: Tuesday, 17-12-2019 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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

Q.2 Attempt ant three. **12**

a) Explain the handling of fuels in thermal power plant.
b) Explain the process of nuclear fission.
c) Explain single line diagram of typical AC power system.
d) Explain pelton turbine with neat diagram.
e) Write a short note on hydrology.

Q.3 Attempt any two. **16**

a) Explain CANDU type reactor with neat diagram, also state its advantages and disadvantages.
b) Discuss factors to be considered for selection of site for thermal power plant.
c) Draw typical layout of hydroelectric power plant and explain it briefly.

Q.4 Attempt any three. **12**

a) Write a short note on load curve.
b) Explain the working of thermal power station.
c) Explain common circular digester with floating gas holder (KVIC digester) with neat diagram.
d) Define bio-gas energy.
e) Explain wind power plant with block diagram.

Q.5 Attempt any two. **16**

a) Explain geo-thermal power plant with neat diagram also state its application.
b) Explain the working of diesel power plant with the help of neat block diagram.
c) Explain the following
1) Load factor
2) Plant capacity factor
3) Demand factor

Seat No.	

Set **Q**

S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
ELECTRICAL POWER GENERATION

Day & Date: Tuesday, 17-12-2019 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
2) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) Pulverized coal is _____.
   a) Coal free from ash b) Non-smoking coal
   c) Coal which bums for long time d) Coal broken into fine particles

2) Coal used in power plant is also known as _____.
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   c) Coke d) Soft coal

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7) Burning of low grade fuel can be improved by _____.
   a) Blending with better quality b) Oil assisted ignition
   c) Pulverizing d) Any of the above

8) In a super-heater _____.
   a) Pressure rises, temperature drops
   b) Pressure rises, temperature remains constant
   c) Pressure remains constant and temperature rises
   d) Both pressure and temperature remains constant

9) Photovoltaic solar energy conversion system makes use of _____.
   a) Fuel cell b) Solar cell
   c) Solar pond d) None of the above

10) Solar cells are made of _____.
   a) silicon b) Germanium
   c) silver d) Aluminium

11) A condenser in a thermal power plant condenses steam combing out of _____.
   a) Boiler b) Super-heater
   c) Economizer d) Turbine

12) Which of the following is not the voltage at which power is usually transmitted?
   a) 132 kV b) 66 kV
   c) 33 kV d) 20 kV

13) Which of the following is considered as superior quality of coal?
   a) Bituminous coal b) Peat
   c) Lignite d) Coke

14) Out of the following which one is not a unconventional source of energy?
   a) Tidal power b) Geothermal energy
   c) Nuclear energy d) Wind power

Seat No.	

Set **Q**

S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
ELECTRICAL POWER GENERATION

Day & Date: Tuesday, 17-12-2019 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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2) Figures to the right indicate full marks.

Q.2 Attempt ant three. **12**

a) Explain the handling of fuels in thermal power plant.
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d) Explain pelton turbine with neat diagram.
e) Write a short note on hydrology.

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a) Explain CANDU type reactor with neat diagram, also state its advantages and disadvantages.
b) Discuss factors to be considered for selection of site for thermal power plant.
c) Draw typical layout of hydroelectric power plant and explain it briefly.

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b) Explain the working of thermal power station.
c) Explain common circular digester with floating gas holder (KVIC digester) with neat diagram.
d) Define bio-gas energy.
e) Explain wind power plant with block diagram.

Q.5 Attempt any two. **16**

a) Explain geo-thermal power plant with neat diagram also state its application.
b) Explain the working of diesel power plant with the help of neat block diagram.
c) Explain the following
1) Load factor
2) Plant capacity factor
3) Demand factor

Seat No.	

Set **R**

S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
ELECTRICAL POWER GENERATION

Day & Date: Tuesday, 17-12-2019 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
2) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) Which of the following is not the voltage at which power is usually transmitted?
   a) 132 kV b) 66 kV
   c) 33 kV d) 20 kV

2) Which of the following is considered as superior quality of coal?
   a) Bituminous coal b) Peat
   c) Lignite d) Coke

3) Out of the following which one is not a unconventional source of energy?
   a) Tidal power b) Geothermal energy
   c) Nuclear energy d) Wind power

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   b) Preheated coal
   c) Storage of coal sufficient to meet 24 hour demand of the plant
   d) Coal in transit

7) In a power plant, coal is carried from storage place to boilers generally by means of _____.
   a) Bucket b) V-belts
   c) Trolleys d) Manually

8) Advantage of hydro-electric power station is _____.
   a) Low operating cost
   b) Free from pollution problems
   c) No fuel transportation problems
   d) All of the above

9) Which coal will have highest ash content?
   a) Bituminous coal b) Grade I steam coal
   c) Coking coal d) Lignite

10) Burning of low grade fuel can be improved by _____.
   a) Blending with better quality
   b) Oil assisted ignition
   c) Pulverizing
   d) Any of the above

11) In a super-heater _____.
   a) Pressure rises, temperature drops
   b) Pressure rises, temperature remains constant
   c) Pressure remains constant and temperature rises
   d) Both pressure and temperature remains constant

12) Photovoltaic solar energy conversion system makes use of _____.
   a) Fuel cell
   b) Solar cell
   c) Solar pond
   d) None of the above

13) Solar cells are made of _____.
   a) silicon
   b) Germanium
   c) silver
   d) Aluminium

14) A condenser in a thermal power plant condenses steam combing out of _____.
   a) Boiler
   b) Super-heater
   c) Economizer
   d) Turbine

Seat No.	

Set **R**

S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
ELECTRICAL POWER GENERATION

Day & Date: Tuesday, 17-12-2019 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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

Q.2 Attempt ant three. **12**

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c) Explain single line diagram of typical AC power system.
d) Explain pelton turbine with neat diagram.
e) Write a short note on hydrology.

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a) Explain CANDU type reactor with neat diagram, also state its advantages and disadvantages.
b) Discuss factors to be considered for selection of site for thermal power plant.
c) Draw typical layout of hydroelectric power plant and explain it briefly.

Q.4 Attempt any three. **12**

a) Write a short note on load curve.
b) Explain the working of thermal power station.
c) Explain common circular digester with floating gas holder (KVIC digester) with neat diagram.
d) Define bio-gas energy.
e) Explain wind power plant with block diagram.

Q.5 Attempt any two. **16**

a) Explain geo-thermal power plant with neat diagram also state its application.
b) Explain the working of diesel power plant with the help of neat block diagram.
c) Explain the following
1) Load factor
2) Plant capacity factor
3) Demand factor

Seat No.	

Set **S**

S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
ELECTRICAL POWER GENERATION

Day & Date: Tuesday, 17-12-2019 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
2) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) Live storage of coal in a power plant means _____.
   a) Coal ready for combustion
   b) Preheated coal
   c) Storage of coal sufficient to meet 24 hour demand of the plant
   d) Coal in transit

2) In a power plant, coal is carried from storage place to boilers generally by means of _____.
   a) Bucket b) V-belts
   c) Trolleys d) Manually

3) Advantage of hydro-electric power station is _____.
   a) Low operating cost
   b) Free from pollution problems
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   d) All of the above

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   c) Coking coal d) Lignite

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13) Pulverized coal is _____.
   a) Coal free from ash b) Non-smoking coal
   c) Coal which bums for long time d) Coal broken into fine particles

14) Coal used in power plant is also known as _____.
   a) Steam Coal b) Charcoal
   c) Coke d) Soft coal

Seat No.	

Set **S**

S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
ELECTRICAL POWER GENERATION

Day & Date: Tuesday, 17-12-2019 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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

Q.2 Attempt ant three. **12**

a) Explain the handling of fuels in thermal power plant.
b) Explain the process of nuclear fission.
c) Explain single line diagram of typical AC power system.
d) Explain pelton turbine with neat diagram.
e) Write a short note on hydrology.

Q.3 Attempt any two. **16**

a) Explain CANDU type reactor with neat diagram, also state its advantages and disadvantages.
b) Discuss factors to be considered for selection of site for thermal power plant.
c) Draw typical layout of hydroelectric power plant and explain it briefly.

Q.4 Attempt any three. **12**

a) Write a short note on load curve.
b) Explain the working of thermal power station.
c) Explain common circular digester with floating gas holder (KVIC digester) with neat diagram.
d) Define bio-gas energy.
e) Explain wind power plant with block diagram.

Q.5 Attempt any two. **16**

a) Explain geo-thermal power plant with neat diagram also state its application.
b) Explain the working of diesel power plant with the help of neat block diagram.
c) Explain the following
1) Load factor
2) Plant capacity factor
3) Demand factor

Seat No.	

Set **P**

S.E. (Part - II) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
A.C. MACHINES

Day & Date: Saturday, 23-11-2019 Max. Marks: 70
Time: 02.30 PM To 05.30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
2) Figures to the right indicate full marks.
3) Assume the suitable data whenever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) Which of the following rotor quantity in a SCIM does NOT depend on its slip?
   a) Reactance b) Speed
   c) Induced EMF d) Frequency

2) Pull-out torque of a SCIM occurs at that value of slip where rotor power factor equals _____.
   a) Unity b) 0.707
   c) 0.86 d) 0.5

3) The fractional slip of an induction motor is the ratio _____.
   a) Rotor Cu loss/rotor input b) Stator Cu loss/stator input
   c) Rotor Cu loss/rotor output d) Rotor Cu loss/stator Cu loss

4) When load is placed on a 3-phase induction motor, its slip, _____.
   a) Increases b) Decreases
   c) Remain constant d) None of the above

5) The power factor of a 3-phase induction motor at no load is approximately _____.
   a) 0.2 b) 0.7
   c) 0.85 d) 1

6) The maximum torque in a 3-phase induction motor occurs at a slip _____.
   a) R2/X2 b) X2/R2
   c) R2= X2 d) none of the above

7) The torque developed by a split phase motor is proportional to _____.
   a) Sine of angle between I_m and I_s
   b) Cosine of angle between I_m and I_s
   c) Main winding current I_m
   d) Auxiliary winding current I_s

8) In a shaded pole motor, shading coils are used to _____.
   a) Reduce windage losses
   b) Reduce friction losses
   c) Produce rotating magnetic field
   d) To protect against sparking

9) Which kind of rotor is most suitable for turbo alternators?
   a) Salient pole type
   b) Non-salient pole type
   c) Both (A) and (B) above
   d) None of the above

10) The number of electrical degrees passed through in one revolution of a 4 pole synchronous alternator is _____.
   a) 360
   b) 720
   c) 1080
   d) 2160

11) Synchronous motor can operate at _____.
   a) Lagging power factor only
   b) Leading power factor only
   c) Unity power factor only
   d) Lagging, leading and unity power factor only

12) When applied rated voltage per phase is reduced by one-half, the starting torque of a SCIM becomes_____ of the starting torque with full voltage.
   a) 1/2
   b) 1/4
   c) 3/4
   d) 3/2

13) V curves for a synchronous motor represent relation between _____.
   a) Field current and speed
   b) field current and power factor
   c) Power factor and speed
   d) armature current and field current

14) The effect of increasing the length of air-gap in an induction motor will be to increase the _____.
   a) Power factor
   b) Magnetizing current
   c) Speed
   d) None of the above

Seat No.	

Set **P**

S.E. (Part - II) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
A.C. MACHINES

Day & Date: Saturday, 23-11-2019 Max. Marks: 56
Time: 02.30 PM To 05.30 PM

Instructions: 1) All questions are compulsory.
2) Assume the suitable data whenever necessary.

Section – I

Q.2 Attempt any three: **12**

a) With neat diagram explain star-delta starter.

b) 1100V, 50Hz, delta connected slip ring induction motor with phase transformation ratio of 3.8 has rotor resistance and leakage reactances are 0.012Ω and 0.25Ω respectively. Find
1) Rotor current per phase and rotor P.F. at start with slip rings short circuited.
2) Rotor current per phase and rotor P.F. at slip of 4% with slip rings short circuited.

c) Find the condition for maximum torque of 3ø induction motor.

d) Draw any four types of 1ø induction motor.

Q.3 Attempt any two: **16**

a) Explain methods of speed control of 3ø induction motor.

b) Why 1ø induction motor is not self starting? How to make itself start? Explain double field revolving theory?

c) A 3 phase, 400V, 50 Hz, 5.6KW, 4 pole Induction motor gave the following test data.
N.L. Test - 400V, 6A, 0.087.
S.C. Test - 100V, 12A, 720W.
Primary / secondary turns ratio = 2.62, R1/phase = 0.67Ω, R2/phase = 0.185Ω, Draw the circle diagram. Find full load current & P.F., slip, maximum output power.

Section - II

Q.4 Attempt any three. **12**

a) Explain Ampere-turn method of voltage regulation.

b) Derive an expression for EMF equation of alternator.

c) With diagram Explain Synchronous condenser.

d) A 12 pole, 3ø , star connected alternator has 72 slots, flux/pole is 0.0988wb.calculate,
1) Speed if frequency of generated EMF is 50Hz.
2) Terminal EMF for full-pitched coils & 8 conductor/ slot.

Q.5 Attempt any two. **16**

a) With neat vector diagram explain V & inverted V curves of synchronous motor.

b) Explain two reaction theory in an alternator.

c) 750KVA, 11KV, 4 pole, 3ø star connected alternator has percentage resistance and reactance of 1 & 15 respectively. Calculate the synchronizing power per mechanical degree of displacement at

1) No load
2) Full load 0.8 PF lagging.

Terminal voltage in each case is 11KV.

Seat No.	

Set **Q**

S.E. (Part - II) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
A.C. MACHINES

Day & Date: Saturday, 23-11-2019 Max. Marks: 70
Time: 02.30 PM To 05.30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
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MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

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   c) Unity power factor only
   d) Lagging, leading and unity power factor only

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   a) 1/2 b) 1/4
   c) 3/4 d) 3/2

6) V curves for a synchronous motor represent relation between _____.
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   b) field current and power factor
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   b) 0.7
   c) 0.85
   d) 1

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   a) R2/X2
   b) X2/R2
   c) R2= X2
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   a) Sine of angle between I_m and I_s
   b) Cosine of angle between I_m and I_s
   c) Main winding current I_m
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Seat No.	

Set **Q**

S.E. (Part - II) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
A.C. MACHINES

Day & Date: Saturday, 23-11-2019 Max. Marks: 56
Time: 02.30 PM To 05.30 PM

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Section – I

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2) Rotor current per phase and rotor P.F. at slip of 4% with slip rings short circuited.

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d) Draw any four types of 1ø induction motor.

Q.3 Attempt any two: **16**

a) Explain methods of speed control of 3ø induction motor.

b) Why 1ø induction motor is not self starting? How to make itself start? Explain double field revolving theory?

c) A 3 phase, 400V, 50 Hz, 5.6KW, 4 pole Induction motor gave the following test data.
N.L. Test - 400V, 6A, 0.087.
S.C. Test - 100V, 12A, 720W.
Primary / secondary turns ratio = 2.62, R1/phase = 0.67Ω, R2/phase = 0.185Ω, Draw the circle diagram. Find full load current & P.F., slip, maximum output power.

Section - II

Q.4 Attempt any three. **12**

a) Explain Ampere-turn method of voltage regulation.

b) Derive an expression for EMF equation of alternator.

c) With diagram Explain Synchronous condenser.

d) A 12 pole, 3ø , star connected alternator has 72 slots, flux/pole is 0.0988wb.calculate,
1) Speed if frequency of generated EMF is 50Hz.
2) Terminal EMF for full-pitched coils & 8 conductor/ slot.

Q.5 Attempt any two. **16**

a) With neat vector diagram explain V & inverted V curves of synchronous motor.

b) Explain two reaction theory in an alternator.

c) 750KVA, 11KV, 4 pole, 3ø star connected alternator has percentage resistance and reactance of 1 & 15 respectively. Calculate the synchronizing power per mechanical degree of displacement at

1) No load
2) Full load 0.8 PF lagging.

Terminal voltage in each case is 11KV.

Seat No.	

Set **R**

S.E. (Part - II) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
A.C. MACHINES

Day & Date: Saturday, 23-11-2019 Max. Marks: 70
Time: 02.30 PM To 05.30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
2) Figures to the right indicate full marks.
3) Assume the suitable data whenever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) The power factor of a 3-phase induction motor at no load is approximately _____.
   a) 0.2 b) 0.7
   c) 0.85 d) 1

2) The maximum torque in a 3-phase induction motor occurs at a slip _____.
   a) R2/X2 b) X2/R2
   c) R2= X2 d) none of the above

3) The torque developed by a split phase motor is proportional to _____.
   a) Sine of angle between I_m and I_s
   b) Cosine of angle between I_m and I_s
   c) Main winding current I_m
   d) Auxiliary winding current I_s

4) In a shaded pole motor, shading coils are used to _____.
   a) Reduce windage losses
   b) Reduce friction losses
   c) Produce rotating magnetic field
   d) To protect against sparking

5) Which kind of rotor is most suitable for turbo alternators?
   a) Salient pole type b) Non-salient pole type
   c) Both (A) and (B) above d) None of the above

6) The number of electrical degrees passed through in one revolution of a 4 pole synchronous alternator is _____.
   a) 360 b) 720
   c) 1080 d) 2160

7) Synchronous motor can operate at _____.
   a) Lagging power factor only
   b) Leading power factor only
   c) Unity power factor only
   d) Lagging, leading and unity power factor only

8) When applied rated voltage per phase is reduced by one-half, the starting torque of a SCIM becomes_____ of the starting torque with full voltage.
   a) 1/2 b) 1/4
   c) 3/4 d) 3/2

9) V curves for a synchronous motor represent relation between _____.
   a) Field current and speed
   b) field current and power factor
   c) Power factor and speed
   d) armature current and field current

10) The effect of increasing the length of air-gap in an induction motor will be to increase the _____.
   a) Power factor b) Magnetizing current
   c) Speed d) None of the above

11) Which of the following rotor quantity in a SCIM does NOT depend on its slip?
   a) Reactance b) Speed
   c) Induced EMF d) Frequency

12) Pull-out torque of a SCIM occurs at that value of slip where rotor power factor equals _____.
   a) Unity b) 0.707
   c) 0.86 d) 0.5

13) The fractional slip of an induction motor is the ratio _____.
   a) Rotor Cu loss/rotor input b) Stator Cu loss/stator input
   c) Rotor Cu loss/rotor output d) Rotor Cu loss/stator Cu loss

14) When load is placed on a 3-phase induction motor, its slip, _____.
   a) Increases b) Decreases
   c) Remain constant d) None of the above

Seat No.	

Set **R**

S.E. (Part - II) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
A.C. MACHINES

Day & Date: Saturday, 23-11-2019 Max. Marks: 56
Time: 02.30 PM To 05.30 PM

Instructions: 1) All questions are compulsory.
2) Assume the suitable data whenever necessary.

Section – I

Q.2 Attempt any three: **12**

a) With neat diagram explain star-delta starter.

b) 1100V, 50Hz, delta connected slip ring induction motor with phase transformation ratio of 3.8 has rotor resistance and leakage reactances are 0.012Ω and 0.25Ω respectively. Find
1) Rotor current per phase and rotor P.F. at start with slip rings short circuited.
2) Rotor current per phase and rotor P.F. at slip of 4% with slip rings short circuited.

c) Find the condition for maximum torque of 3ø induction motor.

d) Draw any four types of 1ø induction motor.

Q.3 Attempt any two: **16**

a) Explain methods of speed control of 3ø induction motor.

b) Why 1ø induction motor is not self starting? How to make itself start? Explain double field revolving theory?

c) A 3 phase, 400V, 50 Hz, 5.6KW, 4 pole Induction motor gave the following test data.
N.L. Test - 400V, 6A, 0.087.
S.C. Test - 100V, 12A, 720W.
Primary / secondary turns ratio = 2.62, R1/phase = 0.67Ω, R2/phase = 0.185Ω, Draw the circle diagram. Find full load current & P.F., slip, maximum output power.

Section - II

Q.4 Attempt any three. **12**

a) Explain Ampere-turn method of voltage regulation.

b) Derive an expression for EMF equation of alternator.

c) With diagram Explain Synchronous condenser.

d) A 12 pole, 3ø , star connected alternator has 72 slots, flux/pole is 0.0988wb.calculate,
1) Speed if frequency of generated EMF is 50Hz.
2) Terminal EMF for full-pitched coils & 8 conductor/ slot.

Q.5 Attempt any two. **16**

a) With neat vector diagram explain V & inverted V curves of synchronous motor.

b) Explain two reaction theory in an alternator.

c) 750KVA, 11KV, 4 pole, 3ø star connected alternator has percentage resistance and reactance of 1 & 15 respectively. Calculate the synchronizing power per mechanical degree of displacement at

1) No load
2) Full load 0.8 PF lagging.

Terminal voltage in each case is 11KV.

Seat No.	

Set **S**

S.E. (Part - II) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
A.C. MACHINES

Day & Date: Saturday, 23-11-2019 Max. Marks: 70
Time: 02.30 PM To 05.30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
2) Figures to the right indicate full marks.
3) Assume the suitable data whenever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) The number of electrical degrees passed through in one revolution of a 4 pole synchronous alternator is _____.
   a) 360 b) 720
   c) 1080 d) 2160

2) Synchronous motor can operate at _____.
   a) Lagging power factor only
   b) Leading power factor only
   c) Unity power factor only
   d) Lagging, leading and unity power factor only

3) When applied rated voltage per phase is reduced by one-half, the starting torque of a SCIM becomes_____ of the starting torque with full voltage.
   a) 1/2 b) 1/4
   c) 3/4 d) 3/2

4) V curves for a synchronous motor represent relation between _____.
   a) Field current and speed
   b) field current and power factor
   c) Power factor and speed
   d) armature current and field current

5) The effect of increasing the length of air-gap in an induction motor will be to increase the _____.
   a) Power factor b) Magnetizing current
   c) Speed d) None of the above

6) Which of the following rotor quantity in a SCIM does NOT depend on its slip?
   a) Reactance b) Speed
   c) Induced EMF d) Frequency

7) Pull-out torque of a SCIM occurs at that value of slip where rotor power factor equals _____.
   a) Unity b) 0.707
   c) 0.86 d) 0.5

8) The fractional slip of an induction motor is the ratio _____.
   a) Rotor Cu loss/rotor input
   b) Stator Cu loss/stator input
   c) Rotor Cu loss/rotor output
   d) Rotor Cu loss/stator Cu loss

9) When load is placed on a 3-phase induction motor, its slip, _____.
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   b) Decreases
   c) Remain constant
   d) None of the above

10) The power factor of a 3-phase induction motor at no load is approximately _____.
   a) 0.2
   b) 0.7
   c) 0.85
   d) 1

11) The maximum torque in a 3-phase induction motor occurs at a slip _____.
   a) R2/X2
   b) X2/R2
   c) R2= X2
   d) none of the above

12) The torque developed by a split phase motor is proportional to _____.
   a) Sine of angle between I_m and I_s
   b) Cosine of angle between I_m and I_s
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   d) Auxiliary winding current I_s

13) In a shaded pole motor, shading coils are used to _____.
   a) Reduce windage losses
   b) Reduce friction losses
   c) Produce rotating magnetic field
   d) To protect against sparking

14) Which kind of rotor is most suitable for turbo alternators?
   a) Salient pole type
   b) Non-salient pole type
   c) Both (A) and (B) above
   d) None of the above

Seat No.	

Set **S**

S.E. (Part - II) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
A.C. MACHINES

Day & Date: Saturday, 23-11-2019 Max. Marks: 56
Time: 02.30 PM To 05.30 PM

Instructions: 1) All questions are compulsory.
2) Assume the suitable data whenever necessary.

Section – I

Q.2 Attempt any three: **12**

a) With neat diagram explain star-delta starter.

b) 1100V, 50Hz, delta connected slip ring induction motor with phase transformation ratio of 3.8 has rotor resistance and leakage reactances are 0.012Ω and 0.25Ω respectively. Find
1) Rotor current per phase and rotor P.F. at start with slip rings short circuited.
2) Rotor current per phase and rotor P.F. at slip of 4% with slip rings short circuited.

c) Find the condition for maximum torque of 3ø induction motor.

d) Draw any four types of 1ø induction motor.

Q.3 Attempt any two: **16**

a) Explain methods of speed control of 3ø induction motor.

b) Why 1ø induction motor is not self starting? How to make itself start? Explain double field revolving theory?

c) A 3 phase, 400V, 50 Hz, 5.6KW, 4 pole Induction motor gave the following test data.
N.L. Test - 400V, 6A, 0.087.
S.C. Test - 100V, 12A, 720W.
Primary / secondary turns ratio = 2.62, R1/phase = 0.67Ω, R2/phase = 0.185Ω, Draw the circle diagram. Find full load current & P.F., slip, maximum output power.

Section - II

Q.4 Attempt any three. **12**

a) Explain Ampere-turn method of voltage regulation.

b) Derive an expression for EMF equation of alternator.

c) With diagram Explain Synchronous condenser.

d) A 12 pole, 3ø , star connected alternator has 72 slots, flux/pole is 0.0988wb.calculate,
1) Speed if frequency of generated EMF is 50Hz.
2) Terminal EMF for full-pitched coils & 8 conductor/ slot.

Q.5 Attempt any two. **16**

a) With neat vector diagram explain V & inverted V curves of synchronous motor.

b) Explain two reaction theory in an alternator.

c) 750KVA, 11KV, 4 pole, 3ø star connected alternator has percentage resistance and reactance of 1 & 15 respectively. Calculate the synchronizing power per mechanical degree of displacement at

1) No load
2) Full load 0.8 PF lagging.

Terminal voltage in each case is 11KV.

Seat No.	

Set **P**

S.E. (Part - II) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
ELECTRICAL & ELECTRONICS MEASUREMENT

Day & Date: Monday,25-11-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and it should be solved in first 30 minutes in answer book.
2) Figures to the right indicate full marks.
3) Assume the suitable data wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) If the instrument is to have a wide range, the instrument should have _____.
   a) Linear scale b) Square-law scale
   c) Exponential scale d) Logarithmic scale

2) The instrument which is cheapest for dc measurement is _____.
   a) Moving iron b) PMMC
   c) Hot-wire d) Electro-dynamo

3) Which of the following instruments can be used for full scale deflection of 300°?
   a) PMMC b) Induction type
   c) Hot-wire d) Electrostatic

4) The breaking torque provided by permanent in single phase induction energy meter can be changed by _____.
   a) Providing a magnetic shunt & changing its position
   b) Changing the distance of permanent magnet from center of revolving disc
   c) Both a & b
   d) None of the above

5) Moving iron and PMMC instruments can be distinguished from each other by looking at _____.
   a) Pointer b) Terminal size
   c) Scale d) Scale range

6) The power in 3-phase 3-wire circuit can be measured by using _____.
   a) 2 wattmeter b) 1 wattmeter
   c) 3 wattmeter d) None of these

7) In two watt meter method of power measurement, if one of the watt meter shows zero reading, then it can be concluded that _____.
   a) Power factor is unit b) Power factor is zero
   c) Power factor is 0.5 lagging d) Power factor is 0.5 leading

8) For measuring emf of a standard cell we use: _____.
   a) Galvanometer b) Potentiometer
   c) Zener reference d) Electro-dynamic voltmeter

9) An oscilloscope indicates _____.
   a) Peak to peak value of voltage b) DC value of voltage
   c) RMS value d) Average

10) While selecting transducer for particular application _____.
   a) Only the input characteristics should be considered
   b) Only the output characteristics should be considered
   c) Only the transfer characteristics should be considered
   d) Input, output and transfer characteristics should be considered

11) Which of the following optical transducer is an active transducer?
   a) Photo emissive cell b) Photo diode
   c) Photo transistor d) Photovoltaic cell

12) The source of emission of electrons in a CRT is _____.
   a) PN junction diode
   b) A barium & strontium oxide coated cathode
   c) Accelerating anode
   d) Post accelerating anode

13) The instrument having its deflection depends upon average value is: _____.
   a) Moving iron b) Hot wire
   c) Rectifier type d) Induction type

14) In CRO the time base signal is applied to: _____.
   a) Y-plates b) X-plates
   c) Either X-plate or Y-plate d) Both X-plate and Y-plate

Seat No.	

Set **P**

S.E. (Part - II) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
ELECTRICAL & ELECTRONICS MEASUREMENT

Day & Date: Monday, 25-11-2019 Max. Marks: 56
Time: 02:30 PM To 05:30 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume the suitable data wherever necessary.

SECTION I

Q.2 Attempt any four: **16**

a) Explain Maxwell's inductance-capacitance bridge also draw its phasor diagram.
b) Explain shunt and multiplier with neat diagram.
c) Explain measurement of power in 1ø circuit by using 3voltmeter method.
d) An inductive load takes current 2.5 A; an non-inductive resistor is connected in parallel takes 2.4 A, when connected across 250 V supply. The total current taken from supply is 4.5A. Calculate :
1) Power absorbed by load
2) Load impedance
3) Power factor of the load
e) Derive the expression for current through galvanometer in a whetstones bridge for small unbalance.
f) Explain different types of torques in measuring instruments.

Q.3 Attempt any two: **12**

a) Explain LPF wattmeter with neat diagram.
b) Explain current transformer with neat diagram
c) The energy stored in a parallel plate capacitor per unit volume (energy density) is given by

$$w = k\varepsilon^a V^b d^c$$

Where ε = permittivity of medium, d= distance between plates
V= applied voltage, K=constant
Find the values of a,b,c,

SECTION II

Q.4 Attempt any four **16**

a) With neat sketch explain the strain gauge transducer.
b) Explain LED display with diagram.
c) Explain Q-meter with neat diagram.
d) Give the classification of transducers.
e) Explain construction & operation 1ø electrodynamometer power factor meter.
f) What are front panel control details of dual trace oscilloscope?

Q.5 Attempt any two. **12**

a) Explain signal generator with neat diagram.
b) Describe the measurement of phase and frequency by using Lissaious pattern in detail.
c) Explain ramp type digital voltmeter with neat diagram.

Seat No.	

Set **Q**

S.E. (Part - II) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
ELECTRICAL & ELECTRONICS MEASUREMENT

Day & Date: Monday,25-11-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and it should be solved in first 30 minutes in answer book.
2) Figures to the right indicate full marks.
3) Assume the suitable data wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) For measuring emf of a standard cell we use: _____.
   a) Galvanometer b) Potentiometer
   c) Zener reference d) Electro-dynamic voltmeter

2) An oscilloscope indicates _____.
   a) Peak to peak value of voltage b) DC value of voltage
   c) RMS value d) Average

3) While selecting transducer for particular application _____.
   a) Only the input characteristics should be considered
   b) Only the output characteristics should be considered
   c) Only the transfer characteristics should be considered
   d) Input, output and transfer characteristics should be considered

4) Which of the following optical transducer is an active transducer?
   a) Photo emissive cell b) Photo diode
   c) Photo transistor d) Photovoltaic cell

5) The source of emission of electrons in a CRT is _____.
   a) PN junction diode
   b) A barium & strontium oxide coated cathode
   c) Accelerating anode
   d) Post accelerating anode

6) The instrument having its deflection depends upon average value is: _____.
   a) Moving iron b) Hot wire
   c) Rectifier type d) Induction type

7) In CRO the time base signal is applied to: _____.
   a) Y-plates b) X-plates
   c) Either X-plate or Y-plate d) Both X-plate and Y-plate

8) If the instrument is to have a wide range, the instrument should have _____.
   a) Linear scale b) Square-law scale
   c) Exponential scale d) Logarithmic scale

9) The instrument which is cheapest for dc measurement is _____.
   a) Moving iron b) PMMC
   c) Hot-wire d) Electro-dynamo

10) Which of the following instruments can be used for full scale deflection of 300°?
   a) PMMC
   b) Induction type
   c) Hot-wire
   d) Electrostatic

11) The breaking torque provided by permanent in single phase induction energy meter can be changed by _____.
   a) Providing a magnetic shunt & changing its position
   b) Changing the distance of permanent magnet from center of revolving disc
   c) Both a & b
   d) None of the above

12) Moving iron and PMMC instruments can be distinguished from each other by looking at _____.
   a) Pointer
   b) Terminal size
   c) Scale
   d) Scale range

13) The power in 3-phase 3-wire circuit can be measured by using _____.
   a) 2 wattmeter
   b) 1 wattmeter
   c) 3 wattmeter
   d) None of these

14) In two watt meter method of power measurement, if one of the watt meter shows zero reading, then it can be concluded that _____.
   a) Power factor is unit
   b) Power factor is zero
   c) Power factor is 0.5 lagging
   d) Power factor is 0.5 leading

Seat No.	

Set **Q**

S.E. (Part - II) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
ELECTRICAL & ELECTRONICS MEASUREMENT

Day & Date: Monday, 25-11-2019 Max. Marks: 56
Time: 02:30 PM To 05:30 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume the suitable data wherever necessary.

SECTION I

Q.2 Attempt any four: **16**

a) Explain Maxwell's inductance-capacitance bridge also draw its phasor diagram.
b) Explain shunt and multiplier with neat diagram.
c) Explain measurement of power in 1Ø circuit by using 3voltmeter method.
d) An inductive load takes current 2.5 A; an non-inductive resistor is connected in parallel takes 2.4 A, when connected across 250 V supply. The total current taken from supply is 4.5A. Calculate :
1) Power absorbed by load
2) Load impedance
3) Power factor of the load
e) Derive the expression for current through galvanometer in a whetstones bridge for small unbalance.
f) Explain different types of torques in measuring instruments.

Q.3 Attempt any two: **12**

a) Explain LPF wattmeter with neat diagram.
b) Explain current transformer with neat diagram
c) The energy stored in a parallel plate capacitor per unit volume (energy density) is given by

$$w = k\varepsilon^a V^b d^c$$

Where ε = permittivity of medium, d= distance between plates
V= applied voltage, K=constant
Find the values of a,b,c,

SECTION II

Q.4 Attempt any four **16**

a) With neat sketch explain the strain gauge transducer.
b) Explain LED display with diagram.
c) Explain Q-meter with neat diagram.
d) Give the classification of transducers.
e) Explain construction & operation 1Ø electrodynamometer power factor meter.
f) What are front panel control details of dual trace oscilloscope?

Q.5 Attempt any two. **12**

a) Explain signal generator with neat diagram.
b) Describe the measurement of phase and frequency by using Lissaious pattern in detail.
c) Explain ramp type digital voltmeter with neat diagram.

Seat No.	

Set **R**

S.E. (Part - II) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
ELECTRICAL & ELECTRONICS MEASUREMENT

Day & Date: Monday,25-11-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and it should be solved in first 30 minutes in answer book.
2) Figures to the right indicate full marks.
3) Assume the suitable data wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) Moving iron and PMMC instruments can be distinguished from each other by looking at _____.
   a) Pointer b) Terminal size
   c) Scale d) Scale range

2) The power in 3-phase 3-wire circuit can be measured by using _____.
   a) 2 wattmeter b) 1 wattmeter
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3) In two watt meter method of power measurement, if one of the watt meter shows zero reading, then it can be concluded that _____.
   a) Power factor is unit b) Power factor is zero
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4) For measuring emf of a standard cell we use: _____.
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   d) Induction type

10) In CRO the time base signal is applied to: _____.
   a) Y-plates
   b) X-plates
   c) Either X-plate or Y-plate
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11) If the instrument is to have a wide range, the instrument should have _____.
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Seat No.	

Set **R**

S.E. (Part - II) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
ELECTRICAL & ELECTRONICS MEASUREMENT

Day & Date: Monday, 25-11-2019 Max. Marks: 56
Time: 02:30 PM To 05:30 PM

Instructions: 1) All questions are compulsory.
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SECTION I

Q.2 Attempt any four: **16**

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c) Explain measurement of power in 1ø circuit by using 3voltmeter method.
d) An inductive load takes current 2.5 A; an non-inductive resistor is connected in parallel takes 2.4 A, when connected across 250 V supply. The total current taken from supply is 4.5A. Calculate :
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Where ε = permittivity of medium, d= distance between plates
V= applied voltage, K=constant
Find the values of a,b,c,

SECTION II

Q.4 Attempt any four **16**

a) With neat sketch explain the strain gauge transducer.
b) Explain LED display with diagram.
c) Explain Q-meter with neat diagram.
d) Give the classification of transducers.
e) Explain construction & operation 1ø electrodynamometer power factor meter.
f) What are front panel control details of dual trace oscilloscope?

Q.5 Attempt any two. **12**

a) Explain signal generator with neat diagram.
b) Describe the measurement of phase and frequency by using Lissaious pattern in detail.
c) Explain ramp type digital voltmeter with neat diagram.

Seat No.	

Set **S**

S.E. (Part - II) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
ELECTRICAL & ELECTRONICS MEASUREMENT

Day & Date: Monday,25-11-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and it should be solved in first 30 minutes in answer book.
2) Figures to the right indicate full marks.
3) Assume the suitable data wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) While selecting transducer for particular application _____.
   a) Only the input characteristics should be considered
   b) Only the output characteristics should be considered
   c) Only the transfer characteristics should be considered
   d) Input, output and transfer characteristics should be considered

2) Which of the following optical transducer is an active transducer?
   a) Photo emissive cell b) Photo diode
   c) Photo transistor d) Photovoltaic cell

3) The source of emission of electrons in a CRT is _____.
   a) PN junction diode
   b) A barium & strontium oxide coated cathode
   c) Accelerating anode
   d) Post accelerating anode

4) The instrument having its deflection depends upon average value is: _____.
   a) Moving iron b) Hot wire
   c) Rectifier type d) Induction type

5) In CRO the time base signal is applied to: _____.
   a) Y-plates b) X-plates
   c) Either X-plate or Y-plate d) Both X-plate and Y-plate

6) If the instrument is to have a wide range, the instrument should have _____.
   a) Linear scale b) Square-law scale
   c) Exponential scale d) Logarithmic scale

7) The instrument which is cheapest for dc measurement is _____.
   a) Moving iron b) PMMC
   c) Hot-wire d) Electro-dynamo

8) Which of the following instruments can be used for full scale deflection of 300°?
   a) PMMC b) Induction type
   c) Hot-wire d) Electrostatic

9) The breaking torque provided by permanent in single phase induction energy meter can be changed by _____.
   a) Providing a magnetic shunt & changing its position
   b) Changing the distance of permanent magnet from center of revolving disc
   c) Both a & b
   d) None of the above

10) Moving iron and PMMC instruments can be distinguished from each other by looking at _____.
   a) Pointer
   b) Terminal size
   c) Scale
   d) Scale range

11) The power in 3-phase 3-wire circuit can be measured by using _____.
   a) 2 wattmeter
   b) 1 wattmeter
   c) 3 wattmeter
   d) None of these

12) In two watt meter method of power measurement, if one of the watt meter shows zero reading, then it can be concluded that _____.
   a) Power factor is unit
   b) Power factor is zero
   c) Power factor is 0.5 lagging
   d) Power factor is 0.5 leading

13) For measuring emf of a standard cell we use: _____.
   a) Galvanometer
   b) Potentiometer
   c) Zener reference
   d) Electro-dynamic voltmeter

14) An oscilloscope indicates _____.
   a) Peak to peak value of voltage
   b) DC value of voltage
   c) RMS value
   d) Average

Seat No.	

Set **S**

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SECTION I

Q.2 Attempt any four: **16**

a) Explain Maxwell's inductance-capacitance bridge also draw its phasor diagram.
b) Explain shunt and multiplier with neat diagram.
c) Explain measurement of power in 1ø circuit by using 3voltmeter method.
d) An inductive load takes current 2.5 A; an non-inductive resistor is connected in parallel takes 2.4 A, when connected across 250 V supply. The total current taken from supply is 4.5A. Calculate :
1) Power absorbed by load
2) Load impedance
3) Power factor of the load
e) Derive the expression for current through galvanometer in a whetstones bridge for small unbalance.
f) Explain different types of torques in measuring instruments.

Q.3 Attempt any two: **12**

a) Explain LPF wattmeter with neat diagram.
b) Explain current transformer with neat diagram
c) The energy stored in a parallel plate capacitor per unit volume (energy density) is given by

$$w = k\varepsilon^a V^b d^c$$

Where ε = permittivity of medium, d= distance between plates
V= applied voltage, K=constant
Find the values of a,b,c,

SECTION II

Q.4 Attempt any four **16**

a) With neat sketch explain the strain gauge transducer.
b) Explain LED display with diagram.
c) Explain Q-meter with neat diagram.
d) Give the classification of transducers.
e) Explain construction & operation 1ø electrodynamometer power factor meter.
f) What are front panel control details of dual trace oscilloscope?

Q.5 Attempt any two. **12**

a) Explain signal generator with neat diagram.
b) Describe the measurement of phase and frequency by using Lissaious pattern in detail.
c) Explain ramp type digital voltmeter with neat diagram.

Seat No.	

Set **P**

S.E. (Part – II) (Old) (CGPA) Examination Nov/Dec -2019
Electrical & Electronics Engineering
SIGNALS & SYSTEMS

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MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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1) The inverse Laplace transform of $\frac{1}{s-a}$ in a region $\sigma < a$ is
   a) $e^{at}u(t)$ b) $-e^{at}u(-t)$
   c) $e^{-at}u(-t)$ d) $e^{-at}u(t)$

2) $r(n) =$
   a) $u[n]$ b) $nu[n]$
   c) $n^2u[n]$ d) $\sqrt{n}\,u[n]$

3) If f (t) signal has energy E then energy of the signal f (2t) is sequal to
   a) E b) E/2
   c) 2E d) 4E

4) The system y(t)= x(3t-6) is
   a) Linear, time variant b) linear, time invariant
   c) non-linear, time invariant d) None of these

5) The ROC of a function consist of strips
   a) Perpendicular to jw axis b) Lying in jw plane
   c) Parallel to jw axis d) None

6) If $X(s) = \frac{2(S+1)}{S^2+2S+5}$, then x(0+) and x(∞) are given by
   a) 2,0 b) 0,2
   c) 0,1 d) 1,0

7) Which of the following systems are time invariant.
   a) y(t)=x(2t) b) y(t)=x(t)+x(t-1)
   c) y(t)=x(t/2) d) y(t)=x(-t)

8) If x(n)=u(n)-u(n-3) then ROC is
   a) Entire Z plane b) Entire Z plane, except z=0
   c) Entire Z plane, except z=∞ d) Entire Z plane, except z=0 and z=∞

9) The DFT of $x^*(n)$ is
   a) $X^*(k)$ b) $X^*(-k)$
   c) $X(N-k)$ d) $X^*(N-k)$

10) The DFT of sequence $x(n) = \delta(n - n_0)$ is
   a) 1 b) $e^{j\,2\pi k\,n_0}$
   c) $e^{-j\,2\pi k\,n_0/N}$ d) $e^{j\,2\pi k\,n_0/N}$

11) When the system has poles inside the unit circle in Z-domain
   a) The system is stable and its impulse response is a decaying function
   b) Time domain behavior will be exponentially rising signal
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12) A signal x(t) has a Fourier transform X(w). If x(t) is *a* real and even function of t, then X(w) is
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13) The Fourier transform of f(at) is given by
   a) f(at) ↔ aF(W) b) f(at) ↔ (2/a) F(w)
   c) f(at) ↔ (1/a) F(w/a) d) None of these

14) Sampling a signal is equivalent to multiplying it with
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   c) A train of sync functions d) A rectangular window

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Set **P**

S.E. (Part – II) (Old) (CGPA) Examination Nov/Dec -2019
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SIGNALS & SYSTEMS

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Section - I

Q.2 Attempt any three. **12**

a) Find even and odd component of the following signal and plot the components
×(n)={-2,1,2,-1,3} assuming first sample is at n=0.

b) Find the Laplace transform of the x(t)=u(t-2)

c) Explain basic properties of the system with examples.

d) Determine the convolution of two functions
X1(t) = u(t-2) X2(t)= u(t)

Q.3 Attempt any two. **16**

a) Find the Laplace transform of the signal x(t) = $e^{-at}u(t) + e^{-bt}u(-t)$ find the ROC. What are the poles locations?

b) Estimate the convolution for the signals for the following using graphical approach.
$x(t) = e^{-2t}\,u(t)$ h(t) = u(t+2)

c) Check Whether the following systems are static or dynamic, linear or non-linear, causal or non-causal and time invariant of time variant.
y(n) = even[x(n)]

Section - II

Q.4 Attempt any three **12**

a) State and explain Nyquist sampling theorem in detail?

b) State and prove convolution property of Fourier transform?

c) Find Z transform with its ROC for (n) = -2^n . u(-n-1)

d) Find Z transform of x(n)=[1,4,3,2,5]

Q.5 Attempt any two. **16**

a) Find the Fourier transform of $x(t) = e^{-a/t/}$

b) 1) find Z transform of x(n)=u(n)
2) Determine the sequence x(n) associated with Z.T given below using long division method. $X(z) = \frac{1+2z^{-1}}{1-2z^{-1}+z^{-2}}$; Right sided sequence.

c) Find Fourier series coefficient for the continuous time periodic signal $x(t) = \begin{cases} 1.5\ for\ 0 < t < 1 \\ -1.5\ for\ 1 < t < 2 \end{cases}$ with fundamental frequency $wo = \pi$

Seat No.	

Set | Q

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1) If x(n)=u(n)-u(n-3) then ROC is
   a) Entire Z plane
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2) The DFT of $x^*(n)$ is
   a) $X^*(k)$
   b) $X^*(-k)$
   c) $X(N-k)$
   d) $X^*(N-k)$

3) The DFT of sequence $x(n) = \delta(n-n_0)$ is
   a) 1
   b) $e^{j2\pi k n_0}$
   c) $e^{-j2\pi k n_0/N}$
   d) $e^{j2\pi k n_0/N}$

4) When the system has poles inside the unit circle in Z-domain
   a) The system is stable and its impulse response is a decaying function
   b) Time domain behavior will be exponentially rising signal
   c) The system is unstable
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5) A signal x(t) has a Fourier transform X(w). If x(t) is *a* real and even function of t, then X(w) is
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Section - II

Q.4 Attempt any three **12**

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a) State and explain Nyquist sampling theorem in detail?

b) State and prove convolution property of Fourier transform?

c) Find Z transform with its ROC for (n) = -2^n . u(-n-1)

d) Find Z transform of x(n)=[1,4,3,2,5]

Q.5 Attempt any two. **16**

a) Find the Fourier transform of $x(t) = e^{-a/t/}$

b) 1) find Z transform of x(n)=u(n)
2) Determine the sequence x(n) associated with Z.T given below using long division method. $X(z) = \frac{1+2z^{-1}}{1-2z^{-1}+z^{-2}}$; Right sided sequence.

c) Find Fourier series coefficient for the continuous time periodic signal $x(t) = \begin{cases} 1.5\ for\ 0 < t < 1 \\ -1.5\ for\ 1 < t < 2 \end{cases}$ with fundamental frequency $wo = \pi$

Seat No.		Set	P

S.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
DIGITAL TECHNIQUES

Day & Date: Wednesday, 27-11-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data whenever necessary.
4) Q.No.1 is compulsory. It should be solved in 30 minutes in answer book page no 03.Each question carries one mark.
5) Answer MCQ/Objective type questions on page no 3 only. Don't forget to mention, Q.P Set (P/Q/R/S) on top of the page.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) Which of the following is typically longest?
   a) Bit b) byte
   c) word d) nibble

2) The octal numbering system _____.
   a) simplifies tasks
   b) groups binary numbers in groups of 4
   c) saves time
   d) simplifies tasks and saves time

3) How many data select lines are required for selecting eight inputs?
   a) 1 b) 2
   c) 3 d) 4

4) The inverter can be produced with how many NAND gates?
   a) 1 b) 2
   c) 3 d) 4

5) Which of the following logic family having shortest propogation delay?
   a) CMOS b) BICMOS
   c) ECL d) IC7402

6) An open collector output can _____current, but it cannot _____.
   a) sink, source current b) source, sink current
   c) sink, source voltage d) source, sink voltage

7) Which of the following combinations cannot be combined into K-map groups?
   a) Corners in the same row b) Corners in the same column
   c) Diagonal corners d) Overlapping combinations

8) What is a shift register that will accept a parallel input, or a bidirectional serial load and internal shift features, called?
   a) Tristate b) end around
   c) universal d) Conversion

9) A modulus-12 ring counter requires a minimum of _____ flip-flops.
   a) 10 b) 12
   c) 6 d) 4

10) On a master-slave flip-flop, when is the master enabled?
   a) when the gate is LOW b) when the gate is HIGH
   c) both of the above d) neither of the above

11) How many different states does a 3 bit asynchronous counter have?
   a) 2 b) 4
   c) 8 d) 16

12) The MOD number of counter is _____.
   a) The maximum possible number of states
   b) Actual number of states in sequence
   c) The number of FF
   d) None of these

13) Flip-flops can be used to make _____.
   a) Latches b) bounce elimination switches
   c) Registers d) All of the above

14) A universal register _____.
   a) Accepts serial input
   b) Accepts parallel input
   c) gives serial and parallel outputs
   d) is capable of all of the above

Seat No.	

Set **P**

S.E (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
DIGITAL TECHNIQUES

Day & Date: Wednesday, 27-11-2019 Max. Marks: 56
Time: 02:30 PM To 05:30 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data whenever necessary.

Section – I

Q.2 Solve any Four of the followings questions. **16**

a) Explain different number system in brief.
b) Design and explain carry look ahead adder.
c) State and explain different typical values for TTL, CMOS & ECL.
d) Explain with examples the SOP and POS forms of standard representation of logical function.
e) Minimize the following log function using k-map and realize using NAND gate $F(A,B,C,D)=\sum m(0,1,2,3,5,7,8,9,10,1\ 1)$.

Q.3 Solve any two of the followings questions. **12**

a) Realize and Explain 32:1 MUX using 16:1 MUX.
b) Explain Full Subtractor using k-map.
c) Justify the comparison between for TTL and CMOS logic families.

Section – II

Q.4 Solve any four of the followings questions. **16**

a) What is counter? Design mod 10 asynchronous counter.
b) Explain Race around condition in detail.
c) Draw and explain Ring counter.
d) Explain different applications of Flip-flopsr.
e) Explain how combination of NAND/NOR gates acts as 1 bit memory cell?

Q.5 Solve any two of the followings questions. **12**

a) Draw and Explain 4 bit up-down ripple counter using Flip-flops.
b) Write characteristics table, Characteristics equation and excitation table of SR Flip flop.
c) What are the different steps in synchronous design? Design 3-bit synchronous counter using D Flip flop.

Seat No.	

Set **Q**

S.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
DIGITAL TECHNIQUES

Day & Date: Wednesday, 27-11-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data whenever necessary.
4) Q.No.1 is compulsory. It should be solved in 30 minutes in answer book page no 03.Each question carries one mark.
5) Answer MCQ/Objective type questions on page no 3 only. Don't forget to mention, Q.P Set (P/Q/R/S) on top of the page.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) What is a shift register that will accept a parallel input, or a bidirectional serial load and internal shift features, called?
   a) Tristate b) end around
   c) universal d) Conversion

2) A modulus-12 ring counter requires a minimum of _____ flip-flops.
   a) 10 b) 12
   c) 6 d) 4

3) On a master-slave flip-flop, when is the master enabled?
   a) when the gate is LOW b) when the gate is HIGH
   c) both of the above d) neither of the above

4) How many different states does a 3 bit asynchronous counter have?
   a) 2 b) 4
   c) 8 d) 16

5) The MOD number of counter is _____.
   a) The maximum possible number of states
   b) Actual number of states in sequence
   c) The number of FF
   d) None of these

6) Flip-flops can be used to make _____.
   a) Latches b) bounce elimination switches
   c) Registers d) All of the above

7) A universal register _____.
   a) Accepts serial input
   b) Accepts parallel input
   c) gives serial and parallel outputs
   d) is capable of all of the above

8) Which of the following is typically longest?
   a) Bit b) byte
   c) word d) nibble

9) The octal numbering system _____.
   a) simplifies tasks
   b) groups binary numbers in groups of 4
   c) saves time
   d) simplifies tasks and saves time

10) How many data select lines are required for selecting eight inputs?
   a) 1 b) 2
   c) 3 d) 4

11) The inverter can be produced with how many NAND gates?
   a) 1 b) 2
   c) 3 d) 4

12) Which of the following logic family having shortest propogation delay?
   a) CMOS b) BICMOS
   c) ECL d) IC7402

13) An open collector output can _____current, but it cannot _____.
   a) sink, source current b) source, sink current
   c) sink, source voltage d) source, sink voltage

14) Which of the following combinations cannot be combined into K-map groups?
   a) Corners in the same row b) Corners in the same column
   c) Diagonal corners d) Overlapping combinations

Seat No.	

Set **Q**

S.E (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
DIGITAL TECHNIQUES

Day & Date: Wednesday, 27-11-2019 Max. Marks: 56
Time: 02:30 PM To 05:30 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data whenever necessary.

Section – I

Q.2 Solve any Four of the followings questions. **16**

a) Explain different number system in brief.
b) Design and explain carry look ahead adder.
c) State and explain different typical values for TTL, CMOS & ECL.
d) Explain with examples the SOP and POS forms of standard representation of logical function.
e) Minimize the following log function using k-map and realize using NAND gate $F(A,B,C,D)=\sum m(0,1,2,3,5,7,8,9,10,1\ 1)$.

Q.3 Solve any two of the followings questions. **12**

a) Realize and Explain 32:1 MUX using 16:1 MUX.
b) Explain Full Subtractor using k-map.
c) Justify the comparison between for TTL and CMOS logic families.

Section – II

Q.4 Solve any four of the followings questions. **16**

a) What is counter? Design mod 10 asynchronous counter.
b) Explain Race around condition in detail.
c) Draw and explain Ring counter.
d) Explain different applications of Flip-flopsr.
e) Explain how combination of NAND/NOR gates acts as 1 bit memory cell?

Q.5 Solve any two of the followings questions. **12**

a) Draw and Explain 4 bit up-down ripple counter using Flip-flops.
b) Write characteristics table, Characteristics equation and excitation table of SR Flip flop.
c) What are the different steps in synchronous design? Design 3-bit synchronous counter using D Flip flop.

Seat No.	

Set **R**

S.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
DIGITAL TECHNIQUES

Day & Date: Wednesday, 27-11-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data whenever necessary.
4) Q.No.1 is compulsory. It should be solved in 30 minutes in answer book page no 03.Each question carries one mark.
5) Answer MCQ/Objective type questions on page no 3 only. Don't forget to mention, Q.P Set (P/Q/R/S) on top of the page.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) Which of the following logic family having shortest propogation delay?
   a) CMOS b) BICMOS
   c) ECL d) IC7402

2) An open collector output can _____current, but it cannot _____.
   a) sink, source current b) source, sink current
   c) sink, source voltage d) source, sink voltage

3) Which of the following combinations cannot be combined into K-map groups?
   a) Corners in the same row b) Corners in the same column
   c) Diagonal corners d) Overlapping combinations

4) What is a shift register that will accept a parallel input, or a bidirectional serial load and internal shift features, called?
   a) Tristate b) end around
   c) universal d) Conversion

5) A modulus-12 ring counter requires a minimum of _____ flip-flops.
   a) 10 b) 12
   c) 6 d) 4

6) On a master-slave flip-flop, when is the master enabled?
   a) when the gate is LOW b) when the gate is HIGH
   c) both of the above d) neither of the above

7) How many different states does a 3 bit asynchronous counter have?
   a) 2 b) 4
   c) 8 d) 16

8) The MOD number of counter is _____.
   a) The maximum possible number of states
   b) Actual number of states in sequence
   c) The number of FF
   d) None of these

9) Flip-flops can be used to make _____.
   a) Latches
   b) bounce elimination switches
   c) Registers
   d) All of the above

10) A universal register _____.
   a) Accepts serial input
   b) Accepts parallel input
   c) gives serial and parallel outputs
   d) is capable of all of the above

11) Which of the following is typically longest?
   a) Bit
   b) byte
   c) word
   d) nibble

12) The octal numbering system _____.
   a) simplifies tasks
   b) groups binary numbers in groups of 4
   c) saves time
   d) simplifies tasks and saves time

13) How many data select lines are required for selecting eight inputs?
   a) 1
   b) 2
   c) 3
   d) 4

14) The inverter can be produced with how many NAND gates?
   a) 1
   b) 2
   c) 3
   d) 4

Seat No.	

Set **R**

S.E (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
DIGITAL TECHNIQUES

Day & Date: Wednesday, 27-11-2019 Max. Marks: 56
Time: 02:30 PM To 05:30 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data whenever necessary.

Section – I

Q.2 Solve any Four of the followings questions. **16**

a) Explain different number system in brief.
b) Design and explain carry look ahead adder.
c) State and explain different typical values for TTL, CMOS & ECL.
d) Explain with examples the SOP and POS forms of standard representation of logical function.
e) Minimize the following log function using k-map and realize using NAND gate $F(A,B,C,D)=\sum m(0,1,2,3,5,7,8,9,10,1\ 1)$.

Q.3 Solve any two of the followings questions. **12**

a) Realize and Explain 32:1 MUX using 16:1 MUX.
b) Explain Full Subtractor using k-map.
c) Justify the comparison between for TTL and CMOS logic families.

Section – II

Q.4 Solve any four of the followings questions. **16**

a) What is counter? Design mod 10 asynchronous counter.
b) Explain Race around condition in detail.
c) Draw and explain Ring counter.
d) Explain different applications of Flip-flopsr.
e) Explain how combination of NAND/NOR gates acts as 1 bit memory cell?

Q.5 Solve any two of the followings questions. **12**

a) Draw and Explain 4 bit up-down ripple counter using Flip-flops.
b) Write characteristics table, Characteristics equation and excitation table of SR Flip flop.
c) What are the different steps in synchronous design? Design 3-bit synchronous counter using D Flip flop.

Seat No.	

Set **S**

S.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
DIGITAL TECHNIQUES

Day & Date: Wednesday, 27-11-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data whenever necessary.
4) Q.No.1 is compulsory. It should be solved in 30 minutes in answer book page no 03.Each question carries one mark.
5) Answer MCQ/Objective type questions on page no 3 only. Don't forget to mention, Q.P Set (P/Q/R/S) on top of the page.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) On a master-slave flip-flop, when is the master enabled?
   a) when the gate is LOW b) when the gate is HIGH
   c) both of the above d) neither of the above

2) How many different states does a 3 bit asynchronous counter have?
   a) 2 b) 4
   c) 8 d) 16

3) The MOD number of counter is _____.
   a) The maximum possible number of states
   b) Actual number of states in sequence
   c) The number of FF
   d) None of these

4) Flip-flops can be used to make _____.
   a) Latches b) bounce elimination switches
   c) Registers d) All of the above

5) A universal register _____.
   a) Accepts serial input
   b) Accepts parallel input
   c) gives serial and parallel outputs
   d) is capable of all of the above

6) Which of the following is typically longest?
   a) Bit b) byte
   c) word d) nibble

7) The octal numbering system _____.
   a) simplifies tasks
   b) groups binary numbers in groups of 4
   c) saves time
   d) simplifies tasks and saves time

8) How many data select lines are required for selecting eight inputs?
   a) 1 b) 2
   c) 3 d) 4

9) The inverter can be produced with how many NAND gates?
   a) 1 b) 2
   c) 3 d) 4

10) Which of the following logic family having shortest propogation delay?
   a) CMOS b) BICMOS
   c) ECL d) IC7402

11) An open collector output can _____current, but it cannot _____.
   a) sink, source current b) source, sink current
   c) sink, source voltage d) source, sink voltage

12) Which of the following combinations cannot be combined into K-map groups?
   a) Corners in the same row b) Corners in the same column
   c) Diagonal corners d) Overlapping combinations

13) What is a shift register that will accept a parallel input, or a bidirectional serial load and internal shift features, called?
   a) Tristate b) end around
   c) universal d) Conversion

14) A modulus-12 ring counter requires a minimum of _____ flip-flops.
   a) 10 b) 12
   c) 6 d) 4

Seat No.	

Set | S

S.E (Part – II) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
DIGITAL TECHNIQUES

Day & Date: Wednesday, 27-11-2019 Max. Marks: 56
Time: 02:30 PM To 05:30 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data whenever necessary.

Section – I

Q.2 Solve any Four of the followings questions. **16**

a) Explain different number system in brief.
b) Design and explain carry look ahead adder.
c) State and explain different typical values for TTL, CMOS & ECL.
d) Explain with examples the SOP and POS forms of standard representation of logical function.
e) Minimize the following log function using k-map and realize using NAND gate $F(A,B,C,D)=\sum m(0,1,2,3,5,7,8,9,10,1\ 1)$.

Q.3 Solve any two of the followings questions. **12**

a) Realize and Explain 32:1 MUX using 16:1 MUX.
b) Explain Full Subtractor using k-map.
c) Justify the comparison between for TTL and CMOS logic families.

Section – II

Q.4 Solve any four of the followings questions. **16**

a) What is counter? Design mod 10 asynchronous counter.
b) Explain Race around condition in detail.
c) Draw and explain Ring counter.
d) Explain different applications of Flip-flopsr.
e) Explain how combination of NAND/NOR gates acts as 1 bit memory cell?

Q.5 Solve any two of the followings questions. **12**

a) Draw and Explain 4 bit up-down ripple counter using Flip-flops.
b) Write characteristics table, Characteristics equation and excitation table of SR Flip flop.
c) What are the different steps in synchronous design? Design 3-bit synchronous counter using D Flip flop.

Seat No.	

Set | P

T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
ELECTROMAGNETIC ENGINEERING

Day & Date: Friday, 06-12-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
2) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) Unit of Electric Intensity is _____.
   a) Joules/Coulomb b) Newton/Coulomb
   c) Volt/Meter d) Both b & c

2) Vector is the quantity which is completely defined by its _____.
   a) Magnitude b) Direction
   c) Both a) and b) d) None of these

3) The relation between vector potential and field strength is given by _____.
   a) Gradient b) Divergence
   c) Curl d) Del operator

4) The Cartesian system is also called as _____.
   a) Circular coordinate system b) Rectangular coordinate system
   c) Spherical coordinate system d) Space coordinate system

5) A charge located at point p $(5,30^{o},2)$ is said to be in which coordinate system?
   a) Cartesian system b) Cylindrical system
   c) Spherical system d) Space system

6) Convert the given rectangular coordinates A(2,3,1) into corresponding cylindrical coordinates _____.
   a) (3.21, 56.31,1) b) (3.21, 57.31,0)
   c) (3.61, 57.31,0) d) (3.61, 56.31,1)

7) Divergence of gradient of a vector function is equivalent to _____.
   a) Laplacian operation b) Curl operation
   c) Double gradient operation d) Null vector

8) A point charge 2nC is located at origin. What is the potential at (1,0,0)?
   a) 12 b) 14
   c) 16 d) 18

9) The magnetic energy of a magnetic material is given by _____.
   a) BH/2 b) B/2H
   c) H/2B d) B/H

10) Two charges 1C and -4C exists in air. What is the direction of force?
   a) Away from 1C b) Away from -4C
   c) From 1C to -4C d) From -4C to 1C

11) The Gauss divergence theorem converts _____.
   a) line to surface integral
   b) line to volume integral
   c) Surface to line integral
   d) Surface to volume integral

12) Find the flux density of a sheet of charge density 25 units in air _____.
   a) 25
   b) 12.5
   c) 6.25
   d) 3.125

13) Using volume integral, which quantity can be calculated?
   a) area of cube
   b) area of cuboid
   c) volume of cube
   d) Distance of vector

14) Electric field intensity due to infinite sheet of charge σ is.
   a) Zero
   b) Unity
   c) σ/ε
   d) $\sigma/2\varepsilon$

Seat No.	

Set **P**

T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
ELECTROMAGNETIC ENGINEERING

Day & Date: Friday, 06-12-2019 Max. Marks: 56
Time: 02:30 PM To 05:30 PM

Instructions: 1) All questions are compulsory.
2) Figure to the right indicates full marks.

Section – I

Q.2 Write Short notes. (Any four) **16**

a) Derive expression for potential due to infinite line charge.
b) Find the Cartesian coordinates of B(4,25^o,120^o)
c) State and prove Coulomb's low.
d) State and prove Divergence theorem.
e) $A = 2a_x + 2a_{y_{a_z}}, and\ B = a_x - 3\dot{a}_y + 4a_z\ Find\ \overline{A}X\overline{B}$

Q.3 Solve any two. **12**

a) Uniform line charge of 25nC/m lies on X =-3, Z=4 in free space. Find $\overline{\mathrm{E}}$ in Cartesian components at.
1) origin
2) $P_1(2, 15.3)$
b) With usual notations show that $E = -\nabla.V$
c) Concept of boundary conditions for electric field.

Section – II

Q.4 Write Short notes. (Any four) **16**

a) Explain biot Savart Law.
b) Describe physical significance of Maxwells Equations.
c) Find an expression for B at a perpendicular distance R meter away from finite length of a conductor uniformly charged with pl c/m. Use Biot and Savart law.
d) Explain scalar and vector magnetic potential.
e) From ampere's work law deduce the result $\nabla \mathrm{XH} = \mathrm{J}$.

Q.5 Solve any two. **12**

a) Find the boundary conditions in magnetic field between two media having $\mu 1\ and\ \mu 2$.
b) Infinite current filament is placed at z axis find magnetic field intensity at P (2, 3, 4) when carries current 8mA in a_z direction.
c) Derive the set of Maxwell's equation for the harmonically varying field.

Seat No.	

Set **Q**

T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
ELECTROMAGNETIC ENGINEERING

Day & Date: Friday, 06-12-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
2) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) A point charge 2nC is located at origin. What is the potential at (1,0,0)?
   a) 12 b) 14
   c) 16 d) 18

2) The magnetic energy of a magnetic material is given by _____.
   a) BH/2 b) B/2H
   c) H/2B d) B/H

3) Two charges 1C and -4C exists in air. What is the direction of force?
   a) Away from 1C b) Away from -4C
   c) From 1C to -4C d) From -4C to 1C

4) The Gauss divergence theorem converts _____.
   a) line to surface integral b) line to volume integral
   c) Surface to line integral d) Surface to volume integral

5) Find the flux density of a sheet of charge density 25 units in air _____.
   a) 25 b) 12.5
   c) 6.25 d) 3.125

6) Using volume integral, which quantity can be calculated?
   a) area of cube b) area of cuboid
   c) volume of cube d) Distance of vector

7) Electric field intensity due to infinite sheet of charge σ is.
   a) Zero b) Unity
   c) σ/ε d) $\sigma/2\varepsilon$

8) Unit of Electric Intensity is _____.
   a) Joules/Coulomb b) Newton/Coulomb
   c) Volt/Meter d) Both b & c

9) Vector is the quantity which is completely defined by its _____.
   a) Magnitude b) Direction
   c) Both a) and b) d) None of these

10) The relation between vector potential and field strength is given by _____.
   a) Gradient b) Divergence
   c) Curl d) Del operator

11) The Cartesian system is also called as _____.
   a) Circular coordinate system b) Rectangular coordinate system
   c) Spherical coordinate system d) Space coordinate system

12) A charge located at point p ($5,30^{o},2$) is said to be in which coordinate system?
   a) Cartesian system b) Cylindrical system
   c) Spherical system d) Space system

13) Convert the given rectangular coordinates A(2,3,1) into corresponding cylindrical coordinates _____.
   a) (3.21, 56.31,1) b) (3.21, 57.31,0)
   c) (3.61, 57.31,0) d) (3.61, 56.31,1)

14) Divergence of gradient of a vector function is equivalent to _____.
   a) Laplacian operation b) Curl operation
   c) Double gradient operation d) Null vector

Seat No.	

Set **Q**

T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
ELECTROMAGNETIC ENGINEERING

Day & Date: Friday, 06-12-2019 Max. Marks: 56
Time: 02:30 PM To 05:30 PM

Instructions: 1) All questions are compulsory.
2) Figure to the right indicates full marks.

Section – I

Q.2 Write Short notes. (Any four) **16**

a) Derive expression for potential due to infinite line charge.
b) Find the Cartesian coordinates of B(4,25^o,120^o)
c) State and prove Coulomb's low.
d) State and prove Divergence theorem.
e) $A = 2a_x + 2a_{y_{a_z}}, and\ B = a_x - 3\dot{a}_y + 4a_z\ Find\ \overline{A}X\overline{B}$

Q.3 Solve any two. **12**

a) Uniform line charge of 25nC/m lies on X =-3, Z=4 in free space. Find $\overline{\mathrm{E}}$ in Cartesian components at.
1) origin
2) $P_1(2, 15.3)$
b) With usual notations show that $E = -\nabla.V$
c) Concept of boundary conditions for electric field.

Section – II

Q.4 Write Short notes. (Any four) **16**

a) Explain biot Savart Law.
b) Describe physical significance of Maxwells Equations.
c) Find an expression for B at a perpendicular distance R meter away from finite length of a conductor uniformly charged with pl c/m. Use Biot and Savart law.
d) Explain scalar and vector magnetic potential.
e) From ampere's work law deduce the result $\nabla \mathrm{XH} = \mathrm{J}$.

Q.5 Solve any two. **12**

a) Find the boundary conditions in magnetic field between two media having $\mu 1\ and\ \mu 2$.
b) Infinite current filament is placed at z axis find magnetic field intensity at P (2, 3, 4) when carries current 8mA in a_z direction.
c) Derive the set of Maxwell's equation for the harmonically varying field.

Seat No.	

Set **R**

T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
ELECTROMAGNETIC ENGINEERING

Day & Date: Friday, 06-12-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
2) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) A charge located at point p (5,30^o,2) is said to be in which coordinate system?
   a) Cartesian system b) Cylindrical system
   c) Spherical system d) Space system

2) Convert the given rectangular coordinates A(2,3,1) into corresponding cylindrical coordinates _____.
   a) (3.21, 56.31,1) b) (3.21, 57.31,0)
   c) (3.61, 57.31,0) d) (3.61, 56.31,1)

3) Divergence of gradient of a vector function is equivalent to _____.
   a) Laplacian operation b) Curl operation
   c) Double gradient operation d) Null vector

4) A point charge 2nC is located at origin. What is the potential at (1,0,0)?
   a) 12 b) 14
   c) 16 d) 18

5) The magnetic energy of a magnetic material is given by _____.
   a) BH/2 b) B/2H
   c) H/2B d) B/H

6) Two charges 1C and -4C exists in air. What is the direction of force?
   a) Away from 1C b) Away from -4C
   c) From 1C to -4C d) From -4C to 1C

7) The Gauss divergence theorem converts _____.
   a) line to surface integral b) line to volume integral
   c) Surface to line integral d) Surface to volume integral

8) Find the flux density of a sheet of charge density 25 units in air _____.
   a) 25 b) 12.5
   c) 6.25 d) 3.125

9) Using volume integral, which quantity can be calculated?
   a) area of cube b) area of cuboid
   c) volume of cube d) Distance of vector

10) Electric field intensity due to infinite sheet of charge σ is.
   a) Zero b) Unity
   c) σ/ε d) $\sigma/2\varepsilon$

11) Unit of Electric Intensity is _____.
   a) Joules/Coulomb b) Newton/Coulomb
   c) Volt/Meter d) Both b & c

12) Vector is the quantity which is completely defined by its _____.
   a) Magnitude b) Direction
   c) Both a) and b) d) None of these

13) The relation between vector potential and field strength is given by _____.
   a) Gradient b) Divergence
   c) Curl d) Del operator

14) The Cartesian system is also called as _____.
   a) Circular coordinate system b) Rectangular coordinate system
   c) Spherical coordinate system d) Space coordinate system

Seat No.	

Set **R**

T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
ELECTROMAGNETIC ENGINEERING

Day & Date: Friday, 06-12-2019 Max. Marks: 56
Time: 02:30 PM To 05:30 PM

Instructions: 1) All questions are compulsory.
2) Figure to the right indicates full marks.

Section – I

Q.2 Write Short notes. (Any four) **16**

a) Derive expression for potential due to infinite line charge.
b) Find the Cartesian coordinates of B(4,25^o,120^o)
c) State and prove Coulomb's low.
d) State and prove Divergence theorem.
e) $A = 2a_x + 2a_{y_{a_z}}, and\ B = a_x - 3\dot{a}_y + 4a_z\ Find\ \overline{A}X\overline{B}$

Q.3 Solve any two. **12**

a) Uniform line charge of 25nC/m lies on X =-3, Z=4 in free space. Find $\overline{\mathrm{E}}$ in Cartesian components at.
1) origin
2) $P_1(2, 15.3)$
b) With usual notations show that $E = -\nabla.V$
c) Concept of boundary conditions for electric field.

Section – II

Q.4 Write Short notes. (Any four) **16**

a) Explain biot Savart Law.
b) Describe physical significance of Maxwells Equations.
c) Find an expression for B at a perpendicular distance R meter away from finite length of a conductor uniformly charged with pl c/m. Use Biot and Savart law.
d) Explain scalar and vector magnetic potential.
e) From ampere's work law deduce the result $\nabla \mathrm{XH} = \mathrm{J}$.

Q.5 Solve any two. **12**

a) Find the boundary conditions in magnetic field between two media having $\mu 1\ and\ \mu 2$.
b) Infinite current filament is placed at z axis find magnetic field intensity at P (2, 3, 4) when carries current 8mA in a_z direction.
c) Derive the set of Maxwell's equation for the harmonically varying field.

Seat No.	

Set **S**

T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
ELECTROMAGNETIC ENGINEERING

Day & Date: Friday, 06-12-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
2) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) Two charges 1C and -4C exists in air. What is the direction of force?
   a) Away from 1C b) Away from -4C
   c) From 1C to -4C d) From -4C to 1C

2) The Gauss divergence theorem converts _____.
   a) line to surface integral b) line to volume integral
   c) Surface to line integral d) Surface to volume integral

3) Find the flux density of a sheet of charge density 25 units in air _____.
   a) 25 b) 12.5
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4) Using volume integral, which quantity can be calculated?
   a) area of cube b) area of cuboid
   c) volume of cube d) Distance of vector

5) Electric field intensity due to infinite sheet of charge σ is.
   a) Zero b) Unity
   c) σ/ε d) $\sigma/2\varepsilon$

6) Unit of Electric Intensity is _____.
   a) Joules/Coulomb b) Newton/Coulomb
   c) Volt/Meter d) Both b & c

7) Vector is the quantity which is completely defined by its _____.
   a) Magnitude b) Direction
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8) The relation between vector potential and field strength is given by _____.
   a) Gradient b) Divergence
   c) Curl d) Del operator

9) The Cartesian system is also called as _____.
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   c) Spherical coordinate system d) Space coordinate system

10) A charge located at point p ($5,30^o,2$) is said to be in which coordinate system?
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   c) Spherical system d) Space system

11) Convert the given rectangular coordinates A(2,3,1) into corresponding cylindrical coordinates _____.
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   c) (3.61, 57.31,0) d) (3.61, 56.31,1)

12) Divergence of gradient of a vector function is equivalent to _____.
   a) Laplacian operation b) Curl operation
   c) Double gradient operation d) Null vector

13) A point charge 2nC is located at origin. What is the potential at (1,0,0)?
   a) 12 b) 14
   c) 16 d) 18

14) The magnetic energy of a magnetic material is given by _____.
   a) BH/2 b) B/2H
   c) H/2B d) B/H

Seat No.	

Set **S**

T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
ELECTROMAGNETIC ENGINEERING

Day & Date: Friday, 06-12-2019 Max. Marks: 56
Time: 02:30 PM To 05:30 PM

Instructions: 1) All questions are compulsory.
2) Figure to the right indicates full marks.

Section – I

Q.2 Write Short notes. (Any four) **16**

a) Derive expression for potential due to infinite line charge.
b) Find the Cartesian coordinates of B(4,25^o,120^o)
c) State and prove Coulomb's low.
d) State and prove Divergence theorem.
e) $A = 2a_x + 2a_{y_{a_z}}, and\ B = a_x - 3\dot{a}_y + 4a_z\ Find\ \overline{A}X\overline{B}$

Q.3 Solve any two. **12**

a) Uniform line charge of 25nC/m lies on X =-3, Z=4 in free space. Find $\overline{\mathrm{E}}$ in Cartesian components at.
1) origin
2) $P_1(2, 15.3)$
b) With usual notations show that $E = -\nabla.V$
c) Concept of boundary conditions for electric field.

Section – II

Q.4 Write Short notes. (Any four) **16**

a) Explain biot Savart Law.
b) Describe physical significance of Maxwells Equations.
c) Find an expression for B at a perpendicular distance R meter away from finite length of a conductor uniformly charged with pl c/m. Use Biot and Savart law.
d) Explain scalar and vector magnetic potential.
e) From ampere's work law deduce the result $\nabla \mathrm{XH} = \mathrm{J}$.

Q.5 Solve any two. **12**

a) Find the boundary conditions in magnetic field between two media having $\mu 1\ and\ \mu 2$.
b) Infinite current filament is placed at z axis find magnetic field intensity at P (2, 3, 4) when carries current 8mA in a_z direction.
c) Derive the set of Maxwell's equation for the harmonically varying field.

Seat No.	

Set **P**

T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
INSTRUMENTATION TECHNIQUES

Day & Date: Monday, 09-12-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
2) Assume suitable data wherever necessary and state it clearly.
3) Non-programmable calculators are permitted.
4) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) A moving coil permanent magnet instrument can be used as _____ by using low resistance shunt.
   a) Ammeter b) Voltmeter
   c) Wattmeter d) All of above

2) Potentiometer is used for measuring _____.
   a) Resistance
   b) Current
   c) Calibration of ammeter ,voltmeter
   d) All of the above

3) An induction meter can handle current up to _____.
   a) 10 A b) 30 A
   c) 60 A d) 100 A

4) For handling greater current induction wattmeter are used in conjunction with _____.
   a) P.T b) C.T
   c) Shunt d) None of above

5) The use of _____ instrument is merely confined within laboratories as standardizing instrument.
   a) Absolute b) Indicating
   c) Recording d) Integrating

6) A transducer converts _____.
   a) Mechanical energy into electrical energy
   b) Mechanical displacement into electrical signal
   c) One form of energy into another form of energy
   d) Electrical energy into mechanical form

7) One of the following is an active transducer _____.
   a) strain gauge b) selsyn
   c) photovoltaic cell d) photo emissive cell

8) A strip chart recorder is _____.
   a) an active transducer
   b) an inverse transducer
   c) an output transducer
   d) b & c

9) While selecting a transducer for particular application?
   a) Only the input characteristics should be considered
   b) Only the output characteristics should be considered
   c) Only the transfer characteristics should be considered
   d) Input, output and transducer characteristics should be considered

10) A Reynolds's number of 1000 indicates _____.
   a) turbulence flow
   b) laminar flow
   c) a flow which can either be turbulent or laminar
   d) none of these

11) Thermocouples are _____.
   a) Passive transducers
   b) Active transducers
   c) Bothe active and passive transducers
   d) Output transducers

12) In an LVDT the two secondary windings are connected in differential to obtain _____.
   a) Higher output voltage
   b) An output voltage which is phase sensitive i.e. the output voltage has a phase which can lead us to conclusion whether the displacement of the core tool place from right to left or from left to right
   c) In order to establish the null or the reference point for the displacement for the core
   d) Both b & c

13) The dynamic characteristics of capacitive transducers are similar to those of _____.
   a) Low pass filter
   b) High pass filter
   c) Notch filter
   d) Band stop filters

14) Quartz and Rochelle salt belong to _____.
   a) Nature group of piezo-electric material
   b) Synthetic group of piezo-electric material
   c) Can belong to nature or synthetic group of piezo-electric material provided properly polarized
   d) All of these

Seat No.	

Set **P**

T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
INSTRUMENTATION TECHNIQUES

Day & Date: Monday, 09-12-2019 Max. Marks: 56
Time: 02:30 PM To 05:30 PM

Instructions: 1) All questions are compulsory.
2) Assume suitable data wherever necessary and state it clearly.
3) Non-programmable calculators are permitted.
4) Figures to the right indicate full marks.

Section – I

Q.2 Solve any three. **12**

a) Explain following static characteristics
1) Accuracy
2) Errors
3) Uncertainty
4) Linearity

b) Draw & explain block diagram of instrumentation system.

c) Draw & explain Chopper stabilized amplifier.

d) Explain DAC with its block diagram.

Q.3 Solve any two. **16**

a) Explain Modulator and Demodulator with suitable diagram.

b) What is mean by Active filters & Derive the frequency response of 1st & 2nd order filter?

c) Describe the need of signal conditioning in instrumentation system. Explain any one signal conditioning equipment with necessary diagram.

Section – II

Q.4 Solve any three. **12**

a) Explain General telemetry system with block diagram.

b) What is the need of digital display, dimension. State its types and also define.

c) Draw the architecture of PLC and explain it in brief.

d) Write a short note on LED.

Q.5 Solve any two. **16**

a) Draw & Explain block diagram of digital data transmission system. Give its advantages and disadvantages.

b) Give the classification of recorders. Explain strip chart recorder with necessary diagram.

c) Explain function generator & pulse generator.

Seat No.	

Set **Q**

T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
INSTRUMENTATION TECHNIQUES

Day & Date: Monday, 09-12-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
2) Assume suitable data wherever necessary and state it clearly.
3) Non-programmable calculators are permitted.
4) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) A strip chart recorder is _____.
   a) an active transducer b) an inverse transducer
   c) an output transducer d) b & c

2) While selecting a transducer for particular application?
   a) Only the input characteristics should be considered
   b) Only the output characteristics should be considered
   c) Only the transfer characteristics should be considered
   d) Input, output and transducer characteristics should be considered

3) A Reynolds's number of 1000 indicates _____.
   a) turbulence flow
   b) laminar flow
   c) a flow which can either be turbulent or laminar
   d) none of these

4) Thermocouples are _____.
   a) Passive transducers
   b) Active transducers
   c) Bothe active and passive transducers
   d) Output transducers

5) In an LVDT the two secondary windings are connected in differential to obtain _____.
   a) Higher output voltage
   b) An output voltage which is phase sensitive i.e. the output voltage has a phase which can lead us to conclusion whether the displacement of the core tool place from right to left or from left to right
   c) In order to establish the null or the reference point for the displacement for the core
   d) Both b & c

6) The dynamic characteristics of capacitive transducers are similar to those of _____.
   a) Low pass filter
   b) High pass filter
   c) Notch filter
   d) Band stop filters

7) Quartz and Rochelle salt belong to _____.
   a) Nature group of piezo-electric material
   b) Synthetic group of piezo-electric material
   c) Can belong to nature or synthetic group of piezo-electric material provided properly polarized
   d) All of these

8) A moving coil permanent magnet instrument can be used as _____ by using low resistance shunt.
   a) Ammeter
   b) Voltmeter
   c) Wattmeter
   d) All of above

9) Potentiometer is used for measuring _____.
   a) Resistance
   b) Current
   c) Calibration of ammeter ,voltmeter
   d) All of the above

10) An induction meter can handle current up to _____.
   a) 10 A
   b) 30 A
   c) 60 A
   d) 100 A

11) For handling greater current induction wattmeter are used in conjunction with _____.
   a) P.T
   b) C.T
   c) Shunt
   d) None of above

12) The use of _____ instrument is merely confined within laboratories as standardizing instrument.
   a) Absolute
   b) Indicating
   c) Recording
   d) Integrating

13) A transducer converts _____.
   a) Mechanical energy into electrical energy
   b) Mechanical displacement into electrical signal
   c) One form of energy into another form of energy
   d) Electrical energy into mechanical form

14) One of the following is an active transducer _____.
   a) strain gauge
   b) selsyn
   c) photovoltaic cell
   d) photo emissive cell

Seat No.	

Set **Q**

T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
INSTRUMENTATION TECHNIQUES

Day & Date: Monday, 09-12-2019 Max. Marks: 56
Time: 02:30 PM To 05:30 PM

Instructions: 1) All questions are compulsory.
2) Assume suitable data wherever necessary and state it clearly.
3) Non-programmable calculators are permitted.
4) Figures to the right indicate full marks.

Section – I

Q.2 Solve any three. **12**

a) Explain following static characteristics
1) Accuracy
2) Errors
3) Uncertainty
4) Linearity

b) Draw & explain block diagram of instrumentation system.

c) Draw & explain Chopper stabilized amplifier.

d) Explain DAC with its block diagram.

Q.3 Solve any two. **16**

a) Explain Modulator and Demodulator with suitable diagram.

b) What is mean by Active filters & Derive the frequency response of 1st & 2nd order filter?

c) Describe the need of signal conditioning in instrumentation system. Explain any one signal conditioning equipment with necessary diagram.

Section – II

Q.4 Solve any three. **12**

a) Explain General telemetry system with block diagram.

b) What is the need of digital display, dimension. State its types and also define.

c) Draw the architecture of PLC and explain it in brief.

d) Write a short note on LED.

Q.5 Solve any two. **16**

a) Draw & Explain block diagram of digital data transmission system. Give its advantages and disadvantages.

b) Give the classification of recorders. Explain strip chart recorder with necessary diagram.

c) Explain function generator & pulse generator.

Seat No.	

Set **R**

T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
INSTRUMENTATION TECHNIQUES

Day & Date: Monday, 09-12-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
2) Assume suitable data wherever necessary and state it clearly.
3) Non-programmable calculators are permitted.
4) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) The use of _____ instrument is merely confined within laboratories as standardizing instrument.
   a) Absolute b) Indicating
   c) Recording d) Integrating

2) A transducer converts _____.
   a) Mechanical energy into electrical energy
   b) Mechanical displacement into electrical signal
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4) A strip chart recorder is _____.
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   b) laminar flow
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7) Thermocouples are _____.
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   b) An output voltage which is phase sensitive i.e. the output voltage has a phase which can lead us to conclusion whether the displacement of the core tool place from right to left or from left to right
   c) In order to establish the null or the reference point for the displacement for the core
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9) The dynamic characteristics of capacitive transducers are similar to those of _____.
   a) Low pass filter
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10) Quartz and Rochelle salt belong to _____.
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11) A moving coil permanent magnet instrument can be used as _____ by using low resistance shunt.
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   c) Wattmeter
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12) Potentiometer is used for measuring _____.
   a) Resistance
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13) An induction meter can handle current up to _____.
   a) 10 A
   b) 30 A
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14) For handling greater current induction wattmeter are used in conjunction with _____.
   a) P.T
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Seat No.	

Set **R**

T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
INSTRUMENTATION TECHNIQUES

Day & Date: Monday, 09-12-2019 Max. Marks: 56
Time: 02:30 PM To 05:30 PM

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

Q.2 Solve any three. **12**

a) Explain following static characteristics
1) Accuracy
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a) Explain Modulator and Demodulator with suitable diagram.

b) What is mean by Active filters & Derive the frequency response of 1st & 2nd order filter?

c) Describe the need of signal conditioning in instrumentation system. Explain any one signal conditioning equipment with necessary diagram.

Section – II

Q.4 Solve any three. **12**

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c) Draw the architecture of PLC and explain it in brief.

d) Write a short note on LED.

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a) Draw & Explain block diagram of digital data transmission system. Give its advantages and disadvantages.

b) Give the classification of recorders. Explain strip chart recorder with necessary diagram.

c) Explain function generator & pulse generator.

Seat No.	

Set **S**

T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
INSTRUMENTATION TECHNIQUES

Day & Date: Monday, 09-12-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
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MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

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   a) Ammeter b) Voltmeter
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   a) Resistance
   b) Current
   c) Calibration of ammeter ,voltmeter
   d) All of the above

8) An induction meter can handle current up to _____.
   a) 10 A b) 30 A
   c) 60 A d) 100 A

9) For handling greater current induction wattmeter are used in conjunction with _____.
   a) P.T b) C.T
   c) Shunt d) None of above

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   c) photovoltaic cell d) photo emissive cell

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   a) an active transducer b) an inverse transducer
   c) an output transducer d) b & c

14) While selecting a transducer for particular application?
   a) Only the input characteristics should be considered
   b) Only the output characteristics should be considered
   c) Only the transfer characteristics should be considered
   d) Input, output and transducer characteristics should be considered

Seat No.	

Set **S**

T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
INSTRUMENTATION TECHNIQUES

Day & Date: Monday, 09-12-2019 Max. Marks: 56
Time: 02:30 PM To 05:30 PM

Instructions: 1) All questions are compulsory.
2) Assume suitable data wherever necessary and state it clearly.
3) Non-programmable calculators are permitted.
4) Figures to the right indicate full marks.

Section – I

Q.2 Solve any three. **12**

a) Explain following static characteristics
1) Accuracy
2) Errors
3) Uncertainty
4) Linearity

b) Draw & explain block diagram of instrumentation system.

c) Draw & explain Chopper stabilized amplifier.

d) Explain DAC with its block diagram.

Q.3 Solve any two. **16**

a) Explain Modulator and Demodulator with suitable diagram.

b) What is mean by Active filters & Derive the frequency response of 1st & 2nd order filter?

c) Describe the need of signal conditioning in instrumentation system. Explain any one signal conditioning equipment with necessary diagram.

Section – II

Q.4 Solve any three. **12**

a) Explain General telemetry system with block diagram.

b) What is the need of digital display, dimension. State its types and also define.

c) Draw the architecture of PLC and explain it in brief.

d) Write a short note on LED.

Q.5 Solve any two. **16**

a) Draw & Explain block diagram of digital data transmission system. Give its advantages and disadvantages.

b) Give the classification of recorders. Explain strip chart recorder with necessary diagram.

c) Explain function generator & pulse generator.

Seat No.	

Set **P**

T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
MICROPROCESSOR AND ITS APPLICATIONS

Day & Date: Wednesday, 11-12-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
2) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) LDA is _____ byte instruction.
   a) 1 b) 2
   c) 3 d) 4

2) What are software interrupts?
   a) RST 0 – 7 b) RST 5.5 – 7.5
   c) INTR, TRAP d) INTA

3) Which one is bi-directional?
   a) Address Bus b) Data Bus
   c) Both d) None

4) What is SIM?
   a) Select Interrupt Mask b) Sorting Interrupt Mask
   c) Set Interrupt Mask d) Send Interrupt Mask

5) Which of below is not a functional block of 8259?
   a) In service register b) Priority Resolver
   c) Modem Control d) Data Bus Buffer

6) Which one of the following is not a vectored interrupt?
   a) TRAP b) RST 7.5
   c) INTR d) RST 3

7) 8259 is a _____.
   a) PPI b) PIT
   c) USART d) PIC

8) Which one is not a special purpose register?
   a) Program Counter b) Stack pointer
   c) Increment/decrement latch d) Accumulator

9) The cycle required to fetch and execute an instruction in a 8085 microprocessor is which one of the following?
   a) Clock Cycle b) Operand Fetch Cycle
   c) Machine Cycle d) Instruction Cycle

10) Which of the following is a 16-bir register in 8085?
   a) Program counter b) Accumulator
   c) B-register d) C- register

11) In an intel 8085A microprocessor, why is READY signal used?
   a) to indicate to user that the microprocessor is working and is ready for use
   b) to provide proper WAIT states when the microprocessor is communicating with a slow peripheral device
   c) to slow down a fast peripheral device so as to communicate at the microprocessor's device
   d) None of the above

12) Signal requires for Demultiplexing of address data bus of 8085 is _____.
   a) ALE
   b) SOD
   c) IO/M
   d) S0 and S1

13) The 8085 is a _____.
   a) 16-bit parallel CPU
   b) 16-bit Serial CPU
   c) 8-bit parallel CPU
   d) 8-bit Serial CPU

14) When referring to instruction words, a mnemonic is _____.
   a) a short abbreviation for the operand address
   b) a short abbreviation for the operation to be performed
   c) a short abbreviation for the data word stored at the operand address
   d) shorthand for machine language

Seat No.	

Set **P**

T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
MICROPROCESSOR AND ITS APPLICATIONS

Day & Date: Wednesday, 11-12-2019 Max. Marks: 56
Time: 02:30 PM To 05:30 PM

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

Section – I

Q.2 Solve any three. **12**

a) Draw the timing diagram of memory write cycle.
b) Write a program to division of two 8-bit numbers. Also give the result.
c) Explain interrupt structure of 8085.
d) Classify memory & explain in detail.
e) List & explain in brief various registers of 8085.

Q.3 Solve any two. **16**

a) Draw and explain architecture of 8085 microprocessor in detail.
b) Write a program of arranging 10 numbers in ascending order. Assume suitable data and addresses.
c) Explain demultiplexing of address data bus & generation of control signals in detail with diagrams.

Section – II

Q.4 Solve any three. **12**

a) Draw suitable block diagram of 8253/54. Comment on control word format.
b) What is ICW2 of 8259?
c) Compare Syncronous & Asynchronous I/O.
d) Explain Dual Slope ADC.

Q.5 Answer any two. **16**

a) What is DAC? Explain weighted register DAC.
b) Draw and explain interfacing of 8254 with 8085.
c) Explain with diagram, DC Motor control by using 8085.

Seat No.	

Set **Q**

T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
MICROPROCESSOR AND ITS APPLICATIONS

Day & Date: Wednesday, 11-12-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
2) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) Which one is not a special purpose register?
   a) Program Counter b) Stack pointer
   c) Increment/decrement latch d) Accumulator

2) The cycle required to fetch and execute an instruction in a 8085 microprocessor is which one of the following?
   a) Clock Cycle b) Operand Fetch Cycle
   c) Machine Cycle d) Instruction Cycle

3) Which of the following is a 16-bir register in 8085?
   a) Program counter b) Accumulator
   c) B-register d) C- register

4) In an intel 8085A microprocessor, why is READY signal used?
   a) to indicate to user that the microprocessor is working and is ready for use
   b) to provide proper WAIT states when the microprocessor is communicating with a slow peripheral device
   c) to slow down a fast peripheral device so as to communicate at the microprocessor's device
   d) None of the above

5) Signal requires for Demultiplexing of address data bus of 8085 is _____.
   a) ALE b) SOD
   c) IO/M d) S0 and S1

6) The 8085 is a _____.
   a) 16-bit parallel CPU b) 16-bit Serial CPU
   c) 8-bit parallel CPU d) 8-bit Serial CPU

7) When referring to instruction words, a mnemonic is _____.
   a) a short abbreviation for the operand address
   b) a short abbreviation for the operation to be performed
   c) a short abbreviation for the data word stored at the operand address
   d) shorthand for machine language

8) LDA is _____ byte instruction.
   a) 1 b) 2
   c) 3 d) 4

9) What are software interrupts?
   a) RST 0 – 7 b) RST 5.5 – 7.5
   c) INTR, TRAP d) INTA

10) Which one is bi-directional?
   a) Address Bus b) Data Bus
   c) Both d) None

11) What is SIM?
   a) Select Interrupt Mask b) Sorting Interrupt Mask
   c) Set Interrupt Mask d) Send Interrupt Mask

12) Which of below is not a functional block of 8259?
   a) In service register b) Priority Resolver
   c) Modem Control d) Data Bus Buffer

13) Which one of the following is not a vectored interrupt?
   a) TRAP b) RST 7.5
   c) INTR d) RST 3

14) 8259 is a _____.
   a) PPI b) PIT
   c) USART d) PIC

Seat No.	

Set **Q**

T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
MICROPROCESSOR AND ITS APPLICATIONS

Day & Date: Wednesday, 11-12-2019 Max. Marks: 56
Time: 02:30 PM To 05:30 PM

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

Section – I

Q.2 Solve any three. **12**

a) Draw the timing diagram of memory write cycle.
b) Write a program to division of two 8-bit numbers. Also give the result.
c) Explain interrupt structure of 8085.
d) Classify memory & explain in detail.
e) List & explain in brief various registers of 8085.

Q.3 Solve any two. **16**

a) Draw and explain architecture of 8085 microprocessor in detail.
b) Write a program of arranging 10 numbers in ascending order. Assume suitable data and addresses.
c) Explain demultiplexing of address data bus & generation of control signals in detail with diagrams.

Section – II

Q.4 Solve any three. **12**

a) Draw suitable block diagram of 8253/54. Comment on control word format.
b) What is ICW2 of 8259?
c) Compare Syncronous & Asynchronous I/O.
d) Explain Dual Slope ADC.

Q.5 Answer any two. **16**

a) What is DAC? Explain weighted register DAC.
b) Draw and explain interfacing of 8254 with 8085.
c) Explain with diagram, DC Motor control by using 8085.

Seat No.	

Set **R**

T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
MICROPROCESSOR AND ITS APPLICATIONS

Day & Date: Wednesday, 11-12-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
2) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) Which of below is not a functional block of 8259?
   a) In service register b) Priority Resolver
   c) Modem Control d) Data Bus Buffer

2) Which one of the following is not a vectored interrupt?
   a) TRAP b) RST 7.5
   c) INTR d) RST 3

3) 8259 is a _____.
   a) PPI b) PIT
   c) USART d) PIC

4) Which one is not a special purpose register?
   a) Program Counter b) Stack pointer
   c) Increment/decrement latch d) Accumulator

5) The cycle required to fetch and execute an instruction in a 8085 microprocessor is which one of the following?
   a) Clock Cycle b) Operand Fetch Cycle
   c) Machine Cycle d) Instruction Cycle

6) Which of the following is a 16-bir register in 8085?
   a) Program counter b) Accumulator
   c) B-register d) C- register

7) In an intel 8085A microprocessor, why is READY signal used?
   a) to indicate to user that the microprocessor is working and is ready for use
   b) to provide proper WAIT states when the microprocessor is communicating with a slow peripheral device
   c) to slow down a fast peripheral device so as to communicate at the microprocessor's device
   d) None of the above

8) Signal requires for Demultiplexing of address data bus of 8085 is _____.
   a) ALE b) SOD
   c) IO/M d) S0 and S1

9) The 8085 is a _____.
   a) 16-bit parallel CPU
   b) 16-bit Serial CPU
   c) 8-bit parallel CPU
   d) 8-bit Serial CPU

10) When referring to instruction words, a mnemonic is _____.
   a) a short abbreviation for the operand address
   b) a short abbreviation for the operation to be performed
   c) a short abbreviation for the data word stored at the operand address
   d) shorthand for machine language

11) LDA is _____ byte instruction.
   a) 1
   b) 2
   c) 3
   d) 4

12) What are software interrupts?
   a) RST 0 – 7
   b) RST 5.5 – 7.5
   c) INTR, TRAP
   d) INTA

13) Which one is bi-directional?
   a) Address Bus
   b) Data Bus
   c) Both
   d) None

14) What is SIM?
   a) Select Interrupt Mask
   b) Sorting Interrupt Mask
   c) Set Interrupt Mask
   d) Send Interrupt Mask

Seat No.	

Set **R**

T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
MICROPROCESSOR AND ITS APPLICATIONS

Day & Date: Wednesday, 11-12-2019 Max. Marks: 56
Time: 02:30 PM To 05:30 PM

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

Section – I

Q.2 Solve any three. **12**

a) Draw the timing diagram of memory write cycle.
b) Write a program to division of two 8-bit numbers. Also give the result.
c) Explain interrupt structure of 8085.
d) Classify memory & explain in detail.
e) List & explain in brief various registers of 8085.

Q.3 Solve any two. **16**

a) Draw and explain architecture of 8085 microprocessor in detail.
b) Write a program of arranging 10 numbers in ascending order. Assume suitable data and addresses.
c) Explain demultiplexing of address data bus & generation of control signals in detail with diagrams.

Section – II

Q.4 Solve any three. **12**

a) Draw suitable block diagram of 8253/54. Comment on control word format.
b) What is ICW2 of 8259?
c) Compare Syncronous & Asynchronous I/O.
d) Explain Dual Slope ADC.

Q.5 Answer any two. **16**

a) What is DAC? Explain weighted register DAC.
b) Draw and explain interfacing of 8254 with 8085.
c) Explain with diagram, DC Motor control by using 8085.

Seat No.	

Set **S**

T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
MICROPROCESSOR AND ITS APPLICATIONS

Day & Date: Wednesday, 11-12-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
2) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) Which of the following is a 16-bir register in 8085?
   a) Program counter b) Accumulator
   c) B-register d) C- register

2) In an intel 8085A microprocessor, why is READY signal used?
   a) to indicate to user that the microprocessor is working and is ready for use
   b) to provide proper WAIT states when the microprocessor is communicating with a slow peripheral device
   c) to slow down a fast peripheral device so as to communicate at the microprocessor's device
   d) None of the above

3) Signal requires for Demultiplexing of address data bus of 8085 is _____.
   a) ALE b) SOD
   c) IO/M d) S0 and S1

4) The 8085 is a _____.
   a) 16-bit parallel CPU b) 16-bit Serial CPU
   c) 8-bit parallel CPU d) 8-bit Serial CPU

5) When referring to instruction words, a mnemonic is _____.
   a) a short abbreviation for the operand address
   b) a short abbreviation for the operation to be performed
   c) a short abbreviation for the data word stored at the operand address
   d) shorthand for machine language

6) LDA is _____ byte instruction.
   a) 1 b) 2
   c) 3 d) 4

7) What are software interrupts?
   a) RST 0 – 7 b) RST 5.5 – 7.5
   c) INTR, TRAP d) INTA

8) Which one is bi-directional?
   a) Address Bus b) Data Bus
   c) Both d) None

9) What is SIM?
   a) Select Interrupt Mask
   b) Sorting Interrupt Mask
   c) Set Interrupt Mask
   d) Send Interrupt Mask

10) Which of below is not a functional block of 8259?
   a) In service register
   b) Priority Resolver
   c) Modem Control
   d) Data Bus Buffer

11) Which one of the following is not a vectored interrupt?
   a) TRAP
   b) RST 7.5
   c) INTR
   d) RST 3

12) 8259 is a _____.
   a) PPI
   b) PIT
   c) USART
   d) PIC

13) Which one is not a special purpose register?
   a) Program Counter
   b) Stack pointer
   c) Increment/decrement latch
   d) Accumulator

14) The cycle required to fetch and execute an instruction in a 8085 microprocessor is which one of the following?
   a) Clock Cycle
   b) Operand Fetch Cycle
   c) Machine Cycle
   d) Instruction Cycle

Seat No.	

Set **S**

T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
MICROPROCESSOR AND ITS APPLICATIONS

Day & Date: Wednesday, 11-12-2019 Max. Marks: 56
Time: 02:30 PM To 05:30 PM

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

Section – I

Q.2 Solve any three. **12**

a) Draw the timing diagram of memory write cycle.
b) Write a program to division of two 8-bit numbers. Also give the result.
c) Explain interrupt structure of 8085.
d) Classify memory & explain in detail.
e) List & explain in brief various registers of 8085.

Q.3 Solve any two. **16**

a) Draw and explain architecture of 8085 microprocessor in detail.
b) Write a program of arranging 10 numbers in ascending order. Assume suitable data and addresses.
c) Explain demultiplexing of address data bus & generation of control signals in detail with diagrams.

Section – II

Q.4 Solve any three. **12**

a) Draw suitable block diagram of 8253/54. Comment on control word format.
b) What is ICW2 of 8259?
c) Compare Syncronous & Asynchronous I/O.
d) Explain Dual Slope ADC.

Q.5 Answer any two. **16**

a) What is DAC? Explain weighted register DAC.
b) Draw and explain interfacing of 8254 with 8085.
c) Explain with diagram, DC Motor control by using 8085.

Seat No.	

Set **P**

T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
ELEMENTS OF POWER SYSTEM

Day & Date: Friday, 13-12-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
2) Figures to the right indicate full marks.
3) Make suitable assumptions if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q1 Choose the correct alternatives from the options and rewrite the sentence. 14

1) The most economical power factor for a consumer is generally _____.
   a) 0.95 lagging b) Unity
   c) 0.6 lagging d) 0.85 lagging

2) A belted type cable are generally used up to _____.
   a) 22kv b) 33kv
   c) 11kv d) 66kv

3) The underground system is _____.
   a) More costly than the equivalent overhead line system
   b) Less costly than the equivalent overhead line system
   c) Same
   d) None of these

4) The generalized constants A & D of the transmission line have _____.
   a) no dimension b) dimension of oham
   c) dimension of simen d) none of the above

5) Under operating condition the maximum stress in cable is at _____.
   a) Inner side of conductor b) Conductor surface
   c) Both a & b d) None of the above

6) If the length of cable increases, its insulation resistance _____.
   a) Increases b) Decreases
   c) Does not change d) None of these

7) A metallic sheath is provided over the insulation to protect the cable from _____.
   a) Bedding b) Moisture
   c) Armoring d) None of these

8) The line constant of transmission line are _____.
   a) Lumped b) Uniformly distributed
   c) Both (a) and (b) d) None of these

9) The string efficiency of a suspension type insulator is dependent on _____.
   a) Size of conductor
   b) Number of insulator discs in string
   c) Size of the tower
   d) None of these

10) By using guard ring string efficiency _____.
   a) Increased b) Decreased
   c) Same d) None of the above

11) In capacitance grading of cables we use a _____.
   a) Homogeneous dielectric b) composite dielectric
   c) Both a & b d) None of the above

12) In any transmission line AD-BC= _____.
   a) 1 b) 0
   c) infinity d) None of above

13) If the sag in overhead line increases, tension in line _____.
   a) Increases b) Decreases
   c) Does not change d) Equal

14) The spacing between conductor is increased, the corona effect is _____.
   a) Increases b) Decreases
   c) Same d) None of the above

Seat No.	

Set **P**

T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
ELEMENTS OF POWER SYSTEM

Day & Date: Friday, 13-12-2019 Max. Marks: 56
Time: 02:30 PM To 05:30 PM

Instructions: 1) All questions are compulsory.
2) Figure to the right indicates full marks.

Section – I

Q.2 Solve any Three. **12**

a) Write a note on sag and tension.
b) What is the main component of overhead lines? Explain their functions.
c) Explain constants of transmission line.
d) What are advantages and disadvantages of corona?
e) Explain wooden pole with neat diagram.

Q.3 Solve any Two. **16**

a) What is string efficiency? Explain methods of improving string efficiency.
b) Calculate sag in overhead transmission line.
c) Explain any two types of insulators with neat diagram.

Section – II

Q.4 Solve any Three. **12**

a) Explain general construction of cable with neat diagram.
b) Explain types of transmission line.
c) Write short note generalized constant of transmission line.
d) Explain end condenser method of medium transmission line.
e) Explain proprieties of insulating material used for cables.

Q.5 Solve any Two. **16**

a) Calculate capacitance of single core cable.
b) Explain the methods of power factor improvement.
c) What is grading? Explain capacitance grading.

Seat No.	

Set | Q

T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
ELEMENTS OF POWER SYSTEM

Day & Date: Friday, 13-12-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
2) Figures to the right indicate full marks.
3) Make suitable assumptions if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) The line constant of transmission line are _____.
   a) Lumped b) Uniformly distributed
   c) Both (a) and (b) d) None of these

2) The string efficiency of a suspension type insulator is dependent on _____.
   a) Size of conductor
   b) Number of insulator discs in string
   c) Size of the tower
   d) None of these

3) By using guard ring string efficiency _____.
   a) Increased b) Decreased
   c) Same d) None of the above

4) In capacitance grading of cables we use a _____.
   a) Homogeneous dielectric b) composite dielectric
   c) Both a & b d) None of the above

5) In any transmission line AD-BC= _____.
   a) 1 b) 0
   c) infinity d) None of above

6) If the sag in overhead line increases, tension in line _____.
   a) Increases b) Decreases
   c) Does not change d) Equal

7) The spacing between conductor is increased, the corona effect is _____.
   a) Increases b) Decreases
   c) Same d) None of the above

8) The most economical power factor for a consumer is generally _____.
   a) 0.95 lagging b) Unity
   c) 0.6 lagging d) 0.85 lagging

9) A belted type cable are generally used up to _____.
   a) 22kv b) 33kv
   c) 11kv d) 66kv

10) The underground system is _____.
   a) More costly than the equivalent overhead line system
   b) Less costly than the equivalent overhead line system
   c) Same
   d) None of these

11) The generalized constants A & D of the transmission line have _____.
   a) no dimension
   b) dimension of oham
   c) dimension of simen
   d) none of the above

12) Under operating condition the maximum stress in cable is at _____.
   a) Inner side of conductor
   b) Conductor surface
   c) Both a & b
   d) None of the above

13) If the length of cable increases, its insulation resistance _____.
   a) Increases
   b) Decreases
   c) Does not change
   d) None of these

14) A metallic sheath is provided over the insulation to protect the cable from _____.
   a) Bedding
   b) Moisture
   c) Armoring
   d) None of these

Seat No.	

Set **Q**

T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
ELEMENTS OF POWER SYSTEM

Day & Date: Friday, 13-12-2019 Max. Marks: 56
Time: 02:30 PM To 05:30 PM

Instructions: 1) All questions are compulsory.
2) Figure to the right indicates full marks.

Section – I

Q.2 Solve any Three. **12**

a) Write a note on sag and tension.
b) What is the main component of overhead lines? Explain their functions.
c) Explain constants of transmission line.
d) What are advantages and disadvantages of corona?
e) Explain wooden pole with neat diagram.

Q.3 Solve any Two. **16**

a) What is string efficiency? Explain methods of improving string efficiency.
b) Calculate sag in overhead transmission line.
c) Explain any two types of insulators with neat diagram.

Section – II

Q.4 Solve any Three. **12**

a) Explain general construction of cable with neat diagram.
b) Explain types of transmission line.
c) Write short note generalized constant of transmission line.
d) Explain end condenser method of medium transmission line.
e) Explain proprieties of insulating material used for cables.

Q.5 Solve any Two. **16**

a) Calculate capacitance of single core cable.
b) Explain the methods of power factor improvement.
c) What is grading? Explain capacitance grading.

Seat No.	

Set **R**

T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
ELEMENTS OF POWER SYSTEM

Day & Date: Friday, 13-12-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
2) Figures to the right indicate full marks.
3) Make suitable assumptions if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) Under operating condition the maximum stress in cable is at _____.
   a) Inner side of conductor b) Conductor surface
   c) Both a & b d) None of the above

2) If the length of cable increases, its insulation resistance _____.
   a) Increases b) Decreases
   c) Does not change d) None of these

3) A metallic sheath is provided over the insulation to protect the cable from _____.
   a) Bedding b) Moisture
   c) Armoring d) None of these

4) The line constant of transmission line are _____.
   a) Lumped b) Uniformly distributed
   c) Both (a) and (b) d) None of these

5) The string efficiency of a suspension type insulator is dependent on _____.
   a) Size of conductor
   b) Number of insulator discs in string
   c) Size of the tower
   d) None of these

6) By using guard ring string efficiency _____.
   a) Increased b) Decreased
   c) Same d) None of the above

7) In capacitance grading of cables we use a _____.
   a) Homogeneous dielectric b) composite dielectric
   c) Both a & b d) None of the above

8) In any transmission line AD-BC= _____.
   a) 1 b) 0
   c) infinity d) None of above

9) If the sag in overhead line increases, tension in line _____.
   a) Increases b) Decreases
   c) Does not change d) Equal

10) The spacing between conductor is increased, the corona effect is _____.
   a) Increases
   b) Decreases
   c) Same
   d) None of the above

11) The most economical power factor for a consumer is generally _____.
   a) 0.95 lagging
   b) Unity
   c) 0.6 lagging
   d) 0.85 lagging

12) A belted type cable are generally used up to _____.
   a) 22kv
   b) 33kv
   c) 11kv
   d) 66kv

13) The underground system is _____.
   a) More costly than the equivalent overhead line system
   b) Less costly than the equivalent overhead line system
   c) Same
   d) None of these

14) The generalized constants A & D of the transmission line have _____.
   a) no dimension
   b) dimension of oham
   c) dimension of simen
   d) none of the above

Seat No.	

Set **R**

T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
ELEMENTS OF POWER SYSTEM

Day & Date: Friday, 13-12-2019 Max. Marks: 56
Time: 02:30 PM To 05:30 PM

Instructions: 1) All questions are compulsory.
2) Figure to the right indicates full marks.

Section – I

Q.2 Solve any Three. **12**

a) Write a note on sag and tension.
b) What is the main component of overhead lines? Explain their functions.
c) Explain constants of transmission line.
d) What are advantages and disadvantages of corona?
e) Explain wooden pole with neat diagram.

Q.3 Solve any Two. **16**

a) What is string efficiency? Explain methods of improving string efficiency.
b) Calculate sag in overhead transmission line.
c) Explain any two types of insulators with neat diagram.

Section – II

Q.4 Solve any Three. **12**

a) Explain general construction of cable with neat diagram.
b) Explain types of transmission line.
c) Write short note generalized constant of transmission line.
d) Explain end condenser method of medium transmission line.
e) Explain proprieties of insulating material used for cables.

Q.5 Solve any Two. **16**

a) Calculate capacitance of single core cable.
b) Explain the methods of power factor improvement.
c) What is grading? Explain capacitance grading.

Seat No.	

Set **S**

T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
ELEMENTS OF POWER SYSTEM

Day & Date: Friday, 13-12-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
2) Figures to the right indicate full marks.
3) Make suitable assumptions if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) By using guard ring string efficiency _____.
   a) Increased b) Decreased
   c) Same d) None of the above

2) In capacitance grading of cables we use a _____.
   a) Homogeneous dielectric b) composite dielectric
   c) Both a & b d) None of the above

3) In any transmission line AD-BC= _____.
   a) 1 b) 0
   c) infinity d) None of above

4) If the sag in overhead line increases, tension in line _____.
   a) Increases b) Decreases
   c) Does not change d) Equal

5) The spacing between conductor is increased, the corona effect is _____.
   a) Increases b) Decreases
   c) Same d) None of the above

6) The most economical power factor for a consumer is generally _____.
   a) 0.95 lagging b) Unity
   c) 0.6 lagging d) 0.85 lagging

7) A belted type cable are generally used up to _____.
   a) 22kv b) 33kv
   c) 11kv d) 66kv

8) The underground system is _____.
   a) More costly than the equivalent overhead line system
   b) Less costly than the equivalent overhead line system
   c) Same
   d) None of these

9) The generalized constants A & D of the transmission line have _____.
   a) no dimension b) dimension of oham
   c) dimension of simen d) none of the above

10) Under operating condition the maximum stress in cable is at _____.
   a) Inner side of conductor
   b) Conductor surface
   c) Both a & b
   d) None of the above

11) If the length of cable increases, its insulation resistance _____.
   a) Increases
   b) Decreases
   c) Does not change
   d) None of these

12) A metallic sheath is provided over the insulation to protect the cable from _____.
   a) Bedding
   b) Moisture
   c) Armoring
   d) None of these

13) The line constant of transmission line are _____.
   a) Lumped
   b) Uniformly distributed
   c) Both (a) and (b)
   d) None of these

14) The string efficiency of a suspension type insulator is dependent on _____.
   a) Size of conductor
   b) Number of insulator discs in string
   c) Size of the tower
   d) None of these

Seat No.	

Set **S**

T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
ELEMENTS OF POWER SYSTEM

Day & Date: Friday, 13-12-2019 Max. Marks: 56
Time: 02:30 PM To 05:30 PM

Instructions: 1) All questions are compulsory.
2) Figure to the right indicates full marks.

Section – I

Q.2 Solve any Three. **12**

a) Write a note on sag and tension.
b) What is the main component of overhead lines? Explain their functions.
c) Explain constants of transmission line.
d) What are advantages and disadvantages of corona?
e) Explain wooden pole with neat diagram.

Q.3 Solve any Two. **16**

a) What is string efficiency? Explain methods of improving string efficiency.
b) Calculate sag in overhead transmission line.
c) Explain any two types of insulators with neat diagram.

Section – II

Q.4 Solve any Three. **12**

a) Explain general construction of cable with neat diagram.
b) Explain types of transmission line.
c) Write short note generalized constant of transmission line.
d) Explain end condenser method of medium transmission line.
e) Explain proprieties of insulating material used for cables.

Q.5 Solve any Two. **16**

a) Calculate capacitance of single core cable.
b) Explain the methods of power factor improvement.
c) What is grading? Explain capacitance grading.

Seat No.	

Set **P**

T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
CONTROL SYSTEM – I

Day & Date: Monday, 16-12-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
2) Figures to the right indicates full marks.
3) Assume suitable data wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) In open loop system _____.
   a) the control action depends on the size of the system
   b) the control action depends on system variables
   c) the control action depends on the input signal
   d) the control action is independent of the output

2) Transfer function of a system is used to calculate which of the following?
   a) The order of the system b) The time constant
   c) The output for any given input d) The steady state gain

3) The system response of a system can be best tested with _____.
   a) unit impulse input signal
   b) ramp input signal
   c) sinusoidal input signal
   d) exponentially decaying input signal

4) Root locus diagram can be used to determine _____.
   a) absolute stability b) relative stability
   c) conditional stability d) none of these

5) For a stable system _____.
   a) All the close loop poles must be in the LHP
   b) Any one close loop pole must be in the LHP
   c) More than 50% close loop poles must be in the LHP
   d) None of the close loop poles must be in the LHP

6) If the system has multiple poles on the jω axis, the system is _____.
   a) Stable b) Unstable
   c) Marginally Stable d) Conditionally stable

7) When damping factor decreases the per unit overshoot _____.
   a) Increases b) decreases
   c) remains unaffected d) none of the above

8) Derivative control _____.
   a) has the same effect as output rate control
   b) reduces damping
   c) is predictive in nature
   d) increases the order of the system

9) The transfer function of a compensating network is of form $(1 + \alpha Ts)/(1 + Ts)$. If this is a phase-Lag network, the value of α should be _____.
   a) greater than 1
   b) between 0 and 1
   c) exactly equal to 1
   d) exactly equal to 0

10) While designing controller, the advantage of pole-zero cancellation is _____.
   a) The system order is increased
   b) The system order is reduced
   c) The cost of controller becomes low
   d) System's error reduced to optimum levels

11) For an electrically heated temperature controlled liquid heater, the best controller is _____.
   a) Single-position controller
   b) Two- position controller
   c) Floating controller
   d) Proportional-position controller

12) The open-loop transfer function of a unity feedback system is G(S) = (1+S)/S(1+0.5S). The corner frequencies are _____.
   a) 0 and 2
   b) 0 and 1
   c) 0 and -1
   d) 1 and 2

13) By the use of PD controller to the second order system the rise time _____.
   a) Increases
   b) Decreases
   c) remains same
   d) None

14) The phase shift of $G(S) = 1/S^2$ is _____.
   a) 90°
   b) -90°
   c) 180^o
   d) -180^o

Seat No.	

Set **P**

T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
CONTROL SYSTEM – I

Day & Date: Monday, 16-12-2019 Max. Marks: 56
Time: 02:30 PM To 05:30 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicates full marks.
3) Assume suitable data wherever necessary.

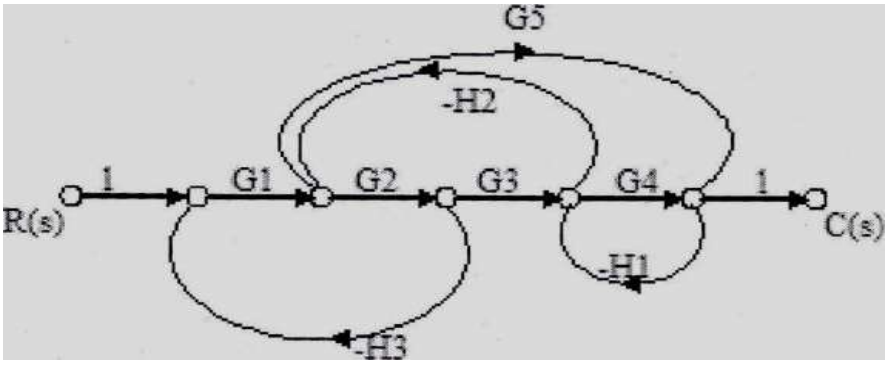
Section – I

Q.2 Solve any four **16**

a) Differentiate between open loop and closed loop control systems.
b) Explain Hurwitz criterion for stability.
c) Derive the static error Coefficients and steady state error for unit ramp input.
d) Give the transfer function of series RLC circuit.
e) Explain the concept of stability.

Q.3 Solve any two **12**

a) Explain Step response of second order system.
b) A second order system is given by $C(s)/R(s) = \frac{8}{s^2+4s+8}$. Find all time domain specifications for unit step response.
c) Find $C(s)/R(s)$ for signal flow graph shown in figure below.



Section – II

Q.4 Solve any four. **16**

a) Explain the frequency domain specifications.
b) Explain PID controller.
c) Explain lead- lag compensator.
d) Check the controllability of system below

$$\begin{bmatrix} x_1 \\ x_2 \end{bmatrix} = \begin{bmatrix} -1 & 0 \\ 0 & -2 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \end{bmatrix} + \begin{bmatrix} 0 \\ 1 \end{bmatrix} u(t)$$

$$Y(t) = \begin{bmatrix} 1 & 2 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \end{bmatrix}; D = 0$$

e) Explain the effect of addition of poles and zeros on Bode plot.
f) Draw the polar plot of G(S) = 1/S

Q.5 Solve any two. **12**

a) Sketch the Asymptotic Bode plot for the system whose transfer function is given below and determine,

1) gain margin.
2) phase margin

$$G(s)H(s) = \frac{2000}{s(1+s)(100+s)}$$

b) Compute the STM when,

$$A = \begin{bmatrix} 0 & 1 \\ -6 & -5 \end{bmatrix}$$

c) Explain the Programmable Logic Controller.

Seat No.	

Set **Q**

T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
CONTROL SYSTEM – I

Day & Date: Monday, 16-12-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
2) Figures to the right indicates full marks.
3) Assume suitable data wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) Derivative control _____.
   a) has the same effect as output rate control
   b) reduces damping
   c) is predictive in nature
   d) increases the order of the system

2) The transfer function of a compensating network is of form $(1 + \alpha Ts)/(1 + Ts)$. If this is a phase-Lag network, the value of α should be _____.
   a) greater than 1 b) between 0 and 1
   c) exactly equal to 1 d) exactly equal to 0

3) While designing controller, the advantage of pole-zero cancellation is _____.
   a) The system order is increased
   b) The system order is reduced
   c) The cost of controller becomes low
   d) System's error reduced to optimum levels

4) For an electrically heated temperature controlled liquid heater, the best controller is _____.
   a) Single-position controller b) Two- position controller
   c) Floating controller d) Proportional-position controller

5) The open-loop transfer function of a unity feedback system is G(S) = (1+S)/S(1+0.5S). The corner frequencies are _____.
   a) 0 and 2 b) 0 and 1
   c) 0 and -1 d) 1 and 2

6) By the use of PD controller to the second order system the rise time _____.
   a) Increases b) Decreases
   c) remains same d) None

7) The phase shift of $G(S) = 1/S^2$ is _____.
   a) 90° b) -90°
   c) 180^o d) -180^o

8) In open loop system _____.
   a) the control action depends on the size of the system
   b) the control action depends on system variables
   c) the control action depends on the input signal
   d) the control action is independent of the output

9) Transfer function of a system is used to calculate which of the following?
   a) The order of the system
   b) The time constant
   c) The output for any given input
   d) The steady state gain

10) The system response of a system can be best tested with _____.
   a) unit impulse input signal
   b) ramp input signal
   c) sinusoidal input signal
   d) exponentially decaying input signal

11) Root locus diagram can be used to determine _____.
   a) absolute stability
   b) relative stability
   c) conditional stability
   d) none of these

12) For a stable system _____.
   a) All the close loop poles must be in the LHP
   b) Any one close loop pole must be in the LHP
   c) More than 50% close loop poles must be in the LHP
   d) None of the close loop poles must be in the LHP

13) If the system has multiple poles on the jω axis, the system is _____.
   a) Stable
   b) Unstable
   c) Marginally Stable
   d) Conditionally stable

14) When damping factor decreases the per unit overshoot _____.
   a) Increases
   b) decreases
   c) remains unaffected
   d) none of the above

Seat No.	

Set **Q**

T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
CONTROL SYSTEM – I

Day & Date: Monday, 16-12-2019 Max. Marks: 56
Time: 02:30 PM To 05:30 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicates full marks.
3) Assume suitable data wherever necessary.

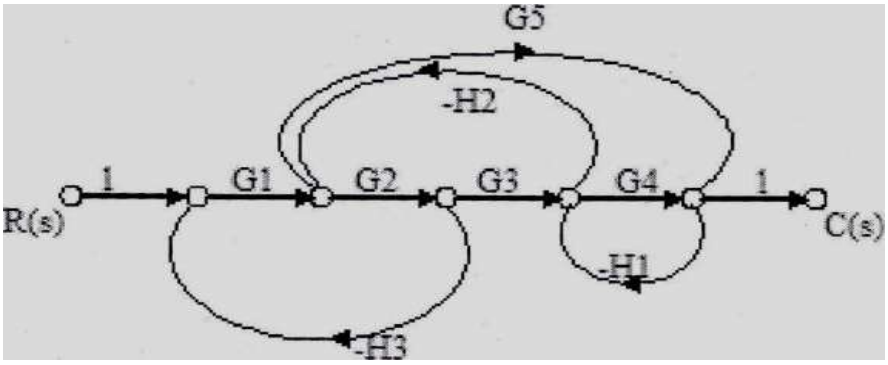
Section – I

Q.2 Solve any four **16**

a) Differentiate between open loop and closed loop control systems.
b) Explain Hurwitz criterion for stability.
c) Derive the static error Coefficients and steady state error for unit ramp input.
d) Give the transfer function of series RLC circuit.
e) Explain the concept of stability.

Q.3 Solve any two **12**

a) Explain Step response of second order system.
b) A second order system is given by $C(s)/R(s) = \frac{8}{s^2+4s+8}$. Find all time domain specifications for unit step response.
c) Find $C(s)/R(s)$ for signal flow graph shown in figure below.



Section – II

Q.4 Solve any four. **16**

a) Explain the frequency domain specifications.
b) Explain PID controller.
c) Explain lead- lag compensator.
d) Check the controllability of system below

$$\begin{bmatrix} x_1 \\ x_2 \end{bmatrix} = \begin{bmatrix} -1 & 0 \\ 0 & -2 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \end{bmatrix} + \begin{bmatrix} 0 \\ 1 \end{bmatrix} u(t)$$

$$Y(t) = \begin{bmatrix} 1 & 2 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \end{bmatrix}; D = 0$$

e) Explain the effect of addition of poles and zeros on Bode plot.
f) Draw the polar plot of G(S) = 1/S

Q.5 Solve any two. **12**

a) Sketch the Asymptotic Bode plot for the system whose transfer function is given below and determine,

1) gain margin.
2) phase margin

$$G(s)H(s) = \frac{2000}{s(1+s)(100+s)}$$

b) Compute the STM when,

$$A = \begin{bmatrix} 0 & 1 \\ -6 & -5 \end{bmatrix}$$

c) Explain the Programmable Logic Controller.

Seat No.	

Set **R**

T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
CONTROL SYSTEM – I

Day & Date: Monday, 16-12-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
2) Figures to the right indicates full marks.
3) Assume suitable data wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) For a stable system _____.
   a) All the close loop poles must be in the LHP
   b) Any one close loop pole must be in the LHP
   c) More than 50% close loop poles must be in the LHP
   d) None of the close loop poles must be in the LHP

2) If the system has multiple poles on the jω axis, the system is _____.
   a) Stable b) Unstable
   c) Marginally Stable d) Conditionally stable

3) When damping factor decreases the per unit overshoot _____.
   a) Increases b) decreases
   c) remains unaffected d) none of the above

4) Derivative control _____.
   a) has the same effect as output rate control
   b) reduces damping
   c) is predictive in nature
   d) increases the order of the system

5) The transfer function of a compensating network is of form $(1 + \alpha Ts)/(1 + Ts)$. If this is a phase-Lag network, the value of α should be _____.
   a) greater than 1 b) between 0 and 1
   c) exactly equal to 1 d) exactly equal to 0

6) While designing controller, the advantage of pole-zero cancellation is _____.
   a) The system order is increased
   b) The system order is reduced
   c) The cost of controller becomes low
   d) System's error reduced to optimum levels

7) For an electrically heated temperature controlled liquid heater, the best controller is _____.
   a) Single-position controller b) Two- position controller
   c) Floating controller d) Proportional-position controller

8) The open-loop transfer function of a unity feedback system is G(S) = (1+S)/S(1+0.5S). The corner frequencies are _____.
   a) 0 and 2
   b) 0 and 1
   c) 0 and -1
   d) 1 and 2

9) By the use of PD controller to the second order system the rise time _____.
   a) Increases
   b) Decreases
   c) remains same
   d) None

10) The phase shift of G(S) = $1/S^2$ is _____.
   a) 90°
   b) -90°
   c) 180^o
   d) -180^o

11) In open loop system _____.
   a) the control action depends on the size of the system
   b) the control action depends on system variables
   c) the control action depends on the input signal
   d) the control action is independent of the output

12) Transfer function of a system is used to calculate which of the following?
   a) The order of the system
   b) The time constant
   c) The output for any given input
   d) The steady state gain

13) The system response of a system can be best tested with _____.
   a) unit impulse input signal
   b) ramp input signal
   c) sinusoidal input signal
   d) exponentially decaying input signal

14) Root locus diagram can be used to determine _____.
   a) absolute stability
   b) relative stability
   c) conditional stability
   d) none of these

Seat No.	

Set **R**

T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
CONTROL SYSTEM – I

Day & Date: Monday, 16-12-2019 Max. Marks: 56
Time: 02:30 PM To 05:30 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicates full marks.
3) Assume suitable data wherever necessary.

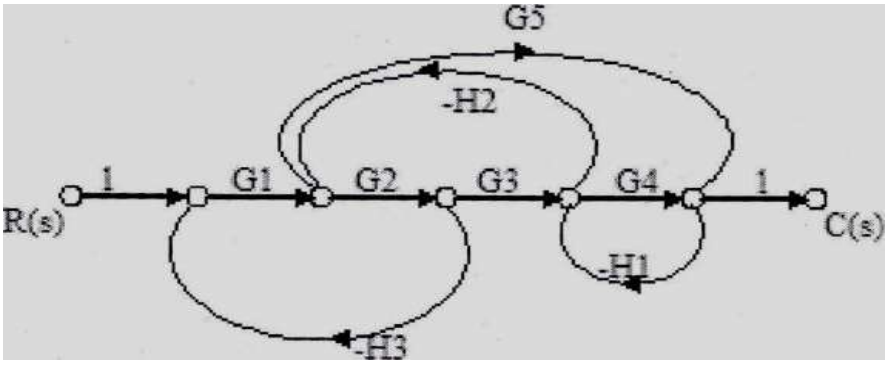
Section – I

Q.2 Solve any four **16**

a) Differentiate between open loop and closed loop control systems.
b) Explain Hurwitz criterion for stability.
c) Derive the static error Coefficients and steady state error for unit ramp input.
d) Give the transfer function of series RLC circuit.
e) Explain the concept of stability.

Q.3 Solve any two **12**

a) Explain Step response of second order system.
b) A second order system is given by $C(s)/R(s) = \frac{8}{s^2+4s+8}$. Find all time domain specifications for unit step response.
c) Find $C(s)/R(s)$ for signal flow graph shown in figure below.



Section – II

Q.4 Solve any four. **16**

a) Explain the frequency domain specifications.
b) Explain PID controller.
c) Explain lead- lag compensator.
d) Check the controllability of system below

$$\begin{bmatrix} x_1 \\ x_2 \end{bmatrix} = \begin{bmatrix} -1 & 0 \\ 0 & -2 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \end{bmatrix} + \begin{bmatrix} 0 \\ 1 \end{bmatrix} u(t)$$

$$Y(t) = \begin{bmatrix} 1 & 2 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \end{bmatrix}; D = 0$$

e) Explain the effect of addition of poles and zeros on Bode plot.
f) Draw the polar plot of G(S) = 1/S

Q.5 Solve any two. **12**

a) Sketch the Asymptotic Bode plot for the system whose transfer function is given below and determine,

1) gain margin.
2) phase margin

$$G(s)H(s) = \frac{2000}{s(1+s)(100+s)}$$

b) Compute the STM when,

$$A = \begin{bmatrix} 0 & 1 \\ -6 & -5 \end{bmatrix}$$

c) Explain the Programmable Logic Controller.

Seat No.	

Set **S**

T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
CONTROL SYSTEM – I

Day & Date: Monday, 16-12-2019 Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
2) Figures to the right indicates full marks.
3) Assume suitable data wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

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

1) While designing controller, the advantage of pole-zero cancellation is _____.
   a) The system order is increased
   b) The system order is reduced
   c) The cost of controller becomes low
   d) System's error reduced to optimum levels

2) For an electrically heated temperature controlled liquid heater, the best controller is _____.
   a) Single-position controller b) Two- position controller
   c) Floating controller d) Proportional-position controller

3) The open-loop transfer function of a unity feedback system is G(S) = (1+S)/S(1+0.5S). The corner frequencies are _____.
   a) 0 and 2 b) 0 and 1
   c) 0 and -1 d) 1 and 2

4) By the use of PD controller to the second order system the rise time _____.
   a) Increases b) Decreases
   c) remains same d) None

5) The phase shift of $G(S) = 1/S^2$ is _____.
   a) 90° b) -90°
   c) 180^o d) -180^o

6) In open loop system _____.
   a) the control action depends on the size of the system
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   c) the control action depends on the input signal
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   d) exponentially decaying input signal

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   a) All the close loop poles must be in the LHP
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   d) None of the close loop poles must be in the LHP

11) If the system has multiple poles on the jω axis, the system is _____.
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   b) Unstable
   c) Marginally Stable
   d) Conditionally stable

12) When damping factor decreases the per unit overshoot _____.
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   b) decreases
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   d) none of the above

13) Derivative control _____.
   a) has the same effect as output rate control
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14) The transfer function of a compensating network is of form $(1 + \alpha Ts)/(1 + Ts)$. If this is a phase-Lag network, the value of α should be _____.
   a) greater than 1
   b) between 0 and 1
   c) exactly equal to 1
   d) exactly equal to 0

Seat No.	

Set **S**

T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019
Electrical & Electronics Engineering
CONTROL SYSTEM – I

Day & Date: Monday, 16-12-2019 Max. Marks: 56
Time: 02:30 PM To 05:30 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicates full marks.
3) Assume suitable data wherever necessary.

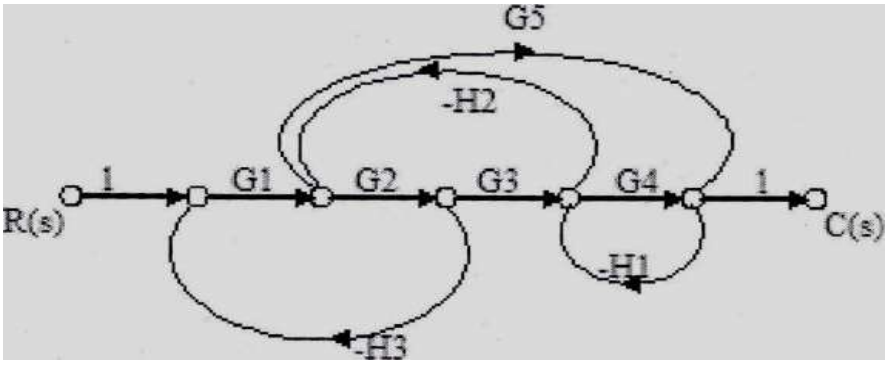
Section – I

Q.2 Solve any four **16**

a) Differentiate between open loop and closed loop control systems.
b) Explain Hurwitz criterion for stability.
c) Derive the static error Coefficients and steady state error for unit ramp input.
d) Give the transfer function of series RLC circuit.
e) Explain the concept of stability.

Q.3 Solve any two **12**

a) Explain Step response of second order system.
b) A second order system is given by $C(s)/R(s) = \frac{8}{s^2+4s+8}$. Find all time domain specifications for unit step response.
c) Find $C(s)/R(s)$ for signal flow graph shown in figure below.



Section – II

Q.4 Solve any four. **16**

a) Explain the frequency domain specifications.
b) Explain PID controller.
c) Explain lead- lag compensator.
d) Check the controllability of system below

$$\begin{bmatrix} x_1 \\ x_2 \end{bmatrix} = \begin{bmatrix} -1 & 0 \\ 0 & -2 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \end{bmatrix} + \begin{bmatrix} 0 \\ 1 \end{bmatrix} u(t)$$

$$Y(t) = \begin{bmatrix} 1 & 2 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \end{bmatrix}; D = 0$$

e) Explain the effect of addition of poles and zeros on Bode plot.
f) Draw the polar plot of G(S) = 1/S

Q.5 Solve any two. **12**

a) Sketch the Asymptotic Bode plot for the system whose transfer function is given below and determine,

1) gain margin.
2) phase margin

$$G(s)H(s) = \frac{2000}{s(1+s)(100+s)}$$

b) Compute the STM when,

$$A = \begin{bmatrix} 0 & 1 \\ -6 & -5 \end{bmatrix}$$

c) Explain the Programmable Logic Controller.