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 Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer

2) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes

Time: 10:00 AM To 01:00 PM

Seat

No.

- Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14
 - The dc armature winding in which coil sides are a pole pitch apart called 1) is winding.
 - Multiplex a)

book.

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

The main function of inter poles is to minimize between the brushes 3) & the commutator when the d.c. machine is loaded.

- armature reaction a) b) Sparking
- mechanical losses d) none of the above c)
- 4) In a dc generator the effect of armature reaction the main pole flux is to _____.
 - b) distort it reduce it a)
 - d) both a and b c) reverse it

5) In a clockwise rotating loaded dc generator brushes have to shifted .

- clockwise b) Anticlockwise a)
- either a or b d) neither a nor b c)
- The most likely causes of sparking at the brushes in d.c. machines is . 6)
 - Open coil in the armature a)
 - Defective inter poles b)
 - Incorrect brush spring pressure c)
 - 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.
 - Armature control a) b) flux control
 - Ward-learned d) tapper field control
- 8) The most usual test for determining the efficiency of a traction motor is the test.
 - Field's a)

c)

c)

- Hopkinson's
- b) Retardation
- d) Swinburne's

SLR-FM-505



Set

Marks: 14

				SLR-FM-505
				Set P
9)	Whi	ch of the following is not basic el	eme	ent of a transformer?
	a)	Core	b)	Primary winding
	c)	Secondary winding	d)	Mutual flux
10)	A 20	00 KVA transformer has an iron I	oss	of 1KW & full load cu. loss of 2KW
	its lo	bad KVA corresponding to maxin	num	efficiency is KVA.
	a)	100	b)	141.4
	c)	50	d)	200
11)	The they a) c)	essential condition for parallel o v should have the same Polarity Voltage ratio	pera b) d)	ation of two 1ø transformers is that KVA rating Percentage impedance
12)	lf th	e load p.f. is 0.866 then the aver	age	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 fo	r pol	ly phase transformer connections
	whic	ch 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.
 - b) 23 d) 25 20 a)
 - c) 34.6

Seat No.

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

Day & Date: Tuesday, 10-12-2019

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.

- 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.

- 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.

- 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.

Max. Marks: 56

16

12

16

Q.5 Attempt any two

- 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.

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

Day & Date: Tuesday, 10-12-2019 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

- Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14
 - The most usual test for determining the efficiency of a traction motor is the 1) test.

b)

- Field's a)
- Hopkinson's C) d) Swinburne's
- Which of the following is not basic element of a transformer? 2)
 - a) Core b) Primary winding d) Mutual flux
 - c) Secondary winding
- 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.
 - b) 141.4 100 a)
 - C) 50 d) 200
- The essential condition for parallel operation of two 1ø transformers is that 4) they should have the same _____.
 - Polarity b) KVA rating a)
 - Voltage ratio d) Percentage impedance C)
- If the load p.f. is 0.866 then the average p.f. of the V-V bank is 5)
 - 0.866 b) 0.75 a)
 - C) 0.51 d) 0.65
- Out of the following given choices for poly phase transformer connections 6) which one will you select for three to two phase conversion.0?
 - Scott b) Star/Star a) c) double scott d) star/double delta
- For supplying a balanced 3ø load of 40KVA rating of each transformer in 7)
 - v-v bank should be nearly KVA.
 - 20 b) 23 a) d) 25 34.6 c)
- The dc armature winding in which coil sides are a pole pitch apart called 8) is winding.
 - Multiplex a) Full pitch

C)

- b) Fractional pitch
- d) Pole pitch

SLR-FM-505

Max. Marks: 70

Marks: 14



Retardation





				Set	Q
9)	For the a) c)	a 4 pole, 2 layer dc lap winding v number of commutator for bars is 80 40	with s b) d)	20 slots & one conductor per layer 20 160	
10)	The & th a) c)	main function of inter poles is to e commutator when the d.c. mad armature reaction mechanical losses	min chine b) d)	imize between the brushes is loaded. Sparking none of the above	
11)	In a a) c)	dc generator the effect of armate reduce it reverse it	ure r b) d)	eaction the main pole flux is to distort it both a and b	
12)	In a a) c)	clockwise rotating loaded dc ger clockwise either a or b	nera b) d)	tor brushes have to shifted Anticlockwise neither a nor b	
13)	The a) b)	most likely causes of sparking a Open coil in the armature Defective inter poles	t the	e brushes in d.c. machines is	

- c) Incorrect brush spring pressured) 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
 - c) Ward-learned
- b) flux control
- d) tapper field control

SLR-FM-505

Seat No.

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

Day & Date: Tuesday, 10-12-2019

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.

- 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.

- 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.

- 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.

Max. Marks: 56

12

16



Q.5 Attempt any two

- 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.

Set S.E. (Part - I) (Old) (CBCS) Examination Nov/Dec-2019

D.C. MACHINES AND TRANSFORMERS Day & Date: Tuesday, 10-12-2019

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.

Electrical & Electronics Engineering

2) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes

a)

Seat

No.

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

- In a clockwise rotating loaded dc generator brushes have to shifted . 1)
 - clockwise a) b) Anticlockwise
 - d) neither a nor b either a or b c)
- The most likely causes of sparking at the brushes in d.c. machines is . 2)
 - Open coil in the armature a)
 - Defective inter poles b)
 - Incorrect brush spring pressure C)
 - All of the above d)
- The most efficient method of increasing the speed of a 3.75KW dc shunt 3) motor would be the method.
 - Armature control a) 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.
 - Field's Retardation a) b)
 - c) Hopkinson's d) Swinburne's
- 5) Which of the following is not basic element of a transformer?
 - Core b) Primary winding a)
 - d) Mutual flux Secondary winding c)
- 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 _____.
 - Polarity b) KVA rating
 - Voltage ratio d) Percentage impedance c)
- 8) If the load p.f. is 0.866 then the average p.f. of the V-V bank is _____.
 - 0.866 b) 0.75 a)
 - 0.51 d) 0.65 c)

SLR-FM-505

Max. Marks: 70

Marks: 14

Page	10	of	16
------	----	----	----

- Out of the following given choices for poly phase transformer connections 9) which one will you select for three to two phase conversion.0?
 - Scott a)

c)

double scott

- b) Star/Star
- 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.
 - b) 23 20 a)
 - 34.6 d) 25 c)
- The dc armature winding in which coil sides are a pole pitch apart called 11) is winding.
 - Multiplex a)
 - b) Fractional pitch d) Pole pitch
- Full pitch c) For a 4 pole, 2 layer dc lap winding with 20 slots & one conductor per layer 12)
 - the number of commutator for bars is 80 b) 20 a)
 - c) 40 d) 160
- 13) 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
- In a dc generator the effect of armature reaction the main pole flux is to _____. 14)
 - a) reduce it C)

d) both a and b

- reverse it
- b) distort it

- **SLR-FM-505**
 - Set

Seat No.

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

Day & Date: Tuesday, 10-12-2019

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.

- 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.

- 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.

- 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.

Max. Marks: 56

Set

12

16

16

Q.5 Attempt any two

- 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.

SLR-FM-505 Set

Seat No.

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

Day & Date: Tuesday, 10-12-2019 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

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

- A 200 KVA transformer has an iron loss of 1KW & full load cu. loss of 2KW 1) its load KVA corresponding to maximum efficiency is _____ KVA.
 - 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 _____. b) KVA rating
 - a) Polarity
 - Voltage ratio d) Percentage impedance c)
- If the load p.f. is 0.866 then the average p.f. of the V-V bank is 3)
 - b) 0.75 0.866 a) c) 0.51 d) 0.65
 - Out of the following given choices for poly phase transformer connections 4) which one will you select for three to two phase conversion.0?
 - b) Star/Star Scott a)
 - double scott d) star/double delta c)
 - For supplying a balanced 3ø load of 40KVA rating of each transformer in 5) v-v bank should be nearly _____ KVA.
 - a) 20 b) 23 d) 25 34.6 C)
 - 6) The dc armature winding in which coil sides are a pole pitch apart called is winding.
 - Multiplex a)
 - b) Fractional pitch Full pitch c) d) Pole pitch
 - 7) For a 4 pole, 2 layer dc lap winding with 20 slots & one conductor per layer the number of commutator for bars is
 - 80 20 a) b) c) 40 d) 160
 - The main function of inter poles is to minimize _____ between the brushes 8) & the commutator when the d.c. machine is loaded.
 - armature reaction a) b) Sparking
 - d) none of the above mechanical losses c)

Marks: 14

Max. Marks: 70

				Set S
9)	In a a) c)	dc generator the effect of armat reduce it reverse it	ure ı b) d)	reaction the main pole flux is to distort it both a and b
10)	In a a) c)	clockwise rotating loaded dc ge clockwise either a or b	nera b) d)	tor brushes have to shifted Anticlockwise neither a nor b
11)	The a) b) c) d)	e most likely causes of sparking a Open coil in the armature Defective inter poles Incorrect brush spring pressure All of the above	it the	e brushes in d.c. machines is
12)	The mot a) c)	e most efficient method of increas or would be the method. Armature control Ward-learned	b) d)	the speed of a 3.75KW dc shunt flux control tapper field control
13)	The	e most usual test for determining test.	the e	efficiency of a traction motor is the
	a) c)	Field's Hopkinson's	b) d)	Retardation Swinburne's
14)	Whi a)	ich of the following is not basic el Core	leme b)	ent of a transformer? Primary winding

- c) Secondary winding
- d) Mutual flux

Seat No.

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

Day & Date: Tuesday, 10-12-2019

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.

- 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.
- With a neat sketch explain the Swinburne's test for dc motor. C)
- 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.

- With a neat sketch explain the commutation process of a dc generator. a)
- 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.

- With neat sketch explain how the mutual flux remains constant at any a) 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
 - KVA supplied by each transformer 1)
 - KW supplied by each transformer 2)
- 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.

Max. Marks: 56

12

16



16

Q.5 Attempt any two

- 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.

Marks: 14

14

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

POWER ELECTRONICS Day & Date: Friday, 22-11-2019

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

Seat

No.

Q.1 Solve the following

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

Double fourier series analysis of PWM is 4) a)

- Two dimensional functions b) Three dimensional functions
- One dimensional functions d) All of these c)
- In single phase VSI, the harmonic which is not present is _____. 5)
 - 3rd 2nd a) b) $\mathbf{5}^{\text{th}}$ 7th d) c)
- 6) Very large values of modulation index (greater than 3.24) lead to
 - Square AC output voltage a)
- Sine AC output voltage b)
- Triangular AC output voltage Trapezoidal AC output voltage d) C)

Single phase VSI are mainly used in _ 7)

- a) Power supplies
- Ups b)
- Multilevel configuration d) All of these
- c)



Max. Marks: 70

SLR-FM-528

Set

- 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
 - 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.	

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

Day & Date: Friday, 22-11-2019 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.

- 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

- 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.
- 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.

- 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

- a) Explain Three phase full bridge inverter with 180° 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.

16

12

12

16



Max. Marks: 56

Set

Max. Marks: 70

Seat No.

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

Day & Date: Friday, 22-11-2019 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

4)

Q.1 Solve the following

- 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
 - 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

d) Equal to that of BJT

c) Harmonic distortion decreases and quality of input current increases

b) Active filter

- 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
 - c) Both passive and active filters d) None of these

Marks: 14



- 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) 2nd
 b) 3rd
 - \dot{c} 5th \dot{d} 7th
- 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
 - b) Ups
 - a) Power suppliesc) Multilevel configuration
- d) All of these

Max. Marks: 56

Seat	
No.	

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

Day & Date: Friday, 22-11-2019 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.

- 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

- 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.

- 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

- a) Explain Three phase full bridge inverter with 180° 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.

12

16

12

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

Day & Date: Friday, 22-11-2019 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

Q.1 Solve the following

C)

- In single phase VSI, the harmonic which is not present is . 1)
 - 2nd b) a) 5th 7th d) c)
- Very large values of modulation index (greater than 3.24) lead to 2)
 - a) Square AC output voltage
 - Triangular AC output voltage C)
- Single phase VSI are mainly used in 3)
 - Power supplies Ups a) b)
 - Multilevel configuration All of these d) c)
- 4) For bidirectional operation of converters
 - A parallel combination of controllable switch and a diode is used a)

d)

- A parallel combination of controllable switch and capacitor is used b)
- A series combination of controllable switch and diode is used c)
- A series combination of controllable switch and a capacitor is used d)

5) For a buck converter to reduce the conduction losses in diode _

- a) A high on resistance switch can be added in parallel
- A low on resistance switch can be added in parallel b)
- A high on resistance switch can be added in series c)
- A low on resistance switch can be added in series d)
- 6) The conduction losses in IGBT is
 - More than that of MOSFET a)
 - Equal to that of MOSFET
- b) Lower than that of MOSFET d) Equal to that of BJT
- 7) The power MOSFET device is a
 - Current controlled unipolar device a)
 - Voltage controlled unipolar device b)
 - Current controlled bipolar device c)
 - Voltage controlled bipolar device d)

Max. Marks: 70

Marks: 14

14

3rd

- b) Sine AC output voltage

Trapezoidal AC output voltage

Set

SLR-FM-528

Seat No.

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

Set |

- Harmonic distortion decreases and quality of input current increases c)
- Both harmonic distortion and quality of input current decreases d)
- 9) The most suited gate pulses given to the AC regulator with R – L load can be in the form of
 - Continuous signal a)
 - b) Large isolating pulse transformer
 - A train of pulses c)
 - d) None of these
- Harmonics in 3 phase inverters can be reduced by using _____. 10)
 - a) Passive filter b) Active filter
 - Both passive and active filters d) None of these C)
- For similar carrier and modulating signals, the line current used in CSI is 11)
 - Identical to line voltage in a VSI a)
 - b) Identical to line current in VSI
 - Identical to phase voltage in VSI c)
 - d) Identical to phase voltage in CSI
- 12) Under harmonic free load voltages, the 3 phase VSI _____.
 - Does not contains second harmonic a)
 - b) Does not contains third harmonic
 - Does not contains fifth harmonic C)
 - Does not contains seventh harmonic d)
- 13) The square wave operation of 3 phase VSI lines contains the harmonics. The amplitudes are
 - Directly proportional to their harmonic order a)
 - Inversely proportional to their harmonic order b)
 - c) Not related to their harmonic order
 - d) None of these

a)

- Double fourier series analysis of PWM is _ 14) Two dimensional functions
 - b) Three dimensional functions
 - One dimensional functions c) d) All of these

Seat	
No.	

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

Day & Date: Friday, 22-11-2019 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.

- 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

- 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.

- 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

- a) Explain Three phase full bridge inverter with 180° 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.

16

12

16



Max. Marks: 56

Seat	
No.	

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

Day & Date: Friday, 22-11-2019 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

Q.1 Solve the following

- The conduction losses in IGBT is _ 1)
 - More than that of MOSFET a)
 - C) Equal to that of MOSFET d) Equal to that of BJT
- The power MOSFET device is a 2)
 - Current controlled unipolar device a)
 - Voltage controlled unipolar device b)
 - Current controlled bipolar device c)
 - Voltage controlled bipolar device d)
- 3) With increase in firing angle,
 - Both harmonic distortion and quality of input current increases a)
 - Harmonic distortion increases and quality of input current decreases b)
 - Harmonic distortion decreases and quality of input current increases c)
 - Both harmonic distortion and guality of input current decreases d)
- The most suited gate pulses given to the AC regulator with R L load can 4) be in the form of
 - Continuous signal a)
 - Large isolating pulse transformer b)
 - A train of pulses C)
 - None of these d)

a)

- 5) Harmonics in 3 phase inverters can be reduced by using _____. Passive filter
 - b) Active filter
 - Both passive and active filters d) None of these C)
- 6) For similar carrier and modulating signals, the line current used in CSI is
 - Identical to line voltage in a VSI a)
 - Identical to line current in VSI b)
 - Identical to phase voltage in VSI C)
 - d) Identical to phase voltage in CSI

Max. Marks: 70

b) Lower than that of MOSFET

Marks: 14

- 7) Under harmonic free load voltages, the 3 phase VSI Does not contains second harmonic a)
 - b) Does not contains third harmonic
 - c) Does not contains fifth harmonic
 - Does not contains seventh harmonic d)
- 8) The square wave operation of 3 phase VSI lines contains the harmonics. The amplitudes are
 - Directly proportional to their harmonic order a)
 - Inversely proportional to their harmonic order b)
 - Not related to their harmonic order c)
 - None of these d)

a)

- 9) Double fourier series analysis of PWM is
 - Two dimensional functions b) Three dimensional functions

SLR-FM-528

Set |

- c) One dimensional functions d) All of these
- 10) In single phase VSI, the harmonic which is not present is .
 - $2^{\overline{n}d}$ 3rd a) b) 5th 7th d) c)
- 11) Very large values of modulation index (greater than 3.24) lead to
 - Square AC output voltage a)
- b) Sine AC output voltage
- Triangular AC output voltage C)
- d) Trapezoidal AC output voltage
- 12) Single phase VSI are mainly used in
 - Power supplies b) Ups a) Multilevel configuration All of these d) C)
- For bidirectional operation of converters 13)
 - A parallel combination of controllable switch and a diode is used a)
 - 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 high on resistance switch can be added in parallel a)
 - A low on resistance switch can be added in parallel b)
 - A high on resistance switch can be added in series c)
 - d) A low on resistance switch can be added in series

Seat	
No.	

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

Day & Date: Friday, 22-11-2019 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.

- 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

- 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.

- 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

- a) Explain Three phase full bridge inverter with 180° 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.

16

12

16

12

Max. Marks: 56

	3	 Assume suitable data if necess 	ary.		
ion: 3	0 Mi	MCQ/Objective Ty	vpe (Questions Mark	s: ′
Choo sente 1)	ose f ence The wav a) c)	the correct alternatives from the correct alternatives from the set of the minimum antenna height required velength λ is	e op t ed for b) d)	tions and rewrite the transmission in reference to $\lambda/4$ 4λ	
2)	AM a) b) c) d)	wave may be represented as E(Envelope of the AM wave Carrier signal Amplitude of modulating signal None of the above	t) cos	$\omega_c t$ where $E(t)$ is	
3)	Cal 15h a) c)	lculate the modulation index wher KW, and after modulation, carrier 68% 82.58%	n the powe b) d)	un modulated carrier power is er is 17KW. 51.63% 34.66%	
4)	TRI a) c)	F receiver and super heterodyne Detection of modulating signal Both a and b	recei b) d)	ver are used for Removal of unwanted signal None of the above	
5)	Car a) c)	rson's rule is used to calculate Bandwidth of FM signal Modulation index	b) d)	 Signal to noise ratio Noise figure	
6)	Fre a) b) c) d)	equency deviation in FM is Change in carrier frequency to center frequency Formation of side bands The variation of the instantaneo the modulating signal All of the above	the bus c	frequency above and below the arrier frequency in proportion to	
7)	The a) b) c) d)	e modulation index of FM is given μ = frequency deviation / modula μ = modulating frequency / frequ μ = modulating frequency / carrient μ = carrier frequency / modulating	by ating lency er fre ng fre	frequency deviation quency quency	
	 ion: 3 Choo Sento 1) 2) 3) 4) 5) 6) 7) 	ion: 30 Mi Choose sentence 1) The wa a) c) 2) AM a) c) 2) AM a) c) 3) Cal b) c) 4) TR a) c) 4) TR a) c) 5) Cal a) c) 6) Free a) c) d) 7) The a) c) d) 7) The a) b) c) c) d) 7) The a) b) c) c) c) c) c) c) c) c) c) c	MCQ/Objective Tyion: 30 MinutesChoose the correct alternatives from the sentence.1) The minimum antenna height require wavelength λ isa) λ c) $\lambda/2$ 2) AM wave may be represented as E(i a) Envelope of the AM wave b) Carrier signal c) Amplitude of modulating signal d) None of the above3) Calculate the modulation index wher 15KW, and after modulation, carrier a) 68% c) 82.58%4) TRF receiver and super heterodyne a) Detection of modulating signal c) Both a and b5) Carson's rule is used to calculate a) Bandwidth of FM signal c) Modulation index6) Frequency deviation in FM is a) Change in carrier frequency to center frequency b) Formation of side bands c) The variation of the instantaneou the modulating signal d) All of the above7) The modulation index of FM is given a) μ = frequency deviation / modulation b) μ = modulating frequency / frequency c) μ = modulating frequency / carried d) μ = carrier frequency / modulation	MCQ/Objective Type O ion: 30 Minutes Choose the correct alternatives from the opt sentence. 1) The minimum antenna height required for wavelength λ is a) λ b) c) $\lambda/2$ d) 2) AM wave may be represented as E(t) cos a) Envelope of the AM wave b) c) $\lambda/2$ d) 2) AM wave may be represented as E(t) cos a) Envelope of the AM wave b) Calculate the modulation index when the 15KW, and after modulation, carrier power a) 68% b) c) 82.58% d) 4) TRF receiver and super heterodyne receir a) Detection of modulating signal b) c) c) Both a and b d) d) 5) Carson's rule is used to calculate	MCQ/Objective Type Questions ion: 30 Minutes Mark Choose the correct alternatives from the options and rewrite the sentence. 1) The minimum antenna height required for transmission in reference to wavelength λ is a) λ b) $\lambda/4$ c) 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) 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) 4λ 2) 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) None of the above 5) Carson's rule is used to calculate a) Badwidth of FM signal

Electrical and Electronics Engineering ELECTRONIC COMMUNICATION ENGINEERING Max. Marks: 70

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019

Day & Date: Saturday, 23-11-2019 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.

Du

Seat

No.

SLR-FM-529

Set

Ρ

14

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
- 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 /km²
 - 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
- 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

Set P

Seat No.

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

Day & Date: Saturday, 23-11-2019 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. a) Draw and explain super-heterodyne receiver. b) What is modulation? Evaluation passaging of modulation.

- **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.

- 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.

- 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.

- 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:
 - 1) Code word length
 - 2) Bite rate
 - 3) output signal to quantization noise ratio

5

Max. Marks: 56

16

12

...

12

Set

Max. Marks: 70

Seat	
No.	

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

Day & Date: Saturday, 23-11-2019 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 14 sentence. Aliasing refers to _____. 1) 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 2) Analog signal may be converted into digital signal by . a) Amplitude modulation b) Sampling c) Filtering d) Mixing Spectrum Efficiency of a cellular network is _____. 3) The traffic carried by whole network a) b) The traffic carried per cell divided by the bandwidth of system & the area of a cell c) Expressed in Erlang/MHz /km² d) Both b and c e) Both a and c 4) 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 5) 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 The sequence of operations in which PCM is done is . 6) a) Sampling, quantizing, encoding b) Quantizing, encoding, sampling
 - c) Quantizing, sampling, encoding
 - d) None of the above

- 7) 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
- 8) The minimum antenna height required for transmission in reference to wavelength λ is _____.
 - a) λ b) $\lambda/4$
 - c) $\lambda/2$ d) 4λ
- 9) 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
- 10) 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%
- 11) TRF receiver and super heterodyne receiver are used for ____
 - a) Detection of modulating signal
 - c) Both a and b
- d) None of the above

Removal of unwanted signal

SLR-FM-529

Set

- 12) Carson's rule is used to calculate _
 - a) Bandwidth of FM signal b) Signal to noise ratio
 - c) Modulation index d) Noise figure
- 13) Frequency deviation in FM is ____
 - a) Change in carrier frequency to the frequency above and below the center frequency

b)

- b) Formation of side bands
- 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.

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

Day & Date: Saturday, 23-11-2019 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. 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.

- 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.

- **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.

- 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:
 - 1) Code word length
 - 2) Bite rate
 - 3) output signal to quantization noise ratio

Set

Max. Marks: 56

16

12

12

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.

- Figures to the right indicate full marks.
- 3) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes

Seat

No.

- Q.1 Choose the correct alternatives from the options and rewrite the sentence.
 - 1) Carson's rule is used to calculate ____ a) Bandwidth of FM signal
 - b) Signal to noise ratio
 - d) Noise figure
 - 2) Frequency deviation in FM is ____

c) Modulation index

- Change in carrier frequency to the frequency above and below the a) center frequency
- Formation of side bands b)
- The variation of the instantaneous carrier frequency in proportion to c) the modulating signal
- d) All of the above

3) The modulation index of FM is given by _____

- μ = frequency deviation / modulating frequency a)
- μ = modulating frequency / frequency deviation b)
- c) μ = modulating frequency / carrier frequency
- d) μ = carrier frequency / modulating frequency

4) Aliasing refers to

- Sampling of signals less than at Nyquist rate a)
- Sampling of signals greater than at Nyquist rate b)
- Sampling of signals at Nyquist rate c)
- d) None of the above
- 5) Analog signal may be converted into digital signal by _____.
 - a) Amplitude modulation Sampling b)
 - c) Filtering d) Mixina
- 6) Spectrum Efficiency of a cellular network is _____.
 - The traffic carried by whole network a)
 - The traffic carried per cell divided by the bandwidth of system & the b) area of a cell
 - c) Expressed in Erlang/MHz /km²
 - Both b and c d)
 - e) Both a and c

SLR-FM-529



Marks: 14

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) $\lambda/4$ d) c) $\lambda/2$ 4λ
- 12) 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
- 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

SLR-FM-529

Set

- c) Both a and b
- None of the above d)
Seat No.

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

Day & Date: Saturday, 23-11-2019 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. 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.

- 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.

- **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.

- 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:
 - 1) Code word length
 - 2) Bite rate
 - 3) output signal to quantization noise ratio



Max. Marks: 56

12

16

12

Page 10 of 12

MCQ/Objective Type Questions Marks: 14 14 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 /km² d) Both b and c e) Both a and c 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 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 The sequence of operations in which PCM is done is _____.

Instructions: 1) Q. No. 1 is compulsory. It should be solved in first 30 minutes in Answer Book.

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

- 2) Figures to the right indicate full marks.
- 3) Assume suitable data if necessary.

Duration: 30 Minutes

Day & Date: Saturday, 23-11-2019

Time: 10:00 AM To 01:00 PM

Seat No.

- Q.1 Choose the correct alternatives from the options and rewrite the sentence.
 - 1)
 - 2)
 - 3)
 - 4)
 - a) Sampling, quantizing, encoding
 - b) Quantizing, encoding, sampling
 - c) Quantizing, sampling, encoding
 - d) None of the above
 - 5) 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
 - The minimum antenna height required for transmission in reference to 6) wavelength λ is _____.
 - a) λ b) $\lambda/4$ c) $\lambda/2$ d) 4λ

SLR-FM-529



Max. Marks: 70

SLR-FM-529 Set S 7) 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 8) 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% TRF receiver and super heterodyne receiver are used for _____. 9) a) Detection of modulating signal b) Removal of unwanted signal None of the above c) Both a and b d) Carson's rule is used to calculate ____ 10) Bandwidth of FM signal Signal to noise ratio b) a) c) Modulation index d) Noise figure 11) 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 12) The modulation index of FM is given by _____. μ = frequency deviation / modulating frequency a) b) μ = modulating frequency / frequency deviation C) μ = modulating frequency / carrier frequency d) μ = carrier frequency / modulating frequency 13) Aliasing refers to Sampling of signals less than at Nyquist rate a) Sampling of signals greater than at Nyquist rate b) c) Sampling of signals at Nyquist rate d) None of the above Analog signal may be converted into digital signal by _____. 14) a) Amplitude modulation b) Sampling c) Filtering d) Mixing

Seat No.

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

Day & Date: Saturday, 23-11-2019 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. 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.

- 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.

- 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.

- 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:
 - 1) Code word length
 - 2) Bite rate
 - 3) output signal to quantization noise ratio

)

Max. Marks: 56

16

12

12

Seat	
No.	

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

Day & Date: Monday, 25-11-2019 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

4)

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

- The Gauss Seidel load flow method has following disadvantages, the 1) incorrect statement is .
 - a) Unreliable convergence
 - b) Slow convergence
 - Choice of slack bus affects convergence c)
 - 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
- For a fixed value of complex power flow in a transmission line having a 3) sending end voltage V, the real loss will be proportional to .
 - b) V^2 a) V $1/V^{2}$ c)
 - An acceleration factor is used in load flow studies using G-S method to
 - to increase the number of iterations a)
 - to increase the speed of calculations b)
 - c) both a and b
 - none of above d)
- The sequence components of the fault current are as follows: 5)
 - $I_{\text{positive}} = j1.5 \text{ pu}, I_{\text{negative}} = -j0.5 \text{ pu}, I_{\text{zero}} = -j1 \text{ pu}.$
 - a) LG b) LL LLG d) LLLG C)
- 6) The complex conjugate of α is _____
 - α^2 b) $1/\alpha$ a) d) none of the above c) both a and b
- A 500 MW, 21 kV, 50 Hz, 3-phase, 2-pole synchronous generator having 7) a rated p.f = 0.9, has a moment of inertia of 27.5×10^3 kg-m². The inertia constant H will be _____.
 - a) 2.44s
 - b) 2.71 s c) 4.88 s d) 5.42 s



Marks: 14

Max. Marks: 70

- d) 1/V

SLR-F	⁻ M-530
-------	--------------------

Set | P

- 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 groundc) double line to ground
- b) line to lined) 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 \in
- c) Slack bus
- d) none of above
- 14) For a power system network with *n* nodes, Z_{33} of its bus impedance matrix is *j*0.5 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
 - c) 0.371<100

- b) 0.325<80
- d) 0.433<80

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

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

Seat

No.

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.

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.

Max. Marks: 56

16

Set P

Set P 12

SLR-FM-530

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.



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.

Q.4 Attempt any four of the following questions.

- 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.



 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.

12

- 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 selfimpedances 'Zs' per phase and mutual impedances 'Zm' between the phases.

Q.5 Attempt any two of the following questions.

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:
 a) and b) a

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

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019

Electrical & Electronics Engineering POWER SYSTEM ANALYSIS

Day & Date: Monday, 25-11-2019 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

Seat No.

Marks: 14

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

- 1) For a stable operation the normal value of δ lies between β .
 - a) 0-30 b) 0-90
 - c) 0-60 d) 0-180
- 2) Negative sequence reactance of a transformer is _____.
 - a) equal to the positive sequence reactance
 - smaller than positive sequence reactance b)
 - c) larger than the positive sequence reactance
 - d) none of the above

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_r) for phase 'a' will be _____.

- a) 4.97 p.u b) 7.0 p.u
- 14.93 p.u d) 29.85 p.u c)
- 4) The zero sequence fault currents are absent when the fault is _____. b) line to line
 - a) single line to ground C) double line to ground
- d) none of above A three-phase, 33 kV oil circuit breaker is rated 1200 A, 2000 MVA, 3 s. 5) The symmetrical breaking current is

INE	e symmetrical breaking ci	urrent is	·
a)	1200 A	b)	3600 A
c)	35 KA	d)	104.8 kA

- In G-S method the number of iterations of the load flow study depend 6) upon _____.
 - a) number of buses b) Tolerance factor \in
 - d) none of above c) Slack bus
- 7) For a power system network with n nodes, Z_{33} of its bus impedance matrix is *j*0.5 per unit. The voltage at node 3 is 1.3<10 per unit. If a capacitor having reactance of -i3.5 per unit is now added to the network between node 3 and the reference node, the current drawn by the capacitor per unit is
 - 0.325<100 b) 0.325<80 a)
 - 0.371<100 d) 0.433<80 C)

SLR-FM-530



Max. Marks: 70





- A 500 MW, 21 kV, 50 Hz, 3-phase, 2-pole synchronous generator having 14) a rated p.f = 0.9, has a moment of inertia of 27.5×10^3 kg-m². The inertia constant H will be _____.
 - 2.44s b) 2.71 s a)

8)

9)

4.88 s d) 5.42 s c)

SLR-FM-530

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

Day & Date: Monday, 25-11-2019 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.

An alternator is connected to infinite bus as shown in fig. it delivers 1 pu a) 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.



- With the help of suitable example explain process obtaining nodal b) admittance matrix.
- A single phase transformer is rated 100 KVA, 11/0.4 KV, 50 Hz have C) leakage reactance of 0.15 ohm referred to low voltage side. Determine its leakage reactance in percent and per unit.
- Derive static load flow equations. Write it in the complex form and real d) form.
- e) For the sample network shown in fig determine bus admittance matrix.



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

Max. Marks: 56

16

Set O

Seat

No.

SLR-FM-530 Set Q

12

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.



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.

- 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.



 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.

- A 50 MVA, 11 KV three phase alternator subjected to different types of e) 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.
- Derive the sequence impedances of 3 phase transmission line having self**f**) impedances 'Zs' per phase and mutual impedances 'Zm' between the phases.

Q.5 Attempt any two of the following questions.

12 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 around.

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

a)

NO. 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 Max. Marks: 70

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

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:

Ipos	$_{\rm sitive} = j1.5 {\rm pu}, I_{\rm negative}$	$= -j0.5 \text{ pu}, I_{\text{zero}} = -j1 \text{ pu}.$
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 27.5×10^3 kg-m². The inertia constant H will be _____.

a)	2.44s	b)	2.71 s
``	1 0 0	N N	E 40

- 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

a)

- 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 _____.
 - 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
 - a) 1200 A b) 3600 A c) 35 KA d) 104.8 kA





Marks: 14

Page 12 of 20

- 9) In G-S method the number of iterations of the load flow study depend upon _____.
 - a) number of buses
- b) Tolerance factor \in

SLR-FM-530

Set R

- c) Slack bus d) none of above
- 10) For a power system network with *n* nodes, Z_{33} of its bus impedance matrix is *j*0.5 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

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

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

Seat

No.

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.

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.

Max. Marks: 56



SLR-FM-530 Set R

12

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.



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.

Q.4 Attempt any four of the following questions.

- 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.



 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.

- 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 selfimpedances 'Zs' per phase and mutual impedances 'Zm' between the phases.

Q.5 Attempt any two of the following questions.

- 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.	

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

Day & Date: Monday, 25-11-2019 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

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

- Instead of the three phase fault, if a single line to ground fault occurs on 1) 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
- 2) The zero sequence fault currents are absent when the fault is _____.
 - a) single line to ground b) line to line
 - double line to ground d) none of above C)
- 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
			1)	404014

- d) 104.8 kA C) 35 KA
- 4) In G-S method the number of iterations of the load flow study depend upon .
 - a) number of buses
- b) Tolerance factor \in

C) Slack bus

c) 14.93 p.u

- 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 -i3.5 per unit is now added to the network between node 3 and the reference node, the current drawn by the capacitor per unit is
 - b) 0.325<80 a) 0.325<100
 - d) 0.433<80 0.371<100 c)
- The Gauss Seidel load flow method has following disadvantages, the 6) 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
- For limiting short circuits we use _ 7)
 - Reactors a)
 - Capacitors c)

- b) resistors
- d) any of these

Max. Marks: 70

Marks: 14

- b) 7.0 p.u
- d) 29.85 p.u

	SLR-FM-530)
	Set S)
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 a) V b) V^2 c) $1/V^2$ d) $1/V$	
9)	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 	
10)	The sequence components of the fault current are as follows: $I_{\text{positive}} = j1.5 \text{ pu}, I_{\text{negative}} = -j0.5 \text{ pu}, I_{\text{zero}} = -j1 \text{ pu}.$ a) LG b) LL c) LLG d) LLLG	
11)	The complex conjugate of α is a) α^2 b) $1/\alpha$ c) both a and b d) none of the above	
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 27.5×10^3 kg-m ² . The inertia constant H will be a) 2.44s b) 2.71 s c) 4.88 s d) 5.42 s	
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 d) none of the above 	

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

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

Seat

No.

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.

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.

Max. Marks: 56

Set

SLR-FM-530 Set S

12

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.



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.

Q.4 Attempt any four of the following questions.

- 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.

- 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 selfimpedances 'Zs' per phase and mutual impedances 'Zm' between the phases.

Q.5 Attempt any two of the following questions.

- 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

		T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 Electrical & Electronics Engineering CONTROL SYSTEM – II
Day Time	& Date : 10:0	: Tuesday, 26-11-2019 Max. Marks: 70) AM To 01:00 PM
Instr	uctio	s: 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
Dura	tion: 3	0 Minutes Marks: 14
Q.1	Choo	ose the correct alternatives from the options and rewrite the 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 asa) System equationb) State Equationc) State transition equationd) None
	3)	State space analysis is applicable even if the initial conditions area) Zerob) Non-zeroc) Equald) 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° b) ∞
	6)	 a) Integrator b) Differentiator c) Phase lead compensator d) None of these d) None of these d) None of these d) Integrate 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

d)

All of the above

c) Linear & time invariant

Seat No.

SLR-FM-531

Set P

Set 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 Nodal Point d) The transfer function of the zero order hold is ____. $a^{T} = e^{TS}$ b) $(1 - e^{TS})/s$ 11) $(1 - e^{-TS})/s$ c) $1 - e^{-/TS}$ d) For an nth order system state equations will be _____. 12) a) n b) 1 $\frac{n}{2}$ n+1C) d) 2 The Limit cycles are the self sustained oscillations of _ 13) 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

SLR-FM-531

Seat No.

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

Day & Date: Tuesday, 26-11-2019 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:

- 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 variable2)State space3)State vector4)State traiector
 - 3) State vector4) State trajectoryWhat are the different methods to obtain state feedback gain matrix?
 - Explain any one.
- e) Find the eigenvectors of the matrix $A = \begin{bmatrix} -3 & 1 \\ 1 & -3 \end{bmatrix}$

Q.3 Solve any two:

d)

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

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

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

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.

- 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.

- a) Derive describing function of saturation and deadzone
- **b)** Examine the stability of the system given by equation by Jury's stability test.

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

c) Examine the stability of the system by using Bilinear transformation coupled with Routh's criteria. $5Z^2 - 2Z + 2 = 0$



12

16

12

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.

T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019

- 2) Figures to the right indicate full marks.
 - 3) Assume suitable data wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes

- Q.1 Choose the correct alternatives from the options and rewrite the sentence.
 - The state transition matrix for the system $X^{\circ} = AX$ with initial state X (0) is 1)

a) $(sI - A)^{-1}$

- b) $e^{At}X(0)$
- c) Laplace inverse of $[(sl A)^{-1}]$
- d) Laplace inverse of $[(sl A)^{-1} X(0)]$

A state variable approach can be applied to _____ Systems. 2)

- a) Time Variant Non-Linear b)
- c) Linear & time invariant d) All of the above
- 3) The Singular points around which the state trajectories are concentric circles or ellipses, are called
 - a) Focus Point b) Centreor vortex
 - c) Saddle Point Nodal Point d)

The transfer function of the zero order hold is _____ 4)

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

For an nth order system state equations will be _____. 5)

- b) a) n 1 n n+1 c)
 - d) 2 2

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

- a) fixed amplitude variable frequency b) c) variable amplitude fixed amplitude and frequency d)
- The term backlash is associated with 7)
 - induction relays a) servomotors b) c) gear trains d) any of above
- 8) The eigen values of the system are represented by _____
 - a) 0,0,0,0 b) 1,1,1,1 c) 0,0,0,-1 1,0,0,0 d)

Seat No.

Marks: 14

14

Set Q

			Set Q
9)	 x(t) = A x(t) + Bu(t) is called as a) System equation c) State transition equation 	b) d)	State Equation None
10)	State space analysis is applicable ev a) Zero c) Equal	/en if b) d)	the initial conditions are Non-zero Not equal
11)	 A system with gain margin close to is a) Highly stable c) Relatively stable 	unity b) d)	or a phase margin close to zero Oscillatory Unstable
12)	Slope of factor K in plotting bode ma a) 0° c) 90°	gnituo b) d)	de plot is $^{\infty}$ None of these
13)	 increases the transient responsea) Integratorc) Phase lead compensator	nse. b) d)	Differentiator Phase lag Compensator
14)	For the state transition matrix $\emptyset(t)$ _ a) $\emptyset^{-1}(t) = \emptyset(-t)$ c) $\emptyset^{-1}(t) = \emptyset(t)$	 b) d)	$ \begin{split} & \emptyset^{-1}(t) = -\emptyset(-t) \\ & \emptyset^{-1}(t) = -\emptyset(t) \end{split} $

Seat No.

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

Day & Date: Tuesday, 26-11-2019 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:

- 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 variable2)State space3)State vector4)State trajector
- 3) State vector4) State trajectoryd) What are the different methods to obtain state feedback gain matrix? Explain any one.
- e) Find the eigenvectors of the matrix $A = \begin{bmatrix} -3 & 1 \\ 1 & -3 \end{bmatrix}$

Q.3 Solve any two:

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

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

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

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.

- 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.

- a) Derive describing function of saturation and deadzone
- **b)** Examine the stability of the system given by equation by Jury's stability test.

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

c) Examine the stability of the system by using Bilinear transformation coupled with Routh's criteria. $5Z^2 - 2Z + 2 = 0$

SLR-FM-531



Max. Marks: 56

12

16

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. Or K in plotting bode magnitude plot is	No.						Set	R
Day & Date: Tuesday, 26-11-2019Max. Marks: 70Time: 10:00 AM To 01:00 PMInstructions: 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 QuestionsDuration: 30 MinutesMCQ/Objective Type QuestionsDuration: 30 MinutesMarks: 14Q. Choose the correct alternatives from the options and rewrite the sentence.1)Slope of factor K in plotting bode magnitude plot isa)0°b)c)90°d)None of these2)increases the transient response.a)Integratorb)Differentiatorc)Phase lead compensatord) $0^{-1}(t) = -\phi(-t)$ d) $\phi^{-1}(t) = \phi(-t)$ d) $\phi^{-1}(t) = -\phi(-t)$ d) $\phi^{-1}(t) = \phi(t)$ d) $\phi^{-1}(t) = -\phi(t)$ d) $\phi^{-1}(t) = \phi(-t)$ d) $\phi^{-1}(t) = \phi(-t)$ d) $\phi^{-1}(t) = -\phi(t)$ d) $\phi^{-1}(t) = \phi(-t)$ d) $\phi^{-1}(t) = -\phi(t)$ d) $\phi^{-1}(t) = \phi(-t)$ d) $\phi^{-1}(t) = -\phi(t)$ d) $\phi^{-1}(t) = \phi(-t)$ d) $\phi^{-1}(t) = -\phi(-t)$ d) $\phi^{-1}(t) = -\phi(-t)$ d) <t< th=""><th colspan="6">T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 Electrical & Electronics Engineering CONTROL SYSTEM – II</th></t<>	T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 Electrical & Electronics Engineering CONTROL SYSTEM – II							
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 Output (1) Slope of factor K in plotting bode magnitude plot is a) 0° b) ∞ c) 90^{\circ} d) None of these 2)	Day & Time: 7	Date: T 10:00 A	uesday, 26-1 M To 01:00 P	1-2019 M		Ma	ax. Marks	s: 70
MCQ/Objective Type Questions Duration: 30 Minutes Marks: 14 9.1 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° b) ∞ c) 90° d) None of these 14 2)	Instrue	ctions:	 Q. No. 1 is book. Figures to Assume sume sume sume sume sume sume sume	compulsory and sho the right indicate full uitable data whereve	ould b mark r nece	e solved in first 30 minute s. essary.	es in ans	wer
Duration: 30 MinutesMarks: 14 Q.1 Choose the correct alternatives from the options and rewrite the sentence.11) Slope of factor K in plotting bode magnitude plot is1a) 0° b) ∞ c) 90° d) None of these2)			N	ICQ/Objective Ty	vpe (Questions		
Q.1 Choose the correct alternatives from the options and rewrite the sentence.141) Slope of factor K in plotting bode magnitude plot is a) 0° b) ∞ c) 90° d) None of these172)	Duratio	on: 30 N	linutes				Mark	s: 14
sentence. 1) Slope of factor K in plotting bode magnitude plot is a) 0° b) ∞ c) 90° 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 \overline{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) $\frac{\pi}{2}$ d) $\frac{\pi + 1}{2}$	Q.1 (Choose	the correct a	alternatives from th	ne opt	tions and rewrite the		14
(a) 0° (b) 0° (c) 90° (c) 10° (c)	5	sentend	e. one of factor l	K in plotting bode ma	anitu	de nlot is		
c) 90° 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) $\frac{n+1}{2}$		a)	0°		b)	∞		
2) increases the transient response. a) Integrator b) Differentiator c) Phase lead compensator d) Phase lag Compensator 3) For the state transition matrix $\phi(t)$ a) $\phi^{-1}(t) = \phi(-t)$ b) $\phi^{-1}(t) = -\phi(-t)$ c) $\phi^{-1}(t) = \phi(t)$ d) $\phi^{-1}(t) = -\phi(t)$ 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) $\frac{n+1}{2}$		c)	90°		d)	None of these		
a) Integrator b) Differentiator c) Phase lead compensator d) Phase lag Compensator 3) For the state transition matrix $\phi(t)$ a) $\phi^{-1}(t) = \phi(-t)$ b) $\phi^{-1}(t) = -\phi(-t)$ c) $\phi^{-1}(t) = \phi(t)$ d) $\phi^{-1}(t) = -\phi(t)$ 4) The state transition matrix for the system X° = 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) $\frac{n}{2}$	2	2)	increase	s the transient respo	nse.	D		
3) For the state transition matrix $\phi(t)$ a) $\phi^{-1}(t) = \phi(-t)$ b) $\phi^{-1}(t) = -\phi(-t)$ c) $\phi^{-1}(t) = \phi(t)$ d) $\phi^{-1}(t) = -\phi(t)$ 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) $\frac{n+1}{2}$		a)	Integrator Phase lead	compensator	d)	Differentiator Phase lag Compensator	r	
a) $\phi^{-1}(t) = \phi(-t)$ b) $\phi^{-1}(t) = -\phi(-t)$ c) $\phi^{-1}(t) = \phi(t)$ d) $\phi^{-1}(t) = -\phi(t)$ 4) The state transition matrix for the system X° = AX with initial state X (0) is \overline{a} , $\overline{(sl - A)^{-1}}$ b) $e^{At}X(0)$ c) Laplace inverse of $[(sl - A)^{-1}]$ d) Laplace inverse of $[(sl - A)^{-1}X(0)]$ 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 c) $\frac{n}{2}$ d) $\frac{n+1}{2}$	-	3) Ec	or the state tra	unsition matrix $\phi(t)$	u)		I	
c) $\phi^{-1}(t) = \phi(t)$ d) $\phi^{-1}(t) = -\phi(t)$ 4) The state transition matrix for the system X° = 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) $\frac{n+1}{2}$		a)	$\phi^{-1}(t) = \phi(t)$			$\emptyset^{-1}(t) = -\emptyset(-t)$		
 4) The state transition matrix for the system X° = 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 nth order system state equations will be a) n b) 1 c) n/2 d) n⁺¹/2 		c)	$\emptyset^{-1}(t) = \emptyset($	t)	d)	$\emptyset^{-1}(t) = -\emptyset(t)$		
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 Variantb) Non-Linearc) Linear & time invariantd) All of the above6) The Singular points around which the state trajectories are concentriccircles or ellipses, are calleda) Focus Pointb) Centreor vortexc) Saddle Pointd) Nodal Point7) The transfer function of the zero order hold isa) $1 - e^{TS}$ b) $(1 - e^{TS})/s$ c) $1 - e^{-/TS}$ d) $(1 - e^{-TS})/s$ 8) For an n th order system state equations will bea) nb) 1c) $\frac{n}{2}$ d) $\frac{n+1}{2}$	2	4) Th	e state transi	tion matrix for the sy	stem	$X^{\circ} = AX$ with initial state	X (0) is	
b) $e^{At}X(0)$ c) Laplace inverse of $[(s1 - A)^{-1}]$ d) Laplace inverse of $[(s1 - A)^{-1}X(0)]$ 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) $\frac{n+1}{2}$		a)	$(sI - A)^{-1}$					
c)Laplace inverse of $[(si - A)^{-1} X(0)]$ d)Laplace inverse of $[(si - A)^{-1} X(0)]$ 5)A state variable approach can be applied to Systems.a)Time Variantb)Non-Linearc)Linear & time invariantd)All of the above6)The Singular points around which the state trajectories are concentriccircles or ellipses, are calleda)Focus Pointb)Centreor vortexc)Saddle Pointd)Nodal Point7)The transfer function of the zero order hold isa) $1 - e^{TS}$ b) $(1 - e^{TS})/s$ c) $1 - e^{-TS}$ d) $(1 - e^{-TS})/s$ 8)For an n th order system state equations will bea)nc) $\frac{n}{2}$ d) $\frac{n+1}{2}$		b)	e ^{At} X(0)	erse of $[(c] - \Lambda)^{-1}$				
 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 nth order system state equations will be a) n b) 1 c) n/2 d) n+1/2 		d)	Laplace inv	erse of $[(s1 - A)^{-1}]$	X (0)]			
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) $\frac{n+1}{2}$	5	5) A	state variable	approach can be ap	plied	to Systems.		
c) Linear & time invariantd) All of the above6) The Singular points around which the state trajectories are concentric circles or ellipses, are calleda) Focus Pointb) Centreor vortexc) Saddle Pointd) Nodal Point7) The transfer function of the zero order hold isa) $1 - e^{TS}$ b) $(1 - e^{TS})/s$ c) $1 - e^{-/TS}$ d) $(1 - e^{-TS})/s$ 8) For an n th order system state equations will bea) nb) 1c) $\frac{n}{2}$ d) $\frac{n+1}{2}$		a)	Time Varia	nt	b)	Non-Linear		
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) $\frac{n+1}{2}$		C)	Linear & tin	ne invariant	a)	All of the above		
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) $\frac{n+1}{2}$	6) The Singular points around which the state trajectories are concentric circles or ellipses, are called							
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) $\frac{n+1}{2}$		a)	Focus Poin	t	b)	Centreor vortex		
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) $\frac{n+1}{2}$		c)	Saddle Poir	nt	d)	Nodal Point		
a) $1 - e^{15}$ b) $(1 - e^{15})/s$ 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) $\frac{n+1}{2}$	7	7) Th	e transfer fun	ction of the zero ord	er ho	ld is		
8) For an n th order system state equations will be a) n b) 1 c) $\frac{n}{2}$ d) $\frac{n+1}{2}$		a)	$1 - e^{15}$ 1 $e^{-/TS}$		d)	$(1 - e^{15})/s$ $(1 - e^{-TS})/s$		
a) n c) $\frac{n}{2}$ b) 1 d) $\frac{n+1}{2}$	c	رن ع) ا	$I = e^{t}$	evetem etate oquati				
c) $\frac{n}{2}$ d) $\frac{n+1}{2}$	C	a)	n n	System state equal	b)	1 .		
=		c)	<u>n</u> 2		d)	$\frac{n+1}{2}$		

SLR-FM-531

Set R

			SLR-FM-531
			Set R
9)	The Limit cycles are the self sustain	ed os	cillations of
	a) fixed amplitude	b)	variable frequency
	c) variable amplitude	d)	fixed amplitude and frequency
10)	The term backlash is associated wit	h	
	a) servomotors	b)	induction relays
	c) gear trains	d)	any of above
11)	The eigen values of the system are	repre:	sented by
	a) 0,0,0,0	b)	1,1,1,1
	c) 0,0,0,-1	d)	1,0,0,0
12)	 x(t) = A x(t) + Bu(t) is called as a) System equation c) State transition equation 	b) d)	State Equation None
13)	State space analysis is applicable e	ven if	the initial conditions are
	a) Zero	b)	Non-zero
	c) Equal	d)	Not equal
14)	A system with gain margin close to is	unity	or a phase margin close to zero

Oscillatory Unstable

- a) Highly stable
 c) Relatively stable
- b) d)

Seat No.

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

Day & Date: Tuesday, 26-11-2019 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:

- 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 variable2)State space3)State vector4)State traiector
- 3) State vector4) State trajectoryd) What are the different methods to obtain state feedback gain matrix? Explain any one.

e) Find the eigenvectors of the matrix $A = \begin{bmatrix} -3 & 1 \\ 1 & 2 \end{bmatrix}$

Q.3 Solve any two:

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

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

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

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.

- 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.

- a) Derive describing function of saturation and deadzone
- **b)** Examine the stability of the system given by equation by Jury's stability test.

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

c) Examine the stability of the system by using Bilinear transformation coupled with Routh's criteria. $5Z^2 - 2Z + 2 = 0$



12

16

12

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. The Singular points around which the state trajectories are concentric 1) 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) $1 - e^{TS}$ $(1 - e^{TS})/s$ b) c) $1 - e^{-/TS}$ $(1 - e^{-TS})/s$ d) For an nth order system state equations will be _____. 3) b) 1 a) n n 2 c) d) n+1 2 4) The Limit cycles are the self sustained oscillations of a) fixed amplitude variable frequency b) c) variable amplitude d) fixed amplitude and frequency 5) The term backlash is associated with a) servomotors induction relays b) any of above c) gear trains d) 6) The eigen values of the system are represented by _____. a) 0,0,0,0 1,1,1,1 b) 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

d)

b) d)

State space analysis is applicable even if the initial conditions are _____.

A system with gain margin close to unity or a phase margin close to zero

b)

d)

None

Non-zero

Not equal

Oscillatory

Unstable

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

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

c) State transition equation

Highly stable

Relatively stable

8)

9)

a) Zero

is

a)

c)

c) Equal

Seat No.

SLR-FM-531

Max. Marks: 70

14

Set

- Slope of factor K in plotting bode magnitude plot is _____. b) ∞ d) None of these
- c) 90°
- 11) ____ increases the transient response.
 - a) Integrator b) c) Phase lead compensator
- Differentiator d) Phase lag Compensator

Set S

- 12) For the state transition matrix $\phi(t)$ _ a) $\phi^{-1}(t) = \phi(-t)$ b) $\emptyset^{-1}(t) = -\emptyset(-t)$ c) $\phi^{-1}(t) = \phi(t)$ $\emptyset^{-1}(t) = -\emptyset(t)$ d)
- The state transition matrix for the system $X^{\circ} = AX$ with initial state X (0) is 13)
 - $(sI A)^{-1}$ a)
 - b) $e^{At}X(0)$

10)

a) 0°

- c) Laplace inverse of $[(sl A)^{-1}]$
- d) Laplace inverse of $[(sl A)^{-1} X(0)]$
- A state variable approach can be applied to _____ Systems. 14)
 - a) Time Variant Non-Linear b)
 - All of the above c) Linear & time invariant d)

Seat No.

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

Day & Date: Tuesday, 26-11-2019 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:

- a) Explain procedure to design lag compensator by using frequency response.
- b) Give steps to design lag compensator using Root Locus Method.
- c) Define :
 - State variable
 State vector
 State trajectory
- d) What are the different methods to obtain state feedback gain matrix? Explain any one.
- e) Find the eigenvectors of the matrix $A = \begin{bmatrix} -3 & 1 \\ 1 & -3 \end{bmatrix}$

Q.3 Solve any two:

a) Design a suitable compensator for the system whose OLTF is $G(s) = \frac{16}{s(s+4)}$

so that the static velocity error constant $K_V = 20 \text{sec}^{-1}$.

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

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

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.

- 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.

- a) Derive describing function of saturation and deadzone
- **b)** Examine the stability of the system given by equation by Jury's stability test.

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

c) Examine the stability of the system by using Bilinear transformation coupled with Routh's criteria. $5Z^2 - 2Z + 2 = 0$

Max. Marks: 56

SLR-FM-531

12

16

16

12

Set S
Seat	
No.	

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

Day & Date: Thursday, 28-11-2019 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

- Q.1 Choose the correct alternatives from the options and rewrite the sentence.
 - 1) Falling interest rates are an example of what external force?
 - Market place a)
 - Government laws and regulations b)
 - c) Labour market
 - d) Economic change
 - 2) Managing change is an integral part of
 - a) Top management's job middle level management b)
 - c) The first line manager's job d) Every manager's job
 - The founder of scientific management was 3)
 - a) F. W. Taylor F. Gilbreth b)
 - 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
 - Manufacturing a number of identical articles in lots either to meet specific 5) order or to meet continuous demand is known as:
 - a) Job production b)
 - c) Continuous production Flow production d)
 - The appellate authority for any industrial dispute is 6)
 - a) Management b) d)
 - c) High Court
 - 7) Indirect expense includes
 - a) factory expenses b) selling expenses
 - c) Administrative expenses All of the above d)
 - Functional responsibilities of system management is _____. 8)
 - a) Organizational analysis
 - b) Development of written policies and procedures
 - c) Work measurement
 - d) All of the above

10

Marks: 10

Max. Marks: 50

Set

Labour Court

Board of directors

Batch production

SLR-FM-533 Set P

- 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

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

Day & Date: Thursday,28-11-2019 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.

- 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.

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

INDUSTRIAL MANAGEMENT

- **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

Max. Marks: 40

20

20



Seat No.

		SLR-FM-533
Seat No.		Set Q
		.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 Electrical And Electronics Engineering INDUSTRIAL MANAGEMENT
Day & Time:	Date 10:00	Thursday,28-11-2019 Max. Marks: 50 AM To 12:00 PM
Instru	uction	 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
Durati	ion: 2	Minutes Marks: 10
Q.1	Choc	e the correct alternatives from the options and rewrite the 10
	sente 1)	nce. The appellate authority for any industrial dispute is a) Management b) Labour Court c) High Court d) Board of directors
	2)	ndirect expense includes a) factory expenses b) selling expenses c) Administrative expenses d) All of the above
	3)	Functional responsibilities of system management is a) Organizational analysis b) Development of written policies and procedures c) Work measurement b) All of the above
	4)	 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
	5)	Dne of the decisional role of a manager is a) Monitor b) disseminator b) Knowledge team builder d) disturbance handler
	6)	Falling interest rates are an example of what external force? a) Market place b) Government laws and regulations c) Labour market b) Economic change
	7)	Aanaging change is an integral part of a) Top management's job b) middle level management b) The first line manager's job d) Every manager's job
	8)	The founder of scientific management was

a)F. vv. i ayiorb)F. Gilbrethc)H. Ganttd)H. Simon



- The time elapsed between the placing of an order and its arrival is called 9) as _____.
 - a) cycle time

- lead time b)
- c) work station process time
- d) none of the above
- Manufacturing a number of identical articles in lots either to meet specific 10) order or to meet continuous demand is known as:
 - a) Job production

- Batch production b)
- c) Continuous production
- Flow production d)

T.E. (Part – II) (Old) (CGPA) Ex

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

Day & Date: Thursday,28-11-2019 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.

- 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.

- 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

Max. Marks: 40

20

20



Seat No.

Seat No.]			Set	R	
	T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 Electrical And Electronics Engineering							
Day & Time: ²	Date: 10:00	Thursday,28-1 AM To 12:00 F	1-2019 PM		Max	Marks	s: 50	
Instrue	ctions	s: 1) Q. No. 1 is answer bo 3) Figures to	s compulsory and it sl bok. D the right indicate ful	nould I marl	be solved in first 20 minute	es in		
		N	ACQ/Objective Ty	vpe (Questions			
Duratio	on: 20) Minutes		•		Marks	s: 10	
Q.1 (Choos	se the correct	alternatives from th	e opt	ions and rewrite the		10	
1	1) 	Matrix organiza a) Focusing o tasks simu b) Formality o c) Time orien d) Confrontati	ition includes f undivided efforts on Itaneously of structure tation	 two (or more essential organizat	onal		
2	2) (;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;	One of the dec a) Monitor c) Knowledge	isional role of a mana e team builder	ger is b) d)	g disseminator disturbance handler			
3	 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	4) ;;	Managing char a) Top manag c) The first lin	nge is an integral part gement's job ne manager's job	of b) d)	middle level management Every manager's job			
Ę	5) - 	The founder of a) F. W. Taylo c) H. Gantt	scientific manageme or	nt wa b) d)	s F. Gilbreth H. Simon			
e	6) - 	The time elaps as a) cycle time c) work statio	ed between the placi n process time	ng of b) d)	an order and its arrival is o lead time none of the above	alled		
7	7)	Manufacturing order or to mee a) Job produc c) Continuous	a number of identical et continuous demanc etion s production	articl l is kn b) d)	es in lots either to meet spe own as: Batch production Flow production	ecific		
8	3) ⁻	The appellate a a) Manageme	authority for any indus	strial o b)	lispute is Labour Court			

- 9) Indirect expense includes
 - a) factory expenses
- b) selling expenses

Set R

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

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

Day & Date: Thursday,28-11-2019 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.

- 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.

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

INDUSTRIAL MANAGEMENT

- **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

Max. Marks: 40

20



Seat No.

					SLR-FM-533			
Seat No.					Set S			
	T.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 Electrical And Electronics Engineering INDUSTRIAL MANAGEMENT							
Day & Time: 7	Date: 10:00	Th AM	ursday,28-11-2019 I To 12:00 PM		Max. Marks: 50			
Instrue	ctions	s: 1 3) Q. No. 1 is compulsory and it answer book.) Figures to the right indicate f 	should ull mar	l be solved in first 20 minutes in ks.			
			MCQ/Objective	Гуре (Questions			
Duratio	on: 20) Mi	nutes		Marks: 10			
Q.1 (Choos	se t	he correct alternatives from	the op	tions and rewrite the 10			
1	1)	The a) c)	Founder of scientific managem F. W. Taylor H. Gantt	ient wa b) d)	is F. Gilbreth H. Simon			
2	2) -	The	time elapsed between the pla	cing of	an order and its arrival is called			
	; ; (as _ a) c)	cycle time work station process time	b) d)	lead time none of the above			
3	3) ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;	Mar orde a) c)	nufacturing a number of identic er or to meet continuous demai Job production Continuous production	al articl nd is kr b) d)	les in lots either to meet specific nown as: Batch production Flow production			
2	4)	The a) c)	appellate authority for any ind Management High Court	ustrial (b) d)	dispute is Labour Court Board of directors			
Ę	5) ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;	Indi a) c)	rect expense includes factory expenses Administrative expenses	b) d)	selling expenses All of the above			
6	6) 	Fun a) b) c) d)	ctional responsibilities of syste Organizational analysis Development of written policie Work measurement All of the above	m man s and p	agement is procedures			
7	7)	Mat a) b) c) d)	rix organization includes Focusing of undivided efforts of tasks simultaneously Formality of structure Time orientation Confrontation	 on two	or more essential organizational			
8	3) (;	On∉ a) c)	e of the decisional role of a mar Monitor Knowledge team builder	nager is b) d)	s disseminator disturbance handler			

- 9) Falling interest rates are an example of what external force?
 - a) Market place
 - b) Government laws and regulations
 - c) Labour market
 - d) Economic change
- 10) Managing change is an integral part of
 - a) Top management's job
- b) middle level management

Set S

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

Seat No.

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

Day & Date: Thursday,28-11-2019 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.

- 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.

- 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

Max. Marks: 40

20



Seat No.

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

Day & Date: Saturday, 07-12-2019 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

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

- 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 motorsd) single phase motors
- c) squirrel cage induction 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
- Motors preferred for rolling mill drive is _____.
 - a) dc motors

C)

- 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) Spanb) Type of drivec) Tonnesd) Any of the above
- Pole changing method of speed control is used in _____.
 - a) slip ring induction motor

dc series motor

- b) dc shunt motor
- d) squirrel cage induction motor



Max. Marks: 70

Marks: 14



Set |

Max. Marks: 56

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

Day & Date: Saturday, 07-12-2019 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)

- 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.

Seat No.

- 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)

- 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.

- 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.

12

16

12

B.E. (Part – I) (CGPA) Examination Nov/Dec-2019 **Electrical & Electronics Engineering** INDUSTRIAL DRIVES AND CONTROL Max. Marks: 70

Day & Date: Saturday, 07-12-2019 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

Seat No.

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

b)

d)

dc shunt motor

squirrel cage induction motor

- Pole changing method of speed control is used in _____. 1)
 - slip ring induction motor a)
 - dc series motor C)
- 2) To save the energy during braking _
 - dynamic braking is used plugging is used a) b) mechanical braking is used
 - regeneration braking is used d) c)

Most commonly used ac motor is ____ 3)

- Synchronous motor Squirrel cage induction motor b) a)
- c) Slip ring induction motor d) ac commutator induction motor
- The motor commonly used in computers and digital systems is _____. 4)
 - Stepper motor a) dc shunt motor b)
 - Synchronous motor c) Induction motor d)
- Which of the following is preferred for automatic drives? 5)
 - Synchronous motors a)
 - Ward Leonard controlled de motors b)
 - C) Squirrel cage induction motor
 - Any of the above d)
- The characteristics of drive for. crane hoisting and lowering is _____. 6) a)
 - precise control smooth movement b)
 - d) all of the above C) fast speed control
- 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 .
 - Lowering a) lifting b) c)
 - hoisting d) landing the load
- The number of sets used in pole changing type squirrel cage motors for 8) derricks and winches, is .
 - 3 a) 2 b) 4 c) d) 6
- The _____ motors, because of their inherent characteristics, are best 9) suited for the rolling mills.
 - a) dc motors squirrel cage induction motors

c)

- b) slip ring induction motors
- d) single phase motors

SLR-FM-537



Marks: 14

10) Which of the following motor is preferred for blowers?

- wound rotor induction motor a)
- squirrel cage induction motor b)
- dc shunt motor c)
- d) dc series motor
- Reluctance motor is a _____. 11)
 - self-starting type synchronous motors a)
 - low torque variable speed motor b)
 - variable torque motor C)
 - low noise, slow speed motor d)
- 12) The traveling speed of cranes varies from _
 - 1 to 2.5 m/s 5 to 15 m/s b) a) C)
 - 20 to 22.5 m/s d) 25 to 40 m/s
- 13) Motors preferred for rolling mill drive is _____.
 - dc motors a)
 - ac slip ring motors with speed control b)
 - any of the above c)
 - d) none of the above
- 14) The capacity of a crane is expressed in terms of _____.
 - Type of drive a) Span b)
 - Tonnes d) Any of the above C)

SLR-FM-537

Set Q

Seat	
No.	

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

Day & Date: Saturday, 07-12-2019 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)

- 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.

- a) Draw neat Block diagram of electrical drives & briefly describe each block.
- 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)

- 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.

- 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.

Max. Marks: 56

16

12

12

Page	7	of	12
i uge		01	

			Electrical & Electror	nics S AN	Engineering D CONTROL
Day Time	& Date : 02:3	e: Sa 0 PN	turday, 07-12-2019 I To 05:30 PM		Max. Marks: 70
Instr	uctio	n s: 1 2) Q. No. 1 is compulsory and it sh book.) Figures to the right indicate full (ould marks	be solved in first 30 minutes in answer
		_	MCQ/Objective Ty	ne (Questions
Dura	ition: 3	BO Mi	nutes		Marks: 14
Q.1	Cho 1)	ose t The a) c)	he correct alternatives from the traveling speed of cranes varies 1 to 2.5 m/s 20 to 22.5 m/s	e opti from b) d)	ons and rewrite the sentence. 14 5 to 15 m/s 25 to 40 m/s
	2)	Mot a) b) c) d)	ors preferred for rolling mill drive dc motors ac slip ring motors with speed c any of the above none of the above	is	
	3)	The a) c)	capacity of a crane is expressed Span Tonnes	in ter b) d)	rms of Type of drive Any of the above
	4)	Pole a) c)	e changing method of speed cont slip ring induction motor dc series motor	rol is b) d)	used in dc shunt motor squirrel cage induction motor
	5)	To s a) c)	save the energy during braking dynamic braking is used regeneration braking is used	b) d)	plugging is used mechanical braking is used
	6)	Mos a) c)	st commonly used ac motor is Synchronous motor Slip ring induction motor	 b) d)	Squirrel cage induction motor ac commutator induction motor
	7)	The a) c)	motor commonly used in computed of a compute	ters a b) d)	nd digital systems is Stepper motor Synchronous motor
	8)	Whi a)	ich of the following is preferred for Synchronous motors	r auto	matic drives?

RE (Dart I) (CGPA) Examination Nov/Dec-2019

14

SLR-FM-537

Seat No.

R

70

- 14

- Ward Leonard controlled de motors b)
- Squirrel cage induction motor C)
- Any of the above d)
- The characteristics of drive for. crane hoisting and lowering is _____. 9) precise control a)
 - smooth movement b) C)
 - fast speed control d) all of the above

Set



suited for the rolling mills.

10)

11)

12)

a)

C)

a)

c)

a)

lifting

2 4

hoisting

- b) slip ring induction motors
- squirrel cage induction motors C)
- d) single phase motors
- 13) Which of the following motor is preferred for blowers?
 - wound rotor induction motor a)
 - b) squirrel cage induction motor
 - c) dc shunt motor

dc motors

- dc series motor d)
- 14) Reluctance motor is a _
 - self-starting type synchronous motors a)
 - b) low torque variable speed motor
 - variable torque motor C)
 - low noise, slow speed motor d)

Seat	
No.	

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

Day & Date: Saturday, 07-12-2019 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)

- 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.

- a) Draw neat Block diagram of electrical drives & briefly describe each block.
- 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)

- 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.

- 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.

Max. Marks: 56

16

12

16

B.E. (Part – I) (CGPA) Examination Nov/Dec-2019 **Electrical & Electronics Engineering**

Day & Date: Saturday, 07-12-2019 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.

INDUSTRIAL DRIVES AND CONTROL

2) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes

Seat No.

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

b)

- 1) Most commonly used ac motor is _____
 - Synchronous motor a)
 - Slip ring induction motor C)
- ac commutator induction motor d)

Synchronous motor

Stepper motor

Squirrel cage induction motor

- 2) The motor commonly used in computers and digital systems is _____
 - a) dc shunt motor
 - b) c) Induction motor d)
- 3) Which of the following is preferred for automatic drives?
 - Synchronous motors a)
 - b) Ward Leonard controlled de motors
 - Squirrel cage induction motor C)
 - Any of the above d)
- 4) The characteristics of drive for. crane hoisting and lowering is .
 - smooth movement b) precise control a) all of the above
 - fast speed control C) d)
- A pole changing type squirrel cage motor used in derricks has four, eight 5) and twenty four poles. In this the medium speed is used for _____.
 - a) lifting b) Lowering
 - hoisting d) landing the load C)
- 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.
 - dc motors b) slip ring induction motors a) c)
 - d) single phase motors squirrel cage induction motors
- 8) Which of the following motor is preferred for blowers?
 - wound rotor induction motor a)
 - b) squirrel cage induction motor
 - dc shunt motor c)
 - d) dc series motor

Max. Marks: 70

Marks: 14

SLR-FM-537 Set S

- 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
- c) dc series motor
- b) dc shunt motor
- d) squirrel cage induction motor
- 14) To save the energy during braking _____.
 - a) dynamic braking is used
 - c) regeneration braking is used
- b) plugging is used
- d) mechanical braking is used

Seat	
No.	

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

Day & Date: Saturday, 07-12-2019 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)

- 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.

- a) Draw neat Block diagram of electrical drives & briefly describe each block.
- 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)

- 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.

- 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.

Max. Marks: 56

16

12

12

SLR-FM-538 Set

Seat	
No.	

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

Day & Date: Tuesday, 10-12-2019 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

c) Brightness

- b) Luminous intensity 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
- d) 25 kV Three phase AC c) 25 kV Two phase AC
- 5) A vapour absorption refrigerator uses _____ as a refrigerant. a) Water
 - b) Ammonia
 - d) Agua-ammonia
- Solid angle is expressed in terms of 6)
 - a) radians/meter b) steredian
 - c) radians
- 7) Candela is-the unit for _____

c) Freon

- a) Light flux
- c) Brightness
- 8) Which gas is sometimes used in filament lamps?
 - a) Argon b) Krypton
 - c) Nitrogen d) Carbon dioxide
- Radiant efficiency of the luminous source depends on _ 9)
 - a) Shape of the source
 - c) Temperature of the source
- b) Wavelength of light rays
- d) all of the above



Max. Marks: 70

- d) degree
- b) Luminous intensity
- d) Luminous efficiency

- 10) Illumination can be expressed in _____
 - a) radians c) lumens
- b) lux 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
 - 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
 - c) Dry saturated vapour
- b) Wet vapour
- d) Superheated vapour

Set P

SLR-FM-538

Seat No.

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

Day & Date: Tuesday, 10-12-2019

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.

- 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.

Solve any Two. Q.3

- 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.

- 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.
- Explain different system of track electrification. c)
- d) Explain Dead weight, Accelerating weight and Adhesive weight.
- e) Draw and explain characteristics of AC series motor for traction work.

Attempt any Two. Q.5

- a) Draw & Explain characteristics of DC series motor for traction work. Also Explain Suitability of DC series motor for traction work.
- An electric train is weighing 100 tonnes has a rotational inertia 10 %. b) 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.



Max. Marks: 56

12

16

16

12



SLR-FM-538

Seat No.

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

Day & Date: Tuesday, 10-12-2019 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

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 _ b) Wavelength of light rays
 - a) Shape of the source
 - c) Temperature of the source
- 3) Illumination can be expressed in _____
 - a) radians b) lux
 - c) lumens d) candela
- When a body reflects entire radiation incident on it, then it is known as _____. 4)
 - a) white body b) grey body
 - black body d) transparent body C)
- Which bulb operates on lowest power? 5)
 - Night bulb Neon bulb a) b)
 - GLS bulb Torch bulb c) d)
- 6) Which locomotive has the highest operational availability?
 - Diesel b) Electric a) C)
 - Steam d) all has same availability
- The condition of refrigerant after passing through the condenser in a 7) vapour compression system is ____
 - a) Saturated liquid b) Wet vapour
 - d) Superheated vapour Dry saturated vapour C)
- Lumen/watt is the unit of 8)
 - a) Light flux
 - c) Brightness
- 9) A good refrigerant should have
 - a) High latent heat of vaporization and low freezing point
 - b) High operating pressures and low freezing point
 - High specific volume and high latent heat of vaporisation c)
 - d) Low C.O.P. and low freezing point

d) all of the above

- b) Luminous intensity
- d) Luminous efficiency

SLR-FM-538



Max. Marks: 70

Marks: 14

				SLR-FM-538
				Set Q
10)	For a) b) c) d)	the transmission of heat from or Temperature of the two bodies Both bodies must be solids Both bodies must be in contact None of the above	ne bo mus	ody to another t be different
11)	Lor a) c)	ng distance railways use 200 V DC 25 kV Two phase AC	 b) d)	25 kV Single phase AC 25 kV Three phase AC
12)	A v a) c)	apour absorption refrigerator use Water Freon	es b) d)	as a refrigerant. Ammonia Aqua-ammonia
13)	Sol a) c)	id angle is expressed in terms of radians ∕ meter radians	b) d)	 steredian degree
14)	Cai a)	ndela is-the unit for Light flux	b)	Luminous intensity

c) Brightness

d) Luminous efficiency

Seat No.

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

Day & Date: Tuesday, 10-12-2019

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.

- 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.

- 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.

- 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.

- 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-538

Max. Marks: 56

12

16

16

B.E. (Part – I) (CGPA) Examination Nov/Dec-2019 **Electrical & Electronics Engineering** ELECTRICAL ENERGY UTILIZATION AND TRACTION Day & Date: Tuesday, 10-12-2019 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**

- Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14
 - 1) A vapour absorption refrigerator uses _____ as a refrigerant. b) Ammonia
 - a) Water
 - c) Freon d) Aqua-ammonia
 - Solid angle is expressed in terms of _ 2)
 - 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
 - Radiant efficiency of the luminous source depends on ____ 5)
 - a) Shape of the source Temperature of the source c)
- b) Wavelength of light rays d) all of the above
- Illumination can be expressed in ____ 6)
 - a) radians b) lux
 - d) c) lumens candela

When a body reflects entire radiation incident on it, then it is known as . 7)

- white body b) grey body a)
- C) black body d)
- Which bulb operates on lowest power? 8)
 - Night bulb b) Neon bulb a)
 - GLS bulb d) Torch bulb c)
- Which locomotive has the highest operational availability? 9)
 - 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 ____
 - Saturated liquid a)
 - c) Dry saturated vapour
- b) Wet vapour
- d) Superheated vapour



SLR-FM-538

Seat No.

Marks: 14

- transparent body

SLR-FM-538 Set R

- 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
 - c) 25 kV Two phase AC
- b) 25 kV Single phase AC
- d) 25 kV Three phase AC

Seat No.

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

Day & Date: Tuesday, 10-12-2019

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.

- 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.

- 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.

- 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.

- 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.

)N Max. Marks: 56

16

16

12

12



SLR-FM-538

No. B.E. (Part – I) (CGPA) Examination Nov/Dec-2019 **Electrical & Electronics Engineering** ELECTRICAL ENERGY UTILIZATION AND TRACTION Day & Date: Tuesday, 10-12-2019 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

Seat

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
- When a body reflects entire radiation incident on it, then it is known as _____. 2)
 - a) white body b)
 - c) black 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?
 - b) Electric a) Diesel
 - Steam d) all has same availability c)
- The condition of refrigerant after passing through the condenser in a 5) vapour compression system is ____
 - Saturated liquid a) c)
- b) Wet vapour d) Superheated vapour
- Dry saturated 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
 - High specific volume and high latent heat of vaporisation c)
 - d) Low C.O.P. and low freezing point

8) For the transmission of heat from one body to another .

- Temperature of the two bodies must be different a)
- b) Both bodies must be solids
- c) Both bodies must be in contact
- d) None of the above
- Long distance railways use _ 9)
 - a) 200 V DC c) 25 kV Two phase AC
- b) 25 kV Single phase AC
 - d) 25 kV Three phase AC

SLR-FM-538



Max. Marks: 70

Marks: 14

- d)

- grey body

 - transparent body

- A vapour absorption refrigerator uses _____ as a refrigerant. 10) a) Water
 - b) Ammonia
 - d) Aqua-ammonia
- Solid angle is expressed in terms of ____ 11)
 - a) radians/meter c) radians

c) Freon

- b) steredian d) degree
- 12) Candela is-the unit for _____.
 - b) Luminous intensity a) Light flux
 - d) Luminous efficiency c) Brightness
- Which gas is sometimes used in filament lamps? 13)
 - a) Argon

c) Nitrogen

- b) Krypton
- d) Carbon dioxide

_.

- 14) Radiant efficiency of the luminous source depends on ____
 - a) Shape of the source c) Temperature of the source
- b) Wavelength of light rays d) all of the above

.

Set S

SLR-FM-538

Seat No.

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

Day & Date: Tuesday, 10-12-2019

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.

- 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.

- 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.

- 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.

- 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-538

Max. Marks: 56

12

16

16
B.E. (Part - I) (CGPA) Examination Nov/Dec-2019

Electrical & Electronics Engineering ELECTRICAL INSTALLATION. TESTING & MAINTENANCE

Day & Date: Thursday, 12-12-2019 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

1)

Seat No.

- Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14
 - Which of the following fire extinguisher are toxic _
 - a) Carbon tetrachloride c) Carbon hexachloride
- b) Sulphur 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
- The arc voltage in C.B. is _ 3)
 - a) In the phase of arc current Lagging the arc current by 90° b)
 - c) Leading the arc current by 90° d) Legging the arc current by 180°
- 4) Which of the following method used for measuring temperature of insulation?
 - Embedded detector method a)
 - d) C) Megger
- For good transformer oil, as per IS density should be equal to . 5)
 - a) 0.5 gm/cm^3 c) 0.89 gm/cm^3
- 1.15 gm/cm^{3}
- 6) Copper losses in a rotating machine is
 - a) Variable losses
 - c) Either (a) or (b)
- 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 D.C. Machines b)
 - c) Induction machines Equal in all types of machines d)
- Electrical power output in a d.c. generator is equal to _ 8)
 - 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



SLR-FM-539

- b) Voltmeter method
 - None of these
- d)

 0.65 gm/cm^3 b)

- b) Constant losses
 - None of these d)

Max. Marks: 70

Marks: 14

		SLR	-FM-539)
			Set P)
The speed in d.c. machine can b a) Anemometer c) Voltmeter	e measu b) d)	ired by using Tachometer Ammeter		
Which of the following factors aff a) Temperature c) Impurities	ects on l b) d)	ife of insulating material? Deposition of oust All of these		
Severity of electric shock is main a) Voltage c) Type of supply	lly deper b) d)	nds on Current all of these		
In fire extinguisher we use a) CO ₂ c) O ₂	 b) d)	SO ₂ H ₂ O		
The most common method of art a) Schafer's method c) Neilson's method	ificial res b) d)	spiration is Silvester's method Mouth to mouth method		

- 14) The rotational losses in d.c. machines is equal to the _____.

9)

10)

11)

12)

13)

- 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

Max. Marks: 56

Seat No.

B.E. (Part - I) (CGPA) Examination Nov/Dec-2019 Electrical & Electronics Engineering ELECTRICAL INSTALLATION, TESTING & MAINTENANCE

Day & Date: Thursday,12-12-2019 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.

- 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.

- 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.

- 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.

- 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.

12

16

12

B.E. (Part - I) (CGPA) Examination Nov/Dec-2019 **Electrical & Electronics Engineering ELECTRICAL INSTALLATION. TESTING & MAINTENANCE**

Day & Date: Thursday, 12-12-2019 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

Seat No.

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

- Electrical power output in a d.c. generator is equal to 1)
 - 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
- The speed in d.c. machine can be measured by using 2)
 - a) Anemometer b) Tachometer
 - Voltmeter d) Ammeter C)
- Which of the following factors affects on life of insulating material? 3)
 - Deposition of oust a) Temperature b) c) Impurities All of these d)
- 4) Severity of electric shock is mainly depends on
 - a) Voltage Current b)
 - c) Type of supply d) all of these
- 5) In fire extinguisher we use _____.
 - a) CO_2 b) SO₂
 - H₂O c) O_2 d)
- The most common method of artificial respiration is _____. 6)
 - a) Schafer's method b) Silvester's method
 - c) Neilson's method d) Mouth to mouth method
- The rotational losses in d.c. machines is equal to the _____. 7)
 - a) Kinetic energy of armature
 - b) Half of the kinetic energy of armature
 - Square of the kinetic energy of armature c)
 - d) Rate of change of kinetic energy
- Which of the following fire extinguisher are toxic ____ 8) Sulphur hexachloride
 - Carbon tetrachloride b) a)
 - Carbon hexachloride d) Sulphur tetrachloride c)

Max. Marks: 70

Marks: 14

- 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
 - c) Leading the arc current by 90° d) Legging the arc current by 180°
- Which of the following method used for measuring temperature of 11) insulation?
 - a) Embedded detector method
- b) Voltmeter method None of these d)
- For good transformer oil, as per IS density should be equal to _____. 12) b) 0.65 gm/cm³
 - a) 0.5 gm/cm^3

Megger

C)

- c) 0.89 gm/cm^3 d) 1.15 gm/cm³
- 13) Copper losses in a rotating machine is ____
 - a) Variable losses
 - c) Either (a) or (b)

- **Constant losses** b)
- d) None of these
- Stray losses are the losses which vary with the load but their relationship 14) with load current cannot be identified. Stay losses is maximum in .
 - a) Synchronous machines
 - c) Induction machines
- D.C. Machines b)
- Equal in all types of machines d)

b) Lagging the arc current by 90°



Seat No.

B.E. (Part - I) (CGPA) Examination Nov/Dec-2019 Electrical & Electronics Engineering ELECTRICAL INSTALLATION, TESTING & MAINTENANCE

Day & Date: Thursday,12-12-2019 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.

- 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.

- 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.

- 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.

- 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.

Max. Marks: 56

12

16

12

Seat No.

B.E. (Part - I) (CGPA) Examination Nov/Dec-2019 **Electrical & Electronics Engineering ELECTRICAL INSTALLATION. TESTING & MAINTENANCE**

Day & Date: Thursday, 12-12-2019 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

1)

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

- a) 0.5 gm/cm^3
- d)
- Copper losses in a rotating machine is 2)
 - a) Variable losses

c) 0.89 gm/cm^3

c) Either (a) or (b)

- b) Constant losses 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 .

d)

- a) Synchronous machines
- b) D.C. Machines
- c) Induction 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

The speed in d.c. machine can be measured by using _ 5) Tachometer b)

- a) Anemometer
- c) Voltmeter d) Ammeter
- Which of the following factors affects on life of insulating material? 6)
 - Deposition of oust a) Temperature b) c) Impurities All of these d)
- 7) Severity of electric shock is mainly depends on . Current
 - a) Voltage b)
 - c) Type of supply d) all of these
- In fire extinguisher we use ____ 8)
 - a) CO_2 b) SO_2
 - H₂O c) O_2 d)
- 9) The most common method of artificial respiration is
 - a) Schafer's method Silvester's method b)
 - c) Neilson's method d) Mouth to mouth method





- For good transformer oil, as per IS density should be equal to _____.

Equal in all types of machines

Max. Marks: 70

Marks: 14

SLR-FM-539

- 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 d) Sulphur tetrachloride
- 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
- c) Leading the arc current by 90° d) Legging the arc current by 180°
- b) Lagging the arc current by 90°

SLR-FM-539

Set

- 14) Which of the following method used for measuring temperature of insulation?
 - a) Embedded detector method
 - c) Megger

- b) Voltmeter method
- d) None of these

Seat No.

B.E. (Part - I) (CGPA) Examination Nov/Dec-2019 Electrical & Electronics Engineering ELECTRICAL INSTALLATION, TESTING & MAINTENANCE

Day & Date: Thursday,12-12-2019 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.

- 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.

- 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.

- 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.

- 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.

16

12

16

12

Max. Marks: 56

Set R

the pipe connectin	ng ma	ain tank of transformer and
e circuit breaker		
C.B. is of arc current rc current by 90°	b) d)	Lagging the arc current by 90° Legging the arc current by 180°

B.E. (Part - I) (CGPA) Examination Nov/Dec-2019 **Electrical & Electronics Engineering ELECTRICAL INSTALLATION. TESTING & MAINTENANCE**

Day & Date: Thursday, 12-12-2019 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.

MCQ/Objective Type Questions

Duration: 30 Minutes

1)

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

Which of the following factors affects on life of insulating material? Deposition of oust

All of these

b)

d)

- a) Temperature
- c) Impurities
- 2) Severity of electric shock is mainly depends on
 - a) Voltage b) Current
 - c) Type of supply all of these d)
- 3) In fire extinguisher we use ____
 - b) SO₂ a) CO_2 c) O₂ d) H₂O
- 4) 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
- The rotational losses in d.c. machines is equal to the _____. 5)
 - a) Kinetic energy of armature
 - b) Half of the kinetic energy of armature
 - Square of the kinetic energy of armature c)
 - d) Rate of change of kinetic energy

Which of the following fire extinguisher are toxic . 6)

- Sulphur hexachloride a) Carbon tetrachloride b)
- c) Carbon hexachloride d) Sulphur tetrachloride

7) Buchholz relay is _____.

- a) Located in the conservator tank
- b) Located in the transformer tank itself
- c) Connected in th conservator
- d) Installed in the

The arc voltage in 8)

- a) In the phase of c) Leading the a

Marks: 14

Max. Marks: 70

2) Figures to the right indicate full mark.



SLR-FM-539



- 9) Which of the following method used for measuring temperature of insulation?
 - a) Embedded detector method
 - c) Megger
- 10) For good transformer oil, as per IS density should be equal to .
 - a) 0.5 gm/cm^3 c) 0.89 gm/cm^3
- b) 0.65 gm/cm³ d) 1.15 gm/cm^{3}
- 11) Copper losses in a rotating machine is _
 - a) Variable losses

Constant losses b)

Voltmeter method

None of these

c) Either (a) or (b) d) None of these

b)

d)

- Stray losses are the losses which vary with the load but their relationship 12) with load current cannot be identified. Stay losses is maximum in _____.
 - a) Synchronous machines
- D.C. Machines b) d) Equal in all types of machines
- c) Induction 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
- The speed in d.c. machine can be measured by using 14)
 - a) Anemometer

Ammeter

c) Voltmeter

- Tachometer b) d)

SLR-FM-539

Set S

Seat No.

B.E. (Part - I) (CGPA) Examination Nov/Dec-2019 Electrical & Electronics Engineering ELECTRICAL INSTALLATION, TESTING & MAINTENANCE

Day & Date: Thursday,12-12-2019 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.

- 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.

- 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.

- 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.

- 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.

12

16

12

16

Max. Marks: 56

B.E. (Part – I) (CGPA) Examination Nov/Dec-2019 Electrical & Electronics Engineering SWITCHGEAR & PROTECTION

Day & Date: Saturday, 14-12-2019 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

Seat

No.

Q.1 Choose the correct alternatives from the options.

- 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 breakersc) Vacuum circuit breakers
- b) Air blast
- d) SF₆ circuit breakers

Max. Marks: 70

Marks: 14

14

Set F

- b) As a substitute for the circuit breaker It used on either sides of the circuit breaker c) 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 provide cooling of contacts b) none of the above c) quenching arc d) Directional relays work on the bases of flow of _____ 10) a) frequency b) power c) current d) voltage wave 11) IDMT relays are used to protect the power transformers against _____. a) external short-circuits overloads b) c) internal short-circuits d) external short-circuits and overload 12) In HRC Fuse, the fuse element is mainly made up of _____. a) Copper Aluminium b) Silver lead tin alloy c) d) H.R.C. fuses provide best protection against 13) 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

7)

Why is an isolator installed?

a) To isolate one portion of the circuit from another

- c) Relay operates, then successively the isolator and the circuit breaker
- d) Isolator operates, then successively the relay and the circuit breaker

SLR-FM-540

Set

Describe the principle of operation and working of IDMT relay. Describe microprocessor based MHO and off set MHO relay with its block diagram.					

Q.5 Solve any two.

- a) What is the principle of distance protection relay and explain any one type of distance relay.
- d)

b)

c)

- Define potential transformer, relay time, trip circuit, auxiliary switch.
- Write a short note on directional over current relay. a) Write a short on metal oxide arrestor. b) Derive generalized mechanical expression for distance relay. c)

Give the merits and demerits of Vacuum circuit breaker.

Section – II Solve any three.

Q.3 Solve any two.

- State types of isolator. Explain any one of them. d)

What is mean by fuse and briefly explain types of fuses? c)

a)

b)

b)

C)

Q.4

- Draw & Explain principle of arc quenching in air blast circuit breaker. a)

2) Figures to the right indicates full marks.

Derive expression for RRRV

Explain Phenomenon of Current Chopping. Draw and explain Minimum oil circuit breaker.

1) 2)

3)

4)

Day & Date: Saturday, 14-12-2019

Instructions: 1) All questions are compulsory.

Time: 02:30 PM To 05:30 PM

Solve any three.

Explain the terms

RRRV

Restriking voltage

Recovery voltage

Seat

No.

Q.2

B.E. (Part – I) (CGPA) Examination Nov/Dec-2019 **Electrical & Electronics Engineering** SWITCHGEAR & PROTECTION

Section – I

Max. Marks: 56

12

16

12

16

SLR-FM-540

Set

Seat No.

B.E. (Part – I) (CGPA) Examination Nov/Dec-2019 **Electrical & Electronics Engineering** SWITCHGEAR & PROTECTION

Day & Date: Saturday, 14-12-2019 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**

Q.1 Choose the correct alternatives from the options.

- Which device sends the information to the circuit breaker to interrupt the 1) circuit in case of fault?
 - a) Switch
 - Relay b)
 - Circuit breaker itself does this function c)
 - d) Fuse

2) Main purpose of oil in oil circuit breaker is to _____.

- a) provide insulation c) quenching arc
- provide cooling of contacts b)
- none of the above d)

power

3) Directional relays work on the bases of flow of _____

- a) frequency b)
- 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 _____
 - Aluminium a) Copper b) c) Silver
 - d) lead tin allov

6) H.R.C. fuses provide best protection against _____.

- overload b) reverse current a)
- d) short-circuits c) open-circuits
- 7) When a fault occurs in a high voltage transmission line, what happens first?
 - a) Circuit breaker operates then the relay
 - Relay operates and then the circuit breaker b)
 - Relay operates, then successively the isolator and the circuit breaker c)
 - Isolator operates, then successively the relay and the circuit breaker d)

Max. Marks: 70

SLR-FM-540



Marks: 14

- 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) SF₆ 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

Set

Seat No.

B.E. (Part – I) (CGPA) Examination Nov/Dec-2019 Electrical & Electronics Engineering SWITCHGEAR & PROTECTION

Day & Date: Saturday, 14-12-2019 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.
 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.

- 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.

- 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.

- 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.





Max. Marks: 56

16

12

16

Seat No.

B.E. (Part – I) (CGPA) Examination Nov/Dec-2019 **Electrical & Electronics Engineering** SWITCHGEAR & PROTECTION

Day & Date: Saturday, 14-12-2019 Time: 02:30 PM To 05:30 PM

Duration: 30 Minutes

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

Q.1 Choose the correct alternatives from the options.

- In a circuit breaker the contact space is ionized by what? 1)
 - a) Field emission from the contact surface
 - b) Thermal emission from the contact surface
 - Thermal ionization of gas C)
 - d) All of above
- 2) Which of the following circuit breaker is highly reliable and has a least maintenance?
 - a) Oil circuit breakers
 - Vacuum circuit breakers C)
- 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
- Which device sends the information to the circuit breaker to interrupt the 4) circuit in case of fault?
 - a) Switch
 - b) Relay
 - Circuit breaker itself does this function c)
 - d) Fuse

5) Main purpose of oil in oil circuit breaker is to _____.

- a) provide insulation provide cooling of contacts b)
- c) quenching arc d) none of the above
- Directional relays work on the bases of flow of _ 6)
 - 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



14

Marks: 14

SLR-FM-540



Max. Marks: 70

- Air blast
- b) d) SF₆ circuit breakers

Set R

SLR-FM-540

- 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) re c) open-circuits d) sl
 - b) reverse currentd) 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

Solve any two. What is the principle of distance protection relay and explain any one type

Describe microprocessor based MHO and off set MHO relay with its block

- of distance relay. Describe the principle of operation and working of IDMT relay.
- a)
- Define potential transformer, relay time, trip circuit, auxiliary switch. d) Q.5
- Write a short note on directional over current relay. a) Write a short on metal oxide arrestor. b) Derive generalized mechanical expression for distance relay. C)
- Section II Q.4 Solve any three.
- 2) **Recovery voltage** 3) RRRV Derive expression for RRRV 4)
- Solve any two. a)

Restriking voltage

d)

Give the merits and demerits of Vacuum circuit breaker.

b)

c)

b)

c)

diagram.

Seat

No.

Q.2

1)

B.E. (Part – I) (CGPA) Examination Nov/Dec-2019 **Electrical & Electronics Engineering** SWITCHGEAR & PROTECTION

Section – I

State types of isolator. Explain any one of them.

Q.3

- Draw & Explain principle of arc quenching in air blast circuit breaker.

Explain the terms

Day & Date: Saturday, 14-12-2019

Time: 02:30 PM To 05:30 PM

- c)

Solve any three.

Instructions: 1) All questions are compulsory.

- Draw and explain Minimum oil circuit breaker. b)

- a) Explain Phenomenon of Current Chopping.

2) Figures to the right indicates full marks.

- What is mean by fuse and briefly explain types of fuses?

Page **9** of **12**

SLR-FM-540



Max. Marks: 56

R

12

16

12

Seat No.						Set	S
		B.E. (Part Elec	– I) (CGPA) ctrical & Ele) Examina ectronics	tion Nov/Dec-20 Engineering	019	
Day & I	Date: Sa	Saturday, 14-1	WITCHGE/ 2-2019	AR & PRO	TECTION	Max. Marks	s: 70
Time: C	2:30 PN	/ To 05:30 P	M .				
Instruc	tions: 1	Book.	compulsory a	and should b	e solved in first 30	minutes in ans	wer
	2	 Figures to Make suita 	the right indic able assumption	ates full mar	rks. ary.		
		Ν	ICQ/Object	ive Type 🕻	Questions		
Duratio	n: 30 Mi	nutes				Mark	s: 14
Q.1 C	hoose t	the correct a	alternatives f	rom the opt	t ions.		14
	a)	frequency		bases of he	power		
	c)	current		d)	voltage wave		
2) IDN a) b) c) d)	IT relays are external sho overloads internal sho external sho	e used to prote ort-circuits ort-circuits ort-circuits and	ect the powe	r transformers agai	nst	
3) In H a) c)	HRC Fuse, th Copper Silver	ne fuse eleme	nt is mainly b) d)	made up of Aluminium lead tin alloy		
4) H.F a) c)	R.C. fuses pro overload open-circuit	ovide best pro ts	otection agai b) d)	nst reverse current short-circuits		
5) Wh firs a) b) c) d)	ien a fault oc t? Circuit brea Relay opera Relay opera Isolator ope	curs in a high ker operates t ates and then ates, then suc erates, then su	voltage tran then the rela the circuit be cessively the uccessively t	esmission line, what by reaker e isolator and the ci he relay and the cir	t happens ircuit breaker cuit breaker	
6) Wh a) b) c) d)	at is the prim Open the ci Protect the Protect the Prevent exc	nary principle rcuit appliance line cess current fr	of a fuse? rom flowing i	nto the line.		
7) Wh a) b) c) d)	at is the mak Less than th Greater tha Equal to the Equal to the	king capacity on the asymmetric an the asymmetrica asymmetrical	of the circuit cal breaking etrical breaki al breaking c breaking ca	breaker? capacity of the bre ng capacity of the b apacity of the break pacity of the break	aker oreaker ker er	

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) SF₆ circuit breakers

SLR-FM-540

Set

- 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 _____
 - b) provide cooling of contacts
 - a) provide insulationc) quenching arc
- d) none of the above

Describe microprocessor based MHO and off set MHO relay with its block

Describe the principle of operation and working of IDMT relay.

- Derive generalized mechanical expression for distance relay. c) Define potential transformer, relay time, trip circuit, auxiliary switch.
- Write a short on metal oxide arrestor. b)
- Write a short note on directional over current relay. a)
- Solve any three.
- C) Give the merits and demerits of Vacuum circuit breaker. Section – II

Derive expression for RRRV

Q.3 Solve any two. a)

State types of isolator. Explain any one of them. d)

2) Figures to the right indicates full marks.

Explain Phenomenon of Current Chopping.

What is mean by fuse and briefly explain types of fuses? c)

a)

b)

d)

b)

c)

diagram.

B.E. (Part – I) (CGPA) Examination Nov/Dec-2019 **Electrical & Electronics Engineering** SWITCHGEAR & PROTECTION

Section – I

- Draw & Explain principle of arc quenching in air blast circuit breaker.

Explain the terms

RRRV

Restriking voltage

Recovery voltage

Day & Date: Saturday, 14-12-2019

Instructions: 1) All questions are compulsory.

Time: 02:30 PM To 05:30 PM

Solve any three.

Draw and explain Minimum oil circuit breaker. b)

1) 2)

3)

4)

SLR-FM-540



Max. Marks: 56

12

16

12

16

Seat No.

Q.2

Q.4

Q.5

No.							
			B.E. (Part – Electr REN	I) (CGPA) Exa ^r ical & Electro EWABLE ENE	mina nics RGY	tion Nov/Dec-2019 Engineering SOURCES	
Day 8 Time:	C Date 02:30	e: Tu) PN	esday, 17-12-2 1 To 05:30 PM	2019		Max	. Marks: 70
Instru	uction	1 s: 1) Q. No. 1 is co Book.	ompulsory and sh	ould b	e solved in first 30 minutes	in answer
		2		0/Objective T	vne (Duestions	
Durat	ion: 3	0 Mi	nutes		урск		Marks: 14
Q.1	Choc 1)	o se t Mul a) c)	he correct alt ti blade type w High starting o Easily availab	ernatives from tl ind mill is used fo characteristic le	h e op t r pum b) d)	t ions. ping the water because of Low cost All of the above	. 14
	2)	Lov a) c)	ver speed wind Drag factor Plash forces	turbine is mainly	driver b) d)	h by Lift forces None of the above	
	3)	The a) c)	e retention perio 5 to 10 days 30 to 50 days	od ranges from	c b) d)	lays. 20 to 40 days 10 to 20 days	
	4)	The a) c)	e biogas genera Temperature loading rate	ation is not affecte	ed by v b) d)	which of the foiling factors <u>-</u> Type of plant Solid concentration	·
	5)	Fixe a) c)	ed done type bi Pragati plant KVIC plant	iogas plant is also	b calle b) d)	d as Janata modal biogas plan None of these	t
	6)	HD a) c)	R is Heavy depth r Hard dry rock	rock	b) d)	Hot dry rock High density rock	
	7)	The a) c)	binary cycle s Rankin cycle Hybrid system	ystem is basically	/ an b) d)	Claude cycle Bar jot cycle	
	8)	The a) c)	e close cycle is Steam cycle Anderson cycl	called as le	b) d)	Claude cycle Rankin cycle	
	9)	In a a) c)	solid storage t Non -metal hy Non metal hyd	the hydrogen is st /drogen drides	tored i b) d)	n the steam of Metal hydride Metal mixture	
	10)	a) c)	can be use Nitrogen Ethane	d to extract hydro	gen a b) d)	nd use it to power fuel cells Methane Carbon	5.

Seat

Set P





- 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
- Fill factor (FF) for a good silicon cell is about _ 12)
 - a) 1 b) 0.8
 - c) 0.5 d) 10

The following material can be used to fabricate the solar cell _____. 13)

- a) Carbon Cadmium sulphide b) c) Chlorine sulphide
 - d) Potassium sulphide
- Energy pattern factor is always _____. 14)
 - a) Less than one
- b) Equal to one
- None of these c) Greater than one d)

Max. Marks: 56

Seat	
No.	

B.E. (Part – I) (CGPA) Examination Nov/Dec-2019 Electrical & Electronics Engineering RENEWABLE ENERGY SOURCES

Day & Date: Tuesday, 17-12-2019 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:-

- 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:-

- 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.

- 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.

- 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.

12

16

16

Seat No.						Set	Q
		B.E. (Part Elec RE	– I) (CGPA) Exa ctrical & Electro NEWABLE ENE	amina onics ERGY	tion Nov/Dec-2019 Engineering SOURCES		
Day & Time: (Date: Tu 02:30 PM	iesday, 17-12 1 To 05:30 P	2-2019 M		Ν	/lax. Marks	: 70
Instruc	ctions: 1 2) Q. No. 1 is Book. 2) Figures to	compulsory and sh the right indicate fu	nould b Ill mark	e solved in first 30 minu s.	ites in ansv	ver
		, g	ICQ/Objective T	vne (Questions		
Duratio	on: 30 Mi	nutes		700		Marks	: 14
Q.1 C	Choose	the correct a	alternatives from t	he op	tions.		14
1	l) The a) c)	e close cycle Steam cycle Anderson c	is called as e ycle	b) d)	Claude cycle Rankin cycle		
2	2) In a a) c)	a solid storag Non -metal Non metal I	le the hydrogen is s hydrogen hydrides	tored i b) d)	n the steam of Metal hydride Metal mixture		
3	3) a) c)	can be u Nitrogen Ethane	sed to extract hydro	ogen a b) d)	nd use it to power fuel c Methane Carbon	ells.	
4	4) Wh a) c)	ich of the fol I.C engine Solar water	lowing system is ar heating	n applic b) d)	cation of solar thermal e Biogas generation Solar lighting	nergy?	
5	5) Fill a) c)	factor (FF) fo 1 0.5	or a good silicon ce	ll is ab b) d)	out 0.8 10		
6	6) The a) c)	e following m Carbon Chlorine su	aterial can be used Iphide	l to fab b) d)	ricate the solar cell Cadmium sulphide Potassium sulphide	<u></u> .	
7	7) Ene a) c)	ergy pattern t Less than o Greater tha	factor is always ne n one	 b) d)	Equal to one None of these		
8	3) Mul a) c)	lti blade type High startin Easily avail	wind mill is used fo g characteristic able	or pum b) d)	ping the water because Low cost All of the above	of	
g	9) Lov a) c)	ver speed wi Drag factor Plash force	nd turbine is mainly s	v driver b) d)	h by Lift forces None of the above		
1	I0) The a) c)	e retention pe 5 to 10 days 30 to 50 da	eriod ranges from _ s ys	c b) d)	lays. 20 to 40 days 10 to 20 days		

Set Q

SLR-FM-542

- 11) The biogas generation is not affected by which of the foiling factors _____.
 - a) Temperature c) loading rate

- b) Type of plant
- d)
- Fixed done type biogas plant is also called as _____. 12)
 - a) Pragati plant
 - c) KVIC plant
- 13)
 - a) Heavy depth rock
 - c) Hard dry rock

- Solid concentration
- - b) Janata modal biogas plant
 - d) None of these
- HDR is _____.
- b) Hot dry rock High density rock d)
- The binary cycle system is basically an 14)
 - a) Rankin cycle c) Hybrid system

- Claude cycle b)
- Bar jot cycle d)

Max. Marks: 56

Seat	
No.	

B.E. (Part – I) (CGPA) Examination Nov/Dec-2019 Electrical & Electronics Engineering RENEWABLE ENERGY SOURCES

Day & Date: Tuesday, 17-12-2019 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:-

- 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:-

- 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.

- 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.

- 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.

12

16

16

		SLR-FM-542
Seat No.		Set R
		B.E. (Part – I) (CGPA) Examination Nov/Dec-2019 Electrical & Electronics Engineering RENEWABLE ENERGY SOURCES
Day & Time:	Date 02:30	: Tuesday, 17-12-2019 Max. Marks: 70) PM To 05:30 PM
Instru	ction	s: 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.
Duroti	00:2	MCQ/Objective Type Questions
Duran	on: 3	J Minutes Marks: 14
Q.1 (Cnoc 1)	Sector correct alternatives from the options.14Fixed done type biogas plant is also called asa) Pragati plantb) Janata modal biogas plantc) KVIC plantd) None of these
:	2)	HDR isa) Heavy depth rockb) Hot dry rockc) Hard dry rockd) High density rock
	3)	The binary cycle system is basically ana) Rankin cycleb) Claude cyclec) Hybrid systemd) Bar jot cycle
	4)	The close cycle is called asa) Steam cycleb) Claude cyclec) Anderson cycled) Rankin cycle
ł	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 engineb) Biogas generationc) Solar water heatingd) Solar lighting
8	8)	Fill factor (FF) for a good silicon cell is abouta) 1b) 0.8c) 0.5d) 10
ę	9)	The following material can be used to fabricate the solar cella) Carbonb) Cadmium sulphidec) Chlorine sulphided) Potassium sulphide
	10)	Energy pattern factor is always a) Less than one b) Equal to one

c) Greater than one d) None of these

r	۲-	F	ľ	V	-	J)	ł	2

- 11) Multi blade type wind mill is used for pumping the water because of _____. b)
 - a) High starting characteristic
 - c) Easily available

12)

14)

- d) All of the above
 - - Lift forces
 - d) None of the above
- The retention period ranges from _____ days. 13) 20 to 40 days
 - b) a) 5 to 10 days d)
 - c) 30 to 50 days
 - The biogas generation is not affected by which of the foiling factors _____.
 - a) Temperature c) loading rate

c) Plash forces

- Type of plant b)
- Solid concentration d)

10 to 20 days

- **SLR-FM-542**

Set R

- Low cost
- Lower speed wind turbine is mainly driven by _____. a) Drag factor
 - - b)

Max. Marks: 56

Seat	
No.	

B.E. (Part – I) (CGPA) Examination Nov/Dec-2019 Electrical & Electronics Engineering RENEWABLE ENERGY SOURCES

Day & Date: Tuesday, 17-12-2019 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:-

- 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:-

- 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.

- 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.

- 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.

12

16

16

Seat						Sat	c
No.						Sel	3
		B.E. (Part Elec RE	– I) (CGPA) Exa ctrical & Electro NEWABLE ENE	mina nics RGY	tion Nov/Dec-2019 Engineering SOURCES		
Day & I Time: 0	Date: Tu)2:30 PN	iesday, 17-12 /I To 05:30 P	2-2019 M		Max	. Marks	s: 70
Instruc	ctions: 1) Q. No. 1 is Book.	compulsory and sh	ould b	e solved in first 30 minutes	in ansv	wer
	2		ICQ/Objective T	vne (Questions		
Duratio	on: 30 Mi	inutes		760		Marks	s: 14
Q.1 C	choose t	the correct a	alternatives from t	he opt	tions.		14
1) a) c)	can be u Nitrogen Ethane	sed to extract hydro	gen a b) d)	nd use it to power fuel cells Methane Carbon	5.	
2	2) Wh a) c)	ich of the fol I.C engine Solar water	lowing system is an heating	applic b) d)	cation of solar thermal ener Biogas generation Solar lighting	gy?	
3	6) Fill a) c)	factor (FF) fo 1 0.5	or a good silicon cel	l is ab b) d)	out 0.8 10		
4) The a) c)	e following m Carbon Chlorine su	aterial can be used Iphide	to fab b) d)	ricate the solar cell Cadmium sulphide Potassium sulphide		
5	5) Ene a) c)	ergy pattern t Less than o Greater tha	factor is always ne n one	 b) d)	Equal to one None of these		
6	5) Mu a) c)	lti blade type High startin Easily avail	wind mill is used fo g characteristic able	or pum b) d)	ping the water because of . Low cost All of the above		•
7	′) Lov a) c)	ver speed wi Drag factor Plash force	nd turbine is mainly s	driver b) d)	h by Lift forces None of the above		
8	3) The a) c)	e retention pe 5 to 10 days 30 to 50 day	eriod ranges from _ s ys	c b) d)	lays. 20 to 40 days 10 to 20 days		
9)) The a) c)	e biogas gen Temperatur loading rate	eration is not affecte e	ed by v b) d)	which of the foiling factors _ Type of plant Solid concentration		
1	0) Fix a) c)	ed done type Pragati plar KVIC plant	e biogas plant is also nt	b calle b) d)	d as Janata modal biogas plan None of these	t	

Seat

11)	HDR is a) Heavy depth rock c) Hard dry rock	b) d)	Hot dry rock High density rock
12)	The binary cycle system is basica a) Rankin cycle c) Hybrid system	lly an b) d)	Claude cycle Bar jot cycle
13)	The close cycle is called as a) Steam cycle c) Anderson cycle	 b) d)	Claude cycle Rankin cycle
14)	In a solid storage the hydrogen isa) Non -metal hydrogenc) Non metal hydrides	stored i b) d)	n the steam of Metal hydride Metal mixture

Set S

Max. Marks: 56

Seat	
No.	

B.E. (Part – I) (CGPA) Examination Nov/Dec-2019 Electrical & Electronics Engineering RENEWABLE ENERGY SOURCES

Day & Date: Tuesday, 17-12-2019 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:-

- 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:-

- 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.

- 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.

- 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.

12

16

16
B.E. (Part – II) (CGPA) Examination Nov/Dec-2019 **Electrical & Electronics Engineering HVDC & FACTS**

Day & Date: Friday, 22-11-2019 Time: 02:30 PM To 05:30 PM

Duration: 30 Minutes

Q.1

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

Choose the correct answer. FACTS provides 1) a) Power Transfer capability & controllability Phase sequence & comparability b) c) a&b d) None 2) The power flow increased with increased in ____ a) α b) X (transmission line reactance) d) All the above c) δ Transient stability improvement can be conveniently evaluated by _____. 3) Static VAR compensation b) Midpoint compensation a) d) Equal area criteria a&b C) The voltage injection in transmission line is the method of _____ 4) Series compensator b) Shunt compensator a) a + b d) None of above C) The best location for use of a booster transformer in a transmission line is _. 5) a) At the sending end b) At the receiving end c) At the intermediate point d) Anywhere in the line A combination of different Compensator whose outputs are co-6) ordinate. Static & mechanically coupled b) Static & mechanically switched a) Static & dynamically coupled d) None of above C) 7) As the degree of series compensation increases, the _____ increase. a) Voltage stability b) Power factor Transmission line reactance d) All of above c) Individual operation of firing pulses for each valve is the feature of _____. 8) a) IPC b) EPC d) VGC c) CCC 9) A commutation group is defined as, group of valves in which only _____ valves conducts. b) Two a) One

c) Three d) Four

Marks: 14

14



Max. Marks: 70

SLR-FM-547

Seat No.

			SLR-FM-	·547
			Se	t P
10)	Reactive power to HVDC s a) AC filters c) SVS	ystem may b b) d)	e supplied from shunt capacitors all of the above	
11)	As compared to HVAC line line are a) Lower c) The same	, the corona ; b) d)	and radio interference on a HVDC More All of the above	
12)	 A 12-pulse bridge is preferr a) It eliminates certain ha b) It results in better power c) Series connection of certain d) All of above 	red in HVDC rmonics er factor onverters on	because D.C. side is better	
13)	 The bypassing of the bridge a) Replacing a single value b) Replacing both value in c) Activating a bypass paid) Deactivating same arm 	e can be don ve in the arm n same arm ir in the bridg n from conve	ne with the help of ge rter set	
14)	The first commercially used	HVDC link א ה)	was built in. 1954	

a) 2006b) 1954c) 1986d) yet to the built

B.E. (Part – II) (CGPA) Examination Nov/Dec-2019 Electrical & Electronics Engineering HVDC & FACTS

Day & Date: Friday, 22-11-2019 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:

- 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:

- 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:

- 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:

- a) Explain Find the expression of DC output for 6 pulse converter in HVDC system considering overlap angle more than 60°.
- b) Explain capacitor commutated converter in detail.
- c) Give detailed comparison between HVDC and AC transmission.



Max. Marks: 56

16

16

12

B.E. (Part – II) (CGPA) Examination Nov/Dec-2019 **Electrical & Electronics Engineering HVDC & FACTS** Max. Marks: 70

Day & Date: Friday, 22-11-2019 Time: 02:30 PM To 05:30 PM

Duration: 30 Minutes

Seat No.

Q.1

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

Choose the correct answer. Individual operation of firing pulses for each valve is the feature of . 1)

- a) IPC b) EPC c) CCC d) VGC
- A commutation group is defined as, group of valves in which only _____ 2) 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
- As compared to HVAC line, the corona and radio interference on a HVDC 4) line are

b) More

- a) Lower
- 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
 - Series connection of converters on D.C. side is better c)
 - d) All of above
- 6) The bypassing of the bridge can be done with the help of _____.
 - Replacing a single valve in the arm a)
 - Replacing both valve in same arm b)
 - Activating a bypass pair in the bridge c)
 - Deactivating same arm from converter set d)
- The first commercially used HVDC link was built in. 7)
 - 2006 a) b) 1954
 - 1986 d) yet to the built c)
- 8) FACTS provides
 - __. a) Power Transfer capability & controllability
 - b) Phase sequence & comparability
 - c) a&b
 - d) None

SLR-FM-547



Marks: 14

SLR-FM-547 Set The power flow increased with increased in . b) X (transmission line reactance) d) All the above Transient stability improvement can be conveniently evaluated by _____. b) Midpoint compensation

- Static VAR compensation a) c) a&b
- d) Equal area criteria

___.

11) The voltage injection in transmission line is the method of _____

- Series compensator Shunt compensator b)
- 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

9)

10)

a) α

c) δ

a)

c)

a)

c)

C)

- b) At the receiving end
- c) At the intermediate point d) Anywhere in the line
- A combination of different _____ Compensator whose outputs are co-13) ordinate.
 - Static & mechanically coupled b) Static & mechanically switched
 - Static & dynamically coupled None of above d)
- As the degree of series compensation increases, the increase. 14)
 - Voltage stability a)
- b) Power factor
- Transmission line reactance d) All of above

Seat

B.E. (Part – II) (CGPA) Examination Nov/Dec-2019 **Electrical & Electronics Engineering HVDC & FACTS**

Day & Date: Friday, 22-11-2019 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:

No.

- What are the control parameters of transmission line? a)
- Explain basic principle of shunt compensator. b)
- Explain variable impedance type series compensator. c)
- With neat sketch explain fixed capacitor thyristor controller reactor. d)
- Explain objective of a series compensator. e)

Q.3 Attempt any two:

- Explain how stability margin is increased when series compensator is used a) for transmission line.
- Give the detail comparison between STATCOM and SVC. b)
- With neat sketch explain GTO Thyristor Controlled Series Compensator. C)

Section – II

Attempt any four: Q.4

- Explain the EPC scheme of firing angle generation. a)
- Explain with neat diagram the different types of DC links. b)
- Explain limitations of HVDC transmission over EHVAC. C)
- Explain converter control characteristics with neat diagram. d)
- Explain power control in HVDC system with neat block diagram. e)

Q.5 Attempt any two:

- Explain Find the expression of DC output for 6 pulse converter in HVDC a) system considering overlap angle more than 60°.
- Explain capacitor commutated converter in detail. b)
- Give detailed comparison between HVDC and AC transmission. c)



Max. Marks: 56

16

12

16

B.E. (Part – II) (CGPA) Examination Nov/Dec-2019 **Electrical & Electronics Engineering HVDC & FACTS**

Day & Date: Friday, 22-11-2019 Time: 02:30 PM To 05:30 PM

Seat No.

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

Q.1 Choose the correct answer.

Duration: 30 Minutes

- The best location for use of a booster transformer in a transmission line is . 1)
 - a) At the sending end At the intermediate point c)
- b) At the receiving end d) Anywhere in the line
- A combination of different _____ Compensator whose outputs are co-2) ordinate.
 - a) Static & mechanically coupled b) Static & mechanically switched
 - Static & dynamically coupled c) d) None of above
- 3) As the degree of series compensation increases, the _____ increase.
 - a) Voltage stability b) Power factor d) All of above
 - c) Transmission line reactance
- 4) Individual operation of firing pulses for each valve is the feature of _____.
 - a) IPC b) EPC
 - CCC d) VGC c)
- A commutation group is defined as, group of valves in which only _____ 5) valves conducts.
 - One Two a) b) d) Four
 - Three c)
- 6) Reactive power to HVDC system may be supplied from _____.
 - a) AC filters b) shunt capacitors
 - d) all of the above SVS C)
- As compared to HVAC line, the corona and radio interference on a HVDC 7) line are
 - a) Lower b) More
 - The same d) All of the above c)
- A 12-pulse bridge is preferred in HVDC because . 8)
 - a) It eliminates certain harmonics
 - b) It results in better power factor
 - Series connection of converters on D.C. side is better c)
 - d) All of above

SLR-FM-547



Max. Marks: 70

Marks: 14

- 14

- Set R
- 9) The bypassing of the bridge can be done with the help of .
 - Replacing a single valve in the arm a)
 - b) Replacing both valve in same arm
 - Activating a bypass pair in the bridge c)
 - Deactivating same arm from converter set d)
- 10) The first commercially used HVDC link was built in.
 - a) 2006

C)

- b) 1954
- 1986 d) yet to the built
- 11) FACTS provides _____
 - a) Power Transfer capability & controllability
 - b) Phase sequence & comparability
 - a&b c)
 - d) None

α

a)

- The power flow increased with increased in _____. 12)
 - b) X (transmission line reactance)
 - C) δ d) All the above

13) Transient stability improvement can be conveniently evaluated by _____.

- Static VAR compensation a)
- b) Midpoint compensation

c) a&b

- d) Equal area criteria
- 14) The voltage injection in transmission line is the method of
 - Series compensator a)
 - c) a + b

- b) Shunt compensator
- d) None of above

Seat No.

B.E. (Part – II) (CGPA) Examination Nov/Dec-2019 Electrical & Electronics Engineering HVDC & FACTS

Day & Date: Friday, 22-11-2019 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:

- 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:

- 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:

- 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:

- a) Explain Find the expression of DC output for 6 pulse converter in HVDC system considering overlap angle more than 60°.
- b) Explain capacitor commutated converter in detail.
- c) Give detailed comparison between HVDC and AC transmission.



Max. Marks: 56

16

16

12

B.E. (Part – II) (CGPA) Examination Nov/Dec-2019 Electrical & Electronics Engineering

HVDC & FACTS

Day & Date: Friday, 22-11-2019 Time: 02:30 PM To 05:30 PM

Seat No.

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

Q.1 Choose the correct answer.

a) AC filters

Duration: 30 Minutes

c)

- 1) Reactive power to HVDC system may be supplied from _____
 - b) shunt capacitors
 - SVS d) all of the above
- 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 _____.
 - 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

4) 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
- 5) The first commercially used HVDC link was built in.
 - 2006 b) 1954
 - c) 1986 d) yet to the built
- 6) FACTS provides ____

a)

- a) Power Transfer capability & controllability
- b) Phase sequence & comparability
- c) a&b
- d) None

7) The power flow increased with increased in _____

- b) X (transmission line reactance)
- c) δ

a) α

d) All the above

SLR-FM-547



Max. Marks: 70

Marks: 14

				Set S	
8)	Tra a) c)	nsient stability improvement can Static VAR compensation a & b	be c b) d)	conveniently evaluated by Midpoint compensation Equal area criteria	
9)	The a) c)	e voltage injection in transmissior Series compensator a + b	n line b) d)	e is the method of Shunt compensator None of above	
10)	The a) c)	e best location for use of a boost At the sending end At the intermediate point	er tra b) d)	ansformer in a transmission line is At the receiving end Anywhere in the line	
11)	A c ord a) c)	ombination of different Co inate. Static & mechanically coupled Static & dynamically coupled	bmpe b) d)	ensator whose outputs are co- Static & mechanically switched None of above	
12)	As a) c)	the degree of series compensation Voltage stability Transmission line reactance	on in b) d)	creases, the increase. Power factor All of above	
13)	Indi a) c)	ividual operation of firing pulses t IPC CCC	for e b) d)	ach valve is the feature of EPC VGC	
14)	A c valv a)	ommutation group is defined as, ves conducts. One Three	grou b) d)	up of valves in which only Two Four	

c) I hree

d) Four

SLR-FM-547

Seat	
No.	

B.E. (Part – II) (CGPA) Examination Nov/Dec-2019 Electrical & Electronics Engineering HVDC & FACTS

Day & Date: Friday, 22-11-2019 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:

- 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:

- 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:

- 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:

- a) Explain Find the expression of DC output for 6 pulse converter in HVDC system considering overlap angle more than 60°.
- b) Explain capacitor commutated converter in detail.
- c) Give detailed comparison between HVDC and AC transmission.



Max. Marks: 56

16

12

16

Seat	
No.	

B.E. (Part – II) (CGPA) Examination Nov/Dec-2019 **Electrical and Electronics Engineering** ELECTRICAL MACHINE DESIGN

Day & Date: Saturday, 23-11-2019

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
 - Inductively linked b) c) Not linked at all d) Electrically linked
- A salient pole synchronous motor is running at no load. If field current is 2) 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
- If a transformer primary is energised from square wave, its output voltage 4) 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 _____.
 - is proportional to rotor resistance r₂ a)
 - b) Does not depend on r₂
 - c) is proportional to r_2^2
 - d) None of the above
- In induction motors, length of air gap in kept as small as mechanically 6) possible is order to have
 - a) Low power factor b) high power factor
 - any of the above c) High over load capacity d)
- machines, the size of the shaft is decided by the critical 7) In speed which depends on the deflection of the shaft.
 - a) small b) Medium c) large d) any of the above

Set

Max. Marks: 70

Set 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 any of the above c) high d) 11) Transformer-core laminations are made of a) cast iron wrought iron b) c) silicon steel d) cast steel Skewing of rotor slots helps in _____. 12) a) improving beat transfer b) reducing noise c) suppressing undesirable harmonics d) all of the above The critical speed of the shaft for an electric motor should be _____. 13) 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

SLR-FM-548

Seat	
No.	

B.E. (Part – II) (CGPA) Examination Nov/Dec-2019 **Electrical and Electronics Engineering ELECTRICAL MACHINE DESIGN**

Day & Date: Saturday, 23-11-2019 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

Attempt any three of the following questions. Q.2

- Derive an output equation of a single phase core type transformer. a)
- A 3 phase, 50 Hz, oil cooled core type transformer has the following b) 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 1.25Wb/m² and current density in the conductor is 2.5A/mm². 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.
- Explain the principles of design of electromagnetic machines. C)
- Distinguish between core transformer and shell transformer. d)

Attempt any two of the following questions. Q.3

Calculate the KVA output of single phase transformer from following data. a) $- = 2.8 \frac{\text{diameter of Circumcribing circle}}{2}$ core height = 0.56

distance between core centers distance between core centers net iron area area of Circumcribing circle = 0.7,

current density=0.27, frequency=50 Hz, flux density of core=1.2 Wb/m² Distance between core centers=0.4 m

- Explain different cooling methods used in transformer. b)
- Calculate the main dimension of A 100 KVA 2000/400 Volt, 50Hz single c) phase shell type, oil immersed, self-cooled transformer. Assume voltage per turn 10V flux density in core 1.1 Wb/m², current density 2 A/mm², 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.

- Find the current in the bars and end rings of a cage rotor of a 6 pole, 3Φ . a) 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.
- Derive an output equation of 3Ø induction motor. c)
- Find the main dimensions of a 100 MVA, 11 KV, 50 Hz, 40 pole salient d) pole generator, assuming air gap flux density as 0.65 Wb/m² and ampere conductor as 40000 per meter. The peripheral speed should not exceed 60 m/sec.

Max. Marks: 56

16

12



Q.5 Attempt any two of the following questions.

- Explain the design procedure of stator of three phase induction motor. a)
- The following data for a 1250KVA, 0.8p.f, 50Hz, 3300 V, 300 r.p.m, star b) 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.



SLR-FM-548

Seat No.

B.E. (Part – II) (CGPA) Examination Nov/Dec-2019 **Electrical and Electronics Engineering ELECTRICAL MACHINE DESIGN**

Day & Date: Saturday, 23-11-2019 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

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

- The length of air gap to be provided in _____ is primarily determined 1) 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. medium size
 - a) small size
 - c) large size d) any of the above
- 3) The design of mechanical parts is particularly important in case of speed machines.

b)

- a) low b) Medium
- c) high d) any of the above
- 4) Transformer-core laminations are made of
 - a) cast iron wrought iron b)
 - 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

7)

The critical speed of the shaft for an electric motor should be _____. 6)

- a) away from the operating speed
- exactly the same as operating speed b)
- half the operating speed c)
- d) double of the operating speed

are always double layer type.

- a) Closed windings Open windings b)
- 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 Electrically linked d)



Marks: 14

Max. Marks: 70

SLR-FM-548

- 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 **SLR-FM-548**

Set Q

- 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) _ machines, the size of the shaft is decided by the critical In speed which depends on the deflection of the shaft.
 - a) small

b) Medium

c) large

any of the above d)

Page 6 of 16

12

SLR-FM-548

Seat	
No.	

B.E. (Part – II) (CGPA) Examination Nov/Dec-2019 **Electrical and Electronics Engineering ELECTRICAL MACHINE DESIGN**

Day & Date: Saturday, 23-11-2019 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

Attempt any three of the following questions. Q.2

- Derive an output equation of a single phase core type transformer. a)
- A 3 phase, 50 Hz, oil cooled core type transformer has the following b) 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 1.25Wb/m² and current density in the conductor is 2.5A/mm². 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.
- Explain the principles of design of electromagnetic machines. C)
- Distinguish between core transformer and shell transformer. d)

Attempt any two of the following questions. Q.3

Calculate the KVA output of single phase transformer from following data. a) $- = 2.8 \frac{\text{diameter of Circumcribing circle}}{2}$ core height -=0.56

distance between core centers distance between core centers net iron area area of Circumcribing circle = 0.7,

current density=0.27, frequency=50 Hz, flux density of core=1.2 Wb/m² Distance between core centers=0.4 m

- Explain different cooling methods used in transformer. b)
- Calculate the main dimension of A 100 KVA 2000/400 Volt, 50Hz single c) phase shell type, oil immersed, self-cooled transformer. Assume voltage per turn 10V flux density in core 1.1 Wb/m², current density 2 A/mm², 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.

- Find the current in the bars and end rings of a cage rotor of a 6 pole, 3Φ . a) 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.
- Derive an output equation of 3Ø induction motor. c)
- Find the main dimensions of a 100 MVA, 11 KV, 50 Hz, 40 pole salient d) pole generator, assuming air gap flux density as 0.65 Wb/m² and ampere conductor as 40000 per meter. The peripheral speed should not exceed 60 m/sec.

Max. Marks: 56

16

Q.5 Attempt any two of the following questions.

- 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=0.09m², 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.

r



Set Q 16

Set

R

Seat	
No.	

B.E. (Part – II) (CGPA) Examination Nov/Dec-2019 Electrical and Electronics Engineering ELECTRICAL MACHINE DESIGN

Day & Date: Saturday, 23-11-2019 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

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 r₂
 - 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
- 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

Max. Marks: 70

Marks: 14

- 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)
 - b) Inductively linked

SLR-FM-548

Set R

- 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.

B.E. (Part – II) (CGPA) Examination Nov/Dec-2019 **Electrical and Electronics Engineering ELECTRICAL MACHINE DESIGN**

Day & Date: Saturday, 23-11-2019 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.

- Derive an output equation of a single phase core type transformer. a)
- A 3 phase, 50 Hz, oil cooled core type transformer has the following b) 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 1.25Wb/m² and current density in the conductor is 2.5A/mm². 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.
- Explain the principles of design of electromagnetic machines. C)
- Distinguish between core transformer and shell transformer. d)

Attempt any two of the following questions. Q.3

Calculate the KVA output of single phase transformer from following data. a) $- = 2.8 \frac{\text{diameter of Circumcribing circle}}{2}$ core height -=0.56

distance between core centers distance between core centers net iron area area of Circumcribing circle = 0.7,

current density=0.27, frequency=50 Hz, flux density of core=1.2 Wb/m² Distance between core centers=0.4 m

- Explain different cooling methods used in transformer. b)
- Calculate the main dimension of A 100 KVA 2000/400 Volt, 50Hz single c) phase shell type, oil immersed, self-cooled transformer. Assume voltage per turn 10V flux density in core 1.1 Wb/m², current density 2 A/mm², 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.

- Find the current in the bars and end rings of a cage rotor of a 6 pole, 3Φ . a) 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.
- Derive an output equation of 3Ø induction motor. c)
- Find the main dimensions of a 100 MVA, 11 KV, 50 Hz, 40 pole salient d) pole generator, assuming air gap flux density as 0.65 Wb/m² and ampere conductor as 40000 per meter. The peripheral speed should not exceed 60 m/sec.

Max. Marks: 56

16

12

Q.5 Attempt any two of the following questions.

- 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=0.09m², 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.
- induction motor. V, 300 r.p.m, star



Set

B.E. (Part – II) (CGPA) Examination Nov/Dec-2019 **Electrical and Electronics Engineering ELECTRICAL MACHINE DESIGN**

Day & Date: Saturday, 23-11-2019 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

Seat

No.

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 c) silicon steel

- wrought iron b)
- 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 Open windings b)
- c) Either of the above d) None of the above

The two windings of a transformer is 6)

- a) Conductively linked Inductively linked b)
- Not linked at all Electrically linked c) d)
- A salient pole synchronous motor is running at no load. If field current is 7) 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

Set

Max. Marks: 70

Marks: 14



When a synchronous motor is running at synchronous speed, the damper 8) 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)
 - 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

A sine wave

SLR-FM-548

Set

- 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 Medium b) c) large
 - d) any of the above
- The length of air gap to be provided in _____ is primarily determined 13) 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
 - c) large size

- b) medium size
- d) any of the above

Seat	
No.	

B.E. (Part – II) (CGPA) Examination Nov/Dec-2019 **Electrical and Electronics Engineering ELECTRICAL MACHINE DESIGN**

Day & Date: Saturday, 23-11-2019 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

Attempt any three of the following questions. Q.2

- Derive an output equation of a single phase core type transformer. a)
- A 3 phase, 50 Hz, oil cooled core type transformer has the following b) 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 1.25Wb/m² and current density in the conductor is 2.5A/mm². 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.
- Explain the principles of design of electromagnetic machines. C)
- Distinguish between core transformer and shell transformer. d)

Attempt any two of the following questions. Q.3

Calculate the KVA output of single phase transformer from following data. a) $- = 2.8 \frac{\text{diameter of Circumcribing circle}}{\text{distance between between }} = 0.56$ core height

distance between core centers distance between core centers net iron area area of Circumcribing circle = 0.7,

current density=0.27, frequency=50 Hz, flux density of core=1.2 Wb/m² Distance between core centers=0.4 m

- Explain different cooling methods used in transformer. b)
- Calculate the main dimension of A 100 KVA 2000/400 Volt, 50Hz single c) phase shell type, oil immersed, self-cooled transformer. Assume voltage per turn 10V flux density in core 1.1 Wb/m², current density 2 A/mm², 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.

- Find the current in the bars and end rings of a cage rotor of a 6 pole, 3Φ . a) 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.
- Derive an output equation of 3Ø induction motor. c)
- Find the main dimensions of a 100 MVA, 11 KV, 50 Hz, 40 pole salient d) pole generator, assuming air gap flux density as 0.65 Wb/m² and ampere conductor as 40000 per meter. The peripheral speed should not exceed 60 m/sec.

Max. Marks: 56

16

12

Q.5 Attempt any two of the following questions.

- 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=0.09m², 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.

1

SLR-FM-548

Set

			ENERGY CONSERVA	TION	N & AUDITING	
ay ime	& Date : 02:3	e: Tu 0 PN	iesday, 26-11-2019 / To 05:30 PM			Max. Marks: 70
str	uction	าร: 1) Q. No. 1 is compulsory and sho book.	uld b	e solved in first 30 mir	nutes in answer
		2	2) Figures to the right indicate full	mark	<s.< td=""><td></td></s.<>	
			MCQ/Objective Ty	vpe (Questions	
ura	ition: 3	0 Mi	nutes			Marks: 14
.1	Choo sent	ose t ence	the correct alternatives from th e.	e op	tions and rewrite the	14
	1)	Wh	en the current lags the voltage in	an A	C system it is caused	mainly
		a) c)	Resistive load Inductive load	b) d)	Capacitive load None of the above	
	2)	Ene a) c)	ergy conservation act was formed 1998 2000	l in th b) d)	ne year 1999 2001	
	3)	The a) b) c) d)	e main objective of energy manag Minimize energy cost Minimum environmental effects Maintain optimum energy procu All of the above.	eme reme	nt is to nt and utilization	
	4)	EM a) b) c) d)	IS Stands for Energy Management Information Electrical Management Informat Energy Maintains Information Sy None of the above	n Sys ion S /sterr	stems ystems ns	
	5)	Wh a) c)	ich is the major energy source to Coal Natural gas	mee b) d)	t the Indian energy de Oil Lignite	mand?
	6)	In t a) c)	he given options, the non-comme Coal Firewood	ercial b) d)	source of energy is Lignite Refined petroleum p	roducts
	7)	Th∉ a) c)	e proposed international standard ISO 9001 ISO 14001	for e b) d)	energy management is IS014000 ISO 50001	·
	8)	Ene a) b)	ergy monitoring and targeting is b Production can be reduce to ach Consumption of energy is propo	uilt o nieve rtiona	n the principle of reduced energy consu al to production rate	umption

No. B.E. (Part – II) (CGPA) Examination Nov/Dec -2019 Electrical & Electronics Engineering

Da Ti

D

Seat

- c) You can't manage what you don't measure
- d) None of the above

SLR-FM-551



Demand factor b) **Production factor** a) Utilization factor d) Load factor c) 10) What does the concept of true value of money imply _____. Present value of money Future value of money b) a) Discounting of cash flows All of these c) d) 11) The major source of electrical power generation in India is _____. a) Thermal Hydel b) Wind c) nuclear d) One unit of Electricity is equivalent to ____ Kcal heat units. 12) a) 800 b) 860 c) 400 680 d) Investment is the ____ 13) . a) net additions made to the nation's capital stocks person's commitment to buy a flat or house b) c) employment of funds on assets to earn returns d) employment of funds on goods and services that are used in production process Project performance consists of ____ 14) a) Time b) Cost

c) Quality

All of the above

d)

SLR-FM-551

Set

- 9) The ratio of current year's production to the reference year's production is

Seat	
No.	

B.E. (Part – II) (CGPA) Examination Nov/Dec-2019 Electrical & Electronics Engineering ENERGY CONSERVATION & AUDITING

Day & Date: Tuesday, 26-11-2019 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

- 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

- 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

- 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

- 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.

Max. Marks: 56

Set

16

12

16

Seat		
No.		
	·	

B.E. (Part – II) (CGPA) Examination Nov/Dec -2019 Electrical & Electronics Engineering ENERGY CONSERVATION & AUDITING

Day & Date: Tuesday, 26-11-2019 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

C)

- Q.1 Choose the correct alternatives from the options and rewrite the sentence.
 - 1) 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
 - 2) The ratio of current year's production to the reference year's production is
 - a) Demand factor

- b) Production factor
- Utilization factor d) Load factor
- What does the concept of true value of money imply_____
 a) Present value of money
 b) Future value of money
 - a) Present value of moneyc) Discounting of cash flows
- d) All of these
- 4) The major source of electrical power generation in India is_____
 - a) Thermal b) Hydel
 - c) nuclear d) Wind
- 5) One unit of Electricity is equivalent to _____ Kcal heat units.
 - a) 800 b) 860
 - c) 400 d) 680
- 6) 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

7) Project performance consists of _____.

- a) Time b) Cost
- c) Quality d) All of the above
- 8) When the current lags the voltage in an AC system it is caused mainly due to _____.
 - a) Resistive load
 - c) Inductive load

- b) Capacitive load
- d) None of the above

Max. Marks: 70

Marks: 14

- Set Q
- 9) Energy conservation act was formed in the year _____.
 - a) 1998 b) 1999
 - c) 2000 d) 2001
- 10) The main objective of energy management is to _____.
 - a) Minimize energy cost
 - Minimum environmental effects b)
 - c) Maintain optimum energy procurement and utilization
 - d) All of the above.
- EMIS Stands for _ 11)
 - a) Energy Management Information Systems
 - b) Electrical Management Information Systems
 - c) Energy Maintains Information Systems
 - d) None of the above

12) Which is the major energy source to meet the Indian energy demand?

b)

- a) Coal
- c) Natural gas d) Lignite
- In the given options, the non-commercial source of energy is _____. 13)
 - a) Coal

b) Lignite

Oil

c) Firewood

- d) Refined petroleum products
- 14) The proposed international standard for energy management is _____.
 - a) ISO 9001

b) IS014000 d)

c) ISO 14001

ISO 50001

Seat	
No.	

B.E. (Part – II) (CGPA) Examination Nov/Dec-2019 Electrical & Electronics Engineering ENERGY CONSERVATION & AUDITING

Day & Date: Tuesday, 26-11-2019 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

- 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

- 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

- 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

- 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.

Max. Marks: 56

Set

16

12

16

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 M Time: 02:30 PM To 05:30 PM						x. Marks	3: 70
 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. 							
Duration: 30 Minutes Marks: 14							s: 14
Q.1 C	Choose sentenc	the correct a	alternatives from th	e opt	ions and rewrite the		14
1	l) WI a) c)	nich is the ma Coal Natural gas	jor energy source to	meet b) d)	the Indian energy deman Oil Lignite	ld?	
2	2) In a) c)	the given opti Coal Firewood	ons, the non-comme	rcial : b) d)	source of energy is Lignite Refined petroleum produ	 Icts	
3	3) Th a) c)	e proposed ir ISO 9001 ISO 14001	ternational standard	for ei b) d)	nergy management is IS014000 ISO 50001		
4	 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	5) Th 	e ratio of curr Demand fa Utilization fa	ent year's productior ctor actor	b) d)	e reference year's produc Production factor Load factor	tion is	
6	6) WI a) c)	nat does the c Present valu Discounting	concept of true value ue of money of cash flows	of mo b) d)	oney imply Future value of money All of these		
7	7) Th a) c)	e major sourc Thermal nuclear	e of electrical power	gene b) d)	ration in India is Hydel Wind		
8	3) Or a) c)	ne unit of Elec 800 400	tricity is equivalent to	b) d)	_ Kcal heat units. 860 680		

- 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

None of the above

SLR-FM-551

Set

- c) Inductive load d)
- 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. | |

B.E. (Part – II) (CGPA) Examination Nov/Dec-2019 Electrical & Electronics Engineering ENERGY CONSERVATION & AUDITING

Day & Date: Tuesday, 26-11-2019 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

- 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

- 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

- 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

- 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.

Max. Marks: 56

Set

16

12

16

Seat No.						Set	S
	B.E.	(Part – Elec ENER	- II) (CGPA) Exar strical & Electror	nina nics TION	tion Nov/Dec -20 Engineering & AUDITING	19	
Day & I Time: (Date: Tuesd)2:30 PM To	ay, 26-11 05:30 Pl	I-2019 M			Max. Mark	s: 70
Instruc	tions: 1) Q. bo 2) Fi	No. 1 is ook.	compulsory and sho	ould b	e solved in first 30 mi	nutes in ans	wer
	2,11				Nuestiens		
Duratio	n: 30 Minute	IVI SS	CQ/Objective Ty	pe (Luestions	Mark	s: 14
Q.1 C	choose the	correct a	alternatives from th	e op	tions and rewrite the		14
1) What d a) Pre c) Dis	oes the c esent valu scounting	concept of true value ue of money of cash flows	e of m b) d)	oney imply Future value of mone All of these	әу	
2	2) The ma a) The c) nue	ajor sourc ermal clear	e of electrical powe	r gene b) d)	eration in India is Hydel Wind		
3	6) One un a) 800 c) 400	it of Elec))	tricity is equivalent t	o b) d)	_ Kcal heat units. 860 680		
4	 Investn a) net b) per c) em d) em 	nent is the addition: son's cou ployment ployment duction p	e s made to the natior mmitment to buy a f t of funds on assets t of funds on goods process	n's ca lat or to ea and s	pital stocks house rn returns ervices that are used	in	
5	i) Project a) Tin c) Qu	performa ne ality	ance consists of	b) d)	Cost All of the above		
6	i) When t due to a) Re c) Ind	he currer sistive loa luctive loa	nt lags the voltage in ad ad	b) d)	C system it is caused Capacitive load None of the above	mainly	
7	 Energy a) 199 c) 200 	conserva 98 00	ation act was formed	d in th b) d)	e year 1999 2001		
8	i) The ma a) Mir b) Mir c) Ma d) All	ain object nimize en nimum er intain op of the ab	ive of energy manag lergy cost livironmental effects timum energy procu love.	gemei reme	nt is to nt and utilization		

9) EMIS Stands for _____

a) Coal

c) Firewood

- a) Energy Management Information Systems
- b) Electrical Management Information Systems
- c) Energy Maintains Information Systems
- d) None of the above

Which is the major energy source to meet the Indian energy demand? 10)

- a) Coal b) Oil
- c) Natural gas d) Lignite
- In the given options, the non-commercial source of energy is _____. 11)
 - - Lignite d) Refined petroleum products

SLR-FM-551

Set S

The proposed international standard for energy management is _____. 12)

b)

- a) ISO 9001 IS014000 b)
- c) ISO 14001 d) ISO 50001
- 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
 - Demand factor a)
 - Utilization factor c)
- Production factor b)
- d) Load factor

Seat	
No.	

B.E. (Part – II) (CGPA) Examination Nov/Dec-2019 Electrical & Electronics Engineering ENERGY CONSERVATION & AUDITING

Day & Date: Tuesday, 26-11-2019 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

- 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

- 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

- 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

- 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.

Max. Marks: 56

16

12

16

S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 **Electrical & Electronics Engineering ENGINEERING MATHEMATICS-III**

Day & Date: Saturday, 07-12-2019 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.
- Use of only on programmable calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes

Choose correct alternatives from the options and rewrite the sentence. 14 Q.1 The solution of $P^2q^3 = 1$ is _____ 1)

b) $x^2 = 1 - y^3$ a) $x^2 y^3 = 1$ c) $z = ax + a^5y + c$ d) None The *PI* of $(x^2D^2 + 2xD)y = \frac{1}{x^2}$ is _____ 2) $\frac{1}{2x^2}$ a) $\frac{1}{5x^2}$ b) c) $C_1 + C_2 x^2$ d) None The solution of 2P + 3q = 1 is _____ 3) b) f(3x + 2y, y - 3z) = 0a) f(3x + 2y, y + 3z) = 0c) f(3x - 2y, y - 3z) = 0d) None If $z\{f(k)\} = F(z)$ then $z\{\frac{f(k)}{k}\} =$ _____. 4) a) $\int_{z}^{\infty} \frac{F(z)}{z} dz$ b) $\int_{\infty} F(z)dz$ d) $\int_{-\infty}^{\infty} z F(z) dz$ c) $\int_{-\infty}^{\infty} -F(z)dz$ $\frac{1}{D+a}X = \underline{\qquad}.$ a) $\int Xe^{ax} dx$ 5) b) $\int Xe^{-ax} dx$ d) $e^{ax} \int e^{-ax} X dx$ c) $e^{-ax} \int e^{ax} X dx$ The CF of differential equation $(D^3 - 3D^2 + 3D - 1) y = e^x$ is _____. a) $(C_1 + C_2 x + C_3 x^2) e^x$ b) $C_1 + C_2 x + C_3 x^2$ 6) c) $(C_1 x + C_2 x^2 + C_3 x^3) e^x$ d) $(C_1 + C_2 x + C_3 x^2)e^{-x}$ $Z^{-1} \begin{bmatrix} 1 \\ z^{-2} \end{bmatrix} \text{ for } 2 < |z| \text{ is } ___.$ a) $2^k \quad k \ge 1$ c) $2^{-k} \quad k \ge 1$ 7)

b) $2^{k-1} k \ge 1$ d) $2^{-k-1} k \ge 1$

Seat No.

SLR-FM-750

Set

Max. Marks: 70

Marks: 14

			Set	Ρ
8)	The Laplace transform of $\int_{0}^{\infty} e^{-3t} t$	sin t d	<i>t</i> is	
	a) $\frac{1}{50}$	b)	$\frac{2}{55}$	
	c) $\frac{3}{50}$	d)	55	
9)	$L^{-1}\left(\frac{s+3}{s^2+9}\right) = $			
	a) $\cos 3t$ c) $3t + \cos 3t$	b) d)	$\sin 3t \\ \cos 3t + \sin 3t$	
10)	Which of the following functions can interval $(-\pi, \pi)$.	be ex	panded in Fourier series in the	
	a) $\sin^{-1}(x)$	b)	tan x	
	c) $\sin x$	d)	$\operatorname{cosec}(x)$	
11)	In the cosine series expansion of sin a) $1/2$ c) π	n <i>x</i> in (b) d)	(0, π) the constant term is 2/ π $\pi/2$	
12)	The maximum directional derivative a) $\sqrt{20}$ c) $4\sqrt{11}$	of	= $x^2 y z^3$ at (2,1,-1) is $\sqrt{11}$ $2\sqrt{7}$	
13)	If $\bar{r} = xi + yj + zk$ and \bar{a} is a constant a) $2\bar{a}$ c) \bar{r}	nt veo b) d)	ctor then $\nabla(\bar{a}. \ \bar{r})$ = \bar{a} $2\bar{r}$	
14)	If $F_c(s)$ is the cosine transform of $f(s)$	x) the	n f(x) =	
	a) $\sqrt{\frac{2}{\pi}} \int_{-\infty}^{\infty} F_c(s) \cos sx ds$	b)	$\frac{1}{\sqrt{2\pi}}\int_{0}^{\infty}F_{c}(s)\cos sxds$	
	c) $\sqrt{\frac{2}{\pi}} \int_{0}^{\infty} F_{c}(s) \cos sx ds$	d)	None of these	

03

SLR-FM-750

Seat	
No.	

S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 **Electrical & Electronics Engineering ENGINEERING MATHEMATICS-III**

Day & Date: Saturday, 07-12-2019 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
$$(D^2 + 4)y = x \sin x$$

c) Solve $(D^3 + 2D^2 + D)y = x^2 + x$
03

c) Solve
$$(D^3 + 2D^2 + D)y = x^2 + x$$

Q.3 a) Solve
$$(x+2)^2 \frac{d^2y}{dx^2} - (x+2)\frac{dy}{dx} + y = 3x + 4$$
 03

b) Solve
$$x^2 \frac{d^2 y}{dx^2} - x \frac{dy}{dx} + 2y = x \log x$$

c) The differential equation of a circuit is $P \frac{dq}{dx} + \frac{q}{dx} = 40 e^{-3t} + 20 e^{-6t}$
03

The differential equation of a circuit is $R \frac{dq}{dt} + \frac{q}{c} = 40 e^{-3t} + 20 e^{-6t}$ c) 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 $z\{(k + 1)a^k\}$	$k \ge 0$	03	3
C)	Find $z\{\sin \alpha k\}$	$k \ge 0$	03	3

OR

Find $z\{\sin \alpha k\}$ $k \ge 0$ C)

Find $z\{2^k \cos(3k+2)\}$ $k \ge 0$

Q.5 a) Solve
$$\frac{y^2 z P}{x} + xzq = y^2$$

b) Solve $z(p^2 - q^2) = x - y$
03

b) Solve
$$z(p^2 - q^2) = x - y$$

c) Solve $\frac{\partial u}{\partial x} = 4 \frac{\partial u}{\partial x}$ by using variable separable method
03

Solve
$$\frac{\partial u}{\partial x} = 4 \frac{\partial u}{\partial y}$$
 by using variable separable method.

Section – II

Q.6	a)	Find half range sine series for $f(x)$ where	05
		$f(x) = (x, 0 < x \le \pi/2)$	
		$f(x) = \{\pi - x, \pi/2 < x < \pi\}$	
		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	04
		not an integer.	

Q.7 a) Find the Fourier integral of
$$f(x)$$
 Where

$$f(x) = \begin{cases} 1 - x^2, & |x| < 1 \\ 0, & |x| > 1 \end{cases}$$
04



Max. Marks: 56

		SLR-FM-7	'50
		Set	Ρ
	b)	Find the Fourier sine transform of $f(x) = \frac{e^{-ax}}{x}$ and hence evaluate	05
		$\int_{0}^{\infty} \tan^{-1}\left(\frac{x}{a}\right) \cdot \sin x dx$	
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 $\overline{F} = (x + 2y + az)i + (bx - 3y - z)j + (4x + (y + 2z)k)$ is solenoidal and find the a,b,c if \overline{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

Prove that $\nabla \cdot \left(\frac{\bar{r}}{r^3}\right) = 0$

Page **4** of **16**

Set

Seat No.

S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Electrical & Electronics Engineering ENGINEERING MATHEMATICS-III

Day & Date: Saturday, 07-12-2019 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

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

1)	The Laplace transform of $\int e^{-3t} t$	sin t d	<i>t</i> is
	a) $\frac{1}{50}$	b)	<u>2</u> 55
	c) $\frac{3}{50}$	d)	<u>4</u> 55
2)	$L^{-1}\left(\frac{s+3}{s^2+9}\right) = _$		
	a) $\cos 3t$	b)	sin 3t
	c) $3t + \cos 3t$	d)	$\cos 3t + \sin 3t$
3)	Which of the following functions can interval $(-\pi, \pi)$.	be ex	panded in Fourier series in the
	a) $\sin^{-1}(x)$	b)	tan x
	c) $\sin x$	d)	$\operatorname{cosec}(x)$
4)	In the cosine series expansion of sin	n x in ($(0,\pi)$ the constant term is
,	a) 1/2	b)	2/π
	C) π	d)	π/2
5)	The maximum directional derivative	of φ =	$= x^2 y z^3$ at (2,1,-1) is
	a) $\sqrt{20}$	b)	$\sqrt{11}$
	c) $4\sqrt{11}$	d)	$2\sqrt{7}$
6)	If $\bar{r} = xi + yj + zk$ and \bar{a} is a constant	nt veo	ctor then $\nabla(\bar{a}. \bar{r}) =$
	a) $2\bar{a}$	b)	ā
	C) <i>r</i>	d)	$2\bar{r}$
7)	If $F_c(s)$ is the cosine transform of $f(s)$	x) the	n $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



Marks: 14

Set Q

SLR-FM-750

Set The solution of $P^2q^3 = 1$ is _____. b) $x^2 = 1 - y^3$ 8) c) $z = ax + a^5y + c$ d) None The *PI* of $(x^2D^2 + 2xD)y = \frac{1}{x^2}$ is _____ 9) $\frac{1}{2x^2}$ a) $\frac{1}{5x^2}$ b) c) $C_1 + C_2 x^2$ d) None The solution of 2P + 3q = 1 is _____ 10) b) f(3x + 2y, y - 3z) = 0a) f(3x + 2y, y + 3z) = 0c) f(3x - 2y, y - 3z) = 0d) None If $z\{f(k)\} = F(z)$ then $z\{\frac{f(k)}{k}\} =$ _____. 11) a) $\int \frac{F(z)}{z} dz$ b) $\int_{-\infty}^{\infty} F(z)dz$ c) $\int_{z} -F(z)dz$ d) $\int z F(z) dz$ 12) $\frac{1}{D+a}X = \underline{\qquad}.$ a) $\int Xe^{ax} dx$ b) $\int Xe^{-ax} dx$ d) $e^{ax} \int e^{-ax} X dx$ c) $e^{-ax} \int e^{ax} X dx$ The CF of differential equation $(D^3 - 3D^2 + 3D - 1) y = e^x$ is _____. a) $(C_1 + C_2 x + C_3 x^2) e^x$ b) $C_1 + C_2 x + C_3 x^2$ 13) c) $(C_1 x + C_2 x^2 + C_3 x^3) e^x$ d) $(C_1 + C_2 x + C_3 x^2)e^{-x}$ 14) $Z^{-1}\left[\frac{1}{z-2}\right]$ for 2 < |z| is _____. a) $2^k k \ge 1$ c) $2^{-k} k \ge 1$ b) $2^{k-1} k \ge 1$ d) $2^{-k-1} k \ge 1$

SLR-FM-750

03

SLR-FM-750

S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 **Electrical & Electronics Engineering ENGINEERING MATHEMATICS-III**

Day & Date: Saturday, 07-12-2019 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
$$(D^2 + 4)y = x \sin x$$

c) Solve $(D^3 + 2D^2 + D)y = x^2 + x$
03

c) Solve
$$(D^3 + 2D^2 + D)y = x^2 + x$$

Q.3 a) Solve
$$(x+2)^2 \frac{d^2y}{dx^2} - (x+2)\frac{dy}{dx} + y = 3x + 4$$
 03

b) Solve
$$x^2 \frac{d^2 y}{dx^2} - x \frac{dy}{dx} + 2y = x \log x$$

c) The differential equation of a circuit is $P \frac{dq}{dx} + \frac{q}{dx} = 40 e^{-3t} + 20 e^{-6t}$
03

The differential equation of a circuit is $R \frac{dq}{dt} + \frac{q}{c} = 40 e^{-3t} + 20 e^{-6t}$ C) 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.

Find $Z^{-1}\left[\frac{z}{(z-2)(z-3)}\right] 2 < |z| < 3$ Q.4 04 a)

b)	Find $z\{(k+1)a^k\}$	$k \ge 0$	03
C)	Find $z\{\sin \alpha k\}$	$k \ge 0$	03

OR

Find $z\{\sin \alpha k\}$ $k \ge 0$ c)

Find $z\{2^k \cos(3k+2)\}$ $k \ge 0$

Q.5 a) Solve
$$\frac{y^2 z P}{x} + xzq = y^2$$

b) Solve $z(p^2 - q^2) = x - y$
03

b) Solve
$$z(p^2 - q^2) = x - y$$

c) Solve $\frac{\partial u}{\partial x} = 4 \frac{\partial u}{\partial x}$ by using variable separable method 03

Solve $\frac{\partial x}{\partial x} = 4 \frac{\partial y}{\partial y}$ by using variable separable method.

Section - II

Q.6	a)	Find half range sine series for $f(x)$ where	05
		$f(x) = \begin{cases} x, & 0 < x \le \pi/2 \end{cases}$	
		$\int (x)^{-1} (\pi - x), \pi/2 < x < \pi$	
	b)	Hence, deduce that $\frac{\pi^2}{8} = \frac{1}{1^2} + \frac{1}{3^2} + \frac{1}{5^2} + \cdots$ 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

$$f(x) = \begin{cases} 1 - x^2, & |x| < 1 \\ 0, & |x| > 1 \end{cases}$$
04

Set

Max. Marks: 56

		Set	Q	
	b)	Find the Fourier sine transform of $f(x) = \frac{e^{-ax}}{x}$ and hence evaluate	05	
		$\int_{0}^{\infty} \tan^{-1}\left(\frac{x}{a}\right) \cdot \sin x dx$		
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 $\overline{F} = (x + 2y + az)i + (bx - 3y - z)j + (4x + (y + 2z)k)$ is solenoidal and find the a,b,c if \overline{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	

Prove that $\nabla \cdot \left(\frac{\bar{r}}{r^3}\right) = 0$

Page **8** of **16**

03

SLR-FM-750

S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Electrical & Electronics Engineering

Day & Date: Saturday, 07-12-2019 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

ENGINEERING MATHEMATICS-III

Duration: 30 Minutes

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

1)	$\frac{1}{D+a}X = \underline{\qquad}.$		
	a) $\int Xe^{ax} dx$	b)	$\int X e^{-ax} \ dx$
	c) $e^{-ax} \int e^{ax} X dx$	d)	$e^{ax}\int e^{-ax}Xdx$
2)	The CF of differential equation (D^3)	$-3D^{2}$	$x^{2} + 3D - 1$) $y = e^{x}$ is
	a) $(C_1 + C_2 x + C_3 x^2) e^x$	b)	$C_1 + C_2 x + C_3 x^2$
	c) $(C_1 x + C_2 x^2 + C_3 x^3) e^x$	d)	$(C_1 + C_2 x + C_3 x^2)e^{-x}$
3)	$Z^{-1}\left[\frac{1}{z-2}\right]$ for 2 < z is		
	a) $2^k k \ge 1$	b)	$2^{k-1} k \ge 1$
	c) $2^{-k} \ k \ge 1$	d)	$2^{-k-1} k \ge 1$
	°° C		
4)	The Laplace transform of $\int e^{-3t} t$	sin t	<i>dt</i> is
	, 1 0		2
	a) $\frac{1}{50}$	b)	55
	c) $\frac{3}{50}$	d)	<u>4</u> 55
5)	$L^{-1}\left(\frac{s+3}{s^2+9}\right) = \underline{\qquad}.$		
	a) $\cos 3t$	b)	sin 3t
	c) $3t + \cos 3t$	d)	$\cos 3t + \sin 3t$
6)	Which of the following functions can	n be e	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 si	n x in	$(0, \pi)$ the constant term is
	a) 1/2	b)	2/π
	C) π	d)	$\pi/2$

Seat No.



Max. Marks: 70

Marks: 14

Set R

Set | R The maximum directional derivative of $\phi = x^2 y z^3$ at (2,1,-1) is _____. 8) b) $\sqrt{11}$ a) $\sqrt{20}$ c) $4\sqrt{11}$ d) $2\sqrt{7}$ If $\bar{r} = xi + yj + zk$ and \bar{a} is a constant vector then $\nabla(\bar{a}, \bar{r}) =$ _____. 9) a) 2ā b) ā d) c) \bar{r} $2\bar{r}$ If $F_c(s)$ is the cosine transform of f(x) then f(x) =_____. 10) a) $\sqrt{\frac{2}{\pi}} \int_{-\infty}^{\infty} F_c(s) \cos sx \, ds$ b) $\frac{1}{\sqrt{2\pi}}\int_{a}F_{c}(s)\cos sx \, ds$ d) None of these c) $\sqrt{\frac{2}{\pi}} \int_{0}^{\infty} F_c(s) \cos sx \, ds$ The solution of $P^2q^3 = 1$ is _____. 11) b) $x^2 = 1 - y^3$ a) $x^2 y^3 = 1$ c) $z = ax + a^5y + c$ None d) The *PI* of $(x^2D^2 + 2xD)y = \frac{1}{x^2}$ is _____. 12) $\frac{1}{2x^2}$ a) $\frac{1}{5x^2}$ b) c) $C_1 + C_2 x^2$ d) None The solution of 2P + 3q = 1 is _____ 13) a) f(3x + 2y, y + 3z) = 0b) f(3x + 2y, y - 3z) = 0c) f(3x - 2y, y - 3z) = 0None d) If $z\{f(k)\} = F(z)$ then $z\left\{\frac{f(k)}{k}\right\} =$ _____ 14) a) $\int_{z}^{\infty} \frac{F(z)}{z} dz$ c) $\int_{z}^{\infty} -F(z) dz$ b) $\int_{\infty}^{\infty} F(z)dz$ d) $\int_{0}^{\infty} z F(z)dz$

SLR-FM-750

03

SLR-FM-750

Seat	
No.	

S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 **Electrical & Electronics Engineering ENGINEERING MATHEMATICS-III**

Day & Date: Saturday, 07-12-2019 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
$$(D^2 + 4)y = x \sin x$$

c) Solve $(D^3 + 2D^2 + D)y = x^2 + x$
03

c) Solve
$$(D^3 + 2D^2 + D)y = x^2 + x$$

Q.3 a) Solve
$$(x+2)^2 \frac{d^2y}{dx^2} - (x+2)\frac{dy}{dx} + y = 3x + 4$$
 03

b) Solve
$$x^2 \frac{d^2 y}{dx^2} - x \frac{dy}{dx} + 2y = x \log x$$

c) The differential equation of a circuit is $P \frac{dq}{dx} + \frac{q}{dx} = 40 e^{-3t} + 20 e^{-6t}$
03

The differential equation of a circuit is $R \frac{dq}{dt} + \frac{q}{c} = 40 e^{-3t} + 20 e^{-6t}$ C) 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.

Find $Z^{-1}\left[\frac{z}{(z-2)(z-3)}\right] 2 < |z| < 3$ Q.4 04 a)

b) Find
$$z\{(k+1)a^k\}$$
 $k \ge 0$ **03**
c) Find $z\{\sin \alpha k\}$ $k \ge 0$ **03**

OR

Find $z\{\sin \alpha k\}$ $k \ge 0$ c)

Find $z\{2^k \cos(3k+2)\}$ $k \ge 0$

Q.5 a) Solve
$$\frac{y^2 z P}{x} + xzq = y^2$$

b) Solve $z(p^2 - q^2) = x - y$
03

b) Solve
$$z(p^2 - q^2) = x - y$$

c) Solve $\frac{\partial u}{\partial x} = 4 \frac{\partial u}{\partial x}$ by using variable separable method
03

Solve $\frac{\partial x}{\partial x} = 4 \frac{\partial x}{\partial y}$ by using variable separable method.

Section - II

Q.6	a)	Find half range sine series for $f(x)$ where	05
		$f(x) = \begin{cases} x, & 0 < x \le \pi/2 \end{cases}$	
		$\int (x)^{-1} (\pi - x), \pi/2 < x < \pi$	
	b)	Hence, deduce that $\frac{\pi^2}{8} = \frac{1}{1^2} + \frac{1}{3^2} + \frac{1}{5^2} + \cdots$ 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

$$f(x) = \begin{cases} 1 - x^2, & |x| < 1 \\ 0, & |x| > 1 \end{cases}$$
04



Max. Marks: 56

		SLR-FM-7	50
		Set	R
	b)	Find the Fourier sine transform of $f(x) = \frac{e^{-ax}}{x}$ and hence evaluate	05
		$\int_{0}^{\infty} \tan^{-1}\left(\frac{x}{a}\right) \cdot \sin x dx$	
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 $\overline{F} = (x + 2y + az)i + (bx - 3y - z)j + (4x + (y + 2z)k)$ is solenoidal and find the a.b.c if \overline{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

Prove that $\nabla \cdot \left(\frac{\bar{r}}{r^3}\right) = 0$

Page **12** of **16**

Page 13 of 16

ENGINEERING MATHEMATICS-III	
Day & Date: Saturday, 07-12-2019 Time: 10:00 AM To 01:00 PM	Max. Mar
 Instructions: 1) Q. No 1 is compulsory should be solved in first 30 minutes book. 2) Figures to the right indicate full marks. 3) Use of only on programmable calculator is allowed. 	in answer

S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 **Electrical & Electronics Engineering**

MCQ/Objective Type Questions

Duration: 30 Minutes

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

Which of the following functions can be expanded in Fourier series in the 1) 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) $2/\pi$

d)

C) π d) $\pi/2$

The maximum directional derivative of $\phi = x^2 y z^3$ at (2,1,-1) is _____. 3) 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) 2ā b) ā d) c) \bar{r} $2\bar{r}$

- If $F_c(s)$ is the cosine transform of f(x) then f(x) =_____. 5) $\frac{2}{\pi} \int F_c(s) \cos sx \, ds$ b) $F_c(s)\cos sx\,ds$ a)
 - c) $\sqrt{\frac{2}{\pi}} \int_{0}^{\infty} F_{c}(s) \cos sx \, ds$
- The solution of $P^2q^3 = 1$ is _____ 6) b) $x^2 = 1 - y^3$ a) $x^2 v^3 = 1$
 - c) $z = ax + a^5y + c$ d) None The *PI* of $(x^2D^2 + 2xD)y = \frac{1}{x^2}$ is _____
- 7) $\frac{1}{2x^2}$ a) $\frac{1}{5x^2}$ b) c) $C_1 + C_2 x^2$ d) None 8) The solution of 2P + 3q = 1 is _____
 - a) f(3x + 2y, y + 3z) = 0b) f(3x + 2y, y - 3z) = 0c) f(3x - 2y, y - 3z) = 0d) None

SLR-FM-750

Set

Seat No.

ax. Marks: 70

None of these

Marks: 14

If $z\{f(k)\} = F(z)$ then $z\left\{\frac{f(k)}{k}\right\} =$ _____. a) $\int_{-\infty}^{\infty} \frac{F(z)}{z} dz$ b) $\int_{-\infty}^{z} F(z) dz$ 9) d) $\int z F(z) dz$ c) $\int -F(z)dz$ $\frac{1}{D+a}X = \underline{\qquad}.$ a) $\int Xe^{ax} dx$ 10) b) $\int Xe^{-ax} dx$ c) $e^{-ax} \int e^{ax} X dx$ d) $e^{ax} \int e^{-ax} X dx$ The CF of differential equation $(D^3 - 3D^2 + 3D - 1) y = e^x$ is _____. a) $(C_1 + C_2 x + C_3 x^2) e^x$ b) $C_1 + C_2 x + C_3 x^2$. 11) a) $(C_1 + C_2 x + C_3 x^2)e^x$ c) $(C_1 x + C_2 x^2 + C_3 x^3)e^x$ b) $C_1 + C_2 x + C_3 x^2$ d) $(C_1 + C_2 x + C_3 x^2)e^{-x}$ $Z^{-1}\begin{bmatrix} 1\\ z-2 \end{bmatrix}$ for 2 < |z| is _____. 12) b) $2^{k-1} k \ge 1$ d) $2^{-k-1} k \ge 1$ a) $2^k \ k \ge 1$ c) $2^{-k} \ k \ge 1$ The Laplace transform of $\int e^{-3t} t \sin t \, dt$ is _____. 13) b) $\frac{2}{55}$ d) $\frac{4}{55}$ a) $\frac{1}{50}$ c) $\frac{3}{50}$ 14) $L^{-1}\left(\frac{s+3}{s^2+9}\right) =$ _____ a) cos 3t b) sin 3t c) $3t + \cos 3t$ d) $\cos 3t + \sin 3t$

SLR-FM-750

Set S

03

SLR-FM-750

Seat	
No.	

S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 **Electrical & Electronics Engineering ENGINEERING MATHEMATICS-III**

Day & Date: Saturday, 07-12-2019 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
$$(D^2 + 4)y = x \sin x$$

c) Solve $(D^3 + 2D^2 + D)y = x^2 + x$
03

c) Solve
$$(D^3 + 2D^2 + D)y = x^2 + x$$

Q.3 a) Solve
$$(x+2)^2 \frac{d^2y}{dx^2} - (x+2)\frac{dy}{dx} + y = 3x + 4$$
 03

b) Solve
$$x^2 \frac{d^2 y}{dx^2} - x \frac{dy}{dx} + 2y = x \log x$$

c) The differential equation of a circuit is $P \frac{dq}{dx} + \frac{q}{dx} = 40 e^{-3t} + 20 e^{-6t}$
03

The differential equation of a circuit is $R \frac{dq}{dt} + \frac{q}{c} = 40 e^{-3t} + 20 e^{-6t}$ C) 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.

Find $Z^{-1}\left[\frac{z}{(z-2)(z-3)}\right] 2 < |z| < 3$ Q.4 04 a)

b) Find
$$z\{(k+1)a^k\}$$
 $k \ge 0$ **03**
c) Find $z\{\sin \alpha k\}$ $k \ge 0$ **03**

OR

Find $z\{\sin \alpha k\}$ $k \ge 0$ c)

Find $z\{2^k \cos(3k+2)\}$ $k \ge 0$

Q.5 a) Solve
$$\frac{y^2 z P}{x} + xzq = y^2$$
 03

b) Solve
$$z(p^2 - q^2) = x - y$$

c) Solve $\frac{\partial u}{\partial x} - 4 \frac{\partial u}{\partial y}$ by using variable separable method
03

Solve $\frac{\partial x}{\partial x} = 4 \frac{\partial x}{\partial y}$ by using variable separable method.

Section - II

Q.6	a)	Find half range sine series for $f(x)$ where	05
		$f(x) = \begin{cases} x, & 0 < x \le \pi/2 \end{cases}$	
		$\int (x)^{-1} (\pi - x), \pi/2 < x < \pi$	
		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	04
		not an integer.	

Q.7 a) Find the Fourier integral of
$$f(x)$$
 Where

$$f(x) = \begin{cases} 1 - x^2, & |x| < 1 \\ 0, & |x| > 1 \end{cases}$$
04

Set

Max. Marks: 56

		SLR-FM-750	
		Set	S
	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 $\overline{F} = (x + 2y + az)i + (bx - 3y - z)j + (4x + (y + 2z)k)$ is solenoidal and find the a.b.c if \overline{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

Prove that $\nabla \cdot \left(\frac{\bar{r}}{r^3}\right) = 0$

Page **16** of **16**

S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 **Electrical & Electronics Engineering**

Day & Date: Tuesday, 10-12-2019 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.

D.C. MACHINES AND TRANSFORMERS

2) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes

Seat

No.

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

- DC series motors are used in those applications where is required. 1)
 - a) High starting torque b) Constant speed d) None of the above
 - c) Low no load speed
- The DC armature winding in which coil sides are a pole pitch apart is called 2) winding. b) Fractional pitch

d) Pole pitch

- Multiplex a)
- c) Full 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

The current drawn by 240V DC motor of $Ra = 0.5\Omega \& E_b = 210V$ is _____ A. 6)

- 30 a) b) 60
- c) 20 d) 15

During commutation the coil undergoing communication by the brush. 7) b) Remains open circuited

- a) Remains short circuited d) None of the above
- c) Either a or b
- 8) Transformer is used to
 - a) Increase the voltage
 - c) Both a and b
- b) Decrease the voltage
- d) None of the above

SLR-FM-751



Max. Marks: 70

Marks: 14

b) Constant output c) Capability to operate both on AC & DC d) Maximum efficiency A step up transformer increases _____ & decreases _____. 10) b) Voltage, Frequency a) Current, Voltage 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 d) 177.7 c) 75 The S.C. test of the transformer gives _____ losses. 13) a) Iron loss b) Copper loss c) Both a and b d) None of the above

A universal motor is one which has .

a) Constant speed

- 14) A transformer has negative voltage regulation when its load power factor
 - is _____. a) Zero

9)

b) Unity

c) Leading

d) Lagging

SLR-FM-751

Set

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

Day & Date: Tuesday, 10-12-2019

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.

Seat No.

- 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.

- 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 0.02Ω .

Section – II

Q.4 Attempt any Four.

- 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.

16

12

16

Max. Marks: 56





e) The primary & secondary windings of a 40 KVA, 6600/250V single phase transformer have resistances of $10\Omega \& 0.02\Omega$ 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.

Instr	uction	is: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer
		 Figures to the right indicate full marks.
		MCQ/Objective Type Questions
Dura	tion: 3	0 Minutes Marks: 14
Q.1	Choo 1)	ose the correct alternatives from the options and rewrite the sentence. 14 Transformer is used to a) Increase the voltage b) Decrease the voltage b) Decrease the voltage c) Both a and b d) None of the above
	2)	 A universal motor is one which has a) Constant speed b) Constant output c) Capability to operate both on AC & DC d) Maximum efficiency
	3)	A step up transformer increases& decreasesa) Current, Voltageb) Voltage, Frequencyc) Voltage, Currentd) Voltage, Power
	4)	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
	5)	The maximum efficiency of transformer of 100KVA having iron loss of900KW & full load Cu loss of 1600KW, occurs at KVA.a) 56.3b) 133.3c) 75d) 177.7
	6)	The S.C. test of the transformer gives losses.a) Iron lossb) Copper lossc) Both a and bd) None of the above
	7)	A transformer has negative voltage regulation when its load power factorisa) Zerob) Unityc) Leadingd) Lagging
	8)	DC series motors are used in those applications where is required.a) High starting torqueb) Constant speedc) Low no load speedd) None of the above
	9)	The DC armature winding in which coil sides are a pole pitch apart is called winding. a) Multiplex b) Fractional pitch

Electrical & Electronics Engineering D.C. MACHINES AND TRANSFORMERS

Day & Date: Tuesday, 10-12-2019

Time: 10:00 AM To 01:00 PM

Seat

No.

- c) Full pitch

- d) Pole pitch

SLR-FM-751



Max. Marks: 70

A wave winding must go at least _____ around the armature before it 10) closes back where it started. b) Twice

- a) Once c) Thrice
 - d) Four times
- 11) Because of _____ losses the shaft torque is always less than armature torque in a DC motor.
 - a) Copper c) Iron
- b) Mechanical

SLR-FM-751

Set | Q

d) Rotational

In DC generator the generated E.M.F. is directly proportional to the _____. 12)

- a) Pole flux
- b) Number of armature parallel paths
- c) Field current
- d) Number of dummy coil

The current drawn by 240V DC motor of $Ra = 0.5\Omega \& E_b = 210V$ is _____ A. 13)

- 30 a) b) 60
- c) 20 d) 15
- During commutation the coil undergoing communication _____ by the brush. 14)
 - a) Remains short circuited
- b) Remains open circuited d) None of the above

c) Either a or b

Seat No.

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

Day & Date: Tuesday, 10-12-2019

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.

- 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.

- 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 0.02Ω .

Section – II

Q.4 Attempt any Four.

- 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.

16





Max. Marks: 56

16





e) The primary & secondary windings of a 40 KVA, 6600/250V single phase transformer have resistances of $10\Omega \& 0.02\Omega$ 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.

	0.0	0 /							
Instr	uctio	ns: 1	l) Q. No. 1 is compulsory and she book.	ould	be solved in first 30 minutes in answer				
			2) Figures to the right indicate fu	ll ma	arks.				
MCQ/Objective Type Questions									
Duration: 30 Minutes Marks: 14									
Q.1	Cho (1)	ose In I a) b) c) d)	the correct alternatives from the DC generator the generated E.M Pole flux Number of armature parallel pa Field current Number of dummy coil	n e o .F. is ths	ptions and rewrite the sentence. 14 a directly proportional to the				
	2)	The a) c)	e current drawn by 240V DC mot 30 20	or of b) d)	f Ra = $0.5\Omega \& E_b = 210V$ is A. 60 15				
	3)	Du a) c)	ring commutation the coil underg Remains short circuited Either a or b	oing b) d)	communication by the brush. Remains open circuited None of the above				
	4)	Tra a) c)	Insformer is used to Increase the voltage Both a and b	b) d)	Decrease the voltage None of the above				
	5)	Αι a) b) c) d)	iniversal motor is one which has Constant speed Constant output Capability to operate both on A Maximum efficiency	C &	 DC				
	6)	As	tep up transformer increases		_& decreases				

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

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

SLR-FM-751

Max. Marks: 70

Set

R

- 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 The maximum efficiency of transformer of 100KVA having iron loss of 8)
 - 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
 - None of the above d)

Seat No.

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 torquec) Low no load speed
- b) Constant speedd) None of the above

SLR-FM-751

Set | R

- 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
 - c) Thrice d) Four times
- 14) Because of _____ losses the shaft torque is always less than armature torque in a DC motor.
 - a) Copper
 - c) Iron

b) Mechanical

b) Twice

d) Rotational

Seat No.

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

Day & Date: Tuesday, 10-12-2019

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.

- 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.

- 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 0.02Ω .

Section – II

Q.4 Attempt any Four.

- 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.

Max. Marks: 56

12

16





e) The primary & secondary windings of a 40 KVA, 6600/250V single phase transformer have resistances of $10\Omega \& 0.02\Omega$ 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.

. 10.0					
uctio	ns: 1) Q. No. 1 is compulsory and sh book.	oulc	l be solved in first 30 m		
	2) Figures to the right indicate fu	ull m	arks.		
	MCQ/Objective T	уре	Questions		
tion: 3	0 Minutes				
Cho	ose the correct alternatives from t	he c	ptions and rewrite th		
1)	A step up transformer increases		_ & decreases		
	a) Current, Voltagec) Voltage, Current	b) d)	Voltage, Frequency		
2)	The main purpose to carry out back to back test on				
,	out.				
	a) Efficiency	b)	Temperature rise		
	c) Efficiency & Temperature rise	d)	Regulation		
3)	The maximum efficiency of transfor 900KW & full load Cu loss of 1600k	rmer ⟨₩,	of 100KVA having iror occurs at KVA.		
	a) 56.3	b)	133.3		
	c) 75	d)	1//./		
4)	The S.C. test of the transformer giv	es_	losses.		
	a) Iron loss	b)	Copper loss		
	c) Both a and b	d)	None of the above		
5)	A transformer has negative voltage	reg	ulation when its load po		
	a) Zero	b)	Unity		
	c) Leading	d)	Lagging		
6)	DC series motors are used in those	e apr	plications where		
-,	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 a		
	a) Multiplex	b)	Fractional pitch		
	c) Full pitch	d)	Pole pitch		
8)	A wave winding must go at least		around the armature b		
	a $\Delta n c a$	ь)	Twico		

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

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

Instr ninutes in answer

Durat

Seat

No.

Q.1 e sentence. 14

er is to find

- n loss of
- ower factor

is required.

- apart is called
- before it
 - a) Once I wice b)
 - c) Thrice d) Four times
- 9) Because of _____ losses the shaft torque is always less than armature torque in a DC motor. b) Mechanical
 - a) Copper d) Rotational
 - C) Iron



Marks: 14

Max. Marks: 70

- Set S
- 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 $Ra = 0.5\Omega \& E_b = 210V$ is _____ A. a) 30 b) 60

- a) 30 c) 20
 - d) 15

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 voltagec) Both a and b
- b) Decrease the voltage
- 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.

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

Day & Date: Tuesday, 10-12-2019

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.

- 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.

- 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 0.02Ω .

Section – II

Q.4 Attempt any Four.

- 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.

Max. Marks: 56

12

16





e) The primary & secondary windings of a 40 KVA, 6600/250V single phase transformer have resistances of $10\Omega \& 0.02\Omega$ 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.
Set S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 **Electrical & Electronics Engineering** ELECTRICAL NETWORKS Max. Marks: 70

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

- Choose the correct alternatives from the options and rewrite the Q.1 sentence. Which law plays a significant role in the mesh analysis of the network? 1)
 - KCL b) KVL a)
 - 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 Two b)
 - c) Four d) Infinite
 - Which among the following get/s cancelled under the resonance condition 3) 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?
 - 10Ω b) a) 3Ω
 - 9Ω d) C) $2/3\Omega$
 - 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) bx1 d) 1 x 1 c) bxb
 - What would be the nature of ' Z_L ', if ' Z_{eq} ' reactance is inductive according 6) to 'Maximum power transfer theorem'?
 - a) Inductive Capacitive b)
 - c) Resistive d) All of the above
 - 7) Identify dual of the Resistor ® _____
 - L a) C b) c) H G d)
 - 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?
 - 0.001 50 a) b)
 - 80 d) 4.0 C)

SLR-FM-752

Day & Date: Thursday, 12-12-2019

Time: 10:00 AM To 01:00 PM

Seat No.

Marks: 14

14

Ρ

				SLR-	FM-7	'52
					Set	Ρ
9)	When $X_c = X_L$ a) draws ma c) is at resor	the circuit? ximum current nance	b) d)	applied voltage is zero draws minimum current		
10)	Which element a) Current c) Both a an	ts act as an independ d b	ent va b) d)	riables in Y-parameters? Voltage None of the above		
11)	The transient of a) Changes (b) Impedanc c) Applied vo d) Resistanc	currents are associate in the stored energy in e of the circuit oltage to the circuit e of the circuit	d with the ii	the nductors and capacitors		
12)	Laplace transf a) 1/LS c) LS ²	orm of inductor in Her	nries is b) d)	S LS L/S ²		
13)	Laplace transf function. a) time, time c) frequency	orm changes the	_ dom b) d)	ain function to the do time, frequency frequency, frequency	omain	
14)	Time constant a) RC/R/L c) RC, L/R	of RC and RL circuit	respe b) d)	ctively are R/C,L/R RC,RL		

Seat	
No.	

S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Electrical & Electronics Engineering ELECTRICAL NETWORKS

Day & Date: Thursday,12-12-2019 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.

- 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.



Max. Marks: 56

Set

Ρ

Page **4** of **16**

Q.3 Solve any two of the following.

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.

- 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.

- 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.

SLR-FM-752

Set

12

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

Seat

No.

- Choose the correct alternatives from the options and rewrite the Q.1 sentence. 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 50 b) 4.0
 - 80 d) C)

2) When $X_c = X_i$ the circuit?

- a) draws maximum current applied voltage is zero b)
- draws minimum current c) is at resonance d)

3) Which elements act as an independent variables in Y-parameters?

- a) Current Voltage b)
- c) Both a and b None of the above d)
- 4) 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

Laplace transform of inductor in Henries is 5)

- LS 1/LS a) b) LS² L/S² C) d)
- 6) Laplace transform changes the _____ domain function to the _____ domain function.
 - time, frequency a) time, time b)
 - c) frequency, time frequency, frequency d)
- 7) Time constant of RC and RL circuit respectively are _____.
 - a) RC/R/L R/C.L/R b) c) RC, L/R d) RC,RL
- 8) Which law plays a significant role in the mesh analysis of the network?
 - KCL b) KVL a)
 - Law of Superposition Theorem d) None of the above c)



Marks: 14

in a a) c)	tree, according to its properties? Only one Four	b) d)	Two Infinite
Whi	ich among the following get/s car	icelle	d under the resonance condition
in a	.c. circuits, if inductive and capac	itive i	reactances are in parallel?
a)	Susceptance	b)	Reactance
c)	Resistance	d)	All of the above
Thre	ee equal resistances of 3Ω are constance in one of the arm in an equival 10 Ω	onnec	eted in star. What is the
resi		uivale	ent delta circuit?
a)		b)	3Ω
c)		d)	2/3Ω
With	n the b no. of branches and poss	ible 1	no. of loops in the graph, the
mes	sh incidence matrix B will have di	mens	ions
a)	1 x b	b)	b x 1
c)	b x b	d)	1 x 1
Whato 'N a) c)	at would be the nature of 'Z _L ', if 'Z Maximum power transfer theorem Inductive Resistive	.eq' rea ı'? b) d)	actance is inductive according Capacitive All of the above
	in a a) c) Whi in a a) c) Thro resi a) c) Whi to 'N a) c) Whi	in a tree, according to its properties? a) Only one c) Four Which among the following get/s can in a.c. circuits, if inductive and capace a) Susceptance c) Resistance Three equal resistances of 3Ω are corresistance in one of the arm in an equal a) 10Ω c) 9Ω With the b no. of branches and possi- mesh incidence matrix B will have divided a) $1 \times b$ c) $b \times b$ What would be the nature of 'Z _L ', if 'Z to 'Maximum power transfer theorem a) Inductive c) Resistive	in a tree, according to its properties? a) Only one b) c) Four d) Which among the following get/s cancelled in a.c. circuits, if inductive and capacitive for a) Susceptance b) c) Resistance d) Three equal resistances of 3Ω are connect resistance in one of the arm in an equivale a) 10Ω b) c) 9Ω d) With the b no. of branches and possible 1 mesh incidence matrix B will have dimenses a) $1 \times b$ b) c) $b \times b$ d) What would be the nature of 'Z _L ', if 'Z _{eq} ' resist to 'Maximum power transfer theorem'? a) Inductive b) c) Resistive d)

How many number of minimum end nodes or terminal nodes are involved

14) Identify dual of the Resistor ® _____

9)

_. b) a) C c) H L d) G

SLR-FM-752

Set Q

Set Q

S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Electrical & Electronics Engineering ELECTRICAL NETWORKS

Day & Date: Thursday,12-12-2019 Time: 10:00 AM To 01:00 PM

Seat

No.

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.

- 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.





Max. Marks: 56

SLR-FM-752 Set Q

140V / 120°

Q.3 Solve any two of the following.

X,=8Ω

a) Find the magnitude of V1 by using nodal analysis.

40

X~=5Ω

٧,



=10Ω

V2

ŝΩ

X_=10Ω

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.

- 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.

- 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.

16

12

Set S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 **Electrical & Electronics Engineering**

Day & Date: Thursday, 12-12-2019 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.

ELECTRICAL NETWORKS

- 2) Figures to the right indicate full marks.
- 3) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes

contonoo

Seat

No.

Q.1

Sente	
1)	With the b no. of branches and possible 1 no. of loops in the graph, the
	mesh incidence matrix B will have dimensions

Choose the correct alternatives from the options and rewrite the

a)	1 x b	b)	bx1
c)	bxb	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 c) Resistive d) All of the above
- 3) Identify dual of the Resistor ® _____
 - b) L a) C c) H d) G
- 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 80 d) 4.0 c)
- 5) When $X_c = X_1$ the circuit?
 - a) draws maximum current applied voltage is zero b)
 - draws minimum current c) is at resonance d)
- 6) Which elements act as an independent variables in Y-parameters?
 - Voltage a) Current b)
 - 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

Max. Marks: 70

SLR-FM-752

Marks: 14

Set | R

- 8) Laplace transform of inductor in Henries is
 - 1/LS LS a) b) c) LS^2 L/S^2 d)
- Laplace transform changes the _____ domain function to the _____ domain 9) function.
 - a) time, time b) time, frequency
 - c) frequency, time d) frequency, frequency
- 10) Time constant of RC and RL circuit respectively are _____.
 - RC/R/L b) R/C,L/R a)
 - c) RC, L/R d) RC,RL
- 11) Which law plays a significant role in the mesh analysis of the network? KCL KVL a) b)
 - 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 Reactance b)
 - c) Resistance d) All of the above
- Three equal resistances of 3Ω are connected in star. What is the 14) resistance in one of the arm in an equivalent delta circuit?
 - a) 10Ω
 - b) 3Ω c) 9Ω d) $2/3\Omega$

Set

Max. Marks: 56

R

Seat	
No.	

S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Electrical & Electronics Engineering ELECTRICAL NETWORKS

Day & Date: Thursday,12-12-2019 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.

- 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.



Page **12** of **16**

Q.3 Solve any two of the following.

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.

- 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.

- 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.

12

SLR-FM-752

Set

12

S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 **Electrical & Electronics Engineering ELECTRICAL NETWORKS** Max. Marks: 70 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

Q.1 Choose the correct alternatives from the options and rewrite the sentence. 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) LS² L/S^2 d) 4) Laplace transform changes the _____ domain function to the _____ domain function. a) time. time b) time, frequency frequency, frequency c) frequency, time d) Time constant of RC and RL circuit respectively are 5) a) RC/R/L R/C,L/R b) c) RC, L/R d) RC,RL 6) Which law plays a significant role in the mesh analysis of the network? a) KCL KVL b) 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

Day & Date: Thursday, 12-12-2019 Time: 10:00 AM To 01:00 PM

Seat No.

Duration: 30 Minutes

SLR-FM-752

Marks: 14

14

- in a.c. circuits, if inductive and capacitive reactances are in parallel?
 - a) Susceptance b) Reactance
 - Resistance d) All of the above c)

Set

			Set	S
9)	Three equal resistances of 3Ω are corresistance in one of the arm in an equal 10Ω c) 9Ω	onneo quival b) d)	eted in star. What is the ent delta circuit? 3Ω 2/3Ω	
10)	With the b no. of branches and poss mesh incidence matrix B will have di a) 1 x b c) b x b	ible 1 imens b) d)	no. of loops in the graph, the ions b x 1 1 x 1	
11)	What would be the nature of 'Z _L ', if 'Z to 'Maximum power transfer theorem a) Inductive c) Resistive	_{eq} ' re '? b) d)	actance is inductive according Capacitive All of the above	
12)	Identify dual of the Resistor ® a) C c) H	 b) d)	L G	
13)	What is the Q (Quality factor) of a set has equal reactance of 4 kilo-ohms ohms?	eries o each,	ircuit that resonates at 6 kHz, and a resistor value of 50	
	a) 0.001 c) 80	b) d)	50 4.0	
		- /		

14) When $X_c = X_{\perp}$ the circuit? a) draws maximum current

c) is at resonance

- b)
- applied voltage is zero draws minimum current d)

SLR-FM-752

Page **14** of **16**

S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 **Electrical & Electronics Engineering ELECTRICAL NETWORKS**

Day & Date: Thursday, 12-12-2019 Time: 10:00 AM To 01:00 PM

Seat

No.

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.

- State and explain Thevenin's Theorem. a)
- b) Two resistances of 10Ω and 40Ω are connected in parallel. A third resistance of 5 Ω 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.
- Find the voltage V using superposition. c)



- Define the terms: Mesh, Tree, link and Degree of node. d)
- Find I_3 from the circuit shown in figure. e)



Max. Marks: 56



SLR-FM-752 Set S

140V / 120°

Q.3 Solve any two of the following.

X,=8Ω

a) Find the magnitude of V1 by using nodal analysis.

40

X~=5Ω

٧,



=10Ω

V2

ŝΩ

X_=10Ω

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.

- 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.

- 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.

12

12

Page **1** of **12**

SLR-FM-753

Set

Max. Marks: 70

	S E (Part - I)	(OId)
No.		
Seat		

I) (Old) (CGPA) Examination Nov/Dec-2019 **Electrical & Electronics Engineering** ANALOG ELECTRONICS

Day & Date: Saturday, 14-12-2019 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

-1

Marks: 14

Choose the correct alternatives from the options and rewrite the sentence. Q.1 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 c) saturation or cutoff
- integration or differentiation b) 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

c) 1K Ω . Zero Ro

- Infinity,100 b)
- All the above d)

The open loop gain of an ideal OP-AMP is 5)

- a) Zero 100 b) None of the above C) ∞ d)
- 6) Transistor Biasing is generally provided by a
 - a) Biasing circuit b) d)
 - c) Diode None of the above
- The Schmitt trigger is a two-state device that is used for . 7)
 - a) pulse shaping c) input noise rejection

c) Double-ended

- peak detection b) d) filtering
- If an op-amp has one input grounded and the other input has a signal feed 8) to it, then it is operating as what?
 - a) Common-mode
- b) Single-ended
- Noninverting mode d)

- **Bias battery**

9) An ideal operational amplifier has ____ infinite output impedance b) zero input impedance a) infinite bandwidth All of the above C) d) 10) The voltage follower has a ____ a) closed-loop voltage gain of unity small open-loop voltage gain b) closed-loop bandwidth of zero C) large closed-loop output d) An ideal amplifier should have _____ a) high input current zero offset b) c) high output impedance d) moderate gain 12) A non inverting closed-loop op-amp circuit generally as a gain factor _____. less than one greater than one b) a) C) d) equal to one zero 13) The closed-loop voltage gain of an inverting amplifier equals . the ratio of the input resistance to the feedback resistance a) b) the open-loop voltage gain the feedback resistance divided by the input resistance C) the input resistance d) 14) If the input to a comparator is a sine wave, the output is a _____. ramp voltage b) sine wave a) rectangular wave c) d) sawtooth wave

SLR-FM-753

Set P

Seat			Sot	D
No.			Oet	
	S.E. (Part - I) Elec	(Old) (CGPA) Examination Nov trical & Electronics Engineerin ANALOG ELECTRONICS	//Dec-2019 Ig	
Day & Time:	Date: Saturday, 14-12 10:00 AM To 01:00 PM	-2019 1	Max. Marks	56 :
Instru	ictions: 1) All question 2) Figures to t 3) Assume the	s are compulsory. ne right indicate full marks. suitable data if necessary.		
		Section – I		
Q.2	 Solve Any Three. a) What is rectifier and b) What is load line and c) Explain class A and d) Explain the working 	d Explain in brief? nalysis? Explain Q-point. nplifier. g of depletion type MOSFET.		12
Q.3	Solve Any Two.a) Explain operationb) Explain working ofc) What is clamper?	of bridge rectifier. unijunction transistor. Also discuss its Explain positive clamper.	VI characteristics.	16
		Section – II		
Q.4	 Solve Any Three. a) Draw general bloc b) Explain instrumen c) What are the appl d) What are closed be 	k diagram of op-amp and pin diagram ation amplifier. cations of op-amp? op inverting and non-inverting amplifie	of IC 741. ers?	12
Q.5	 Solve Any Two. a) Explain op-amp as b) Explain with neat of multivibrator. Also c) What are ideal char op-amp. 	a integrator. liagram and waveforms of IC 555 as a derive expression for frequency. tracteristics of op-amp? Explain follow	stable ing terms in	16

1) CMRR
 2) PSRR

SLR-FM-753

S.E. (Part - I) (Old) (CGPA) Examination Nov/Dec-2019 **Electrical & Electronics Engineering**

Day & Date: Saturday, 14-12-2019 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.

ANALOG ELECTRONICS

- 2) Figures to the right indicate full mark.
- 3) If necessary, assume suitable data.

MCQ/Objective Type Questions

Duration: 30 Minutes

a)

2)

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
 - c) Double-ended
 - An ideal operational amplifier has ____ b) zero input impedance
 - infinite output impedance infinite bandwidth c) d)
- 3) The voltage follower has a _____.
 - closed-loop voltage gain of unity a)
 - small open-loop voltage gain b)
 - c) closed-loop bandwidth of zero
 - large closed-loop output d)
- 4) An ideal amplifier should have _____
 - a) high input current
 - c) high output impedance d) moderate gain
- A non inverting closed-loop op-amp circuit generally as a gain factor _____. 5) greater than one
 - less than one a) b)
 - equal to one C) zero d)
- The closed-loop voltage gain of an inverting amplifier equals _____. 6)
 - the ratio of the input resistance to the feedback resistance a)
 - the open-loop voltage gain b)
 - the feedback resistance divided by the input resistance c)
 - the input resistance d)
- 7) If the input to a comparator is a sine wave, the output is a .
 - ramp voltage a) b) sine wave
 - rectangular wave d) sawtooth wave c)
- The Op-amp can amplify _____. 8)
 - 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

SLR-FM-753

Max. Marks: 70

Marks: 14

- b) Single-ended
 - d)
 - Noninverting mode

All of the above

- b) zero offset

			Set	Q
9)	 When a capacitor is used in place placement determines a) open- or closed-loop gain c) saturation or cutoff 	ce of a res b) d)	istor in an op-amp network, its integration or differentiation addition or subtraction	
10)	 The input offset current equals t a) average of two base current b) collector current divided by c) difference between two base d) difference between two base 	he ts the curren e-emitter \ e currents	 t gain voltages	
11)	 An ideal OP-AMP is has input reof a) Infinity, Zero c) 1KΩ, Zero Ro 	esistance d b) d)	of and output resistance Infinity,100 All the above	
12)	The open loop gain of an ideal (a) Zero c) ∞	DP-AMP is b) d)	3 100 None of the above	
13)	Transistor Biasing is generally p a) Biasing circuit c) Diode	provided by b) d)	/ a Bias battery None of the above	
14)	The Schmitt trigger is a two-stat a) pulse shaping c) input noise rejection	e device tl b) d)	hat is used for peak detection filtering	

Seat No.			Set	Q	
	S.E. (Part - I) Elec	(Old) (CGPA) Examination Nov/Dec-2 ctrical & Electronics Engineering ANALOG ELECTRONICS	019		
Day & Time:	Date: Saturday, 14-12 10:00 AM To 01:00 PM	2-2019 M	Max. Marks	s: 56	
Instru	ictions: 1) All question 2) Figures to t 3) Assume the	s are compulsory. he right indicate full marks. e suitable data if necessary.			
		Section – I			
Q.2	 Solve Any Three. a) What is rectifier ar b) What is load line a c) Explain class A an d) Explain the working 	nd Explain in brief? analysis? Explain Q-point. nplifier. ng of depletion type MOSFET.		12	
Q.3	Solve Any Two.a) Explain operationb) Explain working ofc) What is clamper?	of bridge rectifier. ^f unijunction transistor. Also discuss its VI chara Explain positive clamper.	acteristics.	16	
		Section – II			
Q.4	 Solve Any Three. a) Draw general bloc b) Explain instrument c) What are the applied d) What are closed be 	k diagram of op-amp and pin diagram of IC 741 tation amplifier. ications of op-amp? oop inverting and non-inverting amplifiers?	Ι.	12	
Q.5	 Solve Any Two. a) Explain op-amp as b) Explain with neat of multivibrator. Also c) What are ideal char op-amp. (1) CMDD 	s a integrator. diagram and waveforms of IC 555 as astable derive expression for frequency. aracteristics of op-amp? Explain following terms	sin	16	

CMRR
 PSRR

SLR-FM-753

S.E. (Part - I) (Old) (CGPA) Examination Nov/Dec-2019 **Electrical & Electronics Engineering** ANALOG ELECTRONICS

Day & Date: Saturday, 14-12-2019 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

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

b)

d)

- 1) The open loop gain of an ideal OP-AMP is
 - a) Zero
 - c) ∞
- 2) Transistor Biasing is generally provided by a _____
 - a) Biasing circuit b)
 - c) Diode
- 3) The Schmitt trigger is a two-state device that is used for
 - a) pulse shaping b)
 - c) input noise rejection d) filterina
- 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
 - c) Double-ended
- 5) An ideal operational amplifier has _ infinite output impedance a)
 - infinite bandwidth c)
- The voltage follower has a _____ 6)

a)

c)

zero

- closed-loop voltage gain of unity a)
- small open-loop voltage gain b)
- closed-loop bandwidth of zero c)
- large closed-loop output d)
- An ideal amplifier should have ____ 7)
 - a) high input current b) zero offset
 - c) high output impedance d) moderate gain
- A non inverting closed-loop op-amp circuit generally as a gain factor _____. 8) greater than one
 - less than one b)
 - d) equal to one

- Single-ended b)
- d) Noninverting mode
- b) zero input impedance
- All of the above d)

Max. Marks: 70

Marks: 14

Set R



- 100
- None of the above

- d)
- Bias battery
- None of the above

- peak detection

M-75	3
Set F	२
ts	
ICE	
r	ts

Seat			Set	R			
No.							
S.E. (Part - I) (Old) (CGPA) Examination Nov/Dec-2019 Electrical & Electronics Engineering ANALOG ELECTRONICS							
Day & Time:	Date: Saturday, 14-12 10:00 AM To 01:00 PM	2-2019 M	Max. Marks	s: 56			
Instru	ictions: 1) All question 2) Figures to t 3) Assume the	is are compulsory. he right indicate full marks. e suitable data if necessary.					
		Section – I					
Q.2	 Solve Any Three. a) What is rectifier and b) What is load line and c) Explain class A and d) Explain the working 	nd Explain in brief? analysis? Explain Q-point. nplifier. ng of depletion type MOSFET.		12			
Q.3	 Solve Any Two. a) Explain operation b) Explain working of c) What is clamper? 	of bridge rectifier. f unijunction transistor. Also discuss its VI c Explain positive clamper.	naracteristics.	16			
		Section – II					
Q.4	 Solve Any Three. a) Draw general bloc b) Explain instrumen c) What are the appl d) What are closed be 	k diagram of op-amp and pin diagram of IC tation amplifier. ications of op-amp? oop inverting and non-inverting amplifiers?	741.	12			
Q.5	 Solve Any Two. a) Explain op-amp as b) Explain with neat of multivibrator. Also c) What are ideal char op-amp. 	s a integrator. diagram and waveforms of IC 555 as astab derive expression for frequency. aracteristics of op-amp? Explain following te	e erms in	16			

1) CMRR
 2) PSRR

SLR-FM-753 Γ

S.E. (Part - I) (Old) (CGPA) Examination Nov/Dec-2019 **Electrical & Electronics Engineering** ANALOG ELECTRONICS

Day & Date: Saturday, 14-12-2019 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

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

- 1) The voltage follower has a
 - closed-loop voltage gain of unity a)
 - small open-loop voltage gain b)
 - closed-loop bandwidth of zero c)
 - large closed-loop output d)
- An ideal amplifier should have ____ 2)
 - a) high input current
 - c) high output impedance d) moderate gain
- A non inverting closed-loop op-amp circuit generally as a gain factor _____. 3)
 - a) less than one greater than one b)
 - equal to one C) zero d)
- 4) The closed-loop voltage gain of an inverting amplifier equals _____.
 - the ratio of the input resistance to the feedback resistance a)
 - the open-loop voltage gain b)
 - the feedback resistance divided by the input resistance c)
 - the input resistance d)
- 5) If the input to a comparator is a sine wave, the output is a .
 - ramp voltage sine wave a) b)
 - rectangular wave C) d) sawtooth wave
- 6) 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
- When a capacitor is used in place of a resistor in an op-amp network, its 7) placement determines
 - a) open- or closed-loop gain
 - saturation or cutoff C) d)
- integration or differentiation b)
- addition or subtraction

Max. Marks: 70

Marks: 14

Set



- b)

- zero offset

	Set	S
8)	 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 	
9)	An ideal OP-AMP is has input resistance of and output resistanceofa) Infinity, Zerob) Infinity,100c) 1KΩ, Zero Rod) All the above	
10)	The open loop gain of an ideal OP-AMP is a) Zero b) 100 c) ∞ d) None of the above	
11)	Transistor Biasing is generally provided by a a) Biasing circuit b) Bias battery c) Diode d) None of the above	
12)	The Schmitt trigger is a two-state device that is used fora) pulse shapingb) peak detectionc) input noise rejectiond) filtering	
13)	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	
14)	An ideal operational amplifier has a) infinite output impedance b) zero input impedance	

- c) infinite bandwidth d)

All of the above

	-		r	
Seat No.			Set	S
	S.E. (Part - I) Elec	(Old) (CGPA) Examination Nov/Dec-2 trical & Electronics Engineering ANALOG ELECTRONICS	019	
Day & Time:	Date: Saturday, 14-12 10:00 AM To 01:00 PM	2-2019 A	Max. Marks	s: 56
Instru	ictions: 1) All question 2) Figures to t 3) Assume the	s are compulsory. he right indicate full marks. e suitable data if necessary.		
		Section – I		
Q.2	 Solve Any Three. a) What is rectifier ar b) What is load line a c) Explain class A an d) Explain the working 	nd Explain in brief? Inalysis? Explain Q-point. Inplifier. Ig of depletion type MOSFET.		12
Q.3	Solve Any Two.a) Explain operationb) Explain working ofc) What is clamper?	of bridge rectifier. ⁻ unijunction transistor. Also discuss its VI chara Explain positive clamper.	acteristics.	16
		Section – II		
Q.4	 Solve Any Three. a) Draw general bloc b) Explain instrument c) What are the applied d) What are closed be 	k diagram of op-amp and pin diagram of IC 74 tation amplifier. cations of op-amp? oop inverting and non-inverting amplifiers?	1.	12
Q.5	 Solve Any Two. a) Explain op-amp as b) Explain with neat of multivibrator. Also c) What are ideal char op-amp. 1) CMDD 	s a integrator. diagram and waveforms of IC 555 as astable derive expression for frequency. aracteristics of op-amp? Explain following terms	s in	16

CMRR
 PSRR

SLR-FM-753

Soat

Seat No.						Set	Ρ		
	S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Electrical & Electronics Engineering ELECTRICAL POWER GENERATION								
Day & I Time: 1	Date: T 10:00 A	uesday, 17-1: M To 01:00 P	2-2019 M		Мах	. Marks	3: 70		
Instruc	Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.								
				i man	vo.				
Duratio	Duration: 30 Minutes Marks: 14								
Q.1 C 1	Choose) In a) b) c) d)	the correct a a super-heate Pressure ris Pressure ris Pressure re Both pressu	alternatives from th er ses, temperature dro ses, temperature rem emains constant and ure and temperature	e opt ps nains tempo rema	ions. constant erature rises ins constant		14		
2	2) Pr a) c)	otovoltaic sol Fuel cell Solar pond	ar energy conversior	n syst b) d)	em makes use of Solar cell None of the above				
3	8) So a) c)	olar cells are r silicon silver	nade of	b) d)	Germanium Aluminium				
4	l) A a) c)	condenser in Boiler Economize	a thermal power plar r	nt con b) d)	denses steam combing ou Super-heater Turbine	t of			
5	5) W tra a) c)	hich of the fol insmitted? 132 kV 33 kV	lowing is not the volt	age a b) d)	t which power is usually 66 kV 20 kV				
6	6) W a) c)	hich of the fol Bituminous Lignite	lowing is considered coal	as su b) d)	iperior quality of coal? Peat Coke				
7	΄) Οι a) c)	ut of the follow Tidal power Nuclear ene	ving which one is not ergy	a un b) d)	conventional source of ene Geothermal energy Wind power	ergy?			
8	8) Pu a) c)	Ilverized coal Coal free fro Coal which	is om ash bums for long time	b) d)	Non-smoking coal Coal broken into fine part	icles			
9	9) Co a) c)	oal used in po Steam Coa Coke	wer plant is also kno I	wn as b) d)	S Charcoal 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

a) Bituminous coal

13) Which coal will have highest ash content?

b) Grade I steam coal

SLR-FM-754

Set P

- c) Coking coal d) Lignite
- 14) Burning of low grade fuel can be improved by ____
 - a) Blending with better quality
 - c) Pulverizing
- b) Oil assisted ignition
- d) Any of the above

Seat No.					Set	Ρ
		S.E. (Part – I) Elec ELE	(Old) (CGPA) E trical & Electro CTRICAL POW	Examination Nov/Dec nics Engineering ER GENERATION	c-2019	
Day & Time:	Date 10:0	e: Tuesday, 17-12 0 AM To 01:00 Pl	-2019 ⁄I		Max. Marks	: 56
Instru	ictio	ns: 1) All questior 2) Figures to t	is are compulsory. he right indicate fu	ll marks.		
Q.2	Atte a) b) c) d) e)	mpt ant three. Explain the hand Explain the proce Explain single lin Explain pelton tu Write a short not	ling of fuels in therr ess of nuclear fissic e diagram of typica bine with neat diag e on hydrology.	nal power plant. n. I AC power system. gram.		12
Q.3	Atte a) b) c)	mpt any two. Explain CANDU and disadvantag Discuss factors to plant. Draw typical layo	type reactor with ne es. b be considered for ut of hydroelectric	eat diagram, also state its selection of site for thern	advantages nal power t briefly.	16
Q.4	Atte a) b) c) d) e)	mpt any three. Write a short not Explain the work Explain common with neat diagran Define bio-gas en Explain wind pov	e on load curve. ng of thermal powe circular digester w n. nergy. ver plant with block	er station. ith floating gas holder (K∨ diagram.	/IC digester)	12
Q.5	Atte a) b)	mpt any two. Explain geo-ther application. Explain the work	nal power plant wit ng of diesel power	h neat diagram also state plant with the help of nea	e its it block	16
	c)	diagram. Explain the follow 1) Load factor 2) Plant capaci	ving ty factor			

Seat

Demand factor

SLR-FM-754

Seat No.						Ś	Set	Q	
S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Electrical & Electronics Engineering ELECTRICAL POWER GENERATION									
Day & Time:	Date 10:00	: Tu) AN	esday, 17-12 To 01:00 P	2-2019 M		Max. I	Marks	s: 70	
 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 									
2) Figures to the fight indicate full marks. MCO/Objective Type Questions									
Duratio	on: 30) Mi	nutes		pc e		Marks	s: 14	
Q.1 (Choo	se t	he correct a	alternatives from th	e opt	ions.		14	
	1)	Pur a) c)	Coal free fro Coal which	is om ash bums for long time	b) d)	Non-smoking coal Coal broken into fine particl	es		
4	2)	Coa a) c)	al used in po Steam Coal Coke	wer plant is also kno	own as b) d)	S Charcoal Soft coal			
3	3)	Live a) b) c) d)	e storage of o Coal ready Preheated o Storage of o Coal in tran	coal in a power plant for combustion coal coal sufficient to mee sit	: meai et 24 l	ns			
2	4)	In a by r a) c)	power plant neans of Bucket Trolleys	t, coal is carried from 	b) b)	age place to boilers generally V-belts Manually	/		
Ę	5)	Adv a) b) c) d)	antage of hy Low operati Free from p No fuel tran All of the ab	/dro-electric power s ng cost ollution problems sportation problems ove	tation	is			
6	5)	Whi a) c)	ich coal will I Bituminous Coking coal	nave highest ash cor coal	ntent? b) d)	Grade I steam coal Lignite			
7	7)	Bur a) c)	ning of low g Blending wi Pulverizing	rade fuel can be imp th better quality	broved b) d)	d by Oil assisted ignition 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 									

			SLR-I	- IVI - /	J 4
				Set	Q
Pho	otovoltaic solar energy conversior	syste	em makes use of		
a) C)	Solar pond	d)	None of the above		
Sol	ar cells are made of	ч)			
a)	silicon	b)	Germanium		
C)	silver	d)	Aluminium		
Аc	ondenser in a thermal power plar	t con	denses steam combing out	t of	

b)

- Turbine c) Economizer d)
- Which of the following is not the voltage at which power is usually 12) transmitted?
 - a) 132 kV b) 66 kV
 - c) 33 kV d) 20 kV
- Which of the following is considered as superior quality of coal? 13)
 - b) a) Bituminous coal Peat
 - c) Lignite d) Coke
- Out of the following which one is not a unconventional source of energy? 14)
 - a) Tidal power

9)

10)

11)

a)

Boiler

b) Geothermal energy

Super-heater

- Nuclear energy c)
- Wind power d)

Seat No.					Set	Q
		S.E. (Part – I) Elec ELEC	(Old) (CGPA) Exa rical & Electronic CTRICAL POWER	mination Nov/Dec-201 s Engineering GENERATION	9	
Day & Time:	Date 10:0	e: Tuesday, 17-12 0 AM To 01:00 PN	2019 I	Ma	ax. Marks	: 56
Instru	ictio	ns: 1) All question 2) Figures to t	s are compulsory. ne right indicate full m	arks.		
Q.2	Atte a) b) c) d) e)	mpt ant three. Explain the handl Explain the proce Explain single line Explain pelton tur Write a short note	ng of fuels in thermal as of nuclear fission. diagram of typical A pine with neat diagrar on hydrology.	power plant. C power system. n.		12
Q.3	Atte a) b) c)	mpt any two. Explain CANDU t and disadvantage Discuss factors to plant. Draw typical layor	vpe reactor with neat s. be considered for se it of hydroelectric pov	diagram, also state its advar ection of site for thermal por rer plant and explain it briefly	ntages wer y.	16
Q.4	Atte a) b) c) d) e)	mpt any three. Write a short note Explain the workin Explain common with neat diagram Define bio-gas en Explain wind pow	on load curve. ng of thermal power si circular digester with f ergy. er plant with block dia	ation. loating gas holder (KVIC dig gram.	ester)	12
Q.5	Atte a)	mpt any two. Explain geo-thern application.	nal power plant with n	eat diagram also state its		16
	b) c)	Explain the workin diagram. Explain the follow 1) Load factor 2) Plant capacit 3) Demand fact	ng of diesel power pla ng / factor or	nt with the help of neat blocl	¢	

Page **6** of **12**

SLR-FM-754

Seat								_
No.							Set	R
		S.E	. (Part – I)	(Old) (CGPA) E	kami	nation Nov/Dec-2019		
			Elec	ctrical & Electror	nics l	Engineering		
Day & Time [:]	Date	: Tu) AM	בבב esday, 17-12 דס 100 P	2-2019 M	K GI	ENERATION Max	. Marks	s: 70
Instru	ction	s: 1) Q. No. 1 is	compulsorv and sho	ould b	e solved in first 30 minutes	in ans	wer
		2	book.	the right indicate ful	Imark	(S)		
		2		ICO/Objective Tu	ne C)uestions		
Duratio	on: 3(0 Mir	nutes		pc s		Marks	s: 14
Q.1	Choo 1)	se t Whi tran	he correct a ich of the foll smitted?	alternatives from th lowing is not the volt	e opt age a	ions. t which power is usually		14
		a) c)	132 kV 33 kV		b) d)	66 KV 20 kV		
2	2)	Whi a) c)	ch of the foll Bituminous Lignite	owing is considered coal	as su b) d)	perior quality of coal? Peat Coke		
	3)	Out a) c)	of the follow Tidal power Nuclear ene	ving which one is not ergy	a uno b) d)	conventional source of ene Geothermal energy Wind power	rgy?	
2	4)	Pulv a) c)	verized coal Coal free fro Coal which	is om ash bums for long time	b) d)	Non-smoking coal Coal broken into fine parti	icles	
ţ	5)	Coa a) c)	ll used in po Steam Coal Coke	wer plant is also kno	wn as b) d)	s Charcoal Soft coal		
(6)	Live a) b) c) d)	e storage of o Coal ready Preheated o Storage of o Coal in tran	coal in a power plant for combustion coal coal sufficient to mee sit	mear et 24 h	ns		
7	7)	In a by r a) c)	power plant neans of Bucket Trolleys	, coal is carried from 	b) d)	ige place to boilers genera V-belts Manually	lly	
٤	8)	Adv a) b) c) d)	antage of hy Low operati Free from p No fuel tran All of the ab	vdro-electric power s ng cost ollution problems sportation problems vove	tation	is		
Q	9)	Whi a)	ich coal will ł Bituminous	nave highest ash cor coal	ntent? b)	Grade I steam coal		

c) Coking coal Lignite d)

SLR-FM-754

- 10) Burning of low grade fuel can be improved by _____.
 - a) Blending with better quality
- b) Oil assisted ignition

Set R

- 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-heaterd) Turbine
- c) Economizer
| Seat | | | | Set | R |
|----------------|------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------|------|
| NO. | | | | | |
| | | S.E. (Part – I)
Elec
ELE | (Old) (CGPA) Examination Nov
trical & Electronics Engineerin
CTRICAL POWER GENERATIO | v/Dec-2019
Ig
N | |
| Day &
Time: | Date
10:0 | e: Tuesday, 17-12
0 AM To 01:00 Pl | -2019
1 | Max. Marks | 56 : |
| Instru | ctio | ns: 1) All question
2) Figures to t | s are compulsory.
ne right indicate full marks. | | |
| Q.2 | Atte
a)
b)
c)
d)
e) | mpt ant three.
Explain the hand
Explain the proce
Explain single lin
Explain pelton tu
Write a short note | ing of fuels in thermal power plant.
ss of nuclear fission.
e diagram of typical AC power system.
bine with neat diagram.
e on hydrology. | | 12 |
| Q.3 | Atte
a)
b)
c) | mpt any two.
Explain CANDU
and disadvantage
Discuss factors to
plant.
Draw typical layo | ype reactor with neat diagram, also sta
s.
be considered for selection of site for
ut of hydroelectric power plant and exr | ate its advantages
⁻ thermal power
plain it briefly. | 16 |
| Q.4 | Atte
a)
b)
c)
d)
e) | mpt any three.
Write a short not
Explain the work
Explain common
with neat diagran
Define bio-gas en
Explain wind pov | on load curve.
ng of thermal power station.
circular digester with floating gas hold
ergy.
er plant with block diagram. | er (KVIC digester) | 12 |
| Q.5 | Atte
a) | mpt any two.
Explain geo-theri
application. | nal power plant with neat diagram also | o state its | 16 |
| (| b)
c) | Explain the work
diagram.
Explain the follow
1) Load factor
2) Plant capaci
3) Demand fac | ng of diesel power plant with the help o
ing
y factor
or | of neat block | |

a) b) c) d)	Free from pollution problems No fuel transportation problems All of the above					
Wh a) c)	ich coal will have highest ash cor Bituminous coal Coking coal	ntent? b) d)	Grade I steam coal Lignite			
Bu a) c)	rning of low grade fuel can be imp Blending with better quality Pulverizing	brove b) d)	d by Oil assisted ignition Any of the above			
In a a) b) c) d)	 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 					
Phé a) c)	otovoltaic solar energy conversion Fuel cell Solar pond	n syst b) d)	em makes use of Solar cell None of the above			
Sol a) c)	ar cells are made of silicon silver	b) d)	Germanium Aluminium			

S.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 **Electrical & Electronics Engineering ELECTRICAL POWER GENERATION**

Day & Date: Tuesday, 17-12-2019 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

1)

Seat

No.

Q.1 Choose the correct alternatives from the options.

- 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

Advantage of hydro-electric power station is _____. 3)

a) Low operating cost

4)

5)

6)

7)

8)

SLR-FM-754



Max. Marks: 70

Marks: 14

9) A condenser in a thermal power plant condenses steam combing out of _____.

d)

a) Boiler

- b) Super-heater Turbine
- c) Economizer
- Which of the following is not the voltage at which power is usually 10) transmitted?
 - 132 kV b) 66 kV a)
 - 33 kV d) 20 kV C)
- Which of the following is considered as superior quality of coal? 11)
 - a) Bituminous coal b) Peat
 - c) Lignite Coke d)

Out of the following which one is not a unconventional source of energy? 12) Geothermal energy

b)

- a) Tidal power c) Nuclear energy
- Wind power d)
- Pulverized coal is _____. 13) a) Coal free from ash
 - c) Coal which bums for long time
 - Coal used in power plant is also known as
- 14) a) Steam Coal b)
 - Charcoal c) Coke d) Soft coal

Set S

SLR-FM-754

- b) Non-smoking coal
- Coal broken into fine particles d)

0					1	
Seat No.					Set	S
		S.E. (Part – I) Elec ELE	(Old) (CGPA) trical & Electro CTRICAL POW	Examination Nov onics Engineerin /ER GENERATIO	r/Dec-2019 g N	
Day & Time:	Date 10:0	e: Tuesday, 17-12 0 AM To 01:00 Pl	2-2019 M		Max. Marks	: 56
Instru	ictio	n s: 1) All question 2) Figures to t	is are compulsory he right indicate f	ull marks.		
Q.2	Atte a) b) c) d) e)	mpt ant three. Explain the hand Explain the proce Explain single lin Explain pelton tu Write a short note	ling of fuels in the ess of nuclear fissi e diagram of typic rbine with neat dia e on hydrology.	rmal power plant. on. al AC power system. gram.		12
Q.3	Atte a) b)	mpt any two. Explain CANDU and disadvantage Discuss factors to plant.	type reactor with r es. b be considered fo	eat diagram, also sta r selection of site for	ate its advantages thermal power	16
Q.4	c) Atte a) b) c) d) e)	Draw typical layo mpt any three. Write a short note Explain the worki Explain common with neat diagran Define bio-gas en Explain wind pow	ut of hydroelectric e on load curve. ng of thermal pow circular digester v n. nergy. ver plant with bloc	power plant and exp er station. vith floating gas holde diagram.	er (KVIC digester)	12
Q.5	Atte a) b) c)	mpt any two. Explain geo-thern application. Explain the worki diagram. Explain the follow 1) Load factor 2) Plant capaci	nal power plant w ng of diesel powe <i>v</i> ing ty factor	ith neat diagram also r plant with the help c	state its of neat block	16

3) Demand factor

SLR-FM-754

S.E. (Part - II) (Old) (CGPA) Examination Nov/Dec-2019 **Electrical & Electronics Engineering** A.C. MACHINES

Day & Date: Saturday, 23-11-2019 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

Seat

No.

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
 - Induced EMF C)
- 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

The fractional slip of an induction motor is the ratio 3)

- a) Rotor Cu loss/rotor input c) Rotor Cu loss/rotor output
- Stator Cu loss/stator input b) 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
- The power factor of a 3-phase induction motor at no load is approximately 5)
 - 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 X2/R2 b)

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 Im
- d) Auxiliary winding current Is
- 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

SLR-FM-756



Max. Marks: 70

Marks: 14

- Frequency
- Speed

- b)
- d)

Set P

SLR-FM-756

- Which kind of rotor is most suitable for turbo alternators? 9)
 - a) Salient pole type
- Non-salient pole type
- c) Both (A) and (B) above
- b) None of the above d)
- The number of electrical degrees passed through in one revolution of a 4 10) pole synchronous alternator is ____
 - 360 b) 720 a) 2160
 - d) c) 1080
- 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
- The effect of increasing the length of air-gap in an induction motor will be 14) to increase the
 - a) Power factor

b) Magnetizing current

c) Speed

None of the above d)

Seat No.

S.E. (Part - II) (Old) (CGPA) Examination Nov/Dec-2019 Electrical & Electronics Engineering A.C. MACHINES

Day & Date: Saturday, 23-11-2019 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:

- 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 10 induction motor.

Q.3 Attempt any two:

- a) Explain methods of speed control of 30 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.

- 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.

Max. Marks: 56

16

12

Set P

16

Q.5 Attempt any two.

- 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.

Set

S.E. (Part - II) (Old) (CGPA) Examination Nov/Dec-2019 **Electrical & Electronics Engineering** A.C. MACHINES

Day & Date: Saturday, 23-11-2019 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

Seat

No.

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

- In a shaded pole motor, shading coils are used to . 1)
 - a) Reduce windage losses
 - b) Reduce friction losses
 - c) Produce rotating magnetic field
 - d) To protect against sparking

2) Which kind of rotor is most suitable for turbo alternators?

- a) Salient pole type c) Both (A) and (B) above
- b) Non-salient pole type d) None of the above
- The number of electrical degrees passed through in one revolution of a 4 3) pole synchronous alternator is .
 - a) 360 b) 720
 - c) 1080 d) 2160
- 4) 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
- When applied rated voltage per phase is reduced by one-half, the starting 5) torque of a SCIM becomes_____ of the starting torque with full voltage.
 - a) 1/2 1/4 b)
 - c) 3/4 d) 3/2
- 6) 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
- 7) The effect of increasing the length of air-gap in an induction motor will be to increase the
 - a) Power factor b)
 - c) Speed

- Magnetizing current
- d) None of the above



Max. Marks: 70

Marks: 14

c) Induced EMF d) Frequency 9) Pull-out torgue of a SCIM occurs at that value of slip where rotor power factor equals . b) 0.707 a) Unity c) 0.86 d) 0.5 10) 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 Rotor Cu loss/stator Cu loss d) When load is placed on a 3-phase induction motor, its slip, _____. 11) a) Increases Decreases b) c) Remain constant d) None of the above 12) 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 The maximum torque in a 3-phase induction motor occurs at a slip _____. 13) a) R2/X2 X2/R2 b) c) R2= X2 d) none of the above 14) 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

- 8) Which of the following rotor quantity in a SCIM does NOT depend on its slip?
 - a) Reactance Speed b)

Set | Q

SLR-FM-756

- c) Main winding current Im
- d) Auxiliary winding current Is

Seat No.

S.E. (Part - II) (Old) (CGPA) Examination Nov/Dec-2019 Electrical & Electronics Engineering A.C. MACHINES

Day & Date: Saturday, 23-11-2019 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:

- 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 10 induction motor.

Q.3 Attempt any two:

- a) Explain methods of speed control of 30 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.

- 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.

Max. Marks: 56

16

12

Set Q

Q.5 Attempt any two.

- 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.

(Old) (CGPA) Examination Nov/Dec-2019

S.E. (Part - II) (Old) (CGPA) Examination Nov/Dec-2019 Electrical & Electronics Engineering A.C. MACHINES

Day & Date: Saturday, 23-11-2019 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

Seat

No.

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 $I_{\rm m}$ and $I_{\rm s}$
 - c) Main winding current Im
 - 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
- c) 1080 d) 2
- 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

SLR-FM-756

Set | F

Max. Marks: 70

Marks: 14

Page	10	of	16	

- 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
- The effect of increasing the length of air-gap in an induction motor will be 10) to increase the .
 - a) Power factor

- Magnetizing current
- c) Speed
- Which of the following rotor quantity in a SCIM does NOT depend on its 11) slip?
 - a) Reactance b) Speed
 - c) Induced EMF Frequency d)
- 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
- The fractional slip of an induction motor is the ratio _____. 13)
 - a) Rotor Cu loss/rotor input
- Stator Cu loss/stator input b)

Rotor Cu loss/stator Cu loss

- c) Rotor Cu loss/rotor output
- When load is placed on a 3-phase induction motor, its slip, _____. 14)
 - a) Increases

- Decreases b)
- c) Remain constant
- d) None of the above

d)

- d)
- b)
- None of the above

SLR-FM-756



Seat No.

S.E. (Part - II) (Old) (CGPA) Examination Nov/Dec-2019 Electrical & Electronics Engineering A.C. MACHINES

Day & Date: Saturday, 23-11-2019 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:

- 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 10 induction motor.

Q.3 Attempt any two:

- a) Explain methods of speed control of 30 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.

- 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.

Max. Marks: 56

R

16

12

Set

Q.5 Attempt any two.

- 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.

16

R

Set S

Max. Marks: 70

Marks: 14

S.E. (Part - II) (Old) (CGPA) Examination Nov/Dec-2019 Electrical & Electronics Engineering A.C. MACHINES

Day & Date: Saturday, 23-11-2019 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

Seat

No.

- 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
 - 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

		SLR-FIVI-750				
				Set	S	
8)	The a) c)	e fractional slip of an induction mo Rotor Cu loss/rotor input Rotor Cu loss/rotor output	btor is b) d)	the ratio Stator Cu loss/stator input Rotor Cu loss/stator Cu loss		
9)	Wh a) c)	en load is placed on a 3-phase in Increases Remain constant	ducti b) d)	on motor, its slip, Decreases None of the above		
10)	The	e power factor of a 3-phase induc	tion n	notor at no load is approximately		
	a) c)	0.2 0.85	b) d)	0.7 1		
11)	The a) c)	e maximum torque in a 3-phase ir R2/X2 R2= X2	nducti b) d)	on motor occurs at a slip X2/R2 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 c) Main winding current I_m d) Auxiliary winding current I_s 					
13)	In a a) b) c) d)	a shaded pole motor, shading coil Reduce windage losses Reduce friction losses Produce rotating magnetic field To protect against sparking	s are	used to		

- 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.

S.E. (Part - II) (Old) (CGPA) Examination Nov/Dec-2019 Electrical & Electronics Engineering A.C. MACHINES

Day & Date: Saturday, 23-11-2019 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:

- 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 10 induction motor.

Q.3 Attempt any two:

- a) Explain methods of speed control of 30 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.

- 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.

Max. Marks: 56

16

12

Set S

16

Q.5 Attempt any two.

- 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.

S.E. (Part - II) (Old) (CGPA) Examination Nov/Dec-2019 **Electrical & Electronics Engineering ELECTRICAL & ELECTRONICS MEASUREMENT**

Day & Date: Monday, 25-11-2019 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

Seat

No.

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

- If the instrument is to have a wide range, the instrument should have _____. 1)
 - a) Linear scale

c) Exponential scale

- Square-law scale b) Logarithmic scale d)
- The instrument which is cheapest for dc measurement is .
- 2)
 - a) Moving iron PMMC b) c) Hot-wire
 - d) Electro-dynamo
- Which of the following instruments can be used for full scale deflection of 3) 300°?
 - a) PMMC b) Induction type
 - Electrostatic c) Hot-wire d)
- 4) The breaking torgue provided by permanent in single phase induction energy meter can be changed by _____
 - a) Providing a magnetic shunt & changing its position
 - Changing the distance of permanent magnet from center of revolving b) disc
 - Both a & b c)
 - None of the above d)
- Moving iron and PMMC instruments can be distinguished from each other 5) by looking at .
 - a) Pointer

- b) Terminal size d) Scale range
- Scale c)
- 6) The power in 3-phase 3-wire circuit can be measured by using .
 - a) 2 wattmeter 1 wattmeter b) None of these c) 3 wattmeter d)
- In two watt meter method of power measurement, if one of the watt meter 7) shows zero reading, then it can be concluded that _
 - a) Power factor is unit b)
 - Power factor is zero Power factor is 0.5 lagging Power factor is 0.5 leading d)
- For measuring emf of a standard cell we use: 8)
 - a) Galvanometer c) Zener reference

c)

- Potentiometer b)
- d) Electro-dynamic voltmeter

SLR-FM-757

Set

Marks: 14

Max. Marks: 70

				SLR-FM-757			
					Set	Ρ	
9)	An a) c)	oscilloscope indicates Peak to peak value of voltage RMS value	b) d)	DC value of voltage Average			
10)	Wh a) b) c) d)	ile selecting transducer for particle Only the input characteristics sh Only the output characteristics so Only the transfer characteristics Input, output and transfer character	ular a ould should shou cteris	pplication be considered I be considered Id be considered tics should be considered			
11)	Wh a) c)	ich of the following optical transd Photo emissive cell Photo transistor	uceri b) d)	s an active transducer? Photo diode 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 a) c)	e instrument having its deflection Moving iron Rectifier type	depe b) d)	nds upon average value is: Hot wire Induction type			
14)	In C a) c)	CRO the time base signal is appli Y-plates Either X-plate or Y-plate	ed to: b) d)	X-plates Both X-plate and Y-plate			

Set

Seat No.

S.E. (Part - II) (Old) (CGPA) Examination Nov/Dec-2019 Electrical & Electronics Engineering ELECTRICAL & ELECTRONICS MEASUREMENT

Day & Date: Monday, 25-11-2019 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:

- 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 1¢ 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:

- 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

$w = k\epsilon^a V^b d^c$

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

- 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.

- 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.

Max. Marks: 56

12

16

16

S.E. (Part - II) (Old) (CGPA) Examination Nov/Dec-2019 **Electrical & Electronics Engineering ELECTRICAL & ELECTRONICS MEASUREMENT**

Day & Date: Monday, 25-11-2019 Time: 02:30 PM To 05:30 PM

Duration: 30 Minutes

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

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

- For measuring emf of a standard cell we use: 1)
 - a) Galvanometer
 - c) Zener reference

Potentiometer b) Electro-dynamic voltmeter d)

DC value of voltage

- 2) An oscilloscope indicates ____
 - a) Peak to peak value of voltage c) RMS value
 - d) Average

b)

- While selecting transducer for particular application 3)
 - a) Only the input characteristics should be considered
 - Only the output characteristics should be considered b)
 - Only the transfer characteristics should be considered c)
 - Input, output and transfer characteristics should be considered d)
- 4) Which of the following optical transducer is an active transducer?
 - a) Photo emissive cell b) Photo diode
 - Photovoltaic cell c) Photo transistor d)
- The source of emission of electrons in a CRT is . 5)
 - a) PN junction diode
 - b) A barium & strontium oxide coated cathode
 - Accelerating anode c)
 - d) Post accelerating anode

The instrument having its deflection depends upon average value is: 6)

- Moving iron Hot wire a) b)
- c) Rectifier type d) Induction type
- In CRO the time base signal is applied to: _ 7)
 - a) Y-plates

c)

- b) 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)
 - c) Exponential scale
- Square-law scale Logarithmic scale d)
- The instrument which is cheapest for dc measurement is . 9)
 - a) Moving iron Hot-wire
- b) Electro-dynamo d)

PMMC

Max. Marks: 70

Marks: 14

Seat No.

14

- X-plates

Set

- 10) Which of the following instruments can be used for full scale deflection of 300°?
 - a) PMMC

- b) Induction type
- d) Electrostatic c) Hot-wire
- 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
 - Changing the distance of permanent magnet from center of revolving b) disc
 - Both a & b c)
 - d) None of the above
- Moving iron and PMMC instruments can be distinguished from each other 12) by looking at _____.
 - Pointer a)
- b) Terminal size
- Scale c)
- d) Scale range
- 13) The power in 3-phase 3-wire circuit can be measured by using _____.
 - a) 2 wattmeter

- 1 wattmeter b)
- c) 3 wattmeter d) None of these
- In two watt meter method of power measurement, if one of the watt meter 14) shows zero reading, then it can be concluded that _
 - Power factor is unit a)
- Power factor is zero b) d)
- Power factor is 0.5 lagging C)
- Power factor is 0.5 leading

Seat No.

S.E. (Part - II) (Old) (CGPA) Examination Nov/Dec-2019 Electrical & Electronics Engineering ELECTRICAL & ELECTRONICS MEASUREMENT

Day & Date: Monday, 25-11-2019 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:

- 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 1¢ 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:

- 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

$w = k\epsilon^a V^b d^c$

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

- 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.

- 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.



12

16

16

S.E. (Part - II) (Old) (CGPA) Examination Nov/Dec-2019 **Electrical & Electronics Engineering ELECTRICAL & ELECTRONICS MEASUREMENT**

Day & Date: Monday, 25-11-2019 Time: 02:30 PM To 05:30 PM

Duration: 30 Minutes

a)

c)

C)

a)

C)

Seat

No.

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

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

Moving iron and PMMC instruments can be distinguished from each other 1) by looking at _____.

b)

- a) Pointer
 - Scale

2 wattmeter

3 wattmeter

- Scale range c) d)
- 2) The power in 3-phase 3-wire circuit can be measured by using .
 - 1 wattmeter b)
 - d) None of these

In two watt meter method of power measurement, if one of the watt meter 3) shows zero reading, then it can be concluded that

- Power factor is unit a)
- Power factor is zero b) Power factor is 0.5 leading d)

Terminal size

- For measuring emf of a standard cell we use: _ 4)
 - Galvanometer

Power factor is 0.5 lagging

Potentiometer b) d) Electro-dynamic voltmeter

Average

An oscilloscope indicates 5)

Zener reference

- a) Peak to peak value of voltage b) DC value of voltage
- **RMS** value C)
- While selecting transducer for particular application 6)
 - a) Only the input characteristics should be considered
 - Only the output characteristics should be considered b)
 - Only the transfer characteristics should be considered c)
 - d) Input, output and transfer characteristics should be considered

d)

- Which of the following optical transducer is an active transducer? 7)
 - a) Photo emissive cell b) Photo diode
 - c) Photo transistor d) Photovoltaic cell
- The source of emission of electrons in a CRT is _____. 8)
 - a) PN junction diode
 - b) A barium & strontium oxide coated cathode
 - Accelerating anode c)
 - d) Post accelerating anode





Max. Marks: 70

Marks: 14

The instrument which is cheapest for dc measurement is . PMMC b)

If the instrument is to have a wide range, the instrument should have .

b)

d)

- a) Moving iron c) Hot-wire d) Electro-dynamo
- Which of the following instruments can be used for full scale deflection of 13) 300°?
 - a) PMMC b) Induction type
 - c) Hot-wire d) Electrostatic
- 14) The breaking torque provided by permanent in single phase induction energy meter can be changed by _
 - a) Providing a magnetic shunt & changing its position
 - Changing the distance of permanent magnet from center of revolving b) disc
 - Both a & b C)

9)

11)

12)

d) None of the above

- The instrument having its deflection depends upon average value is: Hot wire
 - b) Induction type d)

X-plates

Both X-plate and Y-plate

Square-law scale

Logarithmic scale

In CRO the time base signal is applied to: _ 10)

a) Moving iron

c) Rectifier type

a) Linear scale

c) Exponential scale

- a) Y-plates b)
- c) Either X-plate or Y-plate d)

SLR-FM-757 Set R

Seat No.

S.E. (Part - II) (Old) (CGPA) Examination Nov/Dec-2019 Electrical & Electronics Engineering ELECTRICAL & ELECTRONICS MEASUREMENT

Day & Date: Monday, 25-11-2019 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:

- 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 1¢ 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:

- 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

$w = k\epsilon^a V^b d^c$

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

- 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.

- 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.



R

16

12

16

Set

Max. Marks: 70

S.E. (Part - II) (Old) (CGPA) Examination Nov/Dec-2019 **Electrical & Electronics Engineering ELECTRICAL & ELECTRONICS MEASUREMENT**

Day & Date: Monday, 25-11-2019 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

Seat

No.

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

- 1) While selecting transducer for particular application
 - Only the input characteristics should be considered a)
 - Only the output characteristics should be considered b)
 - 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
- The source of emission of electrons in a CRT is . 3)
 - a) PN junction diode
 - b) A barium & strontium oxide coated cathode
 - Accelerating anode c)
 - d) Post accelerating anode
- The instrument having its deflection depends upon average value is: _____. 4)
 - Moving iron Hot wire b) a)
 - Rectifier type Induction type c) d)
- 5) In CRO the time base signal is applied to: _
 - a) Y-plates X-plates b)
 - c) Either X-plate or Y-plate d) Both X-plate and Y-plate
- If the instrument is to have a wide range, the instrument should have . 6)
 - a) Linear scale Square-law scale b)
 - c) Exponential scale d) Logarithmic scale
- 7) The instrument which is cheapest for dc measurement is _____.
 - a) Moving iron b) c) Hot-wire d)
- Which of the following instruments can be used for full scale deflection of 8) 300°?
 - a) PMMC Induction type b) Electrostatic d)
 - c) Hot-wire

- PMMC
- Electro-dynamo

Marks: 14

- 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
 - Changing the distance of permanent magnet from center of revolving b) disc
 - Both a & b C)

C)

C)

- d) None of the above
- Moving iron and PMMC instruments can be distinguished from each other 10) by looking at _____.
 - Pointer a)
- b) Terminal size
- Scale d) Scale range
- The power in 3-phase 3-wire circuit can be measured by using _____. 11)
 - a) 2 wattmeter c) 3 wattmeter

- 1 wattmeter None of these d)
- 12) In two watt meter method of power measurement, if one of the watt meter shows zero reading, then it can be concluded that _
 - Power factor is unit a)
 - b) Power factor is 0.5 lagging d)
- Power factor is zero Power factor is 0.5 leading
- For measuring emf of a standard cell we use: 13)
 - b) Potentiometer

b)

- d) Electro-dynamic voltmeter
- 14) An oscilloscope indicates ____

a) Galvanometer

c) Zener reference

- a) Peak to peak value of voltage
- c) RMS value
- b) DC value of voltage
- Average d)



Seat No.

S.E. (Part - II) (Old) (CGPA) Examination Nov/Dec-2019 Electrical & Electronics Engineering ELECTRICAL & ELECTRONICS MEASUREMENT

Day & Date: Monday, 25-11-2019 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:

- 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 1¢ 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:

- 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

 $w = k\epsilon^a V^b d^c$

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

- 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.

- 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.



Max. Marks: 56

16

16

12

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

SIGNALS & SYSTEMS

Day & Date: Tuesday, 26-11-2019 Time: 02:30 PM To 05:30 PM

Seat

No.

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.
- Assume suitable data if necessary.

MCQ/Objective Type Questions

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

- The inverse Laplace transform of $\frac{1}{s-a}$ in a region $\sigma < a$ is 1)
 - a) $e^{at}u(t)$ b) $-e^{at}u(-t)$
 - c) $e^{-at}u(-t)$ $e^{-at}u(t)$ d)
- 2) r(n) =

Duration: 30 Minutes

a) u[n]b) nu[n]c) $n^2 u[n]$ d) $\sqrt{n} u[n]$

3) If f (t) signal has energy E then energy of the signal f (2t) is sequal to

b)

- E/2 a) E b) c) 2E d) 4E
- 4) The system y(t) = x(3t-6) is
 - a) Linear, time variant
 - c) non-linear, time invariant None of these d)
- The ROC of a function consist of strips 5)
 - a) Perpendicular to jw axis Lying in jw plane b) d) None
 - c) Parallel to jw axis
- If $X(s) = \frac{2(s+1)}{s^2+2s+5}$, then x(0+) and x(∞) are given by 6)
 - a) 2,0 0,2 b) c) 0,1 d) 1,0

7) Which of the following systems are time invariant.

- a) y(t) = x(2t)b) c) y(t) = x(t/2)d)
- 8) If x(n)=u(n)-u(n-3) then ROC is
 - a) Entire Z plane
 - c) Entire Z plane, except $z=\infty$
- 9) The DFT of $x^*(n)$ is
 - a) $X^{*}(k)$
 - c) X(N-k)

Entire Z plane, except z=0 b)

y(t)=x(t)+x(t-1)

y(t)=x(-t)

linear, time invariant

- Entire Z plane, except z=0 and $z=\infty$ d)
- b) $X^*(-k)$
- d) $X^*(N-k)$

SLR-FM-758

Max. Marks: 70

Marks: 14

14

Set

- 10) The DFT of sequence $x(n) = \delta(n n_0)$ is
 - a) 1 b) $e^{j 2\pi k n_0}$
 - c) $e^{-j2\pi k n_0/N}$ d) $e^{j2\pi k n_0/N}$
- 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
 - c) The system is unstable
 - d) The impulse response is marginally constant
- 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
 - a) A real and even function of w
 - b) An imaginary and odd function of w
 - c) An imaginary and even function of w
 - d) A real and odd function of w
- 13) The Fourier transform of f(at) is given by
 - a) $f(at) \leftrightarrow aF(W)$ b)
 - c) $f(at) \leftrightarrow (1/a) F(w/a)$
- $f(at) \leftrightarrow (2/a) F(w)$

Set P

- d) None of these
- 14) Sampling a signal is equivalent to multiplying it with
 - a) A sync function
 - c) A train of sync functions
- b) A train of impulse
- d) A rectangular window

Seat No.

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

Day & Date: Tuesday, 26-11-2019 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 Attempt any three.

a) Find even and odd component of the following signal and plot the components

 \times (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.

- 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 nonlinear, causal or non-causal and time invariant of time variant.

y(n) = even[x(n)]

Section - II

Q.4 Attempt any three

- 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 $(n) = -2^n \cdot u(-n-1)$
- **d)** Find Z transform of x(n)=[1,4,3,2,5]

Q.5 Attempt any two.

- a) Find the Fourier transform of $x(t) = e^{-a/t/t}$
- **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 $x(t) = \begin{cases} 1.5 \text{ for } 0 < t < 1 \\ -1.5 \text{ for } 1 < t < 2 \end{cases}$ with fundamental frequency $wo = \pi$

Max. Marks: 56

Set

16

12

12

S.E. (Part – II) (Old) (CGPA) Examination Nov/Dec -2019 **Electrical & Electronics Engineering**

SIGNALS & SYSTEMS

Day & Date: Tuesday, 26-11-2019 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.
- Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes

1)

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

b)

d)

- If x(n)=u(n)-u(n-3) then ROC is
 - a) Entire Z plane
 - c) Entire Z plane, except $z=\infty$
- 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
 - $e^{j2\pi k n_0}$ 1 a) b) $e^{j2\pi k n_0/N}$ C) $e^{-j2\pi k n_0/N}$ d)
- When the system has poles inside the unit circle in Z-domain 4)
 - 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
 - d) The impulse response is marginally constant
- A signal x(t) has a Fourier transform X(w). If x(t) is a real and even 5) function of t, then X(w) is
 - a) A real and even function of w
 - b) An imaginary and odd function of w
 - c) An imaginary and even function of w
 - d) A real and odd function of w

The Fourier transform of f(at) is given by 6)

- a) $f(at) \leftrightarrow aF(W)$ $f(at) \leftrightarrow (2/a) F(w)$ b)
 - c) $f(at) \leftrightarrow (1/a) F(w/a)$ d) None of these
- 7) Sampling a signal is equivalent to multiplying it with
 - a) A svnc function A train of impulse b)
 - c) A train of sync functions d) A rectangular window

b)

 $-e^{at}u(-t)$

 $e^{-at}u(t)$

- The inverse Laplace transform of $\frac{1}{s-a}$ in a region $\sigma < a$ is 8)
 - a) $e^{at}u(t)$
 - c) $e^{-at}u(-t)$ d)

SLR-FM-758

Max. Marks: 70

Marks: 14

Entire Z plane, except z=0

Entire Z plane, except z=0 and $z=\infty$

Set

Seat No.
			SLR-FM-758 Set Q	
9)	r(n) =			
	a) $u[n]$ c) $n^2u[n]$	b) d)	$\frac{nu[n]}{\sqrt{n} u[n]}$	
10)	If f (t) signal has energy E then energy a) E c) 2E	gy of t b) d)	the signal f (2t) is sequal to E/2 4E	
11)	The system y(t)= x(3t-6) is a) Linear, time variant c) non-linear, time invariant	b) d)	linear, time invariant None of these	
12)	The ROC of a function consist of stria) Perpendicular to jw axisc) Parallel to jw axis	ps b) d)	Lying in jw plane None	
13)	If $X(s) = \frac{2(S+1)}{S^2+2S+5}$, then x(0+) and x(∞) are given by			
	a) 2,0 c) 0,1	b) d)	0,2 1,0	
14)	Which of the following systems are to a) y(t)=x(2t) c) y(t)=x(t/2)	ime in b) d)	variant. y(t)=x(t)+x(t-1) y(t)=x(-t)	

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

Day & Date: Tuesday, 26-11-2019 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 Attempt any three.

a) Find even and odd component of the following signal and plot the components

 \times (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.

- 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 nonlinear, causal or non-causal and time invariant of time variant.

y(n) = even[x(n)]

Section - II

Q.4 Attempt any three

- 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 $(n) = -2^n \cdot u(-n-1)$
- **d)** Find Z transform of x(n)=[1,4,3,2,5]

Q.5 Attempt any two.

- a) Find the Fourier transform of $x(t) = e^{-a/t/t}$
- **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 $x(t) = \begin{cases} 1.5 \text{ for } 0 < t < 1 \\ -1.5 \text{ for } 1 < t < 2 \end{cases}$ with fundamental frequency $wo = \pi$

Max. Marks: 56

16

12

16

Set S.E. (Part – II) (Old) (CGPA) Examination Nov/Dec -2019 **Electrical & Electronics Engineering**

SIGNALS & SYSTEMS

Day & Date: Tuesday, 26-11-2019 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.
- 4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes

Seat

No.

- Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14
 - The ROC of a function consist of strips 1)
 - a) Perpendicular to jw axis b) Lying in jw plane c) Parallel to jw axis d) None
 - 2)
 - If $X(s) = \frac{2(S+1)}{S^2+2S+5}$, then x(0+) and x(∞) are given by
 - 2.0 0.2 a) b) c) 0,1 d) 1,0
 - Which of the following systems are time invariant. 3)
 - a) y(t)=x(2t)b) y(t) = x(t) + x(t-1)c) y(t) = x(t/2)d) y(t)=x(-t)
 - 4) If x(n)=u(n)-u(n-3) then ROC is
 - a) Entire Z plane
 - c) Entire Z plane, except $z=\infty$ d) Entire Z plane, except z=0 and $z=\infty$

b)

- The DFT of $x^*(n)$ is 5)
 - $X^*(-k)$ a) $X^{*}(k)$ b)
 - $X^*(N-k)$ c) X(N-k)d)

6) The DFT of sequence $x(n) = \delta(n - n_0)$ is

- $e^{j 2\pi k n_0}$ 1 b) a) $e^{j2\pi k n_0/N}$ C) $e^{-j2\pi k n_0/N}$ d)
- 7) 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
 - d) The impulse response is marginally constant
- A signal x(t) has a Fourier transform X(w). If x(t) is a real and even 8) function of t. then X(w) is
 - A real and even function of w a)
 - b) An imaginary and odd function of w
 - c) An imaginary and even function of w
 - d) A real and odd function of w

SLR-FM-758

Max. Marks: 70

Marks: 14

Entire Z plane, except z=0

9) The Fourier transform of f(at) is given by

- a) $f(at) \leftrightarrow aF(W)$ b)
- $f(at) \leftrightarrow (2/a) F(w)$ d) None of these

SLR-FM-758

Set R

c) $f(at) \leftrightarrow (1/a) F(w/a)$

- Sampling a signal is equivalent to multiplying it with 10)
 - A train of impulse a) A sync function b)
 - c) A train of sync functions A rectangular window d)

The inverse Laplace transform of $\frac{1}{s-a}$ in a region $\sigma < a$ is 11)

- b) $-e^{at}u(-t)$ a) $e^{at}u(t)$ $e^{-at}u(t)$ c) $e^{-at}u(-t)$ d)
- 12) r(n) =
 - b) a) u[n]nu[n]
 - c) $n^2 u[n]$ d) $\sqrt{n} u[n]$

13) If f (t) signal has energy E then energy of the signal f (2t) is sequal to E/2

- a) E b)
- c) 2E 4E d)
- The system y(t) = x(3t-6) is 14)
 - a) Linear, time variant
 - c) non-linear, time invariant
- linear, time invariant b)
- d) None of these

Seat No.

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

Day & Date: Tuesday, 26-11-2019 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 Attempt any three.

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.

- 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 nonlinear, causal or non-causal and time invariant of time variant.

y(n) = even[x(n)]

Section - II

Q.4 Attempt any three

- 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 $(n) = -2^n \cdot u(-n-1)$
- **d)** Find Z transform of x(n)=[1,4,3,2,5]

Q.5 Attempt any two.

- a) Find the Fourier transform of $x(t) = e^{-a/t/t}$
- **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 $x(t) = \begin{cases} 1.5 \text{ for } 0 < t < 1 \\ -1.5 \text{ for } 1 < t < 2 \end{cases}$ with fundamental frequency $wo = \pi$

Max. Marks: 56

Set

16

12

12

Set

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

Day & Date: Tuesday, 26-11-2019 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.
- 4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes

1)

- Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14
 - The DFT of sequence $x(n) = \delta(n n_0)$ is

a)	1	b)	$e^{j 2\pi k n_0}$
c)	$e^{-j2\pi k n_0/N}$	d)	$e^{j 2\pi k n_0/N}$

- 2) 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
 - d) The impulse response is marginally constant
- 3) 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
 - A real and even function of w a)
 - b) An imaginary and odd function of w
 - c) An imaginary and even function of w
 - d) A real and odd function of w
- 4) The Fourier transform of f(at) is given by
 - a) $f(at) \leftrightarrow aF(W)$ b) $f(at) \leftrightarrow (2/a) F(w)$
 - c) $f(at) \leftrightarrow (1/a) F(w/a)$ d) None of these

5) Sampling a signal is equivalent to multiplying it with

- A sync function A train of impulse b) a)
- A train of sync functions d) A rectangular window C)

The inverse Laplace transform of $\frac{1}{s-a}$ in a region $\sigma < a$ is 6)

- a) $e^{at}u(t)$ b) $-e^{at}u(-t)$
- $e^{-at}u(t)$ c) $e^{-at}u(-t)$ d)
- 7) r(n) =
 - b) nu[n]a) u[n]c) $n^2 u[n]$ d) $\sqrt{n} u[n]$
- 8) If f (t) signal has energy E then energy of the signal f (2t) is sequal to
 - E/2 a) E b) d) 4E c) 2E

Seat No.

Max. Marks: 70

SLR-FM-758

Marks: 14

- 0,2 b)
- d) 1,0
- Which of the following systems are time invariant. 12)
 - a) y(t)=x(2t)b)
 - c) y(t) = x(t/2)

The ROC of a function consist of strips

13) If x(n)=u(n)-u(n-3) then ROC is

The system y(t) = x(3t-6) is a) Linear, time variant

c) non-linear, time invariant

a) Perpendicular to jw axis

c) Parallel to jw axis

- a) Entire Z plane
- c) Entire Z plane, except $z=\infty$
- The DFT of $x^*(n)$ is 14)
 - a) $X^{*}(k)$

2,0

a)

c) 0,1

9)

10)

11)

c)
$$X(N-k)$$

- Entire Z plane, except z=0 b)
- d) Entire Z plane, except z=0 and $z=\infty$
- b) $X^*(-k)$
- $X^*(N-k)$ d)

Page **11** of **12**

b) linear, time invariant

Lying in jw plane

d) None of these

b)

d)



If $X(s) = \frac{2(S+1)}{S^2+2S+5}$, then x(0+) and x(∞) are given by

None

- d) y(t)=x(-t)
- y(t) = x(t) + x(t-1)

Seat No.

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

Day & Date: Tuesday, 26-11-2019 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 Attempt any three.

a) Find even and odd component of the following signal and plot the components

 \times (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.

- 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 nonlinear, causal or non-causal and time invariant of time variant.

y(n) = even[x(n)]

Section - II

Q.4 Attempt any three

- 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 $(n) = -2^n \cdot u(-n-1)$
- **d)** Find Z transform of x(n)=[1,4,3,2,5]

Q.5 Attempt any two.

- a) Find the Fourier transform of $x(t) = e^{-a/t/t}$
- **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 $x(t) = \begin{cases} 1.5 \text{ for } 0 < t < 1 \\ -1.5 \text{ for } 1 < t < 2 \end{cases}$ with fundamental frequency $wo = \pi$

Max. Marks: 56

16

12

12

.

S.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 **Electrical & Electronics Engineering**

DIGITAL TECHNIQUES

Day & Date: Wednesday, 27-11-2019 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

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

- Which of the following is typically longest? 1)
 - a) Bit b) byte
 - d) nibble word C)
- 2) The octal numbering system
 - simplifies tasks a)
 - b) groups binary numbers in groups of 4
 - saves time C)
 - simplifies tasks and saves time d)
- 3) How many data select lines are required for selecting eight inputs?
 - 1 b) 2 a) C)
 - 3 d) 4
- The inverter can be produced with how many NAND gates? 4)
 - a) 1 b) 2
 - d) 4 3 c)

5) Which of the following logic family having shortest propogation delay?

- b) BICMOS a) CMOS c) ECL d) IC7402
- 6) An open collector output can _____current, but it cannot _____ a)
 - sink, source current b) source, sink current sink, source voltage c)
 - d) source, sink voltage
- 7) Which of the following combinations cannot be combined into K-map groups?
 - Corners in the same row a)
 - b) Corners in the same column c) **Diagonal corners** d) Overlapping combinations
- What is a shift register that will accept a parallel input, or a bidirectional 8) serial load and internal shift features, called?
 - Tristate b) end around a)
 - universal c) d) Conversion



Max. Marks: 70

SLR-FM-759

Marks: 14

Set P

- 9) A modulus-12 ring counter requires a minimum of _____ flip-flops.

 - 10 b) 12 d) 4 6
- On a master-slave flip-flop, when is the master enabled? 10)
 - a) when the gate is LOW
 - b) when the gate is HIGH
 - d) neither of the above
- 11) How many different states does a 3 bit asynchronous counter have?
 - b) 4 a) 2
 - d) 16
- 12) The MOD number of counter is _____
 - The maximum possible number of states a)
 - b) Actual number of states in sequence
 - The number of FF c)

c) both of the above

None of these d)

a)

c)

8 c)

- 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
 - gives serial and parallel outputs c)
 - d) is capable of all of the above

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

DIGITAL TECHNIQUES

Day & Date: Wednesday, 27-11-2019 Time: 02:30 PM To 05:30 PM

Seat

No.

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.

- 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.

- 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.

- 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.

- 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.

SLR-FM-759

Set H

Max. Marks: 56

16

12

16

S.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 **Electrical & Electronics Engineering DIGITAL TECHNIQUES**

Day & Date: Wednesday, 27-11-2019 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.

b) end around

MCQ/Objective Type Questions

Duration: 30 Minutes

a)

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

- What is a shift register that will accept a parallel input, or a bidirectional 1) serial load and internal shift features. called?
 - Tristate a)
 - universal C) d) Conversion
- A modulus-12 ring counter requires a minimum of flip-flops. 2)
 - 10 a) b) 12
 - 6 C) d) 4
- 3) On a master-slave flip-flop, when is the master enabled?
 - a) when the gate is LOW both of the above C)
- b) when the gate is HIGH d) neither of the above
- How many different states does a 3 bit asynchronous counter have? 4)
 - 2 b) 4
 - C) 8 d) 16
- The MOD number of counter is 5)
 - The maximum possible number of states a)
 - Actual number of states in sequence b)
 - The number of FF c)
 - None of these d)
- 6) Flip-flops can be used to make _____
 - b) bounce elimination switches a) Latches
 - d) All of the above C) Registers

b)

byte d) nibble

- A universal register _____. 7)
 - a) Accepts serial input
 - b) Accepts parallel input
 - gives serial and parallel outputs c)
 - d) is capable of all of the above
- Which of the following is typically longest? 8)
 - a) Bit C) word

Max. Marks: 70

Marks: 14

SLR-FM-759



Seat

No.

Set

Set Q

- 9) The octal numbering system .
 - simplifies tasks a)
 - groups binary numbers in groups of 4 b)
 - saves time C)

C)

- simplifies tasks and saves time d)
- 10) How many data select lines are required for selecting eight inputs?
 - a) 1 b) 2
 - d) 4 3 c)
- 11) The inverter can be produced with how many NAND gates?
 - 1 b) 2 a)
 - c) 3 d) 4
- 12) Which of the following logic family having shortest propogation delay? a) CMOS
 - b) BICMOS
 - ECL d) IC7402
- 13) An open collector output can _____current, but it cannot _____.
 - sink, source current b) source, sink current a) 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

S.E (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 Electrical & Electronics Engineering DIGITAL TECHNIQUES

Day & Date: Wednesday, 27-11-2019 Time: 02:30 PM To 05:30 PM

Seat

No.

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.

- 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.

- 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.

- 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.

- 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.

SLR-FM-759



Max. Marks: 56

16

16

12

S.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 **Electrical & Electronics Engineering**

DIGITAL TECHNIQUES

Day & Date: Wednesday, 27-11-2019 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

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

- Which of the following logic family having shortest propogation delay? 1)
 - CMOS a) b) BICMOS
 - d) IC7402 ECL c)
- An open collector output can 2) current, but it cannot
 - sink, source current b) source, sink current a)
 - sink, source voltage d) source, sink voltage C)
- 3) Which of the following combinations cannot be combined into K-map groups?
 - a) Corners in the same row c)
- b) Corners in the same column
- Diagonal corners d) Overlapping combinations
- What is a shift register that will accept a parallel input, or a bidirectional 4) serial load and internal shift features, called?
 - a) Tristate b) end around
 - d) Conversion universal c)
- A modulus-12 ring counter requires a minimum of _____ flip-flops. 5)
 - 10 a) b) 12 6 d) 4
 - C)
- 6) On a master-slave flip-flop, when is the master enabled? a)
 - when the gate is LOW b) when the gate is HIGH
 - both of the above d) neither of the above c)
- 7) How many different states does a 3 bit asynchronous counter have?
 - 2 b) 4 a)
 - d) 16 8 c)
- 8) The MOD number of counter is _____
 - The maximum possible number of states a)
 - b) Actual number of states in sequence
 - The number of FF c)
 - None of these d)

Max. Marks: 70

Marks: 14

SLR-FM-759

Set

Set R

- 9) Flip-flops can be used to make _____
 - a) Latches
 - c) Registers

- b) bounce elimination switches
- 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

S.E (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 Electrical & Electronics Engineering DIGITAL TECHNIQUES

Day & Date: Wednesday, 27-11-2019 Time: 02:30 PM To 05:30 PM

Seat No.

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.

- 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.

- 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.

- 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.

- 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.

SLR-FM-759

Set R

Max. Marks: 56

12

16

16

S.E. (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 **Electrical & Electronics Engineering DIGITAL TECHNIQUES**

Day & Date: Wednesday, 27-11-2019 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

3)

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

- On a master-slave flip-flop, when is the master enabled? 1) b) when the gate is HIGH
 - a) when the gate is LOW
 - c) both of the above
- How many different states does a 3 bit asynchronous counter have? 2)
 - b) 4 2 a) 8 C)
 - The MOD number of counter is _____
 - The maximum possible number of states a)
 - b) Actual number of states in sequence
 - The number of FF c)
 - d) None of these
- Flip-flops can be used to make ____ 4)
 - a) Latches Registers

C)

b) bounce elimination switches

d) neither of the above

d) All of the above

5) A universal register _____.

- a) Accepts serial input
- b) Accepts parallel input
- gives serial and parallel outputs c)
- is capable of all of the above d)
- Which of the following is typically longest? 6)
 - Bit a) b) byte
 - word d) nibble c)
- 7) The octal numbering system _____.
 - simplifies tasks a)
 - groups binary numbers in groups of 4 b)
 - saves time c)
 - simplifies tasks and saves time d)

Max. Marks: 70

Marks: 14

SLR-FM-759

Seat No.

d) 16

- 8) How many data select lines are required for selecting eight inputs?
 - 1 b) 2 a)
 - 3 d) 4 C)
- 9) The inverter can be produced with how many NAND gates?
 - a) 1 b) 2 d) 4
 - c) 3

10) Which of the following logic family having shortest propogation delay? b) BICMOS CMOS a)

- ECL d) IC7402 c)
- 11) An open collector output can _____current, but it cannot __
 - sink, source current b) source, sink current a)
 - sink, source voltage d) source, sink voltage C)
- 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
- 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
 - C) universal d) Conversion
- A modulus-12 ring counter requires a minimum of _____ flip-flops. 14)
 - a) 10 b) 12
 - c) 6

c)

d) 4

b) end around

Set S

S.E (Part – II) (Old) (CGPA) Examination Nov/Dec-2019 Electrical & Electronics Engineering DIGITAL TECHNIQUES

Day & Date: Wednesday, 27-11-2019 Time: 02:30 PM To 05:30 PM

Seat No.

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.

- 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.

- 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.

- 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.

- 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.

SLR-FM-759

)

Max. Marks: 56

12

16

16

			Electrical & Electro	nics IC E	s Engineering NGINEERING
Day Time	& Dat e: 02:3	e: Fri 30 PN	day, 06-12-2019 1 To 05:30 PM		Max. Marks: 70
Instr	uctio	ns: 1) Q. No. 1 is compulsory and s	hould	d be solved in first 30 minutes in answer
		2	book.) Figures to the right indicate ful	l mai	rks.
			MCQ/Objective T	уре	Questions
Dura	tion: 3	30 Mi	nutes		Marks: 14
Q.1	Cho 1)	ose t Unit	the correct alternatives from to the correct alternatives from to the correct alternative is	he o	ptions and rewrite the sentence. 14
		a) c)	Volt/Meter	d)	Both b & c
	2)	Vec a) c)	tor is the quantity which is com Magnitude Both a) and b)	oletel b) d)	ly defined by its Direction None of these
	3)	The a) c)	relation between vector potent Gradient Curl	ial ar b) d)	nd field strength is given by Divergence Del operator
	4)	The a) c)	Cartesian system is also called Circular coordinate system Spherical coordinate system	l as _ b) d)	Rectangular coordinate system Space coordinate system
	5)	A cł syst a) c)	narge located at point p (5,30°,2 tem? Cartesian system Spherical system	2) is s b) d)	said to be in which coordinate Cylindrical system Space system
	6)	Cor cylir a) c)	nvert the given rectangular coordinates (3.21, 56.31,1) (3.61, 57.31,0)	dinato b) d)	es A(2,3,1) into corresponding (3.21, 57.31,0) (3.61, 56.31,1)
	7)	Dive a) c)	ergence of gradient of a vector f Laplacian operation Double gradient operation	uncti b) d)	ion is equivalent to Curl operation Null vector
	8)	A po a) c)	oint charge 2nC is located at or 12 16	gin. \ b) d)	What is the potential at (1,0,0)? 14 18
	9)	The a) c)	magnetic energy of a magnetic BH/2 H/2B	mat b) d)	erial is given by B/2H B/H
	10)	Two a)	o charges 1C and -4C exists in a Away from 1C	air. W b)	/hat is the direction of force? Away from -4C

Seat No.

T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019

- c) From 1C to -4C
- d) From -4C to 1C



SLR-FM-760

Set P

- 11) The Gauss divergence theorem converts _____
 - line to surface integral a)
 - Surface to line integral c)
- b) line to volume integral
- d) Surface to volume integral
- Find the flux density of a sheet of charge density 25 units in air _____. 12)
 - a) 25
- b) 12.5
- 6.25 d) 3.125 c)
- 13) Using volume integral, which quantity can be calculated?
 - a) area of cube volume of cube
- b) area of cuboid d) Distance of vector
- 14) Electric field intensity due to infinite sheet of charge σ is.
 - Zero a)

 σ/ε

c)

c)

- b) Unity
- d) $\sigma/2\varepsilon$

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)

- a) Derive expression for potential due to infinite line charge.
- **b)** Find the Cartesian coordinates of B(4,25°,120°)
- **c)** State and prove Coulomb's low.
- **d)** State and prove Divergence theorem.
- e) $A = 2a_x + 2a_{y_{a_x}}$, and $B = a_x 3\dot{a}_y + 4a_z$ Find $\overline{A}X\overline{B}$

Q.3 Solve any two.

- a) Uniform line charge of 25nC/m lies on X =-3, Z=4 in free space. Find \overline{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)

- 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 $\nabla XH = J$.

Q.5 Solve any two.

- 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.

16

12

12

16



SLR-FM-760

Seat No.

NO.							
T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Electrical & Electronics Engineering ELECTROMAGNETIC ENGINEERING							
Day & Time	& Date : 02:3	e: Fric 0 PM	day, 06-12-2019 To 05:30 PM		Max	Marks:	70
Instr	uctio	ns: 1)	Q. No. 1 is compulsory and sh book.	ould	be solved in first 30 minutes	s in answ	er
		2)	Figures to the right indicate full	mar	ks.		
-			MCQ/Objective Ty	/pe (Questions		
Durat	tion: 3	30 Mir	nutes			Marks:	14
Q.1	Cho 1)	ose tl A po a) c)	he correct alternatives from th int charge 2nC is located at orig 12 16	ie o j jin. V b) d)	ptions and rewrite the sent Vhat is the potential at (1,0,0 14 18	ence. ')?	14
	2)	The a) c)	magnetic energy of a magnetic BH/2 H/2B	mate b) d)	erial is given by B/2H B/H		
	3)	Two a) c)	charges 1C and -4C exists in a Away from 1C From 1C to -4C	ir. W b) d)	hat is the direction of force? Away from -4C From -4C to 1C		
	4)	The a) c)	Gauss divergence theorem con line to surface integral Surface to line integral	verts b) d)	s line to volume integral Surface to volume integral		
	5)	Find a) c)	the flux density of a sheet of ch 25 6.25	arge b) d)	e density 25 units in air 12.5 3.125	<u> </u>	
	6)	Usin a) c)	g volume integral, which quantit area of cube volume of cube	y ca b) d)	n be calculated? area of cuboid Distance of vector		
	7)	Elec a) c)	tric field intensity due to infinite s Zero σ/ε	shee b) d)	et of charge σ is. Unity $\sigma/2\varepsilon$		
	8)	Unit a) c)	of Electric Intensity is Joules/Coulomb Volt/Meter	b) d)	Newton/Coulomb Both b & c		
	9)	Vect a) c)	or is the quantity which is comp Magnitude Both a) and b)	letel <u>)</u> b) d)	y defined by its Direction None of these		
	10)	The a) c)	relation between vector potentia Gradient Curl	al an b) d)	d field strength is given by Divergence Del operator		

Set Q

SLR-FM-760

Seat

11) The Cartesian system is also called as

- Circular coordinate system a)
- Spherical coordinate system d) Space coordinate system c)
- 12) A charge located at point p $(5,30^{\circ},2)$ is said to be in which coordinate system?

b)

a) Cartesian system

c)

- b) Cylindrical system
- Spherical system
- d) Space system

Rectangular coordinate system

- 13) Convert the given rectangular coordinates A(2,3,1) into corresponding cylindrical coordinates _____.
 - (3.21, 56.31, 1)a)

- b) (3.21, 57.31,0)
- (3.61, 57.31, 0)C)
- d) (3.61, 56.31,1)
- 14) Divergence of gradient of a vector function is equivalent to _____.
 - a) Laplacian operation
 - Double gradient operation c)
- b) Curl operation d) Null vector



SLR-FM-760

T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 **Electrical & Electronics Engineering** ELECTROMAGNETIC ENGINEERING

Day & Date: Friday, 06-12-2019

Seat

No.

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)

- Derive expression for potential due to infinite line charge. a)
- Find the Cartesian coordinates of B(4,25°,120°) b)
- State and prove Coulomb's low. c)
- State and prove Divergence theorem. d)
- $A = 2a_x + 2a_{y_{a_z}}$, and $B = a_x 3\dot{a}_y + 4a_z$ Find $\overline{A}X\overline{B}$ e)

Q.3 Solve any two.

- Uniform line charge of 25nC/m lies on X =-3, Z=4 in free space. Find \overline{E} in a) Cartesian components at.
 - origin 1)
 - 2) $P_1(2, 15.3)$
- b) With usual notations show that $E = -\nabla V$
- Concept of boundary conditions for electric field. c)

Section – II

Q.4 Write Short notes. (Any four)

- Explain biot Savart Law. a)
- b) Describe physical significance of Maxwells Equations.
- Find an expression for B at a perpendicular distance R meter away from C) finite length of a conductor uniformly charged with pl c/m. Use Biot and Savart law.
- Explain scalar and vector magnetic potential. d)
- From ampere's work law deduce the result $\nabla XH = J$. e)

Q.5 Solve any two.

- Find the boundary conditions in magnetic field between two media having a) *u*1 *and u*2.
- Infinite current filament is placed at z axis find magnetic field intensity at b) P (2, 3, 4) when carries current 8mA in a_z direction.
- Derive the set of Maxwell's equation for the harmonically varying field. C)

12

16

16



Max. Marks: 56

SLR-FM-760

T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 **Electrical & Electronics Engineering** ELECTROMAGNETIC ENGINEERING

Day & Date: Friday, 06-12-2019 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

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

- A charge located at point p (5,30°,2) is said to be in which coordinate 1) system?
 - a) Cartesian system c) Spherical system
- b) Cylindrical system d) Space system
- 2) Convert the given rectangular coordinates A(2,3,1) into corresponding cylindrical coordinates _____.
 - (3.21, 56.31, 1)a)
 - (3.61, 57.31, 0)c)
- 3) Divergence of gradient of a vector function is equivalent to _____.
 - a) Laplacian operation b) Curl operation d) Null vector
 - Double gradient operation c)
- A point charge 2nC is located at origin. What is the potential at (1,0,0)? 4)
 - a) 12 b) 14
 - c) 16 d) 18

The magnetic energy of a magnetic material is given by _____. 5)

- BH/2b) B/2H a)
- c) H/2B d) B/H

Two charges 1C and -4C exists in air. What is the direction of force? 6)

- Away from 1C b) Away from -4C a) c)
 - From 1C to -4C d) From -4C to 1C

7) The Gauss divergence theorem converts

- line to surface integral a) Surface to line integral c)
 - b) line to volume integral d) Surface to volume integral

Find the flux density of a sheet of charge density 25 units in air . 8)

- 25 b) 12.5 a)
- c) 6.25 d) 3.125

9) Using volume integral, which quantity can be calculated?

- area of cube b) area of cuboid a) volume of cube C)
 - d) Distance of vector

10) Electric field intensity due to infinite sheet of charge σ is.

- Zero b) Unity a) d) $\sigma/2\varepsilon$
- C) σ/ε

- b) (3.21, 57.31,0) d) (3.61, 56.31,1)

Seat No.

Set

SLR-FM-760

Marks: 14

14

Max. Marks: 70

Set R

11) Unit of Electric Intensity is ____

- a) Joules/Coulomb
 - c) Volt/Meter d) Both b & c
- 12) Vector is the quantity which is completely defined by its _____.
 - a) Magnitude

a) Gradient

Curl

c)

- b) Direction
- c) Both a) and b)
- d) None of these

b) Newton/Coulomb

- 13) The relation between vector potential and field strength is given by _____.
 - b) Divergence
 - d) Del operator
- 14) The Cartesian system is also called as _
 - a) Circular coordinate system
 - c) Spherical coordinate system
- b) Rectangular coordinate system
- d) Space coordinate system

T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Electrical & Electronics Engineering ELECTROMAGNETIC ENGINEERING Date: Friday, 06-12-2019 Max, Marks: 56

Day & Date: Friday, 06-12-2019 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)

- a) Derive expression for potential due to infinite line charge.
- **b)** Find the Cartesian coordinates of $B(4,25^{\circ},120^{\circ})$
- **c)** State and prove Coulomb's low.
- **d)** State and prove Divergence theorem.
- e) $A = 2a_x + 2a_{y_{a_x}}$, and $B = a_x 3\dot{a}_y + 4a_z$ Find $\overline{A}X\overline{B}$

Q.3 Solve any two.

- a) Uniform line charge of 25nC/m lies on X =-3, Z=4 in free space. Find \overline{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)

- 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 $\nabla XH = J$.

Q.5 Solve any two.

- 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.

16

12

Set R

SLR-FM-760

Seat No.

12

	C)	Surface to line integral	a)	Surface to volume integral
3)	Find	the flux density of a sheet of ch	arge	density 25 units in air
	a)	25	b)	12.5
	c)	6.25	d)	3.125
4)	Usin	g volume integral, which quantit	y cai	n be calculated?
	a)	area of cube	b)	area of cuboid
	c)	volume of cube	d)	Distance of vector
5)	Elec	tric field intensity due to infinite s	shee	t of charge σ is.
	a)	Zero	b)	Unity
	c)	σ/ε	d)	$\sigma/2\varepsilon$
6)	Unit a) c)	of Electric Intensity is Joules/Coulomb Volt/Meter	b) d)	Newton/Coulomb Both b & c
7)	Vect	tor is the quantity which is compl	etely	/ defined by its
	a)	Magnitude	b)	Direction
	c)	Both a) and b)	d)	None of these
8)	The	relation between vector potentia	l and	d field strength is given by
	a)	Gradient	b)	Divergence
	c)	Curl	d)	Del operator
9)	The a) c)	Cartesian system is also called Circular coordinate system Spherical coordinate system	as _ b) d)	Rectangular coordinate system Space coordinate system
10)	A ch syste a) c)	arge located at point p (5,30°,2) em? Cartesian system Spherical system	is sa b) d)	aid to be in which coordinate Cylindrical system Space system

T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 **Electrical & Electronics Engineering** ELECTROMAGNETIC ENGINEERING

Day & Date: Friday, 06-12-2019 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

Page 10 of 12

Max. Marks: 70

Marks: 14

14

Set

SLR-FM-760

Seat No.

Duration: 30 Minutes

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

- Two charges 1C and -4C exists in air. What is the direction of force? Away from 1C b) Away from -4C
- a) From 1C to -4C d) From -4C to 1C C)

2) The Gauss divergence theorem converts

- line to surface integral a)
- 3)
- 4
- 5)
- 6
- 7
- 8
- 9

- b) line to volume integral
- Surface to lin

Set S

- 11) 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)
- Divergence of gradient of a vector function is equivalent to _____. 12)
 - Laplacian operation a) Double gradient operation
- b) Curl operation d) Null vector
- 13) A point charge 2nC is located at origin. What is the potential at (1,0,0)?
 - 12 b) 14 a) c) 16 d) 18
- The magnetic energy of a magnetic material is given by _____. 14)
 - BH/2 a)

c)

c)

b) B/2H

H/2B

d) B/H

Page **11** of **12**

T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 **Electrical & Electronics Engineering** ELECTROMAGNETIC ENGINEERING

Day & Date: Friday, 06-12-2019

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)

- Derive expression for potential due to infinite line charge. a)
- Find the Cartesian coordinates of B(4,25°,120°) b)
- State and prove Coulomb's low. c)
- State and prove Divergence theorem. d)
- $A = 2a_x + 2a_{y_{a_z}}$, and $B = a_x 3\dot{a}_y + 4a_z$ Find $\overline{A}X\overline{B}$ e)

Q.3 Solve any two.

- Uniform line charge of 25nC/m lies on X =-3, Z=4 in free space. Find \overline{E} in a) Cartesian components at.
 - origin 1)
 - 2) $P_1(2, 15.3)$
- b) With usual notations show that $E = -\nabla V$
- Concept of boundary conditions for electric field. c)

Section – II

Q.4 Write Short notes. (Any four)

- Explain biot Savart Law. a)
- b) Describe physical significance of Maxwells Equations.
- Find an expression for B at a perpendicular distance R meter away from C) finite length of a conductor uniformly charged with pl c/m. Use Biot and Savart law.
- Explain scalar and vector magnetic potential. d)
- From ampere's work law deduce the result $\nabla XH = J$. e)

Solve any two. Q.5

- Find the boundary conditions in magnetic field between two media having a) *u*1 *and u*2.
- Infinite current filament is placed at z axis find magnetic field intensity at b) P (2, 3, 4) when carries current 8mA in a_z direction.
- Derive the set of Maxwell's equation for the harmonically varying field. C)

Max. Marks: 56

12

16

16

12

Set

SLR-FM-760

Seat No.

T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Electrical & Electronics Engineering INSTRUMENTATION TECHNIQUES

Day & Date: Monday, 09-12-2019 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

Seat No.

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

- 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



SLR-FM-761

Max. Marks: 70

Marks: 14

8) A strip chart recorder is _____.

a)

9)

b) an inverse transducer

SLR-FM-761

Set P

c) an output transducer d) b & c

an active transducer

- 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

T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 **Electrical & Electronics Engineering INSTRUMENTATION TECHNIQUES** Day & Date: Monday, 09-12-2019

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.

- Explain following static characteristics a)
 - 1) Accuracy
 - 2) Errors
 - 3) Uncertainty
 - 4) Linearity
- Draw & explain block diagram of instrumentation system. b)
- Draw & explain Chopper stabilized amplifier. c)
- Explain DAC with its block diagram. d)

Q.3 Solve any two.

- Explain Modulator and Demodulator with suitable diagram. a)
- What is mean by Active filters & Derive the frequency response of 1st & b) 2nd order filter?
- Describe the need of signal conditioning in instrumentation system. c) Explain any one signal conditioning equipment with necessary diagram.

Section – II

Solve any three. Q.4

- Explain General telemetry system with block diagram. a)
- What is the need of digital display, dimension. State its types and also b) define.
- Draw the architecture of PLC and explain it in brief. c)
- Write a short note on LED. d)

Q.5 Solve any two.

- Draw & Explain block diagram of digital data transmission system. Give its a) advantages and disadvantages.
- Give the classification of recorders. Explain strip chart recorder with b) necessary diagram.
- Explain function generator & pulse generator. C)

Max. Marks: 56

16

12

12

16

SLR-FM-761



Seat No.

T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 **Electrical & Electronics Engineering INSTRUMENTATION TECHNIQUES**

Day & Date: Monday, 09-12-2019 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

C)

1)

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

- A strip chart recorder is
 - an active transducer a)
- b) an inverse transducer
- an output transducer d) b&c
- 2) While selecting a transducer for particular application?
 - Only the input characteristics should be considered a)
 - b) Only the output characteristics should be considered
 - Only the transfer characteristics should be considered c)
 - Input, output and transducer characteristics should be considered d)
- A Reynolds's number of 1000 indicates _____. 3)
 - turbulence flow a)
 - laminar flow b)
 - a flow which can either be turbulent or laminar c)
 - d) none of these
- 4) Thermocouples are _
 - Passive transducers a)
 - 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
 - Higher output voltage a)
 - 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
 - Both b & c d)

Max. Marks: 70

SLR-FM-761

Marks: 14


Set Q 6) The dynamic characteristics of capacitive transducers are similar to those of . Low pass filter b) High pass filter a) Notch filter d) Band stop filters C) 7) Quartz and Rochelle salt belong to ____ Nature group of piezo-electric material a) Synthetic group of piezo-electric material b) Can belong to nature or synthetic group of piezo-electric material c) provided properly polarized All of these d) 8) A moving coil permanent magnet instrument can be used as _____ by using low resistance shunt. Ammeter b) Voltmeter a) C) Wattmeter d) All of above 9) Potentiometer is used for measuring _____. Resistance a) Current b) Calibration of ammeter ,voltmeter C) All of the above d) 10) An induction meter can handle current up to _____. a) 10 A b) 30 A d) 100 A 60 A c) 11) For handling greater current induction wattmeter are used in conjunction with P.T b) C.T a) d) None of above c) Shunt 12) The use of _____ instrument is merely confined within laboratories as standardizing instrument. Absolute a) b) Indicating Recording d) Integrating C)

- 13) A transducer converts ____
 - Mechanical energy into electrical energy a)
 - Mechanical displacement into electrical signal b)
 - One form of energy into another form of energy C)
 - Electrical energy into mechanical form d)
- 14) One of the following is an active transducer _____.
 - strain gauge a)

- b) selsyn
- photovoltaic cell d) photo emissive cell c)

SLR-FM-761

Seat No. T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Electrical & Electronics Engineering INSTRUMENTATION TECHNIQUES

Day & Date: Monday, 09-12-2019 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.

- **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.

- 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.

- 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.

- 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.

9

Set

SLR-FM-761

Max. Marks: 56

16

12

12

T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 **Electrical & Electronics Engineering** INSTRUMENTATION TECHNIQUES

Day & Date: Monday, 09-12-2019 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

Seat

No.

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

- The use of instrument is merely confined within laboratories as 1) standardizing instrument.
 - Absolute a)

c)

- b) Indicating
- d) Integrating
- 2) A transducer converts

Recording

- Mechanical energy into electrical energy a)
- b) Mechanical displacement into electrical signal
- One form of energy into another form of energy c)
- Electrical energy into mechanical form d)
- 3) One of the following is an active transducer ____ _.
 - a) strain gauge photovoltaic cell c)
- b) selsyn d) photo emissive cell
- 4) A strip chart recorder is ____
 - an active transducer b) an inverse transducer a)
 - d) b&c an output transducer C)
- 5) While selecting a transducer for particular application?
 - Only the input characteristics should be considered a)
 - Only the output characteristics should be considered b)
 - c) Only the transfer characteristics should be considered
 - Input, output and transducer characteristics should be considered d)
- 6) A Reynolds's number of 1000 indicates
 - turbulence flow a)
 - laminar flow b)
 - c) a flow which can either be turbulent or laminar
 - none of these d)
- 7) Thermocouples are
 - Passive transducers a)
 - b) Active transducers
 - Bothe active and passive transducers c)
 - **Output transducers** d)



Set

Max. Marks: 70

Marks: 14



- 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
- 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
- 10) 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
- 11) A moving coil permanent magnet instrument can be used as _____ by using low resistance shunt.
 - a) Ammeter
 - c) Wattmeter
- b) Voltmeterd) All of above
- 12) Potentiometer is used for measuring _____.
 - a) Resistance
 - b) Current

c)

- c) Calibration of ammeter ,voltmeter
- d) All of the above
- 13) An induction meter can handle current up to _____.
 - a) 10 A b) 30 A
 - 60 A d) 100 A
- 14) For handling greater current induction wattmeter are used in conjunction with _____.

b) C.T

- a) P.T
- c) Shunt d) None of above

Seat No. T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Electrical & Electronics Engineering INSTRUMENTATION TECHNIQUES Day & Date: Monday, 09-12-2019 Max

Day & Date: Monday, 09-12-2019 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.

- 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.

- 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.

- 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.

- 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.

9

Set

SLR-FM-761

Max. Marks: 56

16

12

16

T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 **Electrical & Electronics Engineering INSTRUMENTATION TECHNIQUES**

Day & Date: Monday, 09-12-2019 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

- A Reynolds's number of 1000 indicates . 1)
 - turbulence flow a)
 - b) laminar flow
 - a flow which can either be turbulent or laminar c)
 - none of these d)
- 2) Thermocouples are
 - Passive transducers a)
 - b) Active transducers
 - c) Bothe active and passive transducers
 - **Output transducers** d)
- 3) In an LVDT the two secondary windings are connected in differential to obtain
 - a) Higher output voltage
 - An output voltage which is phase sensitive i.e. the output voltage b) 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
 - In order to establish the null or the reference point for the c) displacement for the core
 - Both b & c d)
- 4) The dynamic characteristics of capacitive transducers are similar to those of .
 - Low pass filter a)
- b) High pass filter d) Band stop filters
- Notch filter C)
- 5) Quartz and Rochelle salt belong to _____
 - a) Nature group of piezo-electric material
 - Synthetic group of piezo-electric material b)
 - Can belong to nature or synthetic group of piezo-electric material C) provided properly polarized
 - All of these d)



Max. Marks: 70

SLR-FM-761

SLR-FM-761 Set S 6) A moving coil permanent magnet instrument can be used as _____ by using low resistance shunt. Ammeter b) Voltmeter a) c) Wattmeter d) All of above 7) Potentiometer is used for measuring _____. Resistance a) Current b) Calibration of ammeter ,voltmeter C) All of the above d) An induction meter can handle current up to _____. 8) 10 A b) 30 A a) 60 A d) 100 A c) For handling greater current induction wattmeter are used in conjunction 9) with P.T b) C.T a) C) Shunt d) None of above 10) The use of instrument is merely confined within laboratories as standardizing instrument. Absolute a) b) Indicating Recording C) d) Integrating 11) A transducer converts _____. Mechanical energy into electrical energy a) Mechanical displacement into electrical signal b) One form of energy into another form of energy c) Electrical energy into mechanical form d) 12) One of the following is an active transducer . strain gauge b) selsyn a) photovoltaic cell c) d) photo emissive cell 13) A strip chart recorder is an active transducer b) an inverse transducer a) d) b&c an output transducer c) 14) While selecting a transducer for particular application? Only the input characteristics should be considered a)

- 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. T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Electrical & Electronics Engineering INSTRUMENTATION TECHNIQUES Day & Date: Monday, 09-12-2019 Max Time: 02:30 PM To 05:30 PM Max 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.

- 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.

- 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.

- 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.

- 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.

SLR-FM-761

Max. Marks: 56

12

16

Set S

16

T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 **Electrical & Electronics Engineering**

MICROPROCESSOR AND ITS APPLICATIONS

Day & Date: Wednesday, 11-12-2019 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

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

- 1) LDA is _____ byte instruction. a) 1 b) c) 3 d)
- 2) What are software interrupts?
 - a) RST 0 7
 - c) INTR, TRAP
- 3) Which one is bi-directional?
 - a) Address Bus
 - c) Both
- What is SIM? 4)

7)

- Select Interrupt Mask a)
- Set Interrupt Mask C)
- Which of below is not a functional block of 8259? 5)
 - a) In service register
 - Modem Control c)
- 6) Which one of the following is not a vectored interrupt?
 - TRAP **RST 7.5** a) b) c) INTR RST 3 d)
 - 8259 is a _____. PIT a) PPI b)
 - c) USART d) PIC
- 8) Which one is not a special purpose register?
 - a) Program Counter Stack pointer b)
 - Increment/decrement latch d) Accumulator c)
- The cycle required to fetch and execute an instruction in a 8085 9) microprocessor is which one of the following? **Operand Fetch Cycle**
 - a) Clock Cycle b)
 - c) Machine Cycle d) Instruction Cycle
- Which of the following is a 16-bir register in 8085? 10) Accumulator
 - a) Program counter b)
 - **B**-register d) C- register c)

RST 5.5 - 7.5

2

4

INTA

b)

d)

b)

d)

- b) Sorting Interrupt Mask
- d) Send Interrupt Mask

- **Priority Resolver** b)
- Data Bus Buffer d)

Data Bus None

SLR-FM-762

Set

Max. Marks: 70



Seat

No.

Marks: 14

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

SLR-FM-762

Set P

- 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.	

T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Electrical & Electronics Engineering MICROPROCESSOR AND ITS APPLICATIONS

Day & Date: Wednesday, 11-12-2019 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.

- 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.

- 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.

- 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.

- 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.



16

12

12

Set

Max. Marks: 70

Seat	
No.	

T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 **Electrical & Electronics Engineering** MICROPROCESSOR AND ITS APPLICATIONS

Day & Date: Wednesday, 11-12-2019 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

Choose the correct alternatives from the options and rewrite the sentence. Q.1 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?
 - Clock Cycle a)
 - Machine Cycle d) Instruction Cycle C)
- 3) Which of the following is a 16-bir register in 8085?
 - Program counter a) b) Accumulator
 - c) B-register d) C- register
- In an intel 8085A microprocessor, why is READY signal used? 4)
 - a) to indicate to user that the microprocessor is working and is ready for use

b)

- 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

- SOD b)
- c) IO/M d) S0 and S1
- 6) The 8085 is a _
 - a) 16-bit parallel CPU c) 8-bit parallel CPU
- 16-bit Serial CPU b)

Operand Fetch Cycle

- d) 8-bit Serial CPU
- 7) When referring to instruction words, a mnemonic is _____.
 - a short abbreviation for the operand address a)
 - 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
- LDA is _____ byte instruction. 8)
 - 1 2 a) b)
 - C) 3 d) 4

Marks: 14

b) RST 5.5 – 7.5

d) INTA

b)

10) Which one is bi-directional?

What are software interrupts?

a) Address Bus

c) INTR, TRAP

a) RST 0 – 7

- c) Both
- What is SIM? 11)

9)

- a) Select Interrupt Mask
- c) Set Interrupt Mask
- d) None

Data Bus

- Sorting Interrupt Mask b)
- Send Interrupt Mask d)
- 12) Which of below is not a functional block of 8259?
 - a) In service register c) Modem Control
- **Priority Resolver** b)
- d) Data Bus Buffer

PIT

- 13) Which one of the following is not a vectored interrupt?
 - a) TRAP **RST 7.5** b)
 - c) INTR d) RST 3
- 8259 is a _____. 14)
 - a) PPI c) USART
- b) d) PIC

SLR-FM-762 Set Q

Seat	
No.	

T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Electrical & Electronics Engineering MICROPROCESSOR AND ITS APPLICATIONS

Day & Date: Wednesday, 11-12-2019 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.

- 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.

- 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.

- 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.

- 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.



Max. Marks: 56

16

12

16

book. 2) Figures to the right indicates full marks. MCQ/Objective Type Questions Which of below is not a functional block of 8259? a) In service register b) **Priority Resolver** c) Modem Control d) Data Bus Buffer Which one of the following is not a vectored interrupt? a) TRAP b) **RST 7.5** c) INTR d) RST 3 8259 is a ____ 3) PIT a) PPI b) PIC c) USART d) Which one is not a special purpose register? **Program Counter** b) Stack pointer a) d) c) Increment/decrement latch Accumulator The cycle required to fetch and execute an instruction in a 8085 microprocessor is which one of the following? a) Clock Cycle **Operand Fetch Cycle** b) c) Machine Cycle d) Instruction Cycle Which of the following is a 16-bir register in 8085? a) Program counter Accumulator b)

Electrical & Electronics Engineering MICROPROCESSOR AND ITS APPLICATIONS Day & Date: Wednesday, 11-12-2019

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

T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019

Duration: 30 Minutes

Seat

No.

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

1)

2)

4)

- 5)
- 6)

 - c) B-register d) C- register
- In an intel 8085A microprocessor, why is READY signal used? 7)
 - 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 _____.

- ALE SOD a) b)
- IO/M c) d) S0 and S1

SLR-FM-762

Set R

Max. Marks: 70

Marks: 14

- 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 d) 4
- 12) What are software interrupts?
 - a) RST 0 7
 - c) INTR, TRAP
- 13) Which one is bi-directional?
 - a) Address Bus
 - c) Both
- 14) What is SIM?

c) 3

- a) Select Interrupt Mask
- c) Set Interrupt Mask

- b) RST 5.5 7.5
- d) INTA
- b) Data Bus
- d) None
- b) Sorting Interrupt Mask
- d) Send Interrupt Mask

Seat	
No.	

T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Electrical & Electronics Engineering MICROPROCESSOR AND ITS APPLICATIONS

Day & Date: Wednesday, 11-12-2019 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.

- 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.

- 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.

- 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.

- 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.



R

12

16

16

T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 **Electrical & Electronics Engineering**

MICROPROCESSOR AND ITS APPLICATIONS

Day & Date: Wednesday, 11-12-2019 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

Seat

No.

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

- Which of the following is a 16-bir register in 8085? 1)
 - a) Program counter
 - c) B-register d)
- 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
- c) IO/M

- SOD b)
- d) S0 and S1

- 4) The 8085 is a
 - 16-bit parallel CPU a)
- 16-bit Serial CPU b) 8-bit Serial CPU d)
- c) 8-bit parallel 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
 - a short abbreviation for the data word stored at the operand address c)
 - d) shorthand for machine language
- LDA is byte instruction. 6)
 - a) 1 b) c) 3 d)
- 7) What are software interrupts?
 - a) RST 0 7
 - c) INTR, TRAP
- Which one is bi-directional? 8)
 - a) Address Bus b)
 - c) Both

Data Bus

INTA

RST 5.5 - 7.5

d) None Max. Marks: 70

Set

Marks: 14

- b)
 - Accumulator
 - C- register

- 2
- 4

b)

d)

SLR-FM-762 Set S

- 9) What is SIM?
 - a) Select Interrupt Mask
 - c) Set Interrupt Mask
- Sorting Interrupt Mask b)
- Send Interrupt Mask d)
- Which of below is not a functional block of 8259? 10)
 - a) In service register c) Modem Control
- b) **Priority Resolver**
- d) Data Bus Buffer

PIT

PIC

- Which one of the following is not a vectored interrupt? 11)
 - **RST 7.5** a) TRAP b)
 - c) INTR RST 3 d)
- 8259 is a _____. 12)
 - a) PPI b) d)
 - c) USART
- 13) Which one is not a special purpose register?
 - a) Program Counter
- Stack pointer b)
- 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
 - Machine Cycle c)

- b) Operand Fetch Cycle
- d) Instruction Cycle

Seat	
No.	

T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Electrical & Electronics Engineering MICROPROCESSOR AND ITS APPLICATIONS

Day & Date: Wednesday, 11-12-2019 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.

- 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.

- 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.

- 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.

- 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.

Max. Marks: 56

16

12

16

book. 2) Figures to the right indicate full marks. 3) Make suitable assumptions if necessary. **MCQ/Objective Type Questions** The most economical power factor for a consumer is generally . 1) 0.95 lagging a) b) Unitv d) 0.85 lagging c) 0.6 lagging 2) A belted type cable are generally used up to _ 22kv b) 33kv a) C) 11kv d) 66kv 3) The underground system is . More costly than the equivalent overhead line system a) Less costly than the equivalent overhead line system b) c) Same d) None of these 4) no dimension b) dimension of oham a) dimension of simen d) none of the above C) 5) Inner side of conductor a) b) Conductor surface Both a & b d) None of the above C) If the length of cable increases, its insulation resistance . 6) a) Increases b) Decreases Does not change d) None of these c) 7) Bedding b) Moisture a) d) None of these

T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 **Electrical & Electronics Engineering ELEMENTS OF POWER SYSTEM**

Day & Date: Friday, 13-12-2019 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

Duration: 30 Minutes

Choose the correct alternatives from the options and rewrite the sentence. Q1 14

- The generalized constants A & D of the transmission line have _____.
 - Under operating condition the maximum stress in cable is at _____.
- A metallic sheath is provided over the insulation to protect the cable from
 - c) Armoring
- The line constant of transmission line are _ 8) a) Lumped

 - Both (a) and (b) c)
- 9) The string efficiency of a suspension type insulator is dependent on
 - Size of conductor a)
 - Number of insulator discs in string b)
 - Size of the tower c)
 - d) None of these

Max. Marks: 70

Marks: 14

Set

Seat No.

- b) Uniformly distributed
 - d) None of these

Set P

- 10) By using guard ring string efficiency _
 - a) Increased Same

c)

- b) Decreased
- d) None of the above

____.

- In capacitance grading of cables we use a ____ 11)
 - a) Homogeneous dielectric
 - c) Both a & b
- b) composite dielectric
- d) None of the above
- 12) In any transmission line AD-BC= ____
 - b) 0 a) 1
 - d) None of above c) infinity
- 13) If the sag in overhead line increases, tension in line _____. b) Decreases
 - Increases a) C) Does not change
- d) Equal
- The spacing between conductor is increased, the corona effect is _____. 14)
 - a) Increases
 - c) Same

- b) Decreases
- d) None of the above

		SLR-FM-7	63
Seat No.	It	Set	Ρ
	T.E. (Part – I) (Old) (CGP) Electrical & Elec ELEMENTS O	A) Examination Nov/Dec-2019 tronics Engineering F POWER SYSTEM	
Day & Time	& Date: Friday, 13-12-2019 e: 02:30 PM To 05:30 PM	Max. Marks	s: 56
Instr	ructions: 1) All questions are compuls 2) Figure to the right indicate	ory. s full marks.	
	Se	ction – I	
Q.2	 Solve any Three. a) Write a note on sag and tension b) What is the main component of c) Explain constants of transmission d) What are advantages and disad e) Explain wooden pole with neat of 	overhead lines? Explain their functions. n line. vantages of corona? liagram.	12
Q.3	 Solve any Two. a) What is string efficiency? Explai b) Calculate sag in overhead trans c) Explain any two types of insulate 	n methods of improving string efficiency. mission line. ors with neat diagram.	16
	Se	ction – II	
Q.4	 Solve any Three. a) Explain general construction of a b) Explain types of transmission line c) Write short note generalized condition d) Explain end condenser method e) Explain proprieties of insulating 	cable with neat diagram. e. Istant of transmission line. of medium transmission line. material used for cables.	12
Q.5	 Solve any Two. a) Calculate capacitance of single b) Explain the methods of power factors c) What is grading? Explain capacitation 	core cable. ctor improvement. tance grading.	16

T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 **Electrical & Electronics Engineering ELEMENTS OF POWER SYSTEM**

Day & Date: Friday, 13-12-2019 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

1)

- Q.1 Choose the correct alternatives from the options and rewrite the sentence. 14
 - The line constant of transmission line are
 - Lumped a)
 - Both (a) and (b) d) None of these c)
 - 2) The string efficiency of a suspension type insulator is dependent on
 - Size of conductor a)
 - Number of insulator discs in string b)
 - Size of the tower c)
 - d) None of these

3) By using guard ring string efficiency

- Increased a) b) Decreased
- c) Same d) None of the above
- In capacitance grading of cables we use a _____ 4) b) composite dielectric
 - Homogeneous dielectric a)
 - Both a & b d) None of the above C)
- In any transmission line AD-BC= 5)
 - b) 0 a) 1 C) infinity d) None of above
- 6) If the sag in overhead line increases, tension in line _____.
 - b) Decreases a) Increases
 - Does not change d) Equal c)

7) The spacing between conductor is increased, the corona effect is _____.

- Increases b) Decreases a) d) None of the above c) Same
- The most economical power factor for a consumer is generally _____. 8)

b) Unity 0.95 lagging a) 0.6 lagging c)

d) 0.85 lagging

A belted type cable are generally used up to ____ 9)

a) 22kv b) 33kv C) 11kv d) 66kv

Marks: 14

SLR-FM-763

Set

Max. Marks: 70

b) Uniformly distributed

SLR-FM-763 Set | Q 10) The underground system is . More costly than the equivalent overhead line system a) Less costly than the equivalent overhead line system b) C) Same None of these d) 11) The generalized constants A & D of the transmission line have _____. no dimension b) dimension of oham a) dimension of simen d) none of the above C) Under operating condition the maximum stress in cable is at _____. 12) Inner side of conductor b) Conductor surface a) d) None of the above Both a & b C) 13) If the length of cable increases, its insulation resistance _____. Increases b) Decreases a) Does not change d) None of these c)

- 14) A metallic sheath is provided over the insulation to protect the cable from
 - a) Bedding
 - c) Armoring

- b) Moisture
- d) None of these

	SLI	R-FM-7	63
Seat No.	t	Set	Q
	T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-20 Electrical & Electronics Engineering ELEMENTS OF POWER SYSTEM	19	
Day & Time	& Date: Friday, 13-12-2019 N : 02:30 PM To 05:30 PM	/lax. Marks	s: 56
Instr	uctions: 1) All questions are compulsory.2) Figure to the right indicates full marks.		
	Section – I		
Q.2	 Solve any Three. a) Write a note on sag and tension. b) What is the main component of overhead lines? Explain their function c) Explain constants of transmission line. d) What are advantages and disadvantages of corona? e) Explain wooden pole with neat diagram. 	tions.	12
Q.3	 Solve any Two. 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. 	iency.	16
	Section – II		
Q.4	 Solve any Three. 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. 		12
Q.5	 Solve any Two. a) Calculate capacitance of single core cable. b) Explain the methods of power factor improvement. c) What is grading? Explain capacitance grading. 		16

T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 **Electrical & Electronics Engineering ELEMENTS OF POWER SYSTEM**

Day & Date: Friday, 13-12-2019 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

Under operating condition the maximum stress in cable is at _____.

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

b) Conductor surface Both a & b d) None of the above C) If the length of cable increases, its insulation resistance _____. 2) Increases b) Decreases a) C) Does not change d) None of these 3) Bedding b) Moisture a) Armoring d) None of these C) The line constant of transmission line are 4) b) Uniformly distributed Lumped a) Both (a) and (b) d) None of these C) The string efficiency of a suspension type insulator is dependent on 5) Size of conductor a) Number of insulator discs in string b) C) Size of the tower None of these d) 6) By using guard ring string efficiency Increased b) Decreased a)

- None of the above c) Same d)
- In capacitance grading of cables we use a 7)
 - Homogeneous dielectric b) composite dielectric a)
 - Both a & b d) None of the above C)
- In any transmission line AD-BC= ____ 8)
 - b) 0 a) 1 C) infinity d) None of above
- 9) If the sag in overhead line increases, tension in line ____
 - Increases b) Decreases a)
 - Does not change d) Equal c)

Max. Marks: 70

Marks: 14

Set

Seat No.

Duration: 30 Minutes

a)

1)

Q.1

- A metallic sheath is provided over the insulation to protect the cable from
- Inner side of conductor

Set R

- The spacing between conductor is increased, the corona effect is _____. 10)
 - a) Increases Same

C)

- b) Decreases
- 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 ____
 - b) 33kv a) 22kv
 - 11kv d) 66kv c)
- The underground system is _____. 13)
 - More costly than the equivalent overhead line system a)
 - Less costly than the equivalent overhead line system b)
 - Same c)
 - None of these d)
- The generalized constants A & D of the transmission line have _____. 14)
 - no dimension a)
 - c) dimension of simen
- b) dimension of oham
- d) none of the above

		SLR-FM-7	763
Seat No.	t	Set	R
		T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Electrical & Electronics Engineering ELEMENTS OF POWER SYSTEM	
Day & Time	& Date : 02:3	e: Friday, 13-12-2019 Max. Mark 30 PM To 05:30 PM	s: 56
Instr	uctio	ns: 1) All questions are compulsory.2) Figure to the right indicates full marks.	
		Section – I	
Q.2	Solv a) b) c) d) e)	We any Three. Write a note on sag and tension. What is the main component of overhead lines? Explain their functions. Explain constants of transmission line. What are advantages and disadvantages of corona? Explain wooden pole with neat diagram.	12
Q.3	Solv a) b) c)	Ye any Two. What is string efficiency? Explain methods of improving string efficiency. Calculate sag in overhead transmission line. Explain any two types of insulators with neat diagram.	16
		Section – II	
Q.4	Solv a) b) c) d) e)	Ye any Three. Explain general construction of cable with neat diagram. Explain types of transmission line. Write short note generalized constant of transmission line. Explain end condenser method of medium transmission line. Explain proprieties of insulating material used for cables.	12
Q.5	Solv a) b) c)	ve any Two. Calculate capacitance of single core cable. Explain the methods of power factor improvement. What is grading? Explain capacitance grading.	16

book. 2) Figures to the right indicate full marks. 3) Make suitable assumptions if necessary. **MCQ/Objective Type Questions Duration: 30 Minutes** Marks: 14 Choose the correct alternatives from the options and rewrite the sentence. 14 Q.1 By using guard ring string efficiency 1) Increased a) b) Decreased Same d) None of the above c) 2) In capacitance grading of cables we use a ____ Homogeneous dielectric b) composite dielectric a) d) None of the above C) Both a & b In any transmission line AD-BC= 3) a) 1 b) 0 c) d) None of above infinity 4) If the sag in overhead line increases, tension in line _____. Increases b) Decreases a) Does not change C) d) Equal The spacing between conductor is increased, the corona effect is _____. 5) Increases b) Decreases a) c) Same d) None of the above

Electrical & Electronics Engineering ELEMENTS OF POWER SYSTEM Day & Date: Friday, 13-12-2019 Time: 02:30 PM To 05:30 PM

T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer

Less costly than the equivalent overhead line system b) C)

- 9) The generalized constants A & D of the transmission line have _____.
 - no dimension a) dimension of simen c)
- b) dimension of oham d) none of the above

b) 33kv

d) 66kv

- 6) The most economical power factor for a consumer is generally _____.
 - a) 0.95 lagging b) Unity d) 0.85 lagging c) 0.6 lagging
- 7) A belted type cable are generally used up to _____
- 11kv c)
- 8) The underground system is
 - More costly than the equivalent overhead line system a)
 - Same

22kv

a)

Seat

No.

None of these d)



SLR-FM-763 Set

Set S

- 10) Under operating condition the maximum stress in cable is at
 - Inner side of conductor a) Both a & b
- b) Conductor surface
- 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
 - Bedding a)

C)

C)

- b) Moisture
- Armoring d) None of these
- 13) The line constant of transmission line are
 - Lumped a)
- b) Uniformly distributed
- Both (a) and (b) d) None of these c)
- 14) The string efficiency of a suspension type insulator is dependent on
 - Size of conductor a)
 - b) Number of insulator discs in string
 - Size of the tower C)
 - None of these d)

		SLR-FM-	763
Seat No.	t	Set	S
		T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 Electrical & Electronics Engineering ELEMENTS OF POWER SYSTEM	
Day & Time	& Dat : 02:3	te: Friday, 13-12-2019 Max. Mark 30 PM To 05:30 PM	s: 56
Instr	uctic	2) All questions are compulsory.2) Figure to the right indicates full marks.	
		Section – I	
Q.2	Solv a) b) c) d) e)	ve any Three. Write a note on sag and tension. What is the main component of overhead lines? Explain their functions. Explain constants of transmission line. What are advantages and disadvantages of corona? Explain wooden pole with neat diagram.	12
Q.3	Solv a) b) c)	ve any Two. What is string efficiency? Explain methods of improving string efficiency. Calculate sag in overhead transmission line. Explain any two types of insulators with neat diagram.	16
		Section – II	
Q.4	Solv a) b) c) d) e)	ve any Three. Explain general construction of cable with neat diagram. Explain types of transmission line. Write short note generalized constant of transmission line. Explain end condenser method of medium transmission line. Explain proprieties of insulating material used for cables.	12
Q.5	Solv a) b) c)	ve any Two. Calculate capacitance of single core cable. Explain the methods of power factor improvement. What is grading? Explain capacitance grading.	16

T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019 **Electrical & Electronics Engineering**

Day & Date: Monday, 16-12-2019 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.

CONTROL SYSTEM – I

- 2) Figures to the right indicates full marks.
- 3) Assume suitable data wherever necessary.

MCQ/Objective Type Questions **Duration: 30 Minutes**

Q.1 Choose the correct alternatives from the options.

- In open loop system 1)
 - the control action depends on the size of the system a)
 - the control action depends on system variables b)
 - the control action depends on the input signal c)
 - the control action is independent of the output d)
- 2) Transfer function of a system is used to calculate which of the following?
 - The order of the system b) The time constant a)
 - The output for any given input d) The steady state gain c)
- The system response of a system can be best tested with _____. 3)
 - unit impulse input signal a)
 - b) ramp input signal
 - sinusoidal input signal c)
 - exponentially decaying input signal d)

Root locus diagram can be used to determine ____ 4)

- absolute stability b) relative stability a)
- conditional stability c) d) none of these

For a stable system 5)

a) c)

- All the close loop poles must be in the LHP a)
- Any one close loop pole must be in the LHP b)
- More than 50% close loop poles must be in the LHP c)
- None of the close loop poles must be in the LHP d)
- 6) If the system has multiple poles on the j ω axis, the system is .
 - Stable b) Unstable a)
 - Marginally Stable d) Conditionally stable C)
- When damping factor decreases the per unit overshoot . 7)
 - Increases b) remains unaffected
 - decreases d) none of the above

SLR-FM-764



Max. Marks: 70

Marks: 14

14

Seat No.

Derivative control 8)

- 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
 - greater than 1 a) b) between 0 and 1
 - c) exactly equal to 1 d) exactly equal to 0
- While designing controller, the advantage of pole-zero cancellation is 10)
 - The system order is increased a)
 - b) The system order is reduced
 - c) The cost of controller becomes low
 - d) System's error reduced to optimum levels
- For an electrically heated temperature controlled liquid heater, the best 11) controller is
 - a) Single-position controller
- b) Two- position controller

SLR-FM-764

Set

- c) Floating controller d) Proportional-position controller
- The open-loop transfer function of a unity feedback system is 12) 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 remains same d) None C)
- The phase shift of $G(S) = 1/S^2$ is _ 14)
 - a) 90° 180[°] c) d) -180°

b) -90°

Seat	
No.	

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

Day & Date: Monday, 16-12-2019 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

- 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

- 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.

- 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

Max. Marks: 56

Set

12

16



12

Solve any two. Q.5

- Sketch the Asymptotic Bode plot for the system whose transfer function is a) given below and determine,
 - 1) gain margin.
 - 2) phase margin

2000

 $G(s)H(s) = \frac{1}{s(1+s)(100+s)}$

Compute the STM when, b)

$$A = \begin{bmatrix} 0 & 1 \\ -6 & -5 \end{bmatrix}$$

Explain the Programmable Logic Controller. C)
T.E. (Part – I) (Old) (CGPA) Examination Nov/Dec-2019

CONTROL SYSTEM – I Day & Date: Monday, 16-12-2019 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

Electrical & Electronics Engineering

Duration: 30 Minutes

Seat

No.

Q.1 Choose the correct alternatives from the options.

- 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
- c) Floating controller d) Proportional-position controller

b)

Two-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° d) -180°

Set

Max. Marks: 70

Marks: 14

14

SLR-FM-764

Set Q

SLR-FM-764

- 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 j ω axis, the system is _____.
 - a) Stable
- b) Unstabled) Conditionally stable
- c) Marginally Stabled) Conditionally stableWhen damping factor decreases the per unit overshoot ______.
- a) Increases

14)

- b) decreases
- c) remains unaffected
- d) none of the above

Seat	
No.	

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

Day & Date: Monday, 16-12-2019 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

- 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

- 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.

- 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

Max. Marks: 56

Set

Q

12

16



Solve any two. Q.5

- Sketch the Asymptotic Bode plot for the system whose transfer function is a) given below and determine,
 - 1) gain margin.
 - 2) phase margin

2000

 $G(s)H(s) = \frac{1}{s(1+s)(100+s)}$

Compute the STM when, b)

$$A = \begin{bmatrix} 0 & 1\\ -6 & -5 \end{bmatrix}$$

Explain the Programmable Logic Controller. C)

		Т.	E. (Part – I) (Old) (CGPA) E Electrical & Electro CONTROL S	xan nics YST	nination Nov/Dec-2019 s Engineering EM – I
Day & Time	& Da : 02::	te: M 30 Pl	londay, 16-12-2019 M To 05:30 PM		Max. Marks: 70
Instr	uctio	ons:	 Q. No. 1 is compulsory and she answer book. Figures to the right indicates full 3) Assume suitable data wherever 	ould Ill m er ne	be solved in first 30 minutes in arks. cessary.
			MCQ/Objective T	уре	Questions
Durat	tion:	30 M	linutes		Marks: 14
Q.1	Cho 1)	bose For a) b) c) d)	the correct alternatives from the a stable system All the close loop poles must be Any one close loop pole must be More than 50% close loop poles None of the close loop poles mu	in the interval of the interv	ptions. 14 ne LHP he LHP st be in the LHP e in the LHP
	2)	lf the a) c)	e system has multiple poles on th Stable Marginally Stable	e jω b) d)	axis, the system is Unstable Conditionally stable
	3)	Whe a) c)	en damping factor decreases the Increases remains unaffected	per u b) d)	unit overshoot decreases none of the above
	4)	Deri a) b) c) d)	vative control has the same effect as output ra reduces damping is predictive in nature increases the order of the syster	te co n	ontrol
	5)	The (1 +	transfer function of a compensati $-\alpha Ts$)/(1 + Ts). If this is a phase-	ng r Lag	network is of form network, the value of α should be
		a) c)	greater than 1 exactly equal to 1	b) d)	between 0 and 1 exactly equal to 0
	6)	Whil	le designing controller, the advan	tage	of pole-zero cancellation is
		a) b) c) d)	The system order is increased The system order is reduced The cost of controller becomes I System's error reduced to optim	ow um l	evels
	7)	For a cont a) c)	an electrically heated temperature roller is Single-position controller Floating controller	e co b) d)	ntrolled liquid heater, the best Two- position controller Proportional-position controller

Seat

No.

- Floating controller d) Proportional-position controller

SLR-FM-764

Set | R

					Set	R
8)	The G(S a) c)	e open-loop transfer function of a S) = $(1+S)/S(1+0.5S)$. The corner 0 and 2 0 and -1	unity freq b) d)	r feedback system is uencies are 0 and 1 1 and 2		
9)	By	order system the rise time				
	a) c)	Increases remains same	b) d)	Decreases None		
10)	The a) c)	e phase shift of G(S) = 1/S ² is 90° 180°	b) d)	 -90° -180°		
11)	In c a) b) c) d)	ppen loop system the control action depends on the the control action depends on sy the control action depends on the the control action is independent	e siz sten e inp of t	e of the system n variables out signal ne output		
12)	Tra a) c)	nsfer function of a system is used The order of the system The output for any given input	l to c b) d)	alculate which of the following The time constant The steady state gain	?	
13)	The a) b) c)	e system response of a system ca unit impulse input signal ramp input signal sinusoidal input signal	n be	best tested with		

- d) exponentially decaying input signal
- Root locus diagram can be used to determine _____.a) absolute stabilityb) relative stabilityc) conditional stabilityd) none of these 14)
- b) relative stability
- d) none of these

SLR-FM-764 Set

Seat No.

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

Day & Date: Monday, 16-12-2019 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

Solve any four Q.2

- Differentiate between open loop and closed loop control systems. a)
- Explain Hurwitz criterion for stability. b)
- Derive the static error Coefficients and steady state error for unit ramp c) input.
- Give the transfer function of series RLC circuit. d)
- Explain the concept of stability. e)

Q.3 Solve any two

- Explain Step response of second order system. a)
- A second order system is given by $C(s)/R(s) = \frac{8}{s^2+4s+8}$. Find all time b) domain specifications for unit step response.
- Find C(s)/R(s) for signal flow graph shown in figure below. C)





Q.4 Solve any four.

- Explain the frequency domain specifications. a)
- Explain PID controller. b)
- Explain lead- lag compensator. c)
- Check the controllability of system below d)

$$\begin{bmatrix} x_1 \\ x_2 \end{bmatrix} = \begin{bmatrix} -1 & 0 \\ 0 & -2 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \end{bmatrix} + \begin{bmatrix} 0 \\ 1 \end{bmatrix} u(t)$$

 $Y(t) = \begin{bmatrix} 1 & 2 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \end{bmatrix}; D = 0$

- Explain the effect of addition of poles and zeros on Bode plot. e)
- Draw the polar plot of G(S) = 1/S**f**)

Max. Marks: 56

R

12

16



12

Q.5 Solve any two.

- Sketch the Asymptotic Bode plot for the system whose transfer function is a) given below and determine,
 - 1) gain margin.
 - 2) phase margin

2000

 $G(s)H(s) = \frac{1}{s(1+s)(100+s)}$

Compute the STM when, b)

$$A = \begin{bmatrix} 0 & 1 \\ -6 & -5 \end{bmatrix}$$

Explain the Programmable Logic Controller. C)

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

Day & Date: Monday, 16-12-2019 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

Seat

No.

Q.1 Choose the correct alternatives from the options.

- 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 controllerd) Proportional-position controller
- c) Floating controller d) I
- 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) Decreasesd) None
- 5) The phase shift of $G(S) = 1/S^2$ is _____. a) 90° b) -90° c) 180° d) -180°
- 6) In open loop system _____

c) remains same

- 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
- 7) 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



Max. Marks: 70

Marks: 14

Set 8) The system response of a system can be best tested with . unit impulse input signal a) ramp input signal b) sinusoidal input signal c) d) exponentially decaying input signal 9) Root locus diagram can be used to determine b) relative stability absolute stability a) conditional stability d) none of these c) 10) For a stable system ____ All the close loop poles must be in the LHP a) Any one close loop pole must be in the LHP b) More than 50% close loop poles must be in the LHP c) None of the close loop poles must be in the LHP d) If the system has multiple poles on the j ω axis, the system is _____. 11) Stable b) Unstable a) Marginally Stable d) Conditionally stable c) 12) When damping factor decreases the per unit overshoot _____. Increases b) decreases a) remains unaffected d) none of the above c) 13) 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

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

SLR-FM-764

Seat No.

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

Day & Date: Monday, 16-12-2019 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

Solve any four Q.2

- Differentiate between open loop and closed loop control systems. a)
- Explain Hurwitz criterion for stability. b)
- Derive the static error Coefficients and steady state error for unit ramp c) input.
- Give the transfer function of series RLC circuit. d)
- Explain the concept of stability. e)

Q.3 Solve any two

- Explain Step response of second order system. a)
- A second order system is given by $C(s)/R(s) = \frac{8}{s^2+4s+8}$. Find all time b) domain specifications for unit step response.
- Find C(s)/R(s) for signal flow graph shown in figure below. C)



G5



Q.4 Solve any four.

- Explain the frequency domain specifications. a)
- Explain PID controller. b)
- Explain lead- lag compensator. c)
- Check the controllability of system below d)

$$\begin{bmatrix} x_1 \\ x_2 \end{bmatrix} = \begin{bmatrix} -1 & 0 \\ 0 & -2 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \end{bmatrix} + \begin{bmatrix} 0 \\ 1 \end{bmatrix} u(t)$$

 $Y(t) = \begin{bmatrix} 1 & 2 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \end{bmatrix}; D = 0$

- Explain the effect of addition of poles and zeros on Bode plot. e)
- Draw the polar plot of G(S) = 1/S**f**)

Max. Marks: 56

12

16





12

Q.5 Solve any two.

- Sketch the Asymptotic Bode plot for the system whose transfer function is a) given below and determine,
 - 1) gain margin.
 - 2) phase margin

2000

 $G(s)H(s) = \frac{1}{s(1+s)(100+s)}$

Compute the STM when, b)

$$A = \begin{bmatrix} 0 & 1\\ -6 & -5 \end{bmatrix}$$

Explain the Programmable Logic Controller. C)