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Reg. No: ☐☐☐☐☐☐☐☐☐☐

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech I Year II Semester Supplementary Examinations May-2022
ELECTRICAL TECHNOLOGY
(Electronics and Communication Engineering)

Time: 3 hours
Max. Marks: 60

(Answer all Five Units 5 x 12 = 60 Marks)

UNIT-I

1	Explain the basic principle of operation of a DC Generator with a simple loop generator?	L2	12M

OR

2	a	What are the various characteristics of compound generators?	L2	6M
	b	The armature of a 4 pole, lap-wound DC shunt generator has 120 slots with 4 conductors per slot.The flux per pole is 0.05 wb. The generator runs at speed 1500 rpm. Find the generated voltage?	L4	6M

UNIT-II

3	a	Derive the expression for electromagnetic torque.	L1	6M
	b	A 250V, 4 pole D.C shunt motor has two circuit armature winding with 500 conductors. The armature circuit resistance is 0.25 ohms, field resistance is 125 ohm and the flux per pole is 0.02Wb.Find the speed and torque developed if the motor draws 14A from the mains?	L3	6M

OR

4	Explain swinburne's test for finding the efficiency of D.C machine.	L1	12M

UNIT-III

5	a	Derive an EMF equation of a single-phase transformer.	L3	6M
	b	A single-phase transformer has 400 turns on primary winding 1000 turns on secondary winding. If it is operating at 50Hz supply with a maximum flux of 0.045Wb.Find (i) Primary &Secondary induced EMF (ii) EMF induced per turn.	L4	6M

OR

6	A 5KVA, 500/250V, 50Hz, single –phase transformer gave the following results:	L4	12M

From O.C Test: 500V, 1A, 50W (H.V Side is opened)
From S.C Test: 25V, 10A, 60W (L.V Side is shorted)
Determine:
(i)The Efficiency on Full-load, 0.8 lagging P.F.
(ii)The Voltage Regulation on Full-load 0.8 lagging P.F.
(iii) The Efficiency on 60% of Full-load, 0.8 lagging P.F.
(iv) The Voltage Regulation on Full-load,0.6 leading P.F.

UNIT-IV

7	a	Draw the torque-slip characteristics of a 3-phase induction motor.	L3	6M
	b	A 12 pole 3 φ alternator driver at speed of 500 r.p.m. supplies power to an 8 pole 3 φ induction motor. If the slip of motor is 0.03p.u, calculate the speed.	L4	6M

OR

8	a	Derive the relation between rotor starting torque and maximum torque.	L3	6M
	b	A three phase induction motor is running at 1740 r.p.m. On a 60Hz supply. Calculate number of poles, the slip and the rotor frequency.	L4	6M

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UNIT-V

9	Discuss the construction features of salient and round rotor machine.	L3	12M

OR

10	A 3-phase, 50 Hz, star connected 2000 KVA, 2300V alternator has an effective resistance of 0.12Ω and gives a short circuit current of 600A for a certain field excitation. With the same excitation, the open circuit voltage was 900V. Calculate: i) The synchronous impedance and reactance ii) The full load regulation when the power factor is 0.8 lagging iii) The full load regulation when the power factor is 0.6 leading.	L4	12M

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