

Reg. No:

--	--	--	--	--	--	--	--	--	--

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)

B.Tech I Year II Semester Regular Examinations November-2021

ELECTRICAL TECHNOLOGY

(Electronics and Communication Engineering)

Time: 3 hours

Max. Marks: 60

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

UNIT-I

- 1 a Derive expression for generated EMF of a D.C generator. **L3 6M**
b A 4-pole, long shunt, lap wound generator supplies 25kw at a terminal voltage of 500 V. The armature resistance is 0:03, series field resistance is 0:04 and shunt field resistance is 200. The brush drop may be taken as 1 V. Determine the EMF generated. **L2 6M**

OR

- 2 a A Short shunt compound generator delivers a load current of 30 A at 220 V and has armature, series-field and shunt-field resistances of 0.05 Ω , 0.03 Ω and 200 Ω respectively. Calculate the induced EMF and the armature current. Allow 1.0 V per brush for contact drop. **L4 6M**
b Explain how voltage builds up in D.C shunt generator. **L4 6M**

UNIT-II

- 3 a Explain the working principle of D.C motor. **L2 6M**
b A 4 pole, 500 V DC shunt motor has 720 wave connected conductor on its armature. The full load armature current is 60 A & the flux per pole is 0.03 web, the armature resistance including brush contact is 0.2 Ω . Calculate the full load speed of the motor. **L2 6M**

OR

- 4 a Explain various methods of speed control of D.C shunt motor. **L2 7M**
b A 20HP DC motor has 89.3% efficiency at rated power. What are the total losses? **L2 5M**

UNIT-III

- 5 With relevant phasor diagrams, explain the operation of a practical single phase transformer Operating on lagging and leading power factor condition. **L4 12M**

OR

- 6 a In a 25KVA, 2000/200V, transformer has Iron and copper losses are 350W and 400W respectively. Calculate the efficiency at unity power factor (i) at full load (ii) at half Load. **L3 6M**
b Develop the Equivalent circuit of a single phase transformer referred to secondary. **L4 6M**

UNIT-IV

- 7 Explain the principle of operation of 3-phase induction motor with neat sketch? **L2 12M**

OR

- 8 a Derive relation between rotor full load torque and maximum torque. **L3 6M**
b A 12 pole , 50Hz three phase induction motor has rotor resistance of 0.15ohm and standstill reactance of 0.25ohm. The rotor induced emf per phase at standstill is observed to be 32V. Calculate (i) Starting torque. **L4 6M**

UNIT-V

9 Derive an EMF equation of an alternator.

L4 12M

OR

10 A 200kVA, 415 V, 50 Hz, 3 ϕ alternator has effective armature resistance of 0.01Ω and an armature leakage reactance of 0.05Ω . Compute the voltage induced in the armature winding when the alternator is delivering rated current at a load p.f of (i) 0.8 Lagging (ii) 0.8 leading.

L3 12M

*** END ***