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

B.Tech II Year I Semester Supplementary Examinations November-2020

ELECTRICAL MACHINES –I

(Electrical & Electronics Engineering)

Time: 3 hours

Max. Marks: 60

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

UNIT-I

1 Explain field energy and co-energy in a singly excited magnetic system. **12M**

OR

2 Explain Torque in a singly excited magnetic system. **12M**

UNIT-II

3 Explain the basic principle of operation and commutator action of a DC generator with a simple loop generator. **12M**

OR

4 Enumerate all the parts of a DC machine and indicate their function. **12M**

UNIT-III

5 Draw & Explain the internal and external characteristics of dc shunt and series generators. **12M**

OR

6 A DC Compound Generator has 110V as terminal voltage. The armature resistance, shunt field Resistance and series field resistance are 0.06Ω , 25Ω and 0.04Ω respectively. The load consists of 200A which rated at 55W. Find the total emf generated and armature current when the machine is connected as:
(i) Long Shunt (ii) Short Shunt. **12M**

UNIT-IV

7 A 25HP, 250V DC Series motor has armature resistance 0.1Ω and field resistance 0.05Ω and brush Contact drop 3V. When the line current is 80A, the speed is 600rpm. Find the speed when the line Current is 100A. **12M**

OR

8 **a** Distinguish between generator and motor action. Derive the equation for the back e.m.f of DC motor? **6M**

b Find the torque exerted by a 4-pole series motor whose armature has 1200 conductors Connected up in wave winding. The motor current is 10A and the flux per pole is 0.02Wb. **6M**

UNIT-V

9 A Shunt generator delivers 195A at terminal Voltage of 250V. The armature resistance and shunt Field resistances are 0.02Ω and 50Ω respectively. The iron and friction losses equal 950W. **12M**

Find (i) EMF generated (ii) Copper losses (iii) output of the prime mover (iv) commercial, mechanical and electrical efficiencies.

OR

10 **a** Enumerate the losses in DC machine. **6M**

b Derive the condition for maximum efficiency in dc machine. **6M**

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