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SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)**B. Tech II Year I Semester Supplementary Examinations November-2022**
ELECTRICAL MACHINES-I

(Electrical and Electronics Engineering)

Time: 3 hours

Max. Marks: 60

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

UNIT-I

- 1 a Deduce an expression for E.M.F equation of DC Generator. **L3 6M**
- b A 4 pole generator has a wave wound armature with 722 conductors and it delivers 100A on full load. If the brush leads is 8 degree. Calculate the armature demagnetizing and cross magnetizing ampere turns per pole. **L2 6M**

OR

- 2 a Explain the methods of improving commutation. **L3 6M**
- b A shunt generator delivers 450A at 230V and the resistance of the shunt field and armature are 50ohm and 0.03 ohm respectively. Calculate the generated e.m.f. **L3 6M**

UNIT-II

- 3 a Explain the remedial Measures for the failure of self-excitation of DC generator. **L3 6M**
- b What is the necessity of parallel operation of DC generators. **L1 6M**

OR

- 4 a What are the applications of DC SHUNT generator? **L2 2M**
- b Two 220 V dc generators each have ing linear external characteristic operation in parallel. One machine has a terminal voltage of 270 V on no load and 220 at a load current of 35A while the other has a voltage of 280V at no load and 22V at 50A. Calculate the output current of each machine and the bus bar voltage when the total load is 60A. what is the kW output of each machine under this condition **L4 10M**

UNIT-III

- 5 a Derive the equation for the torque Developed by a D.C. motor. **L3 6M**
- b A 25kW 250 V dc shunt generator has armature and field resistance of 0.06 ohm and 100 ohm respectively. Determine the total armature power developed when working **L3 6M**
- (i) as a generator delivering 25kW output
- (ii) as a motor taking 25kw input.

OR

- 6 **a** Explain Ward- Leonard method of speed control. **L4 6M**
b A 440 v shunt generator has armature resistance of 0.8ohm and field resistance of 200. Determine the back emf when giving an output of 7.46kW at 80% efficiency. **L3 6M**

UNIT-IV

- 7 **a** Explain 4 point starter in detail. **L3 6M**
b A 250V 14.92 kW shunt motor has a maximum efficiency of 88% and a speed of 700 rpm. When delivering 80% of its rated output. The resistance of its shunt field is 100 ohm. Determine the efficiency and speed when the motor draws a current of 78A from the mains. **L4 6M**

OR

- 8 **a** What are the applications of DC SERIES Motor? **L2 2M**
b Explain Hopkinson's test for DC machine and state the merits and demerits. **L3 10M**

UNIT-V

- 9 **a** Explain the working principle of AC series motor with neat sketch. **L4 6M**
b Compare PMBLDC with DC motor. **L2 6M**

OR

- 10 **a** Explain the construction and operation of universal motor. **L4 6M**
b Describe the advantage and disadvantages of permanent magnet stepper motor. **L1 6M**

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