

Reg. No: 

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

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

**B.Tech II Year I Semester Regular Examinations May-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 Explain commutation with relevant sketch. L3 6M  
 b An 8 pole dc shunt generator with 778 wave connected armature conductors and running at 500 rpm supplies a load of 12.5 ohm resistance at terminal voltage of 50v. The armature resistance is 0.24 ohm and the field resistance is 250 ohm. Find the armature current, the induced e.m.f and the flux per pole. L3 6M

OR

- 2 a Explain the term reactance voltage in DC generator. L3 6M  
 b A 400V 1000A lap wound dc machines has 10 poles and 860 armatures conductors. Calculate the number of conductors in the pole face to give full compensation if the pole face covers 70% pole span. L3 6M

**UNIT-II**

- 3 a Explain the external characteristics of DC generator with neat sketch. L3 6M  
 b Explain the procedure for parallel operation of DC generators. L2 6M

OR

- 4 a What is the significance of critical resistance in DC generator? L2 6M  
 b Explain the uses of equalizer bar. L3 6M

**UNIT-III**

- 5 a Explain Ward- Leonard method of speed control. L3 6M  
 b A 250 v dc shunt motor has armature resistance of 0.25 ohm on load it takes an armature current of 50A and runs at 750rpm. If the flux of motor is reduced by 10% without changing the load torque. Find the new speed of the motor. L2 6M

OR

- 6 a Explain the field flux control method for the Speed control of a DC Motor. L2 6M  
 b A 200 V dc shunt motor running at 1000 rpm takes an armature current of 17.5A. it is required to reduce the speed to 600 rpm. What must be the value of resistance to be inserted in the armature circuit if the original armature resistance is 0.4 ohm? Take armature current to be constant during this process. L3 6M

**UNIT-IV**

- 7 a What is the necessity of starter for DC machines? L2 6M  
 b The armature winding of a 4 pole, 250V D shunt motor is lap connected. There are 120 slots. Each slot containing 8 conductors. The flux per pole is 20mWb and current taken by the motor is 25A. The resistance of armature and field circuit is 0.1 and 125ohm respectively. If the rotational losses amount to 810 w. find (i) gross torque (ii) useful torque and (iii) efficiency. L3 6M

OR

- 8 a What are the losses in DC machines? L2 6M
- b In retardation test on a separately excited motor the induced emf in the armature falls from 220V to 190V in 30 seconds on disconnecting the armature from the supply. The same fall takes place in 20 seconds if immediately after disconnection; armature is connected to a resistance which takes 10A during this fall. Find stray losses of the motor. L3 6M

**UNIT-V**

- 9 a Compare VR stepper motor and SR motor. L2 6M
- b Explain the advantage and disadvantages of SRM. L1 6M

OR

- 10 a Explain the construction and operation of universal motor. L3 6M
- b Describe the advantage and disadvantages of permanent magnet stepper motor. L2 6M

\*\*\* END \*\*\*