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

B.Tech II Year I Semester Supplementary Examinations December-2021

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 What is excitation? L1 2M
b Explain field energy and co-energy in a singly excited system in magnetic system. L2 10M

OR

- 2 a Define M.M.F? L4 2M
b Derive the expression for force of a singly excited toroid in a magnetic field system? L4 10M

UNIT-II

- 3 a How demagnetizing and cross magnetizing ampere turns per pole are calculated in a DC Machine? L2 6M
b The brushes of a certain lap connected 400kw, 6-pole generator are given a lead of 18° electrical. From the data given, calculate (i) the demagnetizing ampere-turns (ii) the cross magnetizing ampere-turns (iii) series turns required balancing the demagnetizing component. The full load current is 750A and total number of conductors is 900 and the leakage coefficient is 1.4. L4 6M

OR

- 4 a What is the purpose of inter poles? L1 2M
b Enumerate all the parts of a DC machine and indicate their function. L1 10M

UNIT-III

- 5 a Define critical field resistance? L4 2M
b 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. L2 10M

OR

- 6 a What are the causes for the failure of self-excitation? L2 6M
b Explain the parallel operation of two DC series generators with equalizer bar connection. L1 6M

UNIT-IV

- 7 a Define torque? L2 2M
b Explain the armature voltage and field flux control methods for the Speed control of a DC Motor. L1 10M

OR

- 8 a If the applied voltage of a DC motor is 230 V, then back emf, for maximum power developed is? L4 2M
b Explain the operation of four point starter for a DC motor with neat diagram. L2 10M

UNIT-V

- 9 a Which losses are called variable losses? **L1 2M**
b Explain Swinburne's test on DC machines? What are its advantages and disadvantages? **L2 10M**

OR

- 10 a Enumerate the losses in DC machine. **L1 2M**
b Derive the condition for maximum efficiency. **L1 10M**

*** END ***