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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 Deduce an expression for e.m.f equation of DC Generator? L3 6M
 b An 8-pole lap connected armature has 960 conductors, a flux of 40 m Wb per pole and a speed of 400 r.p.m. Calculate the emf generated on open circuit. If the armature were wave connected, at what speed it must be driven to generate 400 V. L3 6M

OR

- 2 What are the various characteristics of compound generators? L1 12M

UNIT-II

- 3 a Distinguish between generator and motor action. Derive the equation for the back e.m.f of DC motor? L3 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. L3 6M

OR

- 4 Why is a starter necessary for a DC motor? Explain the working of a three-point starter with the help of a neat diagram? L1 12M

UNIT-III

- 5 Explain the procedure for obtaining the efficiency by using brake test on DC shunt machine. L2 12M

OR

- 6 Explain in detail about the parallel operation of DC series generators. L2 12M

UNIT-IV

- 7 a Discuss the constructional features of transformers. Draw neat diagrams. L2 6M
 b A 10KVA, 2200/400V transformer has $R_1=5 \Omega$, $X_1=12 \Omega$, $R_2=0.2 \Omega$ and $X_2=0.48 \Omega$. Determine the equivalent impedance of the transformer referred to (i) primary side (ii) secondary side. L3 6M

OR

- 8 a What is an ideal transformer? Also explain the operation of an ideal single phase transformer under no load condition. L2 6M
 b An ideal 25KVA transformer has 500 turns on the primary winding and 40 turns on the secondary winding. The primary is connected to 3000V, 50HZ supply. Calculate (i) primary and secondary currents at full load (ii) secondary emf and (iii) the maximum core flux. L2 6M

UNIT-V

- 9 a Draw the Connection diagram of open delta connected three-phase transformer. L2 6M
 b Compare a Three -phase transformer with single phase transformer in detail. L2 6M

OR

- 10 a Determine load shared by two transformers are each transformer when connected in parallel With equal voltage ratios. **L2 6M**
- b Draw and explain the Connection diagram of Y- Δ & Δ -Y connected 3-phase transformer. **L2 6M**

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