

Code No: 07A3EC01

**R07****Set No. 2**

**II B.Tech I Semester Examinations, MAY 2011**  
**ELECTRICAL AND ELECTRONICS ENGINEERING**  
 Common to CE, ME, MECT, MEP, AME

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions  
 All Questions carry equal marks

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1. A 11000/230 V, 150 KVA, 1- Phase, 50Hz transformer has core loss of 1.4 kW and full load copper loss of 1.6 kW. Determine:
  - (a) KVA load for maximum efficiency and value of maximum efficiency at unity power factor.
  - (b) The efficiency at half full load 0.8 power factor leading. [16]
2. What do you mean by synchronous reactance of an alternator. Explain the factors responsible for making terminal voltage of an alternator less than induced voltage. [16]
3. A 6-pole, 12 KW, 240 V, DC-machine is wave connected, if the same machine is lap connected, all other things remain same. Calculate its voltage, current and power ratings. [16]
4. (a) Explain the different methods of supporting the moving system in instruments.  
 (b) Explain the advantages and disadvantages of different damping systems. [8+8]
5. (a) A current of 5A is reduced to 2A in 0.05 seconds in a coil of inductance 1.0H. Calculate the mean value of the EMF induced in the coil.  
 (b) List the advantages and disadvantages of Inductances. With proofs. [8+8]
6. (a) How many types of focusing of electron beam possible in CRO? Name them.  
 (b) The distance between the plates of a plane parallel capacitor is 1 cm. An electron starts at rest from the negative plate. If a direct voltage of 1000 volts is applied, how will it take the electron to reach the positive plate? [8+8]
7. (a) Explain the drift and diffusion currents for a semiconductor. State and explain Mass-action law.  
 (b) Compute the conductivity of a silicon semiconductor which is doped with acceptor impurity to a density of  $10^{22}$  atoms/m<sup>3</sup>.  
 Given that  $n = 1.4 \times 10^{16}$  /m<sup>3</sup>,  $\mu_n = 0.145$  m<sup>2</sup>/V-s and  $\mu_p = 0.05$  m<sup>2</sup>/V-s. [8+8]
8. (a) A sinusoidal voltage  $V_i = 200 \sin 314t$  is applied to an SCR whose forward break down voltage is 150 V. Determine the time during which SCR remains OFF.  
 (b) What is the advantages of TRANSISTOR over SCR? [8+8]

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8. (a) How many types of focusing of electron beam possible in CRO? Name them.  
 (b) The distance between the plates of a plane parallel capacitor is 1 cm. An electron starts at rest from the negative plate. If a direct voltage of 1000 volts is applied, how long will it take the electron to reach the positive plate? [8+8]

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