Code.No: 07A40203 | R07 | SET-2

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
II B.TECH II SEM–REGULAR/SUPPLEMENTARY EXAMINATIONS MAY - 2010
ELECTRICAL AND ELECTRONICS ENGINEERING
(AERONAUTICAL ENGINEERING)

Time: 3hours **Max.Marks:80**

Answer any FIVE questions
All questions carry equal marks

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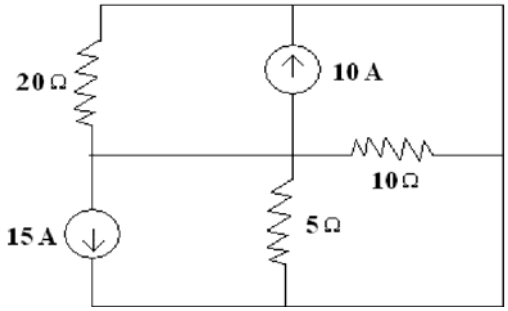
1.a) State the voltage current relationships for:
i) Resistance
ii) Inductance and
iii) Capacitance.
b) Determine the voltage drop across the 10 ohms resistance for the following figure. [8+8]



2.a) Give the constructional details of a DC machine.
b) An 8-pole DC generator running at 1200 rpm, and with a flux of 25m Wb per pole generates 440V. Calculate the number of conductor, if the armature:
i) Lap-wound
ii) Wave wound. [8+8]

3.a) Explain the constructional details of single phase core type transformer.
b) Why is transformer core laminated?
c) Why does voltage drop in power transformer? [8+4+4]

4. A 3-phase, 4-pole, 50-Hz, star-connected alternator has 60 slots with 2 conductors per slot and having armature winding of the double layer type. Coils are short-pitched, that is if one coil side lies in slot number 1, the other coil side lies in slot number 13. Find the useful flux per pole required to induce a line voltage of 6.6kV. [16]

5. A dynamometer type of wattmeter with its voltage coil connected across the load side of the instrument reads 250W. If the load voltage is 220V, estimate the power taken by the load. Assume the resistance of the voltage coil as 2000 ohms. [16]

6.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^3. Given that n = 1.4×10^{16} /m^3, μ_n = 0.145 m^2/V-s and μ_p = 0.05 m^2/V-s. [8+8]

7.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 are the advantages of TRANSISTOR over SCR? [8+8]

8.a) Define magnetic deflection sensitivity.

b) In a CRT, the distance of the screen from the centre of the magnetic field is 22 cm, the deflecting magnetic field of flux density 2×10^4 Wb/m^2 extends for a length of 2.5 cm along the tube axis. The final anode voltage is 1250 V. Calculate the deflection of the spot in cm. [4+12]

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