Code No: 53025 **R09**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B.Tech II Year I Semester Examinations, November - 2015
BASIC ELECTRICAL ENGINEERING
(Common to CSE, IT)

Time: 3 hours **Max. Marks: 75**

Answer any five questions
All questions carry equal marks

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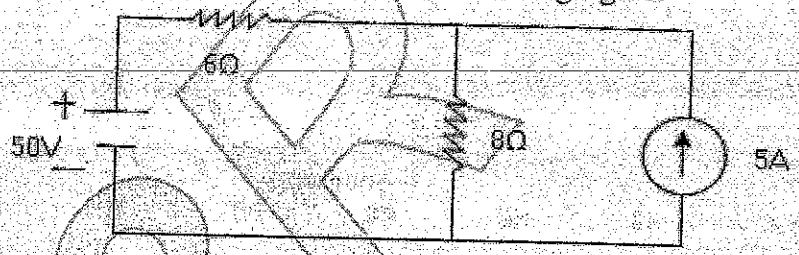
1.a) State and Explain Kirchhoff's Laws.
b) A copper wire of diameter 1cm had a resistance of 0.15 ohm. It was drawn under pressure so that its diameter was reduced to 50%. What is the new resistance of the wire? [7+8]

2.a) Explain with diagrams about different voltage sources and current sources ideal and as well as practical.
b) Determine the current through the voltage source of 50V and voltage across the current source in the network as shown in following figure.



c) State and explain max.power transfer theorem. [5+5+5]

3. A resistance of 20 ohms, an inductive reactance of 5 ohms, and a capacitive reactance of 10 ohms are connected in parallel with each other across a supply of $200 \angle 45^0$ Volts. Calculate:
a) Impedance and admittance of each branch
b) Current in each branch
c) Total current drawn from the supply
d) Draw the phasor diagram. [15]

4.a) Draw and explain the phasor diagram for a single phase transformer when loaded with lagging p.f.
b) The core of a 100 kVA, 11000/550V, 50 Hz, single phase core type transformer has a cross section of 20cm × 20 cm.
Find:
i) The number of H.V. and L.V turns per phase and
ii) The e.m.f. per turn, if the maximum core density is 1.3 tesla. [7+8]

5.a) Name the main parts of a DC machine and state the materials of which part is made and explain clearly.

b) A 4-pole d.c generator having wave wound armature winding has 48 slots, each slot contains 20 conductors. What will be the voltage generated in the machine when drive at 1500 rpm. Assume the flux per pole is 7.0 mwb. [7+8]

6.a) What are the different types of d.c. motor according to the ways in which fields are excited? Show the connection diagram of each type.

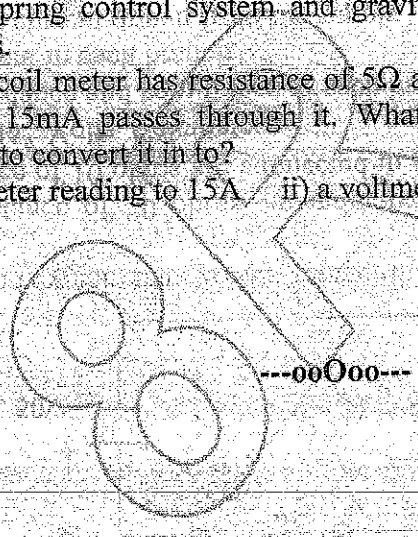
b) A 220V, DC shunt motor on no-load runs at 1000 r.p.m and takes 5 A. The total armature and shunt field resistance are 0.1 Ω and 200 Ω respectively. Calculate the speed when loaded and taking current of 50A if armature reaction weakens the field by 3%. [7+8]

7.a) Explain how the rotating magnetic field is developed in a 3- Φ induction Motor?

b) A 3-phase induction motor has two poles and is connected to 400V, 50 Hz supply. Calculate the actual rotor speed and rotor frequency when slip is 4%. [9+6]

8.a) Compare spring control system and gravity control system used in indicating instruments.

b) A moving coil meter has resistance of 5Ω and given full scale deflection when a current of 15mA passes through it. What modification must be made to the instrument to convert it in to?
i) An ammeter reading to 15A ii) a voltmeter reading to15V. [7+8]



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