

Code: EE1T3

I B.Tech-I Semester-Regular Examinations-February 2013

**BASIC ELECTRICAL ENGINEERING
(For Electrical and Electronics Engineering)**

Duration: 3hours

Marks: 5x14=70

Answer any FIVE questions. All questions carry equal marks

- 1a) What is meant by temperature coefficient of resistance? Explain the graphical method of determining temperature coefficient of resistance. [7M]
- 1b) 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 will be the new resistance and conductance of the wire? [7M]
- 2a) Obtain the generalized expression for the equivalent resistance of number of resistors when connected in (i) series and (ii) parallel. [7M]
- 2b) A battery having an e.m.f. of 10V and internal resistance of 0.01 Ohm is connected in parallel with a second battery of e.m.f. of 10V and internal resistance of 0.008 Ohm. The two batteries in parallel are properly connected in for charging from a dc supply of 20V through a 0.9Ohm resistor. Calculate the current taken by each battery and the current from supply. [7M]
- 3a) Explain the heating effects of electric current. [7M]

- 3b) An electric motor driven pump lifts 10m^3 of water per minute to a height of 20m. The efficiencies of the pump and motor are 80% and 90% respectively. Calculate the current taken by the motor at 400V. Mass of 1m^3 of water is 1000kg. [7M]
- 4a) State and explain Coulomb's law of electrostatics. [7M]
- 4b) Three point charges of $+0.33 \times 10^{-8}\text{C}$, $+0.33 \times 10^{-8}\text{C}$ and $-0.16 \times 10^{-8}\text{C}$ are placed at the corners of a square of 5cm side. Calculate the electric intensity at the fourth corner. [7M]
- 5a) Explain the charging and discharging phenomenon of a capacitor. [7M]
- 5b) A capacitor of $1\mu\text{F}$ and resistance of $8\text{k}\Omega$ are connected in series with an e.m.f. of 100V. Calculate the magnitude of the energy and the time in which energy stored in the capacitor will reach half of its equilibrium value. [7M]
- 6a) What is magnetic hysteresis? Explain the importance of hysteresis loop. [7M]
- 6b) Explain the concepts of absolute and relative permeability. [7M]
- 7a) State and explain the Faraday's laws of electromagnetic induction. [7M]

7b) Derive an expression for the energy stored in a magnetic field. [7M]

8a) What is a chemical cell? Explain the types of cells. [7M]

8b) Explain the Changes during recharging of a chemical cell. [7M]