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BIEE-001

01541

B.Tech. ELECTRONICS ENGINEERING - III (BTCVI/BTECVI/BTELVI)

Term-End Examination

December, 2013

BIEE-001 : BASICS OF ELECTRICAL ENGINEERING

Time : 3 hours *Maximum Marks : 70*

Note : *Attempt **any five** questions.*
Assume missing data if any.

1. (a) Using nodal analysis find power dissipated in the 6Ω resistor. 7

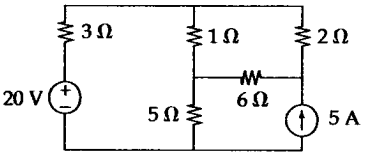


Fig. 1

(b) Determine Thevenin's equivalent circuit across AB. 7

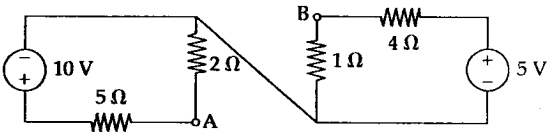


Fig. 2

2. (a) Describe the construction of Lead-acid battery. Write down the chemical equation during the charge and discharge of Lead acid battery. 7

(b) State the indications of a fully charged Lead acid battery. 7

3. (a) Two long parallel conductors are laid at a centre to centre distance of 1.5m in air. Calculate and state the nature of force between them when they are carrying a current of 1000A each in opposite direction. Length of each conductor is 120m. 7

(b) Obtain an expression for energy stored in a magnetic field. 7

4. (a) Derive an expression for current at any time after switching a voltage V across R-C circuit. 7

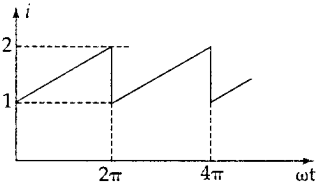
(b) Define and explain : 7

(i) Co-efficient of coupling

(ii) Co-efficient of mutual inductance

(iii) Dynamically induced e.m.f.

5. (a) Calculate rms and average value of current *i* represented by : 7



(b) A 0.8 Pf (Lagging) load draws 100A from 250V, 1ϕ ac supply. Find : 7

(i) The value of true power and apparent power

(ii) Value of circuit components

6. (a) Explain resonance in series RLC circuit and derive relation between Band width, resonance frequency and Q - factor. 7

(b) A 15mH inductor is in series with a parallel combination of an 80Ω resistor and 20 μF capacitor. If the angular frequency of applied voltage is $\omega = 1000$ rad/sec then find the admittance of the network. 7

7. (a) Derive relation between : 7

(i) Line voltage and phase voltage

(ii) Line current and phase current for 3 ϕ delta system

(b) A balanced star connected load of 4+ j3 Ω per phase is connected to a balanced 3 ϕ, 400V supply. The phase current is 12A. Find Total active power, reactive power and apparent power. 7

8. Write short notes on **any two** of the following : **7x2=14**

(a) Power factor improvement.

(b) Superposition Theorem

(c) Charging of battery

(d) Hysteresis and Hysteresis Loop.