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BIEE-001

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

Term-End Examination

June, 2013

BIEE-001 : BASICS OF ELECTRICAL ENGINEERING

Time : 3 hours *Maximum Marks : 70*

Note : *Attempt **any five** questions. All questions* carry *equal marks.*

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1. (a) Obtain Thevenin's equivalent circuit across AB as shown in fig-1 7

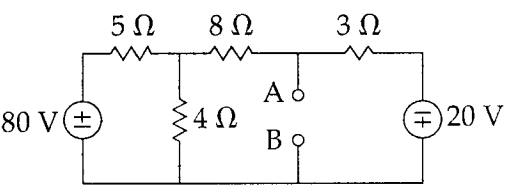

Fig. 1

(b) Deduce the relationship for converting a 3 - terminal star connected network into an equivalent delta network. 7

2. (a) Give the construction and working of Nickel Cadmium cells. What are its merits, demerits and applications. 7

(b) Briefly explain various methods of charging batteries. 7

3. (a) Derive an expression for magnetic field along the axis of a long solenoid carrying direct current. 7

(b) An iron ring of mean length 50 cm has an airgap of 1mm and a winding of 200 turns. If the relative permeability of iron is 300, find the flux density when a current of 1A flows through coil. 7

4. (a) Two coils of self inductances L_1 and L_2 are placed side by side so that mutual inductance between them is M. If they are connected in series addition then derive the expression for net inductance of coil. 7

(b) Two coils of self inductances 150 mH and 250 mH are connected in parallel. Determine the equivalent inductance of the combination if mutual flux opposes the individual flux. The mutual inductance between the coils is 120 mH. 7

5. (a) The equation of an alternating current $i = 42.42 \sin 628t$. Determine : 7

(i) its maximum value

(ii) frequency

(iii) rms value

(iv) form factor

(b) Two coils A and B are connected in series across 9240 V, 50 Hz supply, the resistance of A is 5 Ω and inductance of B is 0.015 H. If the input from the supply is 3 kW and 2 kVAR, then calculate inductance of A and inductance of B. Calculate the voltage across each coil. 7

6. (a) A coil of impedance $R+jX_L$ is connected in parallel with a capacitor C across single phase ac supply. Derive an expression for the resonant frequency of the parallel circuit. 7

(b) Define power factor. What are the disadvantage of low power factor ? Explain the method of improving power factor. 7

7. (a) Derive relationship between Line voltage and Phase voltage, Line current and Phase current for 3 Phase Star connected system. 7

(b) Explain why a leakage percentage of electrical energy used for commercial purposes is generated as ac. 7

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

(a) Advantage of 3 - phase system over single phase system.

(b) Static and dynamically induced emf.

(c) Maintenance of Lead - acid battery.
