



F.E. (Semester – I) Examination, 2011  
BASIC ELECTRICAL ENGG.  
(2008 Pattern)

Time : 3 Hours

Max. Marks : 100

- Instructions:** i) Answers to the **two** Sections should be written in **separate** answer-books.
- ii) Answer question No. 1 or 2, Q. No. 3 or 4, Q. No. 5 or 6, from Section I and Question No. 7 or 8, Q. No. 9 or 10, Q. No. 11 or 12 from Section II.
- iii) Figures to the **right** indicate **full** marks.
- iv) Use of non-programmable pocket size scientific calculator is **permitted**.
- v) **Neat** diagrams must be drawn **wherever** necessary.
- vi) Assume suitable additional data, if **necessary**.



## SECTION – I

1. a) With neat sketch explain the construction and working of Lead Acid Cell. 6
- b) A coil has a resistance of  $40\Omega$  at  $25^\circ\text{C}$ . When its temperature is increased to  $110^\circ\text{C}$  the resistance increases to  $50\Omega$ . Calculate the temperature coefficient of resistance of coil material at i)  $25^\circ\text{C}$  ii)  $110^\circ\text{C}$  and iii)  $0^\circ\text{C}$ . 6
- c) Write down chemical equations during charging of Lead Acid Cell. 4

OR

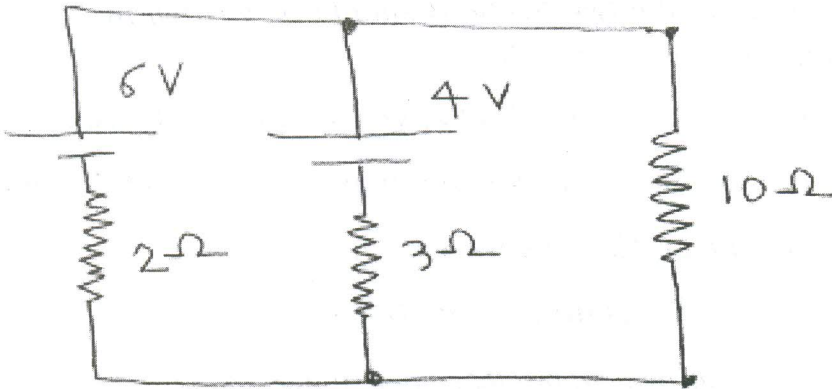
2. a) With usual notations prove that  $(\alpha_1 - \alpha_2) = \alpha_1 \alpha_2 (t_2 - t_1)$ . 6
- b) What is insulation resistance ? Derive the expression for insulation resistance of a Cable. 6
- c) An average water head of 200 m is available for a hydroelectric power station operating at an overall efficiency of 80%. Calculate the volume of water required to generate one unit of electricity. 4

P.T.O.

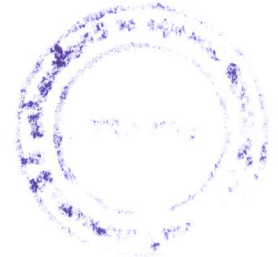


3. a) State and explain Kirchhoff's laws. 4

b) Apply superposition theorem to calculate current flowing in  $10\ \Omega$  resistance for the circuit shown in fig 1. 6



Q 3 (b) Fig 1

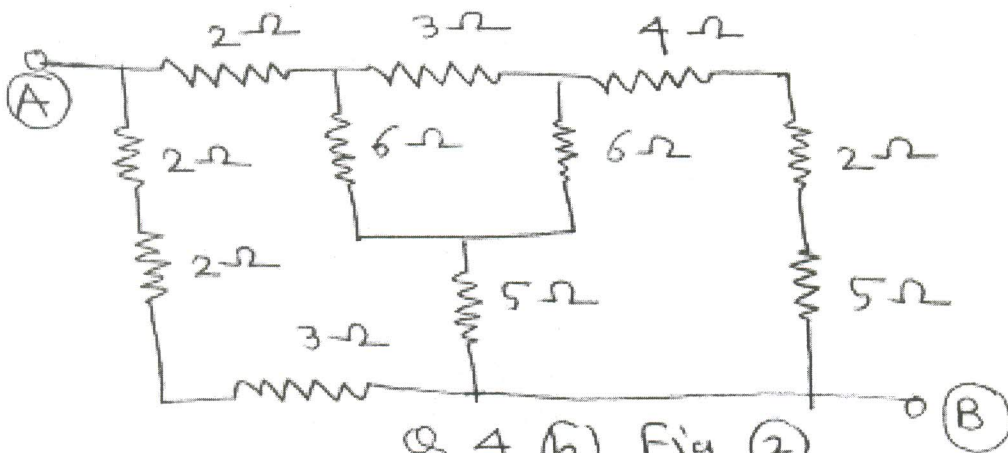


c) State and explain maximum power transfer theorem. 6

OR

4. a) State and explain Thevenin's theorem. 6

b) Calculate the effective resistance between terminals (A) & (B) for the circuit shown in fig 2. 10



Q 4 (b) Fig 2

