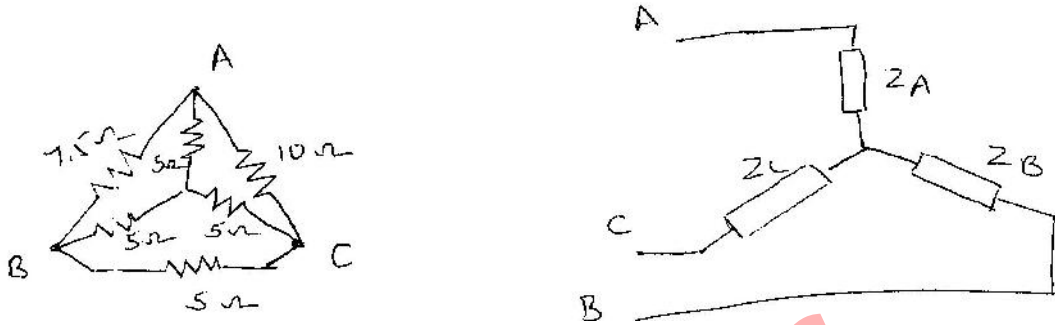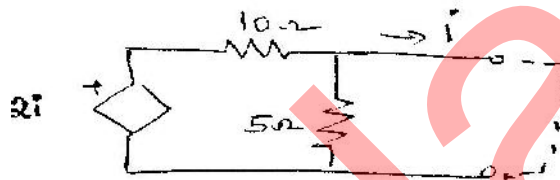9. Obtain the value of star connected equivalent impedance Z_A of the circuit given. 3
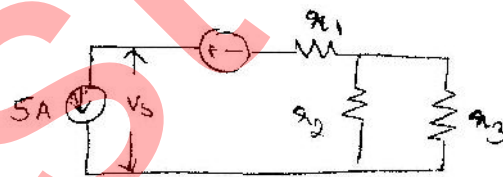

10. The Thevenin's resistance of the circuit shown is 3

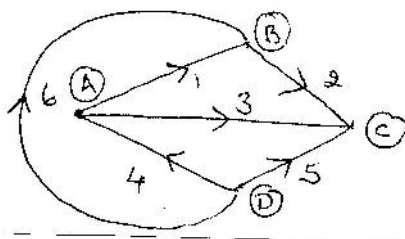

PART – B (50 Marks)

11. a) Explain in detail different classifications of circuit elements. 4

   b) Find V_S if $r_1 = 2\Omega$, $r_2 = 1\Omega$ and $r_3 = 5\Omega$ 6
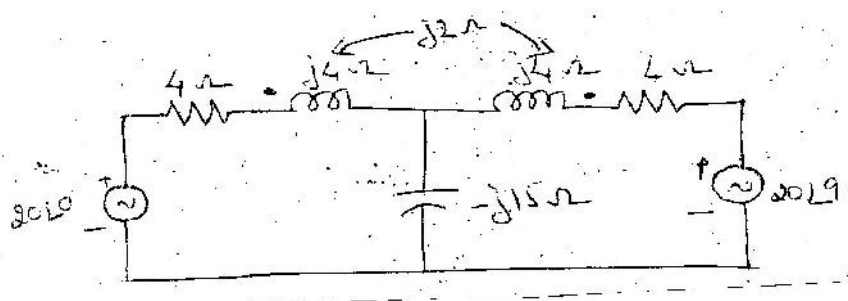

12. a) Explain the concept of Duality in electrical networks. 4

   b) Write the basic cutset matrix and tieset schedule for the graph of a network shown selecting 1, 2, 4 as tree. 6

13. Determine the voltage across the capacitor in the circuit shown below 10

..3

FACULTY OF ENGINEERING

B.E. 2/4 (EEE) I – Semester (Main) Examination, November 2013

Subject : Electrical Circuits – I

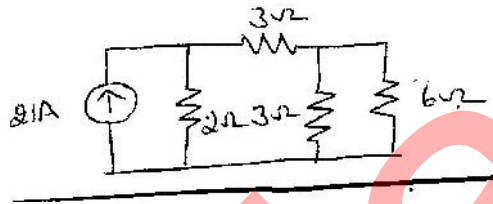**Time : 3 hours**   **Max. Marks : 75**

  Note: Answer all questions from Part-A. Answer any FIVE questions from Part-B.

PART – A (25 Marks)

1. Determine the current through 6Ω resistor and power supplied by the current source.   3


2. Two watt meters are used to measure the power in a 3 phase balanced circuit. What is the power factor of the load when both meters read equal?   2

3. Differentiate between dependent and independent sources.   2

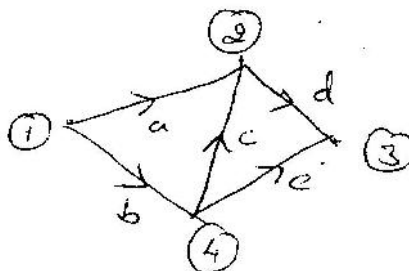4. Find the total inductance of three series connected coupled coils.   3
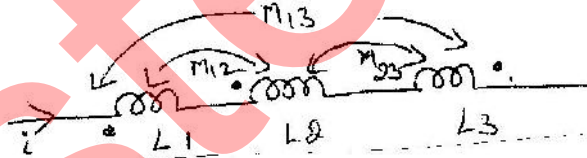
    Given L_1 = 1H L_2 = 2H L_3 = 5H M_{12} = 0.5H M_{23} = 1H M_{13} = 1H

5. The voltage across 5F capacitor in the circuit is   2
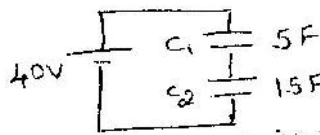
6. Write the incidence matrix of the oriented graph given below.   3


7. Given y_{11} = 10 ℧, y_{22} = 5 ℧, y_{12} = y_{21} = 2℧ find z_{21}.   2

8. In a series resonant circuit, the capacitance has been doubled. Then the new resonant frequency will become _____ times the original resonant frequency.   2

14.a) Obtain the Thevenin's equivalent circuit for the active network shown in figure.   5
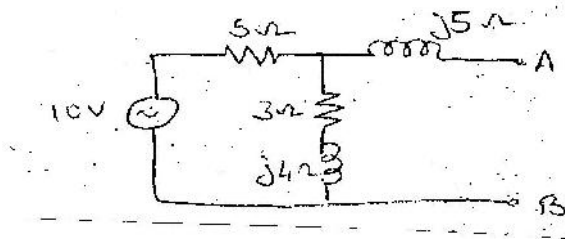
b) Compute the form factor and peak factor of a half wave rectified sinusoidal wave form.   5

15. Both sources shown in figure are operating at the same frequency. Find complex power generated by each source and the complex power absorbed by each passive circuit element.   10
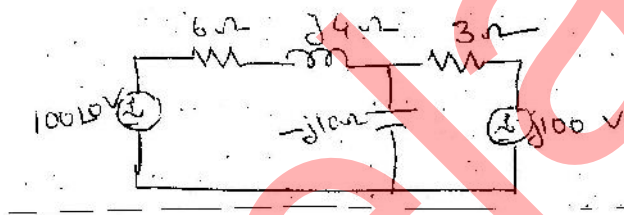
16.a) Find the values of R and C in the circuit shown so that $Vb = 4Va$ 5
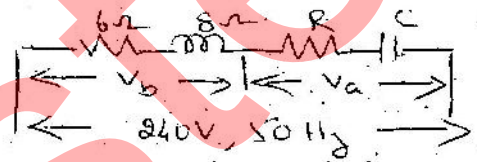
b) Obtain the open circuit parameters of the circuit shown in figure.   5
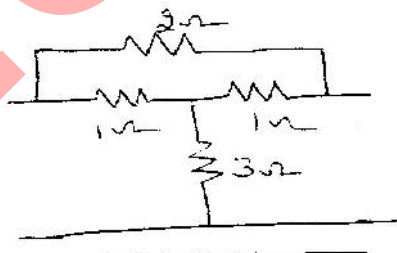
17.a) Draw the phasor diagram of a balanced Δ connected system showing the relation between phase and line quantities of currents and voltages.   5

b) Find the neutral shift voltage of the network shown. The supply voltages are balanced with magnitude $E_a = 230 \angle 0$, $E_b = 230 \angle -120$ and $E_c = 230 \angle +120$ 5