FACULTY OF ENGINEERING
B.E. 2/4 (EEE) I - Semester (Suppl.) Examination, July 2014

Subject : Electrical Circuits - I

Time : 3 Hours   Max. Marks: 75

Note: Answer all questions of Part - A and answer any five questions from Part-B.
PART – A (25 Marks)

1   Distinguish between a independent source and a dependent source.   (2)
2   With reference to network topology define the terms (a) cut set (b) chord   (2)
3   State Norton's theorem.   (3)
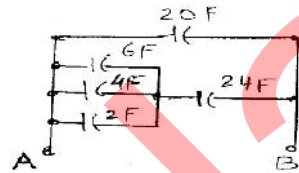4   Find the equivalent capacitance between terminals A and B in the figure (1)   (2)

Figure 1

5   Explain passive sign convention.   (3)
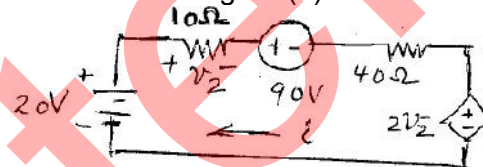6   Find the current "I" in the circuit shown in figure (2).   (2)

Figure 2

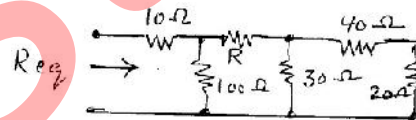7   Find R in figure (3) if R_{eg} = 30 Ω (3)

Figure 3

8   Obtain Z_{11} and Z_{21} in figure (4)   (3)
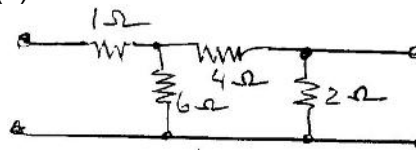

Figure 4

9   Define Mutual Inductance.   (2)
10 In a series RLC circuits the resonant frequency admittance is 2×10^{-2} S. The Q of the circuit is
    50 and resonant frequency is 10 Krad/s. Calclate the values of R, L. C and the bandwidth.   (3)

PART – B (50 Marks)

11 Determine the three mesh currents in the network shown in figure (5)   (10)
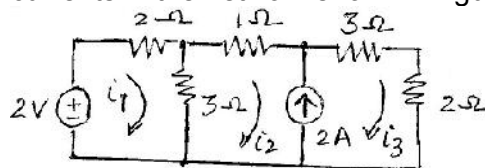

Figure 5

…..2

12 A current of 5A flows through a non inductive resistance in series with a coil when connected to a 250V, 50Hz source. If the voltage across the resistance is 125 V and across the coil 200V, calculate   (10)
    (i) The impedance resistance and reactance of the coil
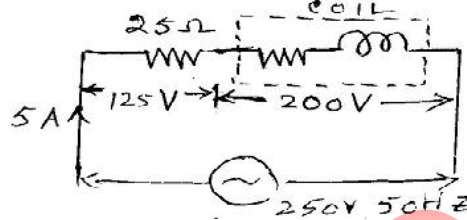   (ii) The power absorbed by the coil. Draw the vector diagram

Figure 6

13 Three loads (31+j59), (30-j40) and (80+j60) ohms are connected in delta across the 400V, 3 phase supply. Find the phase currents and the line currents.

14 Find the resistance between points M and N in figure (7)   (10)

Figure 7

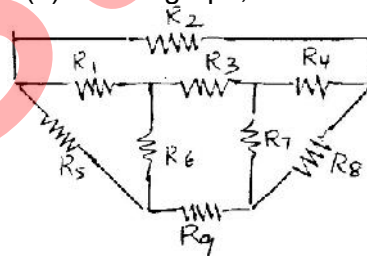15 For the network shown in figure (8) draw a graph, select a tree and obtain the tie-set matrix.   (10)

Figure 8

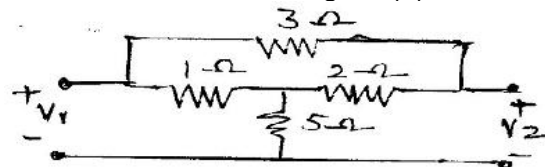16 Find the Z parameters of the network shown in figure (9)   (10)

Figure 9

17 In the circuit shown in figure (10) find the frequency at which this circuit will be at resonances. If the capacitor and inductor are intercharged what would be the value of the resonant frequency?
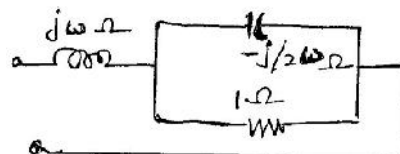

Figure 10

*****