2002 SCHEME

USN | | | | | | | | | | |

EE34

Third Semester B.E. Degree Examination, June 2012
Network Analysis

Time: 3 hrs. Max. Marks:100

Note: ***Answer any FIVE full questions***

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

1 a. Using loop current method, find the power supplied or absorbed by the controlled–voltage source in the network shown in Fig. Q1(a). **(10 Marks)**

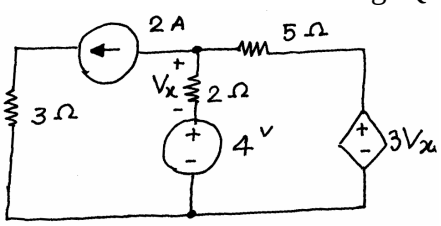

Fig. Q1(a)

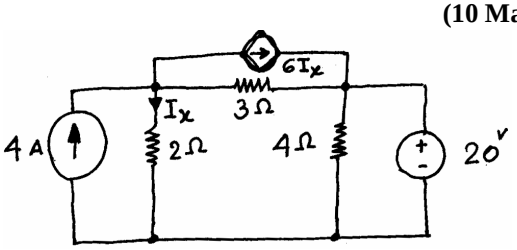

Fig. Q1(b)

b. In the circuit of Fig. Q1(b), find the current through each resistor. Apply nodal voltage method of solving the network. **(10 Marks)**

2 a. Calculate the current in the 6Ω resistor of the circuit of Fig. Q2(a) by Thevenin's theorem. **(10 Marks)**

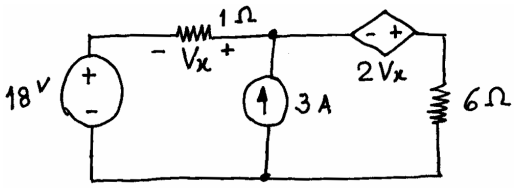

Fig. Q2(a)

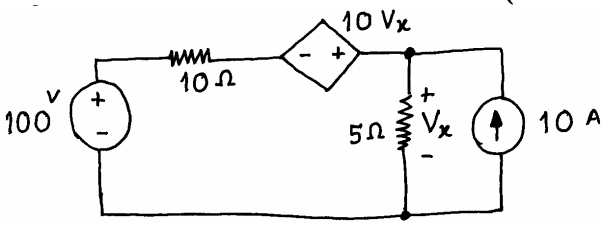

Fig. Q2(b)

b. Find the current in 10 Ωresistor of the circuit of Fig. Q2(b), using Norton's theorem. **(10 Marks)**

3 a. Determine the current I_x in the circuit of Fig. Q3(a) by using superposition theorem. **(10 Marks)**

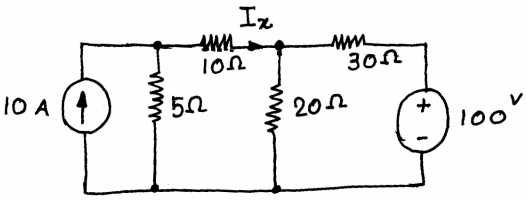

Fig. Q3(a)

b. Explain the importance of topology in network and define the following :
i) Tree ii) Cut set iii) Tie set iv) Co–tree with relevance to an electrical network. **(10 Marks)**

4 a. What do you mean by half–power points in relation to RLC series resonant circuit? Derive a relationship between f_o(resonant frequency), Q (quality factor) and BW(band width). **(10 Marks)**

b. A series RLC circuit has a Q of 5 at its resonant frequency of 100 KHz. Assuming the power dissipation of the circuit is 100 watts when drawing a current of 0.80 A, determine the circuit parameters. Also calculate the band width and the half–power frequencies. **(10 Marks)**

5 a. At t = 0, switch 1 in Fig. Q5(a), is closed and switch 2 is closed 4 seconds later. Find i(t) for t > 0. Calculate i for t = 2 seconds and t = 5 seconds. **(10 Marks)**

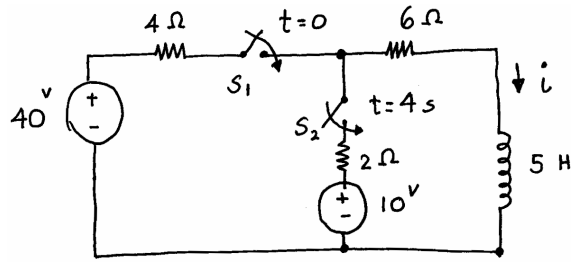

Fig. Q5(a)

b. The switch in Fig. Q5(b) has been in position A for a long time. At t = 0, the switch moves to position B. determine v(t) for t > 0 and calculate its value at t = 1 second and t = 4 seconds. **(10 Marks)**

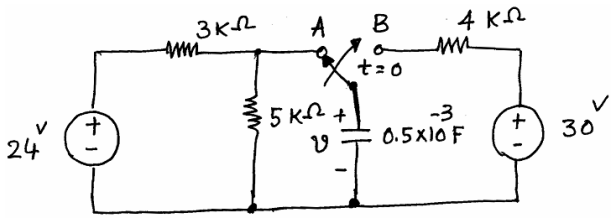

Fig. Q5(b)

6 a. Explain with mathematical derivation, the initial and final value theorems. **(10 Marks)**

b. For the s–domain circuit in Fig. 6(b), find

i) The transfer function $H(s) = v_0(s)/ v_i(s)$,

ii) The impulse response

iii) The response when $v_i(t) = u(t)$ volts. **(10 Marks)**

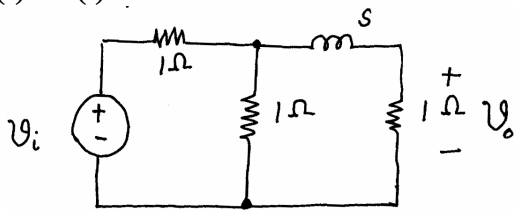

Fig. Q6(b)

7 a. Find the relationship between the z – parameters and h–parameters of a two – port network. **(10 Marks)**

b. Determine the y–parameters for the two – port network shown in Fig. Q7(b). **(10 Marks)**

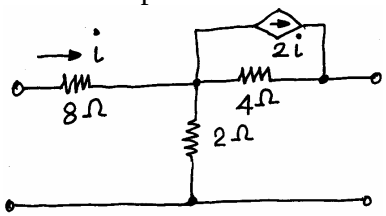

Fig. Q7(b)

8 Write short notes on :

a. Millman's theorem. **(06 Marks)**

b. Duality in networks, **(07 Marks)**

c. Frequency response of series and parallel RLC circuits. **(07 Marks)**

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