Third Semester B.E. Degree Examination, June / July 08

Network Analysis

Time: 3 hrs. Max. Marks:100

Note : ***Answer any FIVE full questions, selecting at least TWO questions from each part.***

PART - A

1 a. Explain mesh method of analysis. **(06 Marks)**

b. Calculate the power delivered by the source in the circuit, shown in Fig. Q 1(b) using node method. **(14 Marks)**

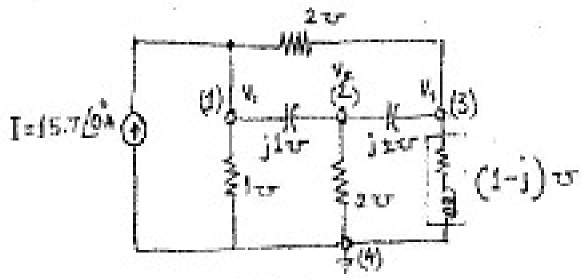

Fig. Q 1(b)

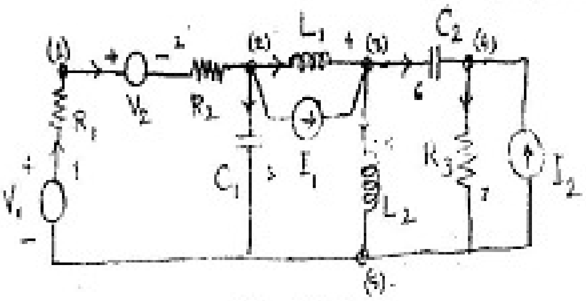

Fig. Q 2(a)

2 a. Obtain the complete incidence matrix for the network shown in Fig. Q 2(a) after writing its graph and oriented graph. **(05 Marks)**

b. For the network shown in Fig. Q 2(b) write the tie set schedule, tie set matrix and obtain equilibrium equation in matrix form using KVL, calculate loop currents. Follow the same orientation and branch numbering as shown in Fig. Q 2(b). Use branches 4, 5 and 6 as tree branches. **(15 Marks)**

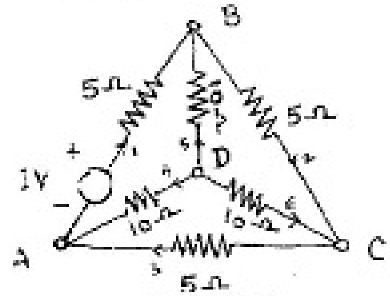

Fig. Q 2(b)

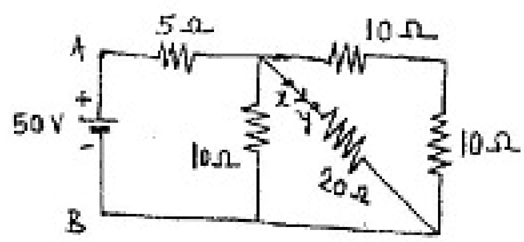

Fig. Q 3(c)

3 a. Define the following theorems.

i) Super position theorem ii) Reciprocity theorem. **(04 Marks)**

b. State and prove Millman's theorem. **(06 Marks)**

c. Show the validity of reciprocity theorem for the following circuit given in Fig. Q 3(c) for AB and XY ports. **(10 Marks)**

4 a. State the following theorems –

i) Norton's theorem ii) Maximum power transfer theorem. **(04 Marks)**

b. State and prove Thevenin's theorem. **(07 Marks)**

c. Find the Thevenin's equivalent circuit of the network shown in Fig. Q 4(b) across load.

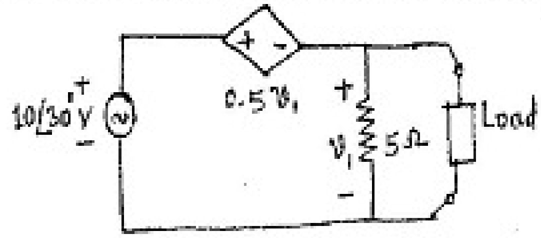

Fig. Q 4(c) **(09 Marks)**

PART - B

5 a. Define the following terms – i) Resonance, ii) A – factor, iii) Selectivity, iv) Band Width. **(04 Marks)**

b. Derive the expression for parallel resonance circuit. Containing resistance in both the branches. **(06 Marks)**

c. A series R L C circuit has $R = 10\ \Omega$, $L = 0.01$ H and $C = 0.01\ \mu$F and it is connected across 10 mV supply. Calculate – i) f_0 ii) Q_0 iii) Band Width iv) f_1 and f_2, v) Io. **(10 Marks)**

6 a. Why to study initial conditions? **(03 Marks)**

b. For the network diagram shown in Fig. Q6 (b) find out $i(0^+)$, $\frac{di(0^+)}{dt}$ and $\frac{d^2i(0^+)}{dt^2}$, take $V_c(0) = 0$ if K is closed at t = 0. **(07 Marks)**

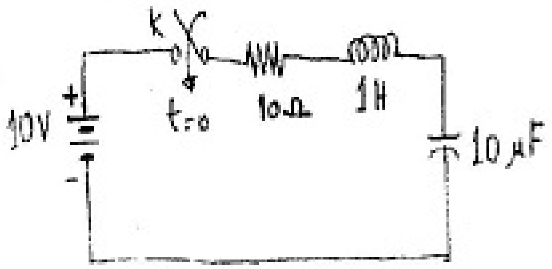

Fig. Q 6(b)

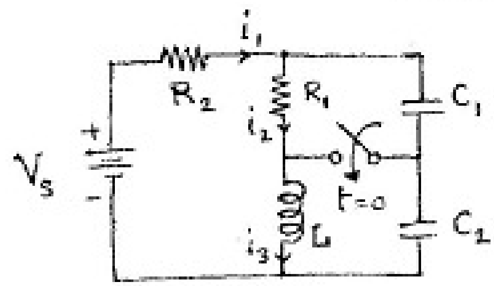

Fig. Q 6(c)

c. Determine the currents at $t = (0^+)$ for the circuit shown in Fig. Q 6(c). **(10 Marks)**

7 a. Define impulse function. Draw diagram of approximate impulse function. Obtain L. T of impulse function. **(05 Marks)**

b. For the circuit shown in Fig. Q 7(b) find out the current i(t) if K is closed at t = 0, use L. T. method. **(05 Marks)**

c. Find the equivalent impedance for the circuit, shown in Fig. Q 7(c) L. T. **(10 Marks)**

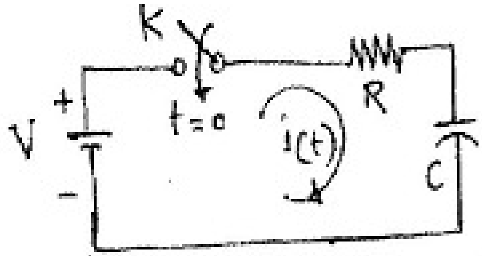

Fig. Q 7(b)

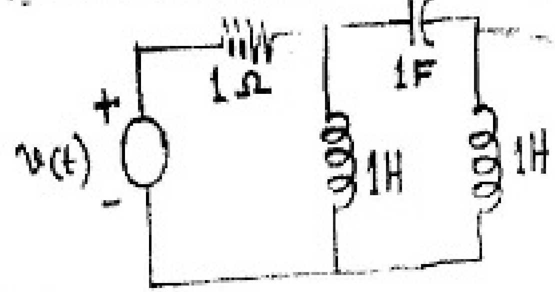

Fig. Q 7(c)

8 a. What is the use of hybrid parameters? Define hybrid parameters. **(05 Marks)**

b. Derive expressions for Y – parameters in terms transmission parameters. **(05 Marks)**

c. For the network shown in Fig. Q 8 (c) obtain the O.C. impedance parameters.

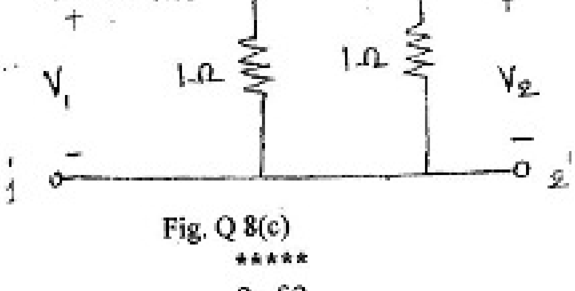

Fig. Q 8(c) **(10 Marks)**

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