2002 SCHEME

EE34

Third Semester B.E. Degree Examination, June-July 2009
Network Analysis

Time: 3 hrs. Max. Marks:100

Note: *Answer any FIVE full questions.*

1 a. Determine R_{AB} in the network shown in figure Q1 (a). (06 Marks)

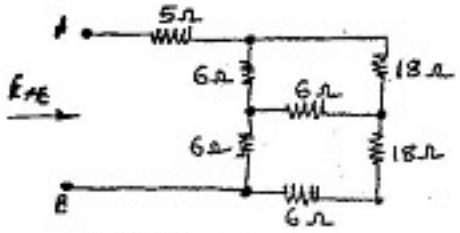

Fig. Q1 (a)

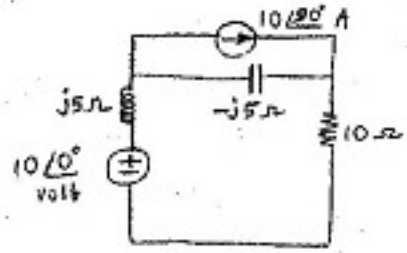

Fig. Q1 (b)

b. By Source transformation find current in 10 Ω resistor in figure Q1 (b). (06 Marks)

c. Find current in 30 Ω resistance using Mesh analysis in figure Q1 (c). (08 Marks)

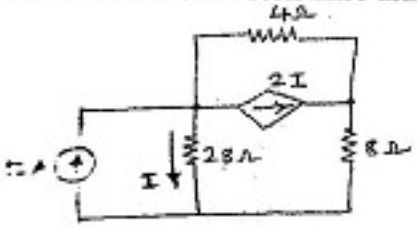

Fig. Q1 (c)

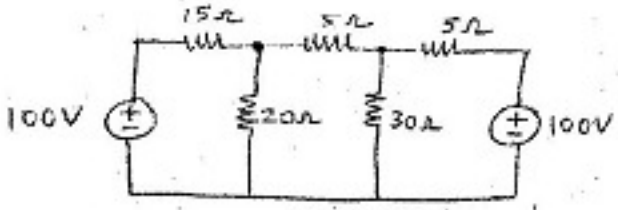

Fig. Q2 (a)

2 a. Find current I using Mesh analysis in figure Q2 (a). (06 Marks)

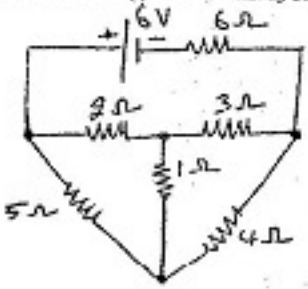

Fig. Q2 (b)

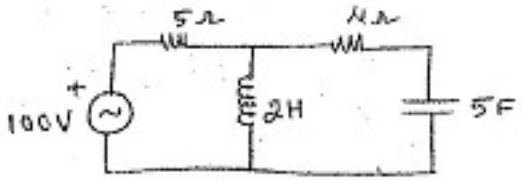

Fig. Q2 (c)

b. Write the oriented graph and write tieset schedule, for the network in figure Q2 (b). (06 Marks)

c. Explain duality in electric networks. Write the dual of the network shown in figure Q2 (c). (08 Marks)

3 a. State superposition theorem. Find current in 3 Ω resistances by superposition theorem in figure Q3 (a). (06 Marks)

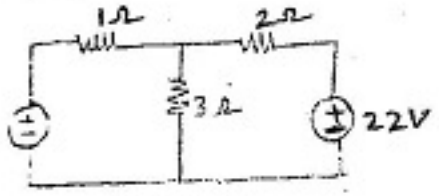

Fig. Q3 (a)

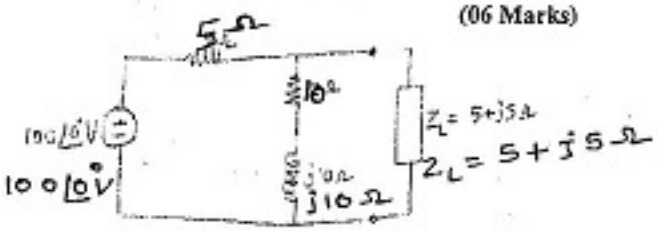

Fig Q3 (b)

b. Find current in Z_L using Thevenin's theorem in the circuit in figure Q3 (b). (06 Marks)

3 c. State and prove Reciprocity theorem in the circuit in figure Q3 (c). (08 Marks)

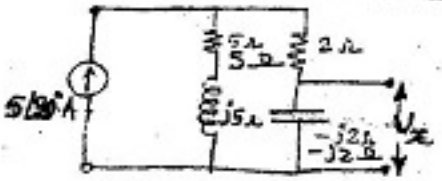

Fig. Q3 (c)

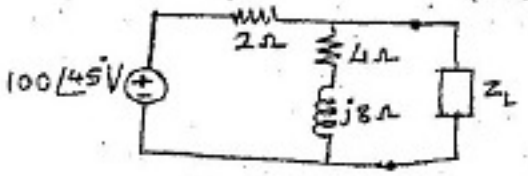

Fig. Q4 (b)

4 a. State and prove maximum power transfer theorem in AC circuits. (10 Marks)

b. In the circuit in figure Q4 (b) find the load impedance Z_L for which the power transfer is maximum. Also calculate the maximum power transferred. (10 Marks)

5 a. Derive the expressions for i) Resonant frequency ii) Half power frequencies iii) Quality factor in R-L-C series circuit. (10 Marks)

b. A series resonant circuit consists of R = 50 Ω, L = 0.2 Henry and C = 10 μF with an applied voltage of 20 V. Find the resonant frequency, Q factor and bandwidth of the circuit. (10 Marks)

6 a. Explain the behaviour of the circuit elements during the process of switching at initial and final conditions. (06 Marks)

b. Find i, $\frac{di}{dt}$ and $\frac{d^2i}{dt}$ at t = 0 + when the switch K is closed at t = 0 in the circuit in figure Q 6(b). (06 Marks)

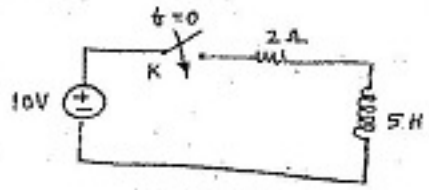

Fig. Q6 (b)

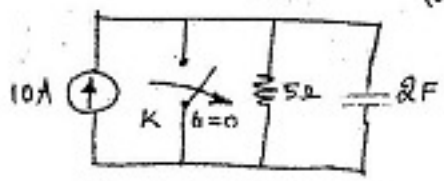

Fig. Q6 (c)

c. Find V_c and $\frac{dV_c}{dt}$ at t = 0 + when the switch K is opened at t = 0, in figure Q 6(c).

7 a. Find the Laplace transform of the signal shown in figure Q7 (a). (08 Marks)

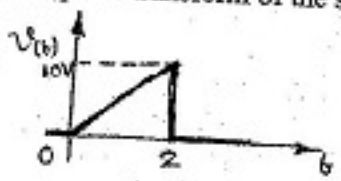

Fig. Q7 (a)

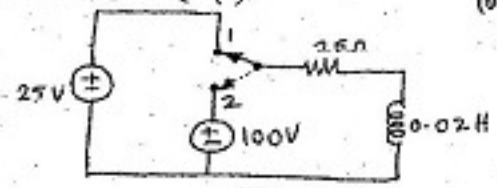

Fig. Q7 (c)

b. State initial value and final value theorems. Find the initial value and final value of the functions if $F(s)=\frac{s^2+2s+3}{s^3+4s^2+2s+1}$. (06 Marks)

c. Find the current i(t) for t > 0 when the switch K is moved from position 1 to 2 at t = 0 assuming the switch K is assumed to be at position 1 for a long time. Refer figure Q7 (c).

8 a. Obtain Y parameters in terms of Z parameters. (08 Marks)

b. Find Z parameters for the circuit in figure Q8 (b). Therefrom obtain Y parameters. (08 Marks) (12 Marks)

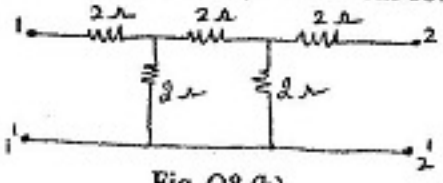

Fig. Q8 (b)

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