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EE34

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

Time: 3 hrs. Max. Marks:100

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

1 a. Convert the network in Fig. Q 1(a) in to a single voltage source by source transformation. **(06 Marks)**

b. Determine the equivalent resistance at terminals AB in the network in Fig. Q 1(b). **(07 Marks)**

c. Find the voltage 'V' across 3 Ω using nodal technique, in the network in Fig. Q 1(c). **(07 Marks)**

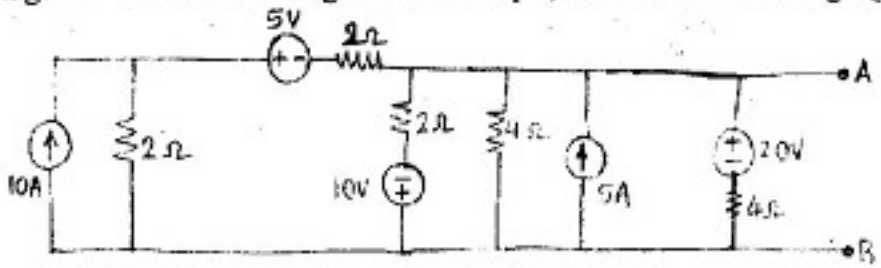

Fig. Q 1(a)

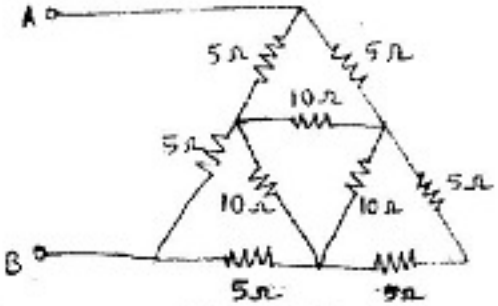

Fig. Q 1(b)

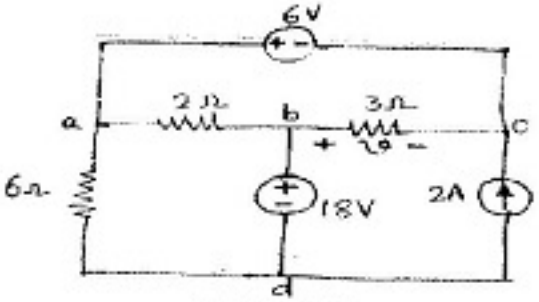

Fig. Q 1(c)

2 a. Find the branch currents using Tie – set schedule for the network in Fig. Q 2(a). **(10 Marks)**

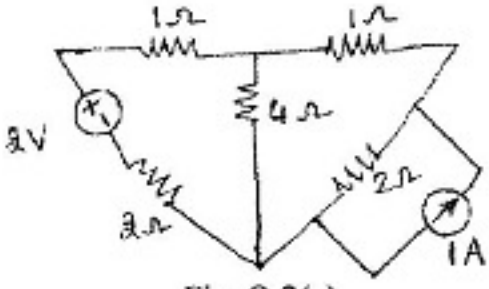

Fig. Q 2(a)

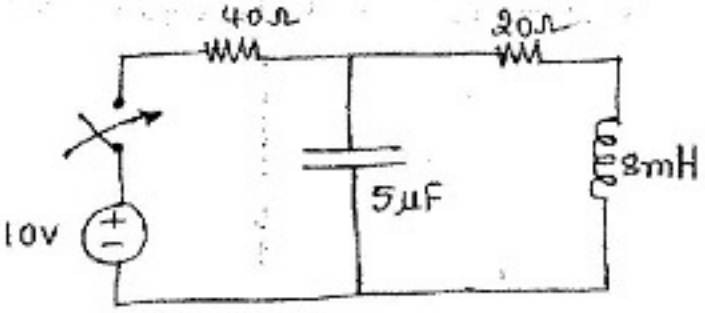

Fig. Q 2(b)

b. Explain Duality in electric networks. Draw the dual of the network in Fig. Q 2(b). Write mesh equation for the given network and Nodal equations for the dual networks. **(10 Marks)**

3 a. State superposition theorem. Find Vx using superposition principle in the network in Fig. Q 3(a). **(10 Marks)**

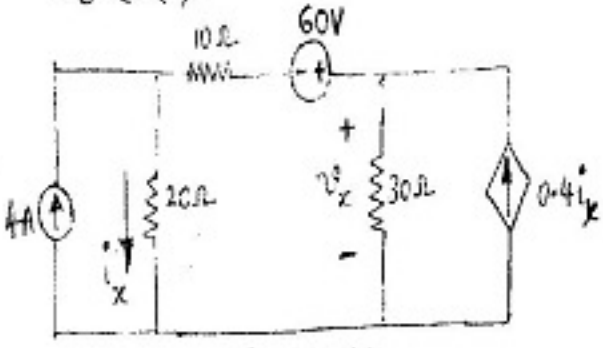

Fig. Q 3(a)

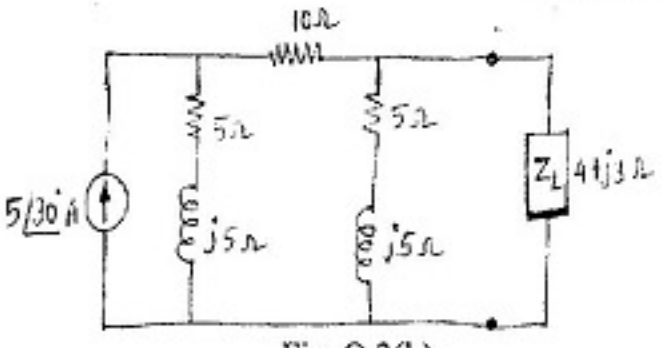

Fig. Q 3(b)

b. Find the current in ZL using Thevenin's theorem in the network in Fig. Q 3(b). State Thevenin's theorem. **(10 Marks)**

4 a. State Reciprocity theorem. Find the current through 5 Ω resistors and verify Reciprocity theorem in the network in Fig. Q 4(a). **(10 Marks)**

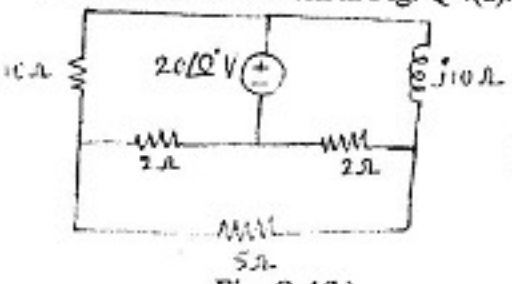

Fig. Q 4(b)

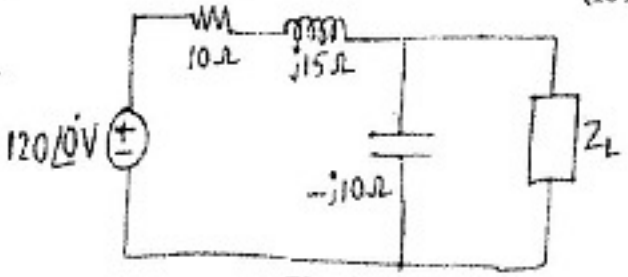

Fig. Q 4(b)

b. State maximum power transfer theorem. Find the value of ZL for which it receives the maximum power in the network in fig 4(b). Find the maximum power. **(10 Marks)**

5 a. In a R – L – C series circuit, determine the expression for the resonant frequency and expressions for half power frequencies and bandwidth. **(10 Marks)**

b. in the network in Fig. Q 5(b) find i) Resonant frequency ii) quality factor iii) bandwidth iv) Half power frequencies v) maximum power dissipated at resonance. **(10 Marks)**

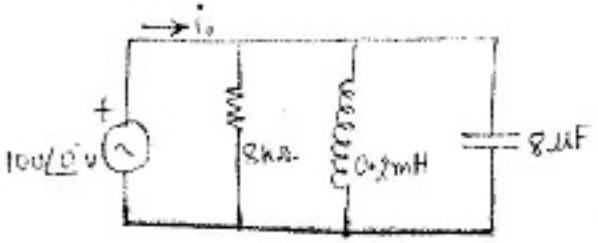

Fig. Q 5(b)

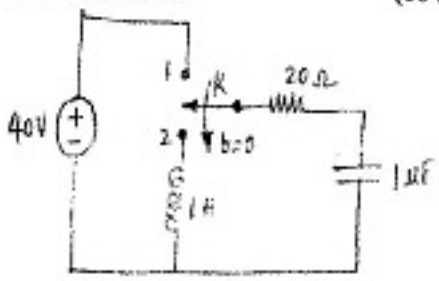

Fig. Q 6(b)

6 a. Explain the behaviour of network elements during switching, both at t = 0+ and t = ∞. **(10 Marks)**

b. In the network in Fig. Q 6(b) the switch is moved from position 1 to 2 at t = 0, steady state having reached before switching. Calculate i, di/dt and d^2i/dt^2 at $t = 0^+$. **(10 Marks)**

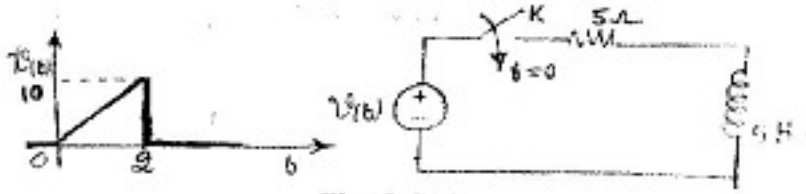

Fig. Q 7(c)

7 a. State and prove Initial and Final value theorem. **(06 Marks)**

b. Find the Initial and final values of i(t) if $I(s) = \dfrac{s+1}{(s+1)^2+9}$. **(04 Marks)**

c. Find the current i(t) for t > 0 when an input voltage signal V(t) of the form shown in Fig. Q 7(c) is applied to the network. Assume zero Initial condition. **(10 Marks)**

8 a. Define Z parameters. Find Z parameters for the network shown in Fig. Q 8(a) and there from find Y parameters. **(10 Marks)**

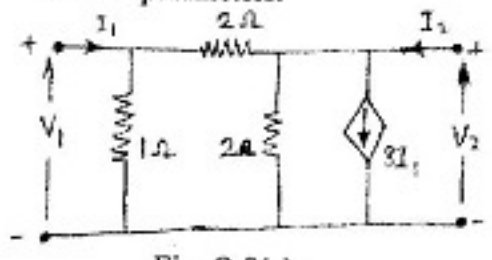

Fig. Q 8(a)

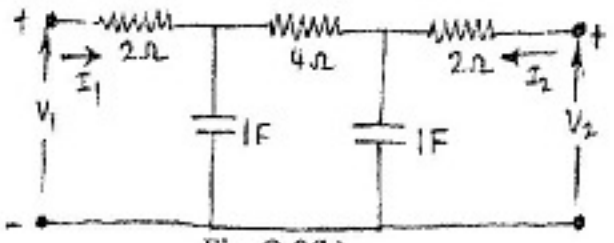

Fig. Q 8(b)

b. Define Hybrid parameters. Find h parameters for the 2 port network in Fig. Q 8(b). **(10 Marks)**

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