B.E. Fourth Semester (Electronics & Tele. Communication / Electrical Engineering) (CGS)

10601 : Network Analysis : 4 XT 03 / 4 XN 03 / 4 IF 03 / 4 BM 03

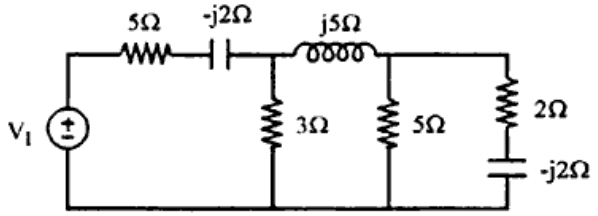
P. Pages : 4 **AU - 2593**

Time : Three Hours * 0 5 5 0 * Max. Marks : 80

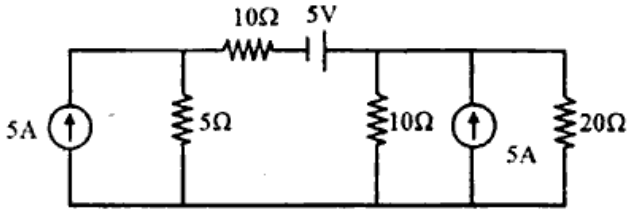
Notes : 1. Answer **three** question from Section A and **three** question from Section B.
2. Assume suitable data wherever necessary.
3. Illustrate your answer necessary with the help of neat sketches.
4. Use of pen Blue/Black ink/refill only for writing the answer book.

SECTION – A

1. a) Determine the value of voltage source V_1 from the network shown in fig. 1 (a) using mesh analysis, if voltage across impedance $(2 - j2)\Omega$ is 5V. 7



b) From the network shown in fig. 1 (b) determine current in 20Ω resistance using source transformation. 7



OR

2. a) Determine all node voltages from the network shown in fig. 2 (a) 7

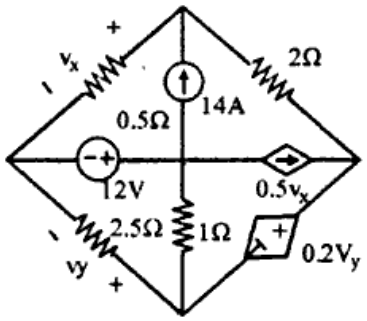


Fig. 2 a

b) Determine single equivalent impedance from Fig 2(b) in between terminal x & y. 7

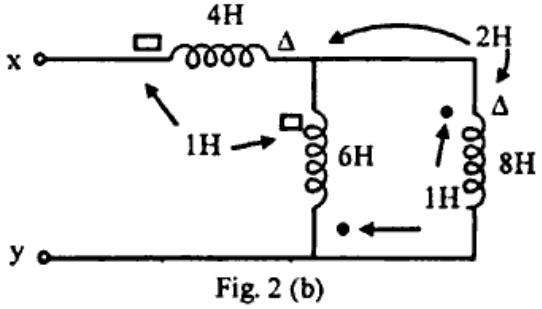


Fig. 2 (b)

3. a) For the circuit shown in fig. 3 (a) draw its oriented graph and write incidence, tie-set and cut-set matrix. 7

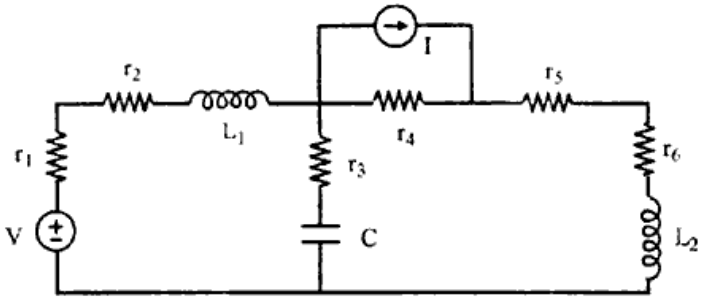


Fig. 3 (a)

b) For the network shown in fig. 3 (b) write down the tie-set matrix and obtain the network equilibrium equation on tie-set matrix using KVL. 7

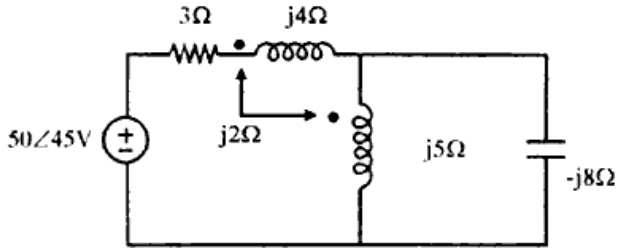


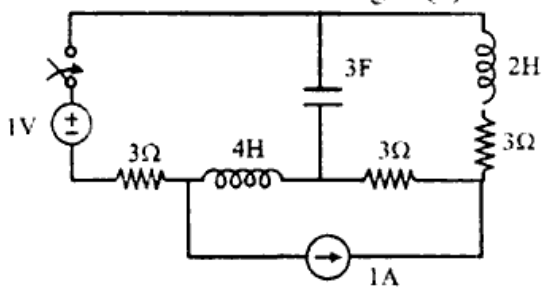
Fig. 3 (b)

OR

4. a) Draw oriented graph from given incidence matrix and construct tie-set and cut-set matrix. 7

	Branches							
Nodes	1	2	3	4	5	6	7	8
1	1	0	0	0	1	0	0	1
2	0	1	0	0	-1	1	0	0
3	0	0	1	0	0	-1	1	-1
4	0	0	0	1	0	0	-1	0

b) Construct dual a network from the circuit shown in fig. 4 (b) 7



5. a) State and prove final value theorem and verify it for the function $f(t) = 2 + e^{-3t}\cos 2t$ 6

b) Determine the value of current in 10Ω resistance when the switch is closed at t = 0. Assume initial current in inductor is zero from fig. 5 (b) 7

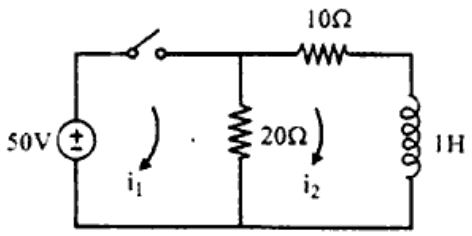


Fig. 5 (b)

OR

6. a) Find Laplace transform of shifted pulse shown in fig. 6 (a) 6

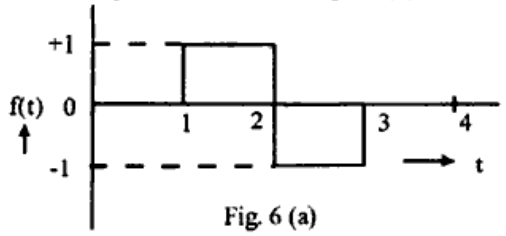


Fig. 6 (a)

b) Find expression of current j(t) when switch is move from position x to y at t = 0. A steady state current having previously established from fig. 6 (b) 7

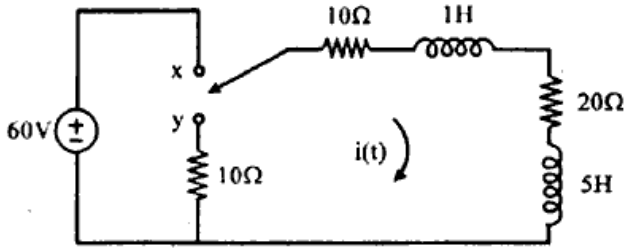


Fig. 6 (b)

SECTION – B

7. a) Obtain Thevenin's equivalent circuit across terminal A and B from fig. 7 (a). 7

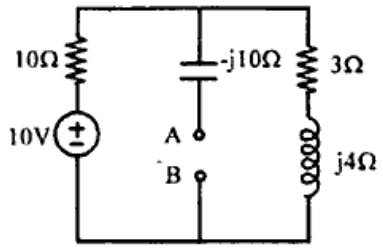


Fig. 7 (a)

b) From the network shown in fig. 7 (b) the branch having impedance (3 + j4)Ω is change to (4+j4)Ω find current in 15Ω resistance before and after change using compensation theorem. 6

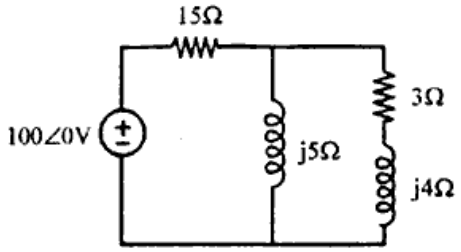


Fig. 7 (b)

OR

8. a) From the network shown in fig. 8 (a) determine current in 10Ω resistance using Norton's theorem. 6

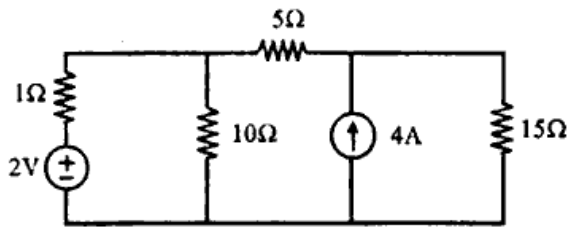


Fig. 8 (a)

b) From the network shown in fig. 8 (b) determine the value of z, such that maximum power will be transfer from source towards load. Also find this maximum power. 7

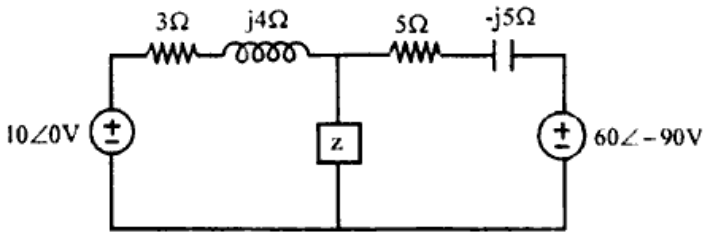


Fig. 8 (b)

9. a) State necessary condition for driving point function. 6

b) Determine voltage transfer function from the network shown in fig. 9 (b) 7

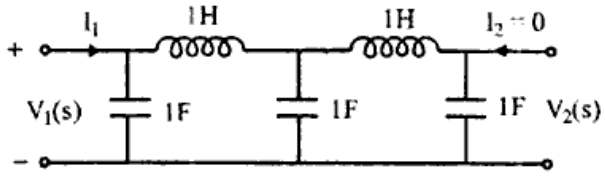


Fig. 9 (b)

OR

10. a) Determine current transfer function from the network shown in fig. 10 (a) 7

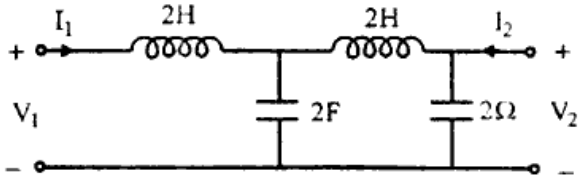
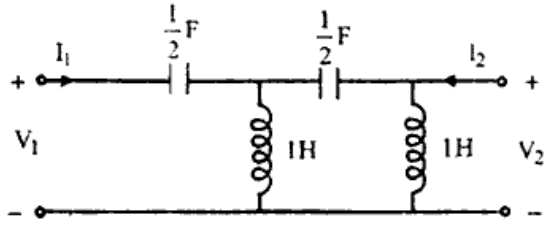


Fig.10 (a)

b) Determine driving point impedance function at port I from the network shown in fig. 10 (a). 6

11. a) Derive the condition of reciprocity and symmetry for two port network in terms of transmission parameter. 6

b) Find h-parameter for the network shown in fig. 11 (b) 7



OR

12. a) Derive the expression for input impedance in terms of trammission parameter. 6

b) Determine short circuit admittance parameter for the network shown in fig. 12 (b) 7

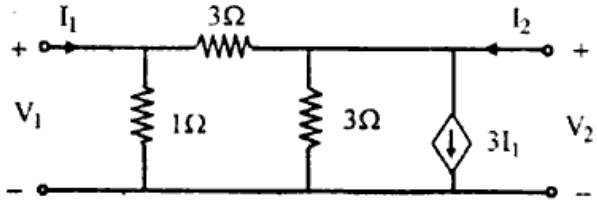


Fig.12 (b)

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