

B. Tech. (EC) I

A

Paper (EEC - 104)
NETWORKS

Time : 3 hours

Maximum Marks : 70

(Write your Roll No. on the top immediately on receipt of this question paper.)

Answer any **FIVE** questions.
All questions carry equal marks.
Assume missing data (if any).

1. a) In the circuit of Fig. 1, determine the current through the 5Ω resistor using Thevenin's theorem.

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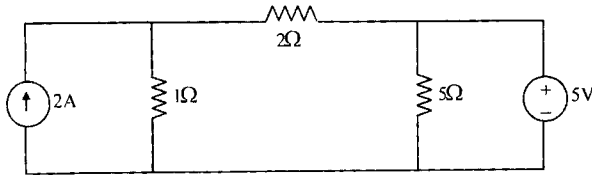


Fig. 1

- b) Find the current in the 5Ω resistor for the circuit shown in Fig. 2. Use Norton's theorem.

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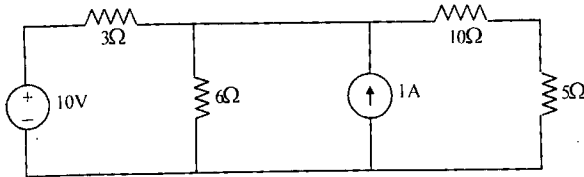


Fig. 2

2. a) Find 'V' in the circuit of Fig. 3. Also obtain the numerical value of the dependent source.

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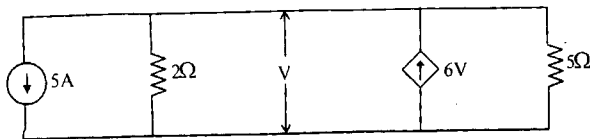


Fig. 3

b) Using Nodal method, find the current through r_2 in Fig.4

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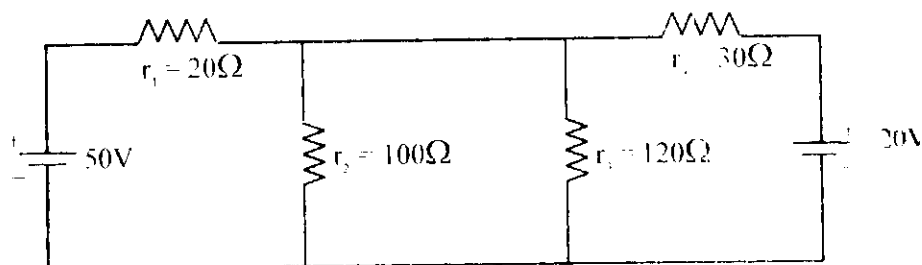


Fig. 4

3 a) Prove that the power transfer from a dc source network to a resistive network is maximum when the internal resistance of the dc source network is equal to the load resistance.

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b) In the network shown in Fig. 5, $V_1 = 10V$, $V_2 = 4V$, $V_3 = 6V$. Also $I_1 = 2A$, $I_2 = 2A$ and $I_3 = 4A$. Check the validity of Tellegen's theorem.

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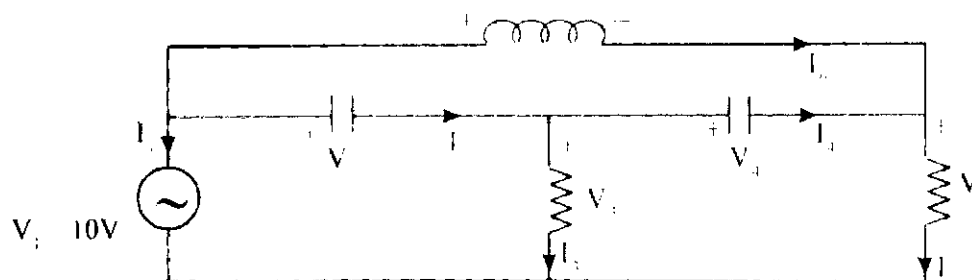


Fig. 5

4 a) State and explain Superposition Theorem.

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b) Find V_1 and V_2 in Fig. 6

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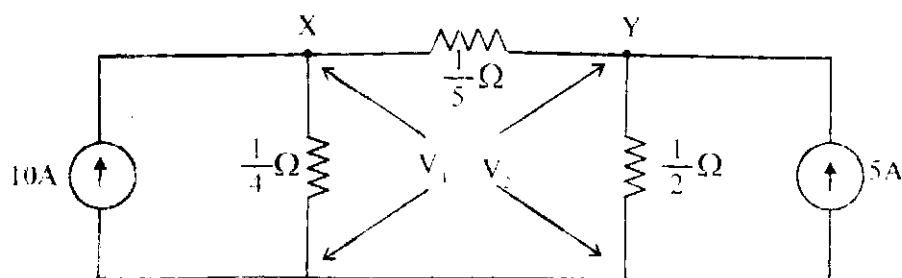


Fig. 6

5 a) Express Z - parameters in terms of Y - parameters.

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b) Explain and derive ABCD parameters of a two port network.

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6 a) Find the open circuit parameter of the two port network shown in Fig. 7

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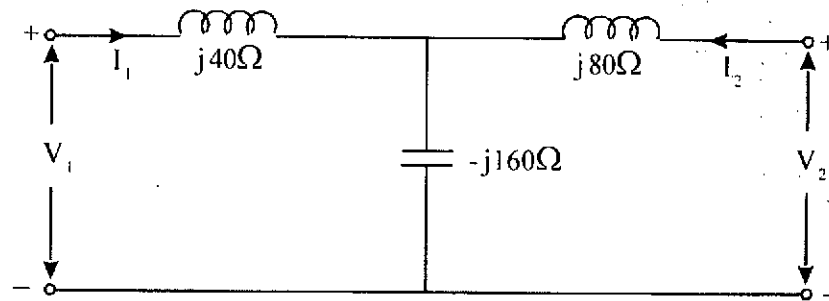


Fig. 7

- b) From the given Z - parameters, determine ABCD parameters. 07
- 7 a) State and explain initial and final value theorem in Laplace transformation. 07
- b) The current through a circuit element is $\frac{4s^2}{(s+7)}$. Find the current in t domain as $s \rightarrow 0$ and $s \rightarrow \infty$.
- 8 a) Explain Mesh and Nodal analysis for linear time invariant networks. 07
- b) State and explain reciprocity theorem. 07