8474

B. Tech. (E) / I

A

Paper (EEE - 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.
Assume missing data, if any, suitably.
All questions carry equal marks.

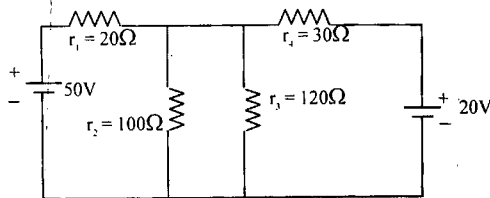1. a) Using Nodal method, find the current through r_g in Fig. 1   07

Fig. 1

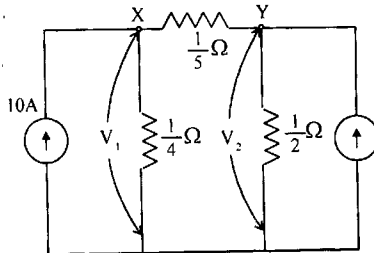b) Find V_1 and V_2 in Fig. 2.   07

Fig. 2

2   a) Differentiate between independent and dependent energy sources. Discuss the types of dependent energy sources.   07

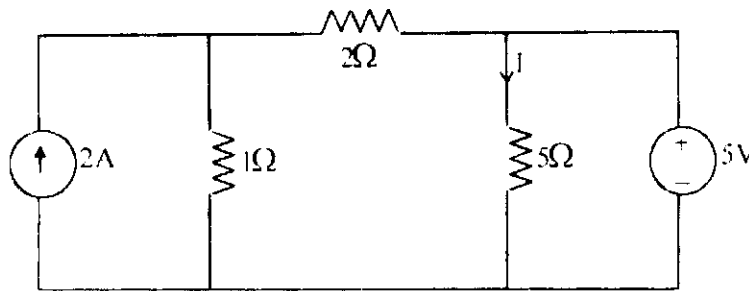b) In the circuit of Fig. 3 determine the current through the 5Ω resistor using Thevenin's theorem.   07

Fig. 3

3 a) Discuss the advantages of three phase system over single phase systems. *07*

   b) Differentiate between Star and Delta connections. Derive the relationship between line and phase voltages and currents in a Star connection. *07*

4 a) From the given Z parameters. find ABCD parameters. *07*

   b) Find ABCD parameters in terms of h parameters. *07*

5 a) In Fig.4, the battery voltage is applied for a steady state period. Obtain the complete expression for the current after closing the switch K. Assume $R_1 = 1\Omega$, $R_2 = 2\Omega$, $I_1 = 1H$, $E = 10V$. *07*
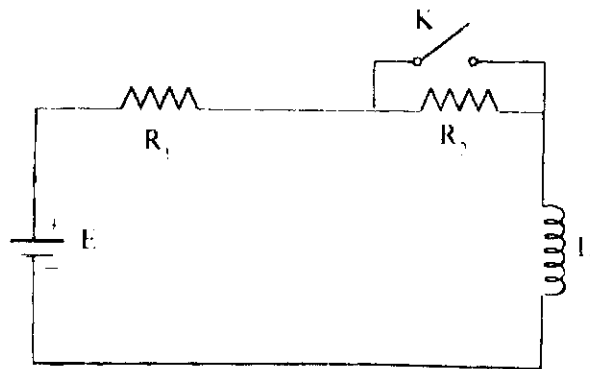

Fig. 4

   b) State initial and final value theorem in Laplace transformation. The current through a circuit element is $\dfrac{+s^2}{(s+7)}$. Find the current in t domain as $s \to 0$ and $s \to \infty$. *07*

6 a) Derive the resonance frequency of a series resonating circuit where a coil is connected across a a.c. voltage source of variable frequency. Also discuss the properties of resonance of series LRC circuit. *07*

   b) A coil has a resistance of 20Ω and inductance of 80mH and is connected in series with a 100pF capacitor. Determine at resonance, the circuit impedance and also find the resonant frequency. *07*

7 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. *07*

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b) Explain and derive ABCD parameters of a two port network. *07*

8 a) Discuss the constant - K band stop and constant K - band pass filters. *07*

   b) State and explain Norton's theorem. *07*