Course Name: **Networks Analysis and Synthesis**

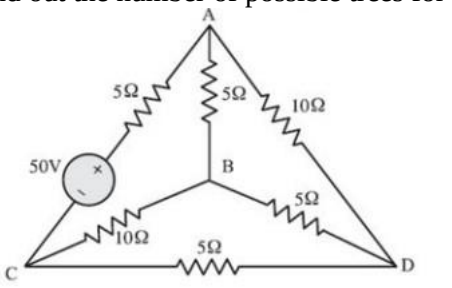
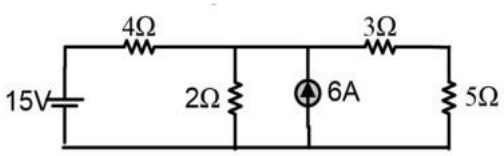
Course Outcomes

- Ability to solve electrical circuits with Graphs.
- To learn techniques of solving circuits involving different active and passive elements.
- To analyze the behaviors of the circuit's response in time domain.
- To analyze behavior of the circuit's response in frequency domain.
- To understand the significance of network function.

Model Question Paper

Course: Networks

Analysis and Synthesis

Q.No	Question	Marks	CO	BL	PI Code
1a	Obtain the oriented from the given Cut-set matrix: $[Q] = \begin{bmatrix} 1 & 0 & 1 & 0 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 1 & 0 & 0 & 1 \\ 0 & 1 & 0 & 0 & 1 & 0 & 1 \end{bmatrix}$	8	1	L3	1.4.1
1b	Find out the number of possible trees for the figure given below: 	10	1	L2	1.4.1
2a	Define the following terms, (I) Link (II) Graph (III) Tree (IV) Node (V) Branch	8	1	L2	1.4.1
2b	Determine the current flowing through 5 ohms resistance in the network shown below (fig-1) using Thevenin's theorem.  Fig (1)	10	2	L3	3.1.6
3a	Explain about properties of Exponential Response of RLC circuits. Deduce the transient response source free series RL circuit	08	3	L3	2.1.3

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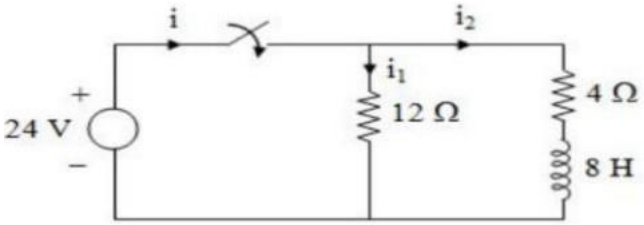
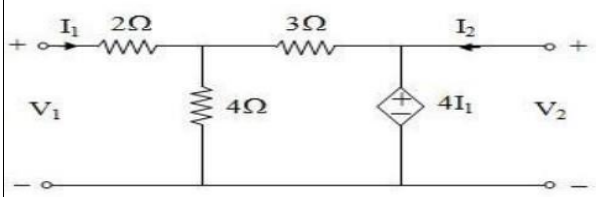
3b	Find the current i 2 for t > 0 in the circuit shown below as shown in fig. 	10	3	L2	1.4.1
4a	Drive the condition for maximum power transfer for an ac circuits and applications of maximum power transfer.	8	3	L2	1.4.1
4b	The impedances of parallel circuit are Z1= (4+j6) ohms and Z2 = (12-j8) ohms. If the applied voltage is 220V, find (i) current and power factor of each branch (ii) overall current (iii) power consumed by each impedance. Draw the phasor diagram	10	3	L3	2.1.3
5a	A resistor of 150Ω, inductance of 200mH and a capacitance of 10μF are connected in series across 500V, 150Hz supply. Determine the following (i) Impedance (ii) current flowing through the circuit (iii) power factor (iv) voltage across R,L &C (v) power in watts.	10	3	L3	3.1.6
5b	Find Y and Z parameters of the networks as shown in fig 	10	4	L2	1.4.1
6a	The transfer function of a system is G(s) =2/(s+1) (s+2). Obtain a state variable representation for the system.	10	4	L2	1.4.1
6b	Drive the condition of symmetry for a two-port network and find condition of symmetry in terms of Y parameter.	10	4	L3	3.1.6
7a	A parallel RLC circuit is supplied with a voltage source of 230 V, 50Hz. Determine circuit current and power factor if R=40Ω, L=0.2H and C=50μF.	08	3	L2	1.4.1
7b	Drive the condition for maximum power transfer for an ac circuits and applications of maximum power transfer.	08	2	L3	3.1.6
8a	Differentiate between Foster and Cauer forms and also write down the steps to obtain Foster-I and Foster-II forms.	08	5	L2	1.4.1

Q.No	Question	Marks	CO	BL	PI Code
8b	How the function can be identified as a positive real function? Explain with a suitable example.	10	5	L3	3.1.6