Total number of printed pages: **3** **D/3rd Semester/DECE305**

2022

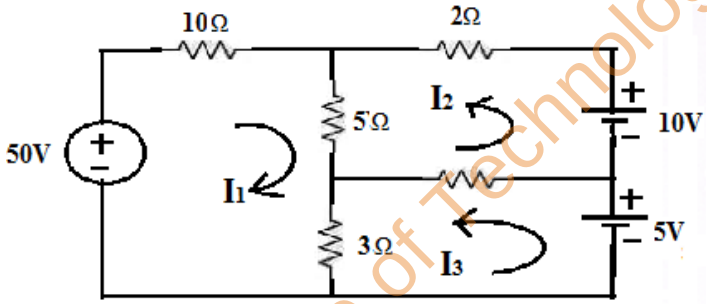
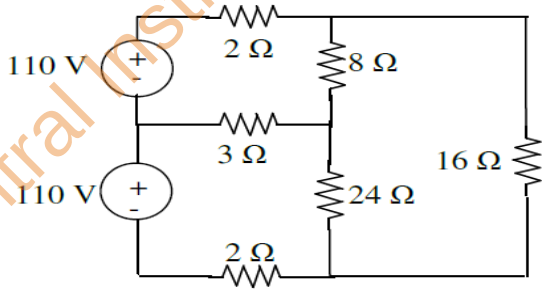
ELECTRIC CIRCUITS AND NETWORK

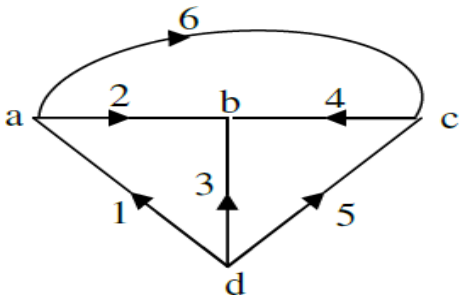
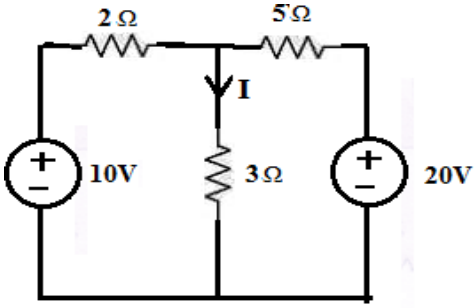
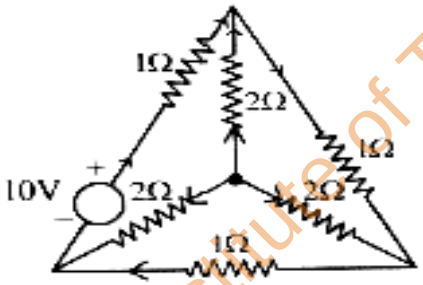
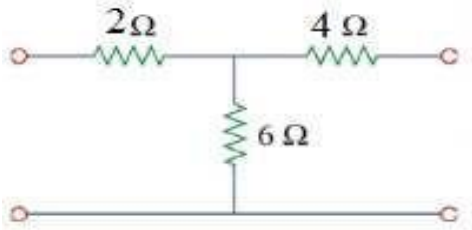
Full Marks : 100

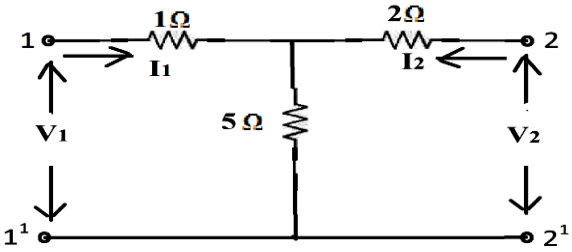
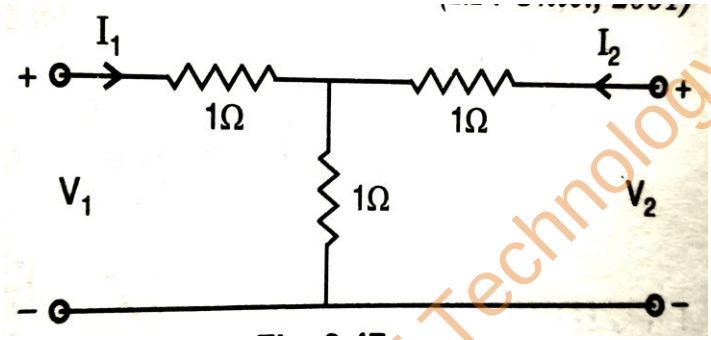
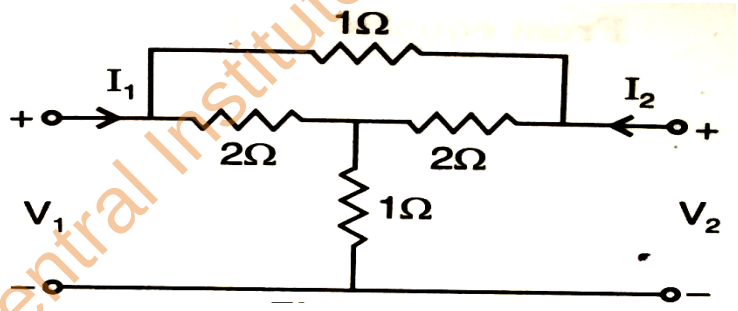
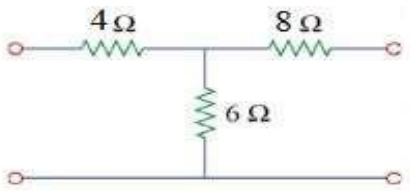
Time : Three hours

The figures in the margin indicate full marks for the questions.

*Answer **any five** questions.*

1.	a)	Define node and mesh of a network. Write statement of Norton's and Thevenin's theorem.	3+5=8
	b)	Determine the mesh currents for the following network. 	6
	c)	Using nodal analysis find all branch currents for the following circuit 	6
2	a)	Define the following terms (i) Branch (ii) Sub graph (iii) Tree	3
	b)	For the graph below, find incidence and cut set matrices.	8

			
	c)	State Reciprocity theorem. Calculate the current "I" shown in below figure by using superposition theorem. 	3+6=9
3	a)	Define and state the properties of incidence matrix. For the network shown below, draw the graph and find incidence and tie – set matrix. 	5+8=13
	b)	State and prove Maximum power transfer theorem.	7
4	a)	What is transient and steady state of a circuit. Derive the Transient Response of series RL-circuit with D.C excitation.	3+7=10
	b)	Find the Z and Y parameters for the following circuit. 	10

5	a)	Define Two-port network. The given Y-parameters are, Y_{11}= 0.5, Y_{12}= Y_{21}= 0.6, Y_{22}= 0.9. Find the impedance parameters.	2+3=5
	b)	Find the transmission parameters for the circuit shown in figure. 	5
	c)	Define input and output impedances. Derive the condition (or result) for parallel interconnection of two 2-port networks.	3+7=10
6	a)	Two identical sections of the network shown in figure are cascaded. Calculate the transmission parameters of the resulting network 	7
	b)	Find the short circuit and open circuit impedances of the network shown in figure. 	7
	c)	Find the h- parameters for the following circuit. 	6