



VIT

Vellore Institute of Technology
(Deemed to be University under section 3 of UGC Act, 1956)

Continuous Assessment Test – II – May 2023

: B.Tech (ECE/ECM)	Semester	: Winter 2022-23
: Circuit Theory	Code	: BECE203L
	Slot	: AI+TAI+TAAI
: Dr. Niraj Kumar Dr. Anith Nelleri Dr M.Saranya Nair Dr. Kalaivanan K Prof. Hemavathy S	Class Nbr(s)	: CH2022232300112 CH2022232300113 CH2022232300114 CH2022232300115 CH2022232300119
: 90 Minutes	Max. Marks	: 50

Answer ALL the questions

Question Description

Marks

Determine the branch voltages, currents and the loop equations using equilibrium equations for the network shown in Fig.1 using a tie-set schedule. Consider the branches 1,2,3 and 6 as twigs for the design of the tree. [12]

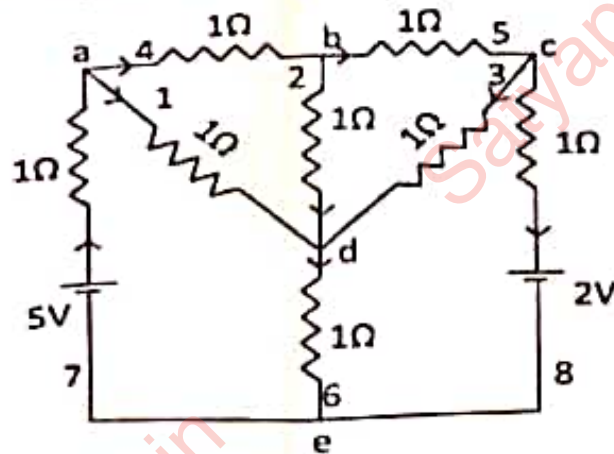
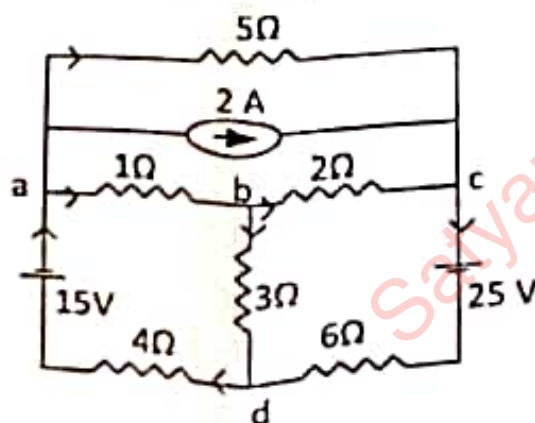


Fig. 1

Draw the oriented graph of the circuit shown in Fig.2. Determine the number of tree, links and incidence matrix. Also draw all the possible trees of the graph. [8]



Calculate the Y-parameters of the two-port network shown in Fig.3.

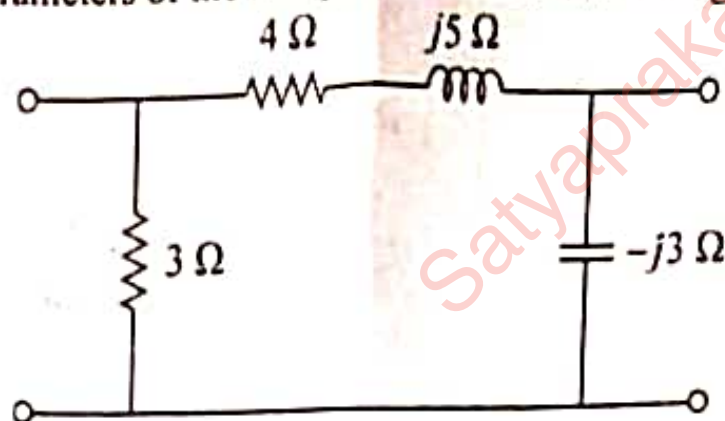


Fig.3

Consider a two-port network as shown in Fig. 4, whose h-parameters are as follows: $h_{11} = 500 \text{ ohm}$, $h_{12} = 1.5 \times 10^{-3}$, $h_{21} = 75$, and $h_{22} = 15 \text{ mS}$. Determine the value of V_2 and I_2 .

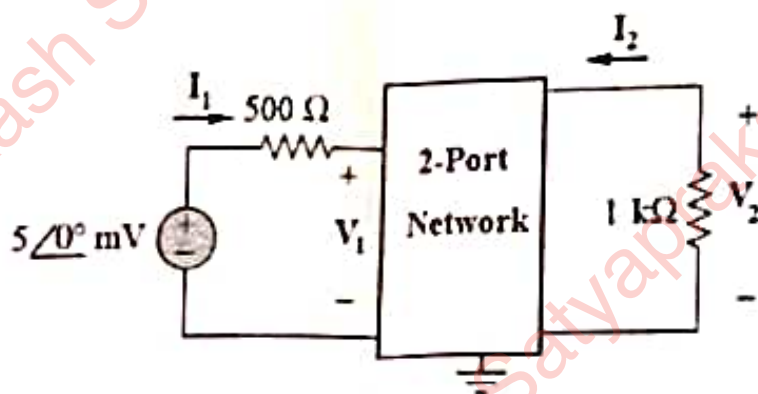


Fig. 4

The two port networks of Fig. 5(a) and Fig. 5(b) are connected in series. Determine the admittance parameters for the series connection by first finding the z parameters of the individual networks.

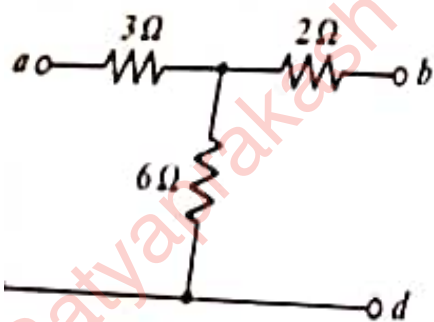


Fig. 5(a)

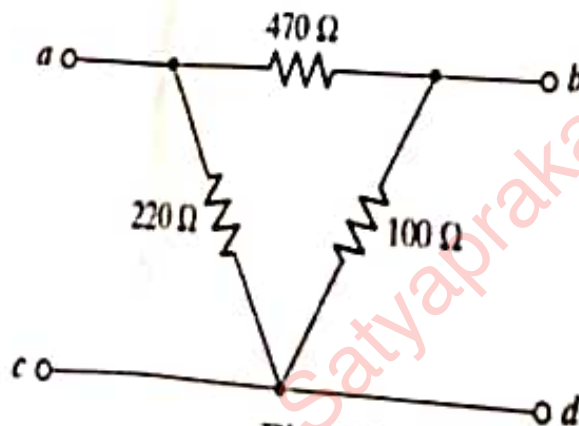


Fig. 5(b)

Total Marks



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Autonomous Institute of Technology and Management, Vellore - 620 015

Continuous Assessment Test – II – May 2023

Programme	B.Tech (ECE)	Semester	Winter 2022-23
Course	Circuit Theory	Code	BECE2031.
Faculty	Dr. ASHISH KUMAR Dr. KRITHIKA ALIAS ANBU DEVI M Prof. SRINIVASAN R Dr. NIRAJ KUMAR Dr. USHA RANI S Dr. SARANYA NAIR M	Slot	A2+TA2+TAA2
Time	90 Minutes	Class Nbr(s)	CH2022232300116 CH2022232300117 CH2022232300118 CH2022232300120 CH2022232300121 CH2022232300122
		Max. Marks	50

Answer ALL the questions

Q.No. Sub.
Sec.

Question Description

Marks

1

Draw the directed graph. Determine and draw the number of all possible trees from the given incidence matrix.

$$\begin{bmatrix} -1 & 0 & 0 & 0 & +1 & 0 & +1 & 0 \\ 0 & -1 & 0 & 0 & 0 & 0 & -1 & +1 \\ 0 & 0 & -1 & -1 & 0 & -1 & 0 & -1 \\ 0 & 0 & 0 & 0 & -1 & +1 & 0 & 0 \\ +1 & +1 & +1 & +1 & 0 & 0 & 0 & 0 \end{bmatrix}$$

[8]

2

For the resistive network shown in Fig.1, write a cut-set schedule and equilibrium equations on voltage basis. Hence obtain values of branch voltages and branch currents.

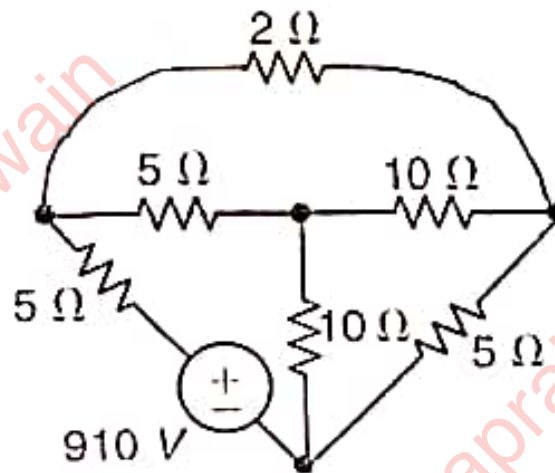
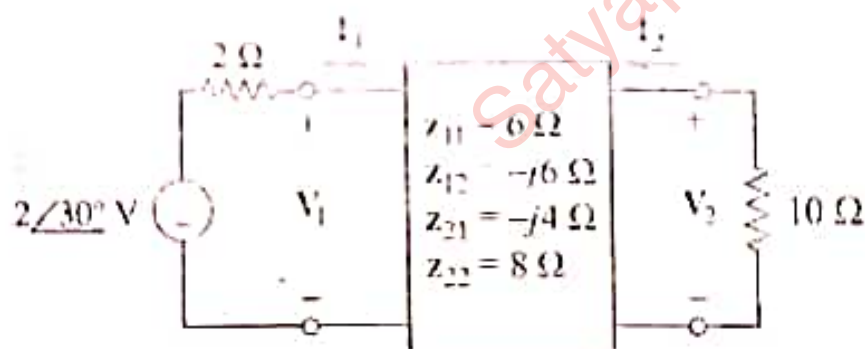


Fig.1

[12]

3

Calculate the incoming currents from port 1 (I_1) and port 2 (I_2) in the circuit of Fig.2.

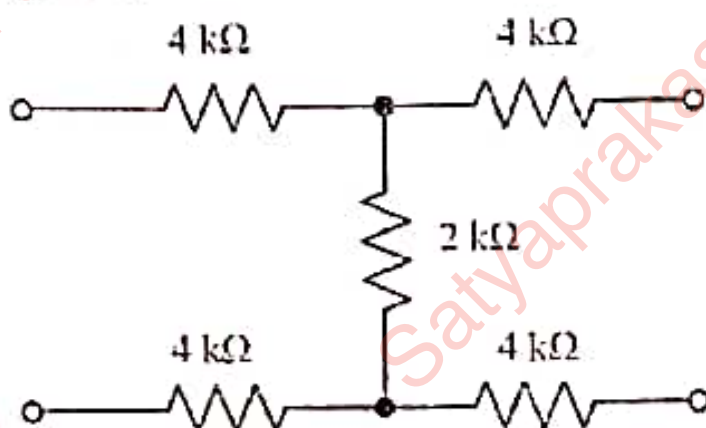


[10]

Fig.2

Consider the two-port network shown in Fig. 3, determine the following.

(i) h_{11} , (ii) h_{12} , (iii) g_{21} , (iv) g_{22}



[10]

Fig. 3

A two-port network with Z-parameters ($Z_{11} = 25\Omega$, $Z_{12} = 20\Omega$, $Z_{21} = 5\Omega$, $Z_{22} = 10\Omega$) is connected in parallel with another network with its Z parameters ($Z_{11} = 50\Omega$, $Z_{12} = 25\Omega$, $Z_{21} = 25\Omega$, $Z_{22} = 30\Omega$). Find the Admittance (Y) parameters of the overall network.

[10]

Total Marks

[50]

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