

EE-225 Network Theory

Tutorial No. 5

Q1. A multi-terminal network has a description

$$\begin{bmatrix} A & B \end{bmatrix} \begin{bmatrix} i \\ p \end{bmatrix} = b$$

What are the constraints on A,B,p ?

Q2. Consider the indefinite admittance matrix below

$$\begin{bmatrix} i_A \\ i_B \end{bmatrix} = \begin{bmatrix} G_{AA} & G_{AB} \\ G_{BA1} & 0 \\ G_{BA2} & G_{AB} \end{bmatrix} \begin{bmatrix} p_A \\ p_B \end{bmatrix}$$

Now suppress B terminals, What is the i_A , p_A description ?

Q3. Find the indefinite admittance matrix for circuit in Fig. 1.

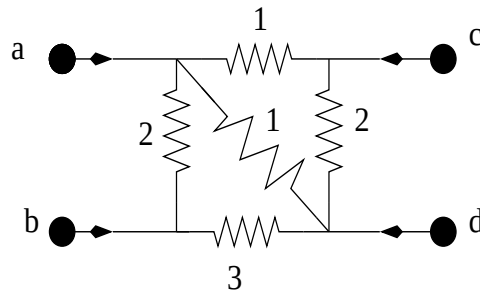


Figure 1:

1. Suppress terminal C.
2. Suppress terminal C and D.
3. Short terminal C and D.

and obtain the new indefinite admittance matrix.

Q4. For the circuit in Fig. 1. find the 3 port admittance matrices corresponding to

1. v_{ab}, v_{ac}, v_{ad}
2. v_{ab}, v_{cb}, v_{db}

3. v_{ad} , v_{cd} , v_{bd}

Hence find the 3 port admittance matrices corresponding to v_{ab} , v_{bc} , v_{cd} .

Q5. Find the indefinite admittance matrix of the circuit in Fig. 2.

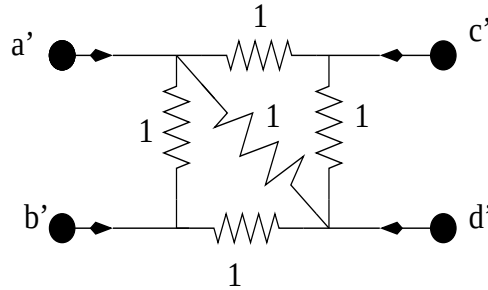


Figure 2:

Now connect the circuits in Fig 1. and Fig 2. in parallel at (a, a') , (b, b') and (c, c') and find the indefinite admittance matrix at nodes (a, a') , (b, b') and (c, c') .