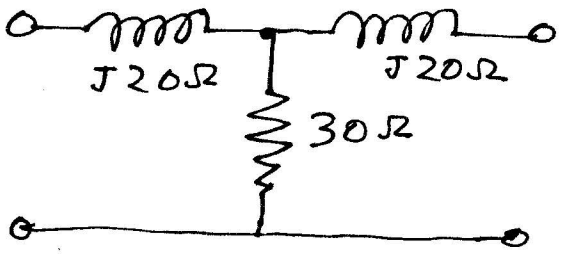
TWO PORT NETWORKS

1) Determine the Z and Y parameters of the network below



Is this network reciprocal? Is this network symmetric?

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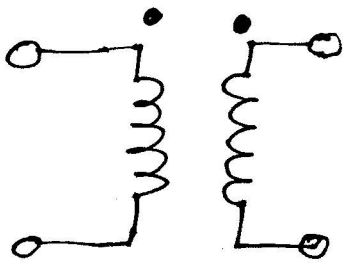
2) Determine the Z and Y parameters of the following network



$L_1 = L_2 = 2H$

$M = 1H$

Is the network reciprocal, symmetric?

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3) Determine the h-parameters with the following data

(i) with output shorted: $V_1 = 25V$, $I_1 = 1A$, $I_2 = 2A$

(ii) with input terminals open-circuited:

$V_1 = 10V$, $V_2 = 50V$, $I_2 = 2A$

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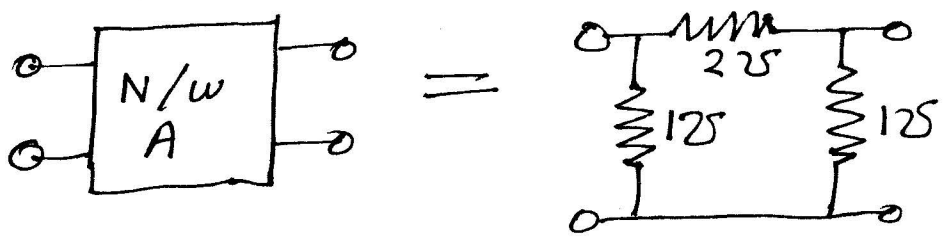
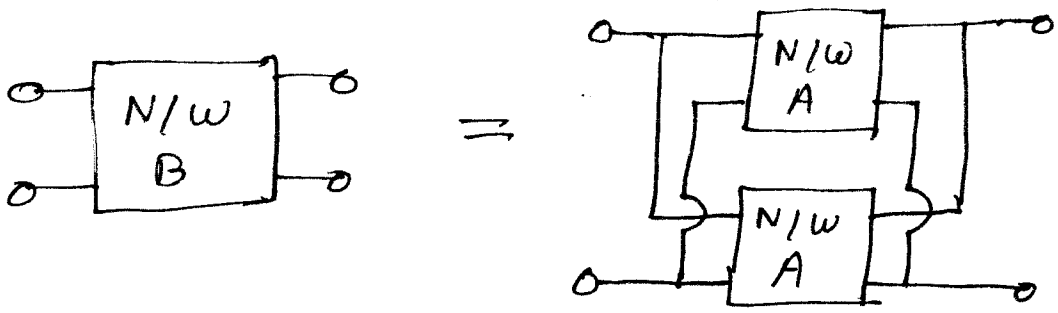
4)





(a) Find the Y- parameters of N/w A

(b) Find the Y- parameters of N/w B

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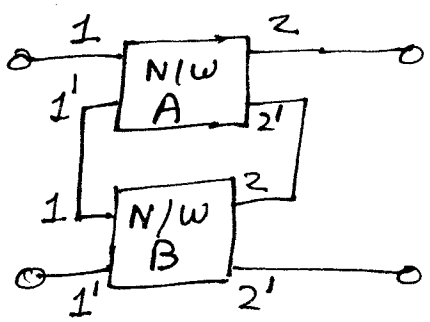
5)



$$Z_{N/wA} = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$$

$$Z_{N/wB} = \begin{bmatrix} 5 & 6 \\ 7 & 8 \end{bmatrix}$$

Fig A

Find the Z -parameters of the combined network in Fig A.

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6) If $Z = \begin{bmatrix} 2 & 1 \\ 3 & 0 \end{bmatrix}$, $h = ?$

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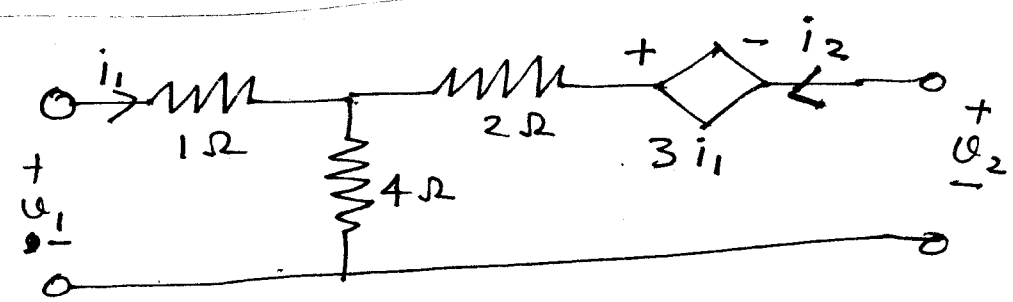
7)

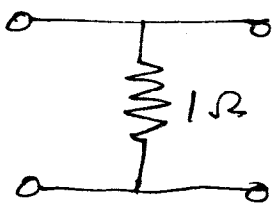


If $\begin{bmatrix} v_2 \\ i_2 \end{bmatrix} = \begin{bmatrix} E & F \\ G & H \end{bmatrix} \begin{bmatrix} v_1 \\ -i_1 \end{bmatrix}$

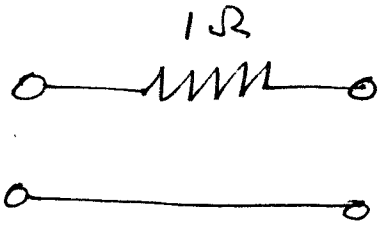
then $E, F, G, H = ?$

9) Determine z, h, y, t parameters of the following network

a)



b)



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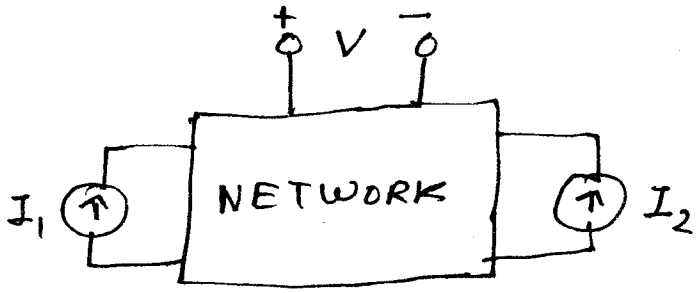
10) The linear network shown in Fig below contains only resistors. If $I_1 = 8A$ and $I_2 = 12A$, V is found to be 80V. However, if $I_1 = -8A$ and $I_2 = 4A$ then $V = 0V$. Find V when $I_1 = I_2 = 20A$



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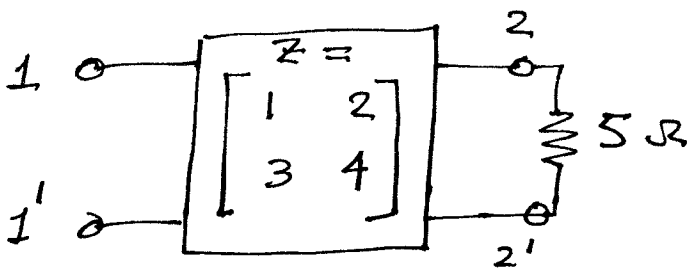
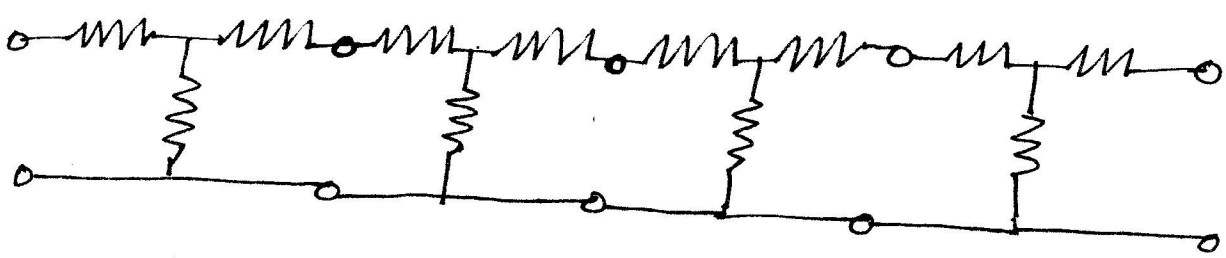
11)



What is the value of driving point impedance of port 1

12)



All resistances are $1\,\Omega$

Find the ABCD parameters of the above network.

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13) Construct a two port network (which can contain dependent sources, but no independent source) such that the h-parameters of the network is given by

$$h = \begin{bmatrix} 1\Omega & .1 \\ 100 & .5\mho \end{bmatrix}$$

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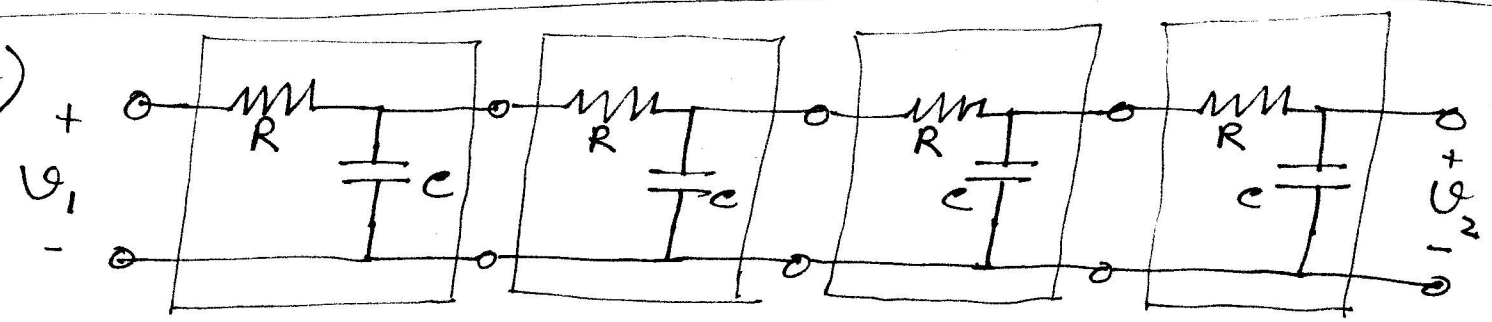
14)



If $v_1 = \cos(\omega t)$

Find $|v_2|$ as a function of ω.
