

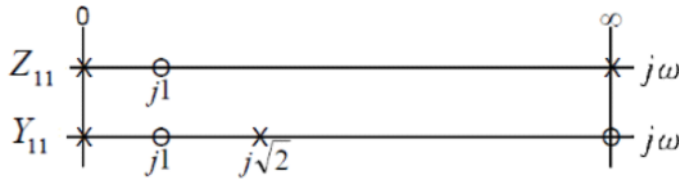
Ejercicio 2

martes, 6 de diciembre de 2022

4:28 p.m.

Ejercicio #2

Sintetice un cuadripolo Lattice simétrico en vacío que cumpla con:



$$Z_{11} = \frac{(\omega^2 + 1)}{\omega}$$

$$Y_{11} = \frac{(\omega^2 + 1)}{\omega(\omega^2 + 2)}$$

LATTICE

$$\begin{cases} Z_A = Z_{11} - Z_{21} \\ Z_B = Z_{11} + Z_{21} \end{cases}$$

Necesito Z_{21}

De la matriz Z

$$Z = \begin{pmatrix} Z_{11} & Z_{12} \\ Z_{21} & Z_{22} \end{pmatrix} \rightarrow \Delta Z = Z_{11} \cdot Z_{22} - Z_{21} \cdot Z_{12}$$

Pero el lattice es PASIVO y SIMETRICO

$$\therefore Z_{11} = Z_{22}^* \wedge Z_{21} = Z_{12}$$

$$\Delta Z = Z_{11}^2 - Z_{21}^2 \quad (1)$$

La relación entre Z e Y para Y_{11} es

$$Y_{11} = \frac{Z_{22}}{\Delta Z} \Rightarrow Y_{11} = \frac{Z_{11}}{\Delta Z} \rightarrow \Delta Z = \frac{Z_{11}}{Y_{11}} \quad (2)$$

(2) \rightarrow (1)

$$\frac{Z_{11}}{Y_{11}} = Z_{11}^2 - Z_{21}^2 \rightarrow Z_{21}^2 = Z_{11}^2 - \frac{Z_{11}}{Y_{11}} = \frac{(\omega^2 + 1)^2}{\omega^2} - \frac{\frac{(\omega^2 + 1)}{\omega}}{\frac{(\omega^2 + 1)}{\omega(\omega^2 + 2)}}$$

$$Z_{21}^2 = \frac{\omega^4 + 2\omega^2 + 1}{\omega^2} - (\omega^2 + 2) = \cancel{\omega^2} + 2 + \frac{1}{\omega^2} - \cancel{\omega^2} - 2 = \frac{1}{\omega^2}$$

$$\therefore Z_{21} = \frac{1}{\omega}$$

$$Z_A = \frac{(\omega^2 + 1)}{\omega} - \frac{1}{\omega} = \omega + \frac{1}{\omega} - \frac{1}{\omega} \rightarrow Z_A = \omega$$



$$Z_B = \frac{(\omega^2 + 1)}{\omega} + \frac{1}{\omega} = \omega + \frac{1}{\omega} + \frac{1}{\omega} \rightarrow Z_B = \omega + \frac{2}{\omega}$$



Circuito Final

