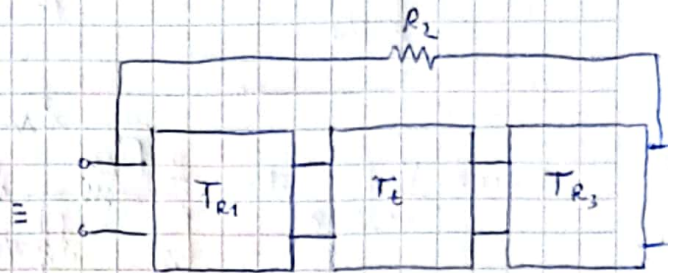
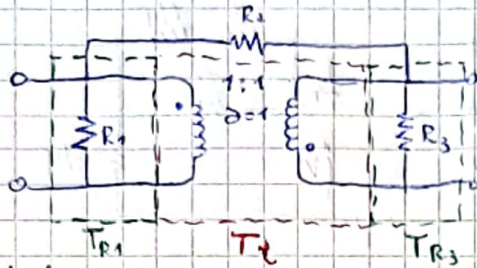


Tarea

# Tarea Semanal #6

## Ejercicio #1:

Calcular parámetros  $z$  de:

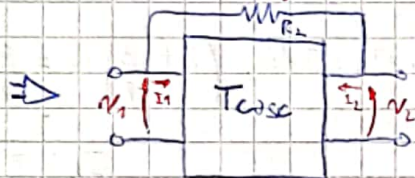


Transformador ideal

$$T_L = \begin{pmatrix} -2 & 0 \\ 0 & -1/2 \end{pmatrix}$$

$$T_{R1} = \begin{pmatrix} 1 & 0 \\ 1/R_1 & 1 \end{pmatrix}$$

$$T_{R3} = \begin{pmatrix} 1 & 0 \\ 1/R_3 & 1 \end{pmatrix}$$



$$T_{Lasc} = T_{R1} \cdot T_L \cdot T_{R3} = \begin{pmatrix} 1 & 0 \\ 1 & 1 \end{pmatrix} \cdot \begin{pmatrix} -1 & 0 \\ 0 & -1 \end{pmatrix} \cdot \begin{pmatrix} 1 & 0 \\ 1/3 & 1 \end{pmatrix} = \begin{pmatrix} -1 & 0 \\ -4/3 & -1 \end{pmatrix}$$

$$\begin{pmatrix} V_1 \\ I_1 \end{pmatrix} = \begin{pmatrix} -1 & 0 \\ -4/3 & -1 \end{pmatrix} \begin{pmatrix} V_2 \\ -I_2 \end{pmatrix} \Rightarrow \begin{cases} V_1 = -V_2 \\ I_1 = -\frac{4}{3} V_2 + I_2 \end{cases}$$

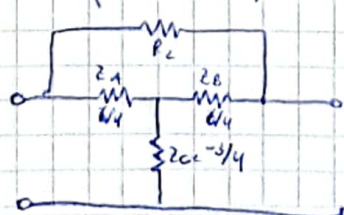
$$T \Rightarrow z : z_{11} = \frac{V_1}{I_1} \Big|_{I_2=0} \Rightarrow I_1 = \frac{4}{3} V_1 + I_2 \Rightarrow z_{11} = \frac{3}{4}$$

$$z_{12} = \frac{V_1}{I_2} \Big|_{I_1=0} \Rightarrow \frac{0}{I_2} = \frac{4}{3} V_1 + I_2 \Rightarrow z_{12} = -\frac{3}{4}$$

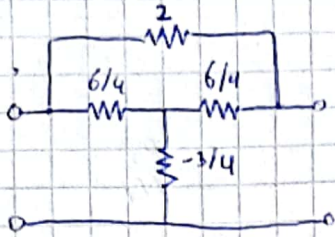
$$z_{21} = \frac{V_2}{I_1} \Big|_{I_2=0} \Rightarrow I_1 = -\frac{4}{3} V_2 + I_2 \Rightarrow z_{21} = -\frac{3}{4}$$

$$z_{22} = \frac{V_2}{I_2} \Big|_{I_1=0} \Rightarrow I_1 = -\frac{4}{3} V_2 + I_2 \Rightarrow z_{22} = \frac{3}{4}$$

$$Z_{Lasc} = \begin{pmatrix} 3/4 & -3/4 \\ -3/4 & 3/4 \end{pmatrix}$$



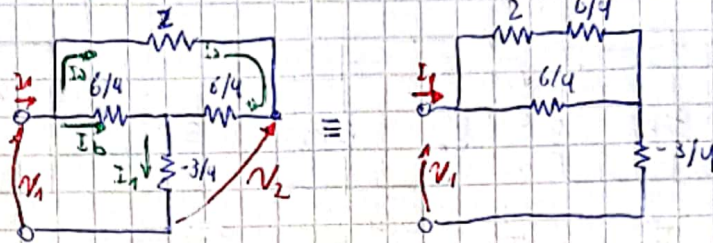
Parámetros  $z$ :



Por simetría sabemos que  $Z_{11} = Z_{22}$

Por pasividad " "  $Z_{12} = Z_{21}$

$$Z_{11} = \frac{V_1}{I_1} \Big|_{I_2=0} \Rightarrow$$



$$Z_{11} = \left[ \left( 2 + \frac{6}{4} \right) \parallel \frac{6}{4} \right] + \left( -\frac{3}{4} \right) = \left( \frac{7}{2} \parallel \frac{3}{2} \right) - \frac{3}{4} = \frac{3,5 \parallel 1,5}{5} - \frac{3}{4} = \frac{3}{4} - \frac{3}{10} = \frac{3}{10}$$

$$Z_{21} = \frac{V_2}{I_1} \Big|_{I_2=0} \Rightarrow V_2 = I_1 \cdot \left( -\frac{3}{4} \right) + I_a \cdot \frac{6}{4} \quad (1) ; I_a + I_b = I_1 \quad (2) ; \left( 2 + \frac{3}{2} \right) I_a = \frac{3}{2} I_b$$

$$I_b = \frac{7}{3} I_a \quad (3)$$

de (3) en (2):  $I_a + \frac{7}{3} I_a = I_1$

$$I_a = \frac{3}{10} I_1 \quad (4)$$

de (4) en (1):  $V_2 = -\frac{3}{4} I_1 + \frac{3}{2} \cdot \frac{3}{10} I_1 \Rightarrow \frac{V_2}{I_1} = -\frac{3}{10}$

$$Z_z = \begin{pmatrix} 3/10 & -3/10 \\ -3/10 & 3/10 \end{pmatrix}$$