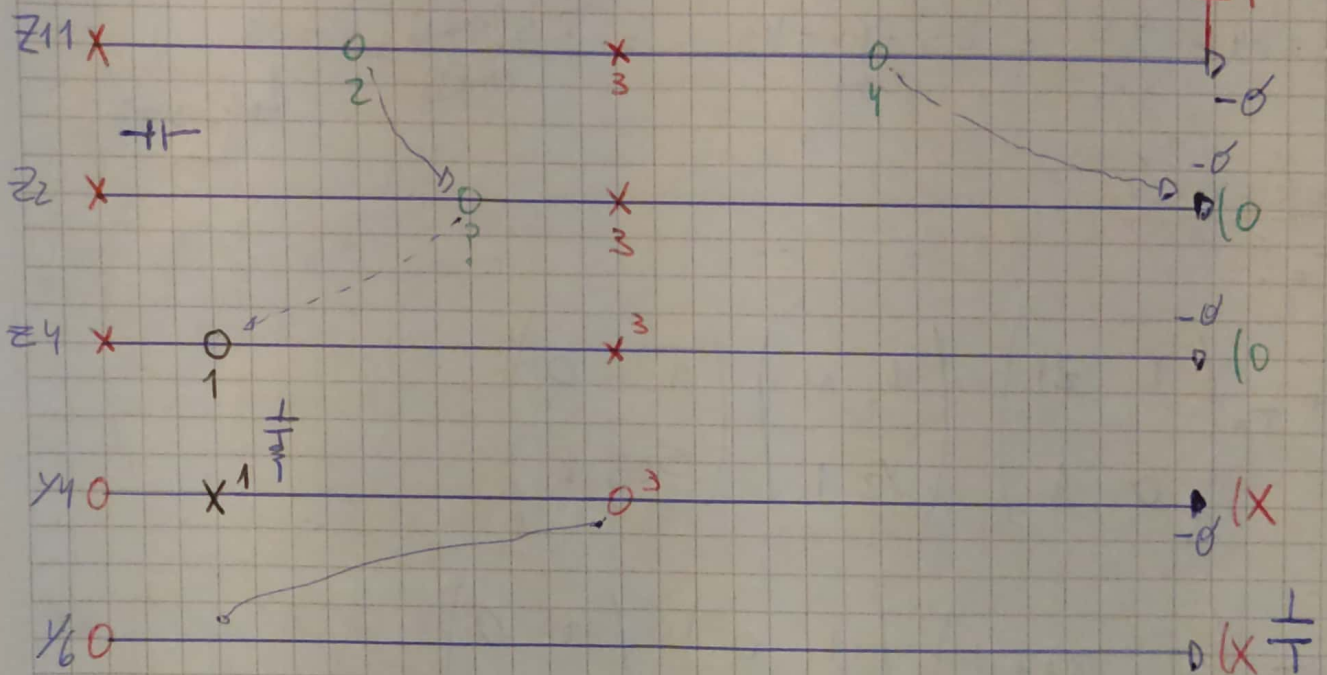
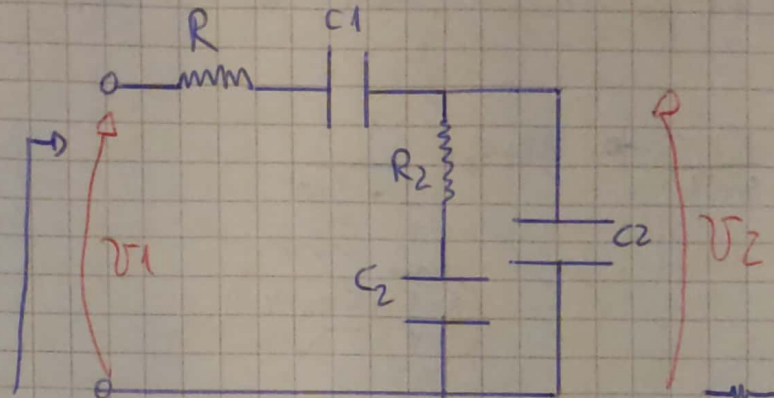


2) a)

$$T = \left. \frac{V_2}{V_1} \right|_{I_2=0} = K \cdot \frac{(s+1)}{(s+2)(s+4)} = \frac{Z_{21}}{Z_{11}} = -\frac{Y_{21}}{Y_{22}}$$

$$Z_{11} = \frac{(s+2)(s+4)}{(s+3)s}$$

$$Z_{21} = \frac{K(s+1)}{s(s+3)}$$



b)

$$Z_{11} = \frac{(s+2)(s+4)}{s(s+3)} ; Z_{22} = Z_{11} - \frac{1}{R_1} = Z_{22} = \frac{s^2 + 6s + 8 - s^2 - 3s}{s(s+3)}$$

$$Z_{22} = \frac{3s+8}{s(s+3)} = \frac{3(s+8/3)}{s(s+3)} ; Z_{44} = Z_{22} - \frac{s}{2} = \frac{3(s+8/3)}{s(s+3)} - \frac{s}{2}$$

$$K_0 = \left[ s \cdot \frac{3(s+8/3)}{s(s+3)} \right]_{s=0} = \frac{3}{2} \rightarrow X_{C1} = \frac{3}{2} \cdot \frac{1}{s} \rightarrow C1 = \frac{2}{3}$$

$$Z_4 = \frac{6s+16-ss-15}{2s(s+3)} = \frac{s+1}{2s(s+3)}$$

$$Y_4 = \frac{Z_4(s+3)}{s+1} \quad ; \quad K_1 = \lim_{s \rightarrow -1} \frac{(s+1)}{s} \cdot \frac{2s(s+3)}{s+1} \Rightarrow K_1 = 4$$

$$Z_{R_2 C_2} = \frac{K_1 s}{s+1} \Rightarrow Z_{R_2 C_2} = \frac{1}{\frac{1}{4} + \frac{1}{4}s^{-1}}$$

$\underbrace{\frac{1}{4}}_{R = \frac{1}{2} \cdot \frac{1}{4}} \quad \underbrace{\frac{1}{4}}_{C_2 = 4}$

$$Y_6 = Y_4 - \frac{4s}{s+1} = \frac{2s^2+6s-4s}{s+1} = \frac{2s(s+1)}{(s+1)} = 2s \quad \hookrightarrow C_3 = 2$$

VERIFICACIÓN

$T = ?$

$$\hookrightarrow T = \begin{pmatrix} 1 & Z_1 \\ 0 & 1 \end{pmatrix} \begin{pmatrix} 1 & 0 \\ Y_2 & 1 \end{pmatrix} \begin{pmatrix} 1 & 0 \\ SC_3 & 1 \end{pmatrix}$$

$$T = \begin{pmatrix} 1 & R_1 + \frac{1}{SC_1} \\ 0 & 1 \end{pmatrix} \begin{pmatrix} 1 & 0 \\ \frac{1}{R_2 + \frac{1}{SC_2}} & 1 \end{pmatrix} \begin{pmatrix} 1 & 0 \\ SC_3 & 1 \end{pmatrix}$$

$$T = \begin{pmatrix} 1 + \left(R_1 + \frac{1}{SC_1}\right) \left(\frac{SC_3 + 1}{SC_2}\right)^{-1} & R_1 + 1/SC_1 \\ \frac{1}{R_2 + \frac{1}{SC_2}} & 1 \end{pmatrix} \begin{pmatrix} 1 & 0 \\ SC_3 & 1 \end{pmatrix}$$



$$T = \begin{pmatrix} 1 + \frac{4s}{s+1} & \frac{\frac{2}{s} \cdot s + 1}{s \cdot \frac{2}{s}} & \frac{\frac{2}{s} s + 1}{s \cdot \frac{2}{s}} \\ \dots & 1 \end{pmatrix} \begin{pmatrix} 1 & 0 \\ s \cdot 2 & 1 \end{pmatrix}$$

$$T = \begin{pmatrix} 1 + \frac{4s}{s+1} & \frac{s + s/2}{s} & \frac{s + s/2}{s} \\ \dots & 1 \end{pmatrix} \begin{pmatrix} 1 & 0 \\ s \cdot 2 & 1 \end{pmatrix}$$

$$T = \begin{pmatrix} \frac{2s^2 + 11s + 8}{s(s+1)} & \frac{s + s/2}{s} \\ \dots & 1 \end{pmatrix} \begin{pmatrix} 1 & 0 \\ s \cdot 2 & 1 \end{pmatrix}$$

$$T(s) \rightarrow A^{-1} \rightarrow A = \frac{v_1}{v_2} \Big|_{I_2=0}$$

$$T = \begin{pmatrix} \frac{2s^2 + 11s + 8}{s(s+1)} + 2(s + s/2) & \dots \\ \dots & 1 \end{pmatrix}$$

$$T(s) = \left( \frac{s^2 + 11s + 2s^2 + 5s + s^2 + 5}{s+1} \right)^{-1}$$

$$K = 1/2$$

$$T(s) = \frac{s+1}{2(s^2 + 6s + 8)}$$

$$\Rightarrow T(s) = \frac{\left(\frac{1}{2}\right)^K (s+1)}{(s+2)(s+4)}$$

# CIRCUITO FINAL

