Método Cauer I (Remueve Polos en HF)

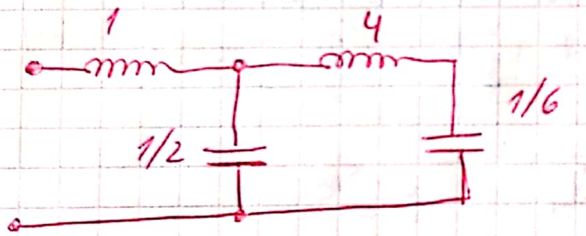
$$Z(s) = \frac{(s^2+3)(s^2+1)}{s(s^2+2)} = \frac{s^4+4s^2+3}{s^3+2s}$$

$$\begin{array}{l|l} s^4+4s^2+3 & s^3+2s \\ s^4+2s^2 & s \quad 1 \end{array}$$

$$\begin{array}{l|l} s^3+2s & 2s^2+3 \\ s^3+3/2\,s & s/2 \quad 1/2 \end{array}$$

$$\begin{array}{l|l} 2s^2+3 & 1/2\,s \\ 2s^2 & 4s \quad 4 \end{array}$$

$$\begin{array}{l|l} 1/2\,s & 3 \\ 0/ & \frac{s}{6} \quad 1/6 \end{array}$$



Método Cauer II (Remueve Polos en LF)

$$Z(s) = \frac{s^4+4s^2+3}{s^3+2s} \Rightarrow$$

$$\begin{array}{l|l} 3+4s^2+s^4 & 2s+s^3 \\ -3+\frac{3}{2}s & \underbrace{3/2(s)^{-1}}_{Z} \quad 2/3 \end{array}$$

$$\begin{array}{l|l} 2s+s^3 & 5/2\,s^2+s^4 \\ 2s+4/5\,s & \underbrace{4/5 \; 1/s}_{Y} \quad 5/4 \end{array}$$

$$\begin{array}{l|l} 5/2\,s^2+s^4 & 1/5\,s^3 \\ 5/2\,s^2 & \underbrace{\frac{25}{2}\,\frac{1}{s}}_{Z} \quad 2/25 \end{array}$$

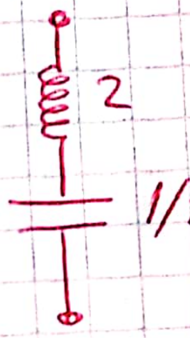
$$\begin{array}{l} \lfloor s^4 \\ \underbrace{1/5\,s}_{Y} \quad 5 \end{array}$$

Método Foster II (Síntesis de Adm)

$$Y(s) = \frac{s(s^2+2)}{(s^2+1)(s^2+3)} \rightarrow \frac{2k_1 s}{s^2+1} + \frac{2k_2 s}{s^2+3}$$

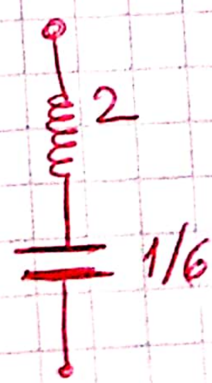
$$2k_1 = \lim_{s^2 \to -1} \frac{Y(s)}{s} \cdot (s^2+1) \Rightarrow \left. \frac{(s^2+2)}{(s^2+3)} \right|_{s^2=-1} = 1/2$$

$$\frac{2k_1 s}{s^2+1} \Rightarrow \frac{1}{\underbrace{\frac{s}{2k_1}}_{L} + \underbrace{\frac{1}{2k_1 s}}_{C}} \Rightarrow$$



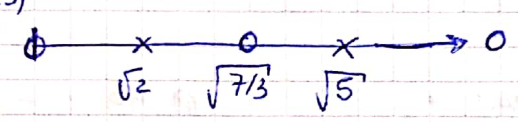
$$2k_2 = \lim_{s^2 \to -3} \frac{Y(s)}{s} (s^2+3) \Rightarrow \left. \frac{(s^2+2)}{(s^2+1)} \right|_{s^2=-3} = 1/2$$

$$\frac{2k_2 s}{s^2+3} = \frac{1}{\underbrace{\frac{s}{2k_2}}_{L} + \underbrace{\frac{3}{2k_2 s}}_{C}} \Rightarrow$$

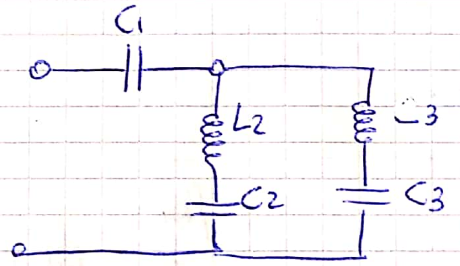


$$Y(s) = \frac{3s\left(s^2+7/3\right)}{\left(s^2+2\right)\left(s^2+5\right)}$$

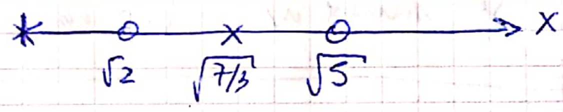
Y(s)



Dado el diseño del circuito; y considerando que el conjunto serie L_2C_2 resuena en $W_0 = 1$ r/seg



y dado el eje de $Z(s)$



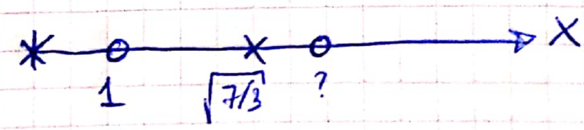
Busco realizar una remoción parcial del polo en cero; con intención de situar el cero $\sqrt{2}$ en 1.

Remoción parcial polo en cero:

$$k_0 = \lim_{s \to -1} \frac{Z(s)}{s} = \frac{(1)(4)}{(-1+7/3)\,3} = 1$$

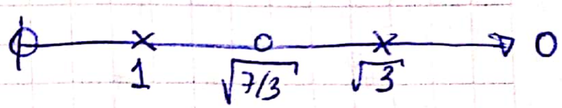
Remueve de $Z(s)$ $\frac{k_0}{s}$

$$Z_2(s) - \frac{1}{s} = \frac{s^4+4s^2+3}{3s^3+7s}$$ $\Rightarrow$ Cero situado en 1



Restan calculos dos imitancias, en derivación → Admitancias

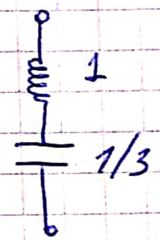
$$Y_2(s) = \frac{3s^3+7s}{s^4+4s^2+3} = \frac{s(3s^2+7)}{(s^2+1)(s^2+3)}$$

$Y(s)$


Remuevo el polo en $\sqrt{3}$

$$2k_2 = \lim_{s^2 \to -3} \frac{(s^2+3)}{s} \cdot Y_2(s) = \frac{-(2)}{-(2)} = 1$$

$$\frac{2k_2 s}{s^2+\omega_p^2} = \frac{1}{\frac{s}{2k_2}+\frac{\omega_p^2}{2k_2 s}} = \frac{1}{\frac{s}{1}+\frac{3}{s}} \equiv$$



$$\cancel{Y_3(s) = Y_2(s) - \frac{2k_2 s}{s^2+\omega_p^2} - \frac{1/3\, s}{1/3\, s^2+1}} =$$

$$Y_3(s) = Y_2(s) - \frac{s}{(s^2+3)} = \frac{2s}{s^2+1} \equiv$$