

TP6

$$\Omega z = 1,2 \text{ k}\Omega$$

$$\Omega w = 650 \text{ krad/s}$$

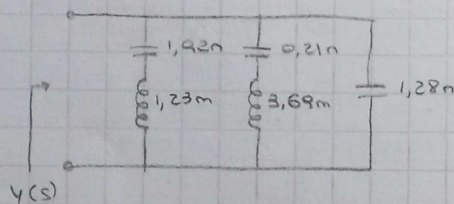
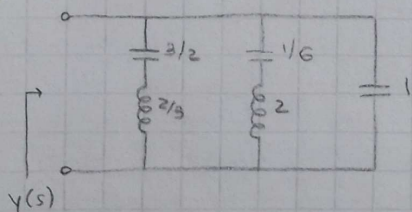
2)  $Y(s) = \frac{s(s^2+2)(s^2+4)}{(s^2+1)(s^2+3)} = \frac{k_0}{s} + \frac{2k_1 s}{s^2+1} + \frac{2k_2 s}{s^2+3} + k_{\infty} \cdot s \rightarrow \text{Foster derivation}$

$$k_0 = \lim_{s \rightarrow 0} s Y(s) = \lim_{s \rightarrow 0} \frac{s^2(s^2+2)(s^2+4)}{(s^2+1)(s^2+3)} = 0$$

$$2k_1 = \lim_{s^2 \rightarrow -1} \frac{(s^2+1)}{s} Y(s) = \lim_{s^2 \rightarrow -1} \frac{(s^2+1)s(s^2+2)(s^2+4)}{(s^2+1)(s^2+3)} = \frac{1 \cdot 3}{2} = \frac{3}{2}$$

$$2k_2 = \lim_{s^2 \rightarrow -3} \frac{(s^2+3)}{s} Y(s) = \lim_{s^2 \rightarrow -3} \frac{(s^2+3)s(s^2+2)(s^2+4)}{(s^2+1)(s^2+3)} = \frac{-1 \cdot 1}{-2} = \frac{1}{2}$$

$$k_{\infty} = \lim_{s \rightarrow \infty} \frac{Y(s)}{s} = \lim_{s \rightarrow \infty} \frac{s(s^2+2)(s^2+4)}{s(s^2+1)(s^2+3)} = 1$$



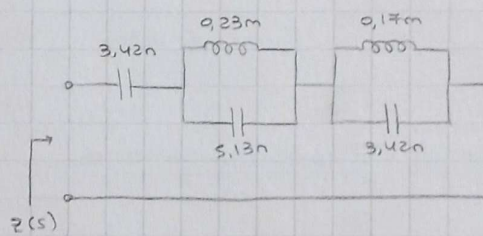
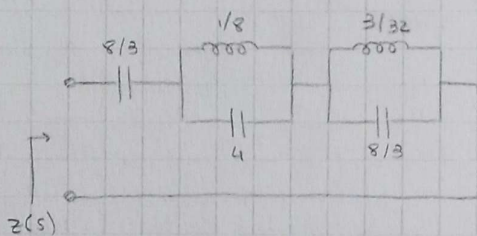
$$Z(s) = \frac{(s^2+1)(s^2+3)}{s(s^2+2)(s^2+4)} = \frac{k_0}{s} + \frac{2k_1 s}{s^2+2} + \frac{2k_2 s}{s^2+4} + k_{\infty} s \rightarrow \text{Foster serie}$$

$$k_0 = \lim_{s \rightarrow 0} \frac{s(s^2+1)(s^2+3)}{s(s^2+2)(s^2+4)} = \frac{1 \cdot 3}{2 \cdot 4} = \frac{3}{8}$$

$$2k_1 = \lim_{s^2 \rightarrow -2} \frac{(s^2+2)}{s} \frac{(s^2+1)(s^2+3)}{s(s^2+2)(s^2+4)} = \frac{-1 \cdot 1}{-2 \cdot 2} = \frac{1}{4}$$

$$2k_2 = \lim_{s^2 \rightarrow -4} \frac{(s^2+4)}{s} \frac{(s^2+1)(s^2+3)}{s(s^2+2)(s^2+4)} = \frac{-3 \cdot (-1)}{-4 \cdot (-2)} = \frac{3}{8}$$

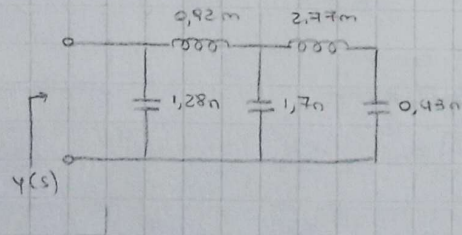
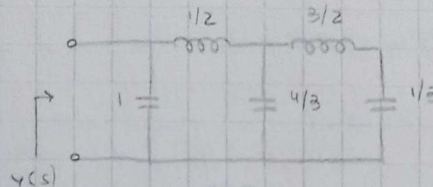
$$k_{\infty} = \lim_{s \rightarrow \infty} \frac{(s^2+1)(s^2+3)}{s^2(s^2+2)(s^2+4)} = 0$$



$$Y(s) = \frac{s^5 + 6s^3 + 8s}{s^4 + 4s^2 + 3}$$

Cajer 1 → Remuevo polo en  $\infty$

$$\begin{array}{r} s^5 + 6s^3 + 8s \quad | \quad s^4 + 4s^2 + 3 \\ - s^4 + 4s^2 + 3s \quad | \quad s \\ \hline 2s^3 + 5s \quad | \quad 3/2 s^2 + 3 \\ - 2s^3 + 4s \quad | \quad 4/3 s \\ \hline 3/2 s^2 + 3 \quad | \quad s \\ - 3/2 s^2 \quad | \quad 3/2 s \\ \hline s \quad | \quad 3 \\ - s \quad | \quad 1/3 s \\ \hline 0 \end{array}$$



$$Z(s) = \frac{s^4 + 4s^2 + 3}{s^5 + 6s^3 + 8s} \rightarrow \text{unlevo la impedancia porque necesito un polo en cero.}$$

Cajer 2 → Remuevo polo en cero.

$$\begin{array}{r} 3 + 4s^2 + s^4 \quad | \quad 8s + 6s^3 + s^5 \\ - 3 + 9/4 s^2 + 3/8 s^4 \quad | \quad 3/8 \quad 1/s \\ \hline 8s + 6s^3 + s^5 \quad | \quad 7/4 s^2 + 5/8 s^4 \\ - 8s + 20/7 s^3 \quad | \quad 32/7 \cdot 1/s \\ \hline 7/4 s^2 + 5/8 s^4 \quad | \quad 22/7 s^3 + s^5 \\ - 7/4 s^2 + 49/32 s^4 \quad | \quad 49/32 \quad 1/s \\ \hline 22/7 s^3 + s^5 \quad | \quad 3/44 s^4 \\ - 22/7 s^3 \quad | \quad 968/21 \cdot 1/s \\ \hline 3/44 s^4 \quad | \quad s^5 \\ - 3/44 s^4 \quad | \quad 3/44 \cdot 1/s \\ \hline 0 \end{array}$$

