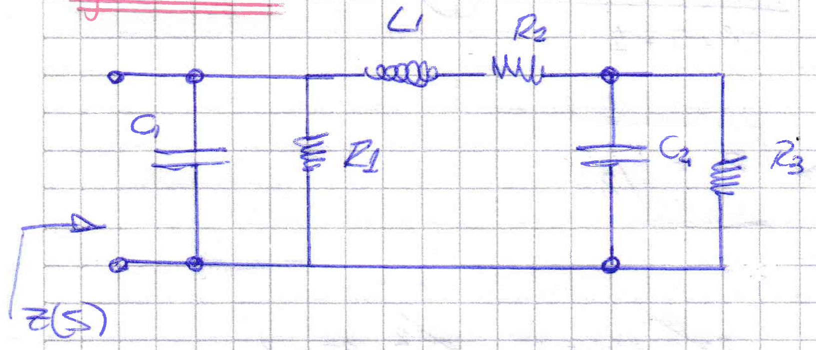
HOJA Nº

FECHA

EJERCICIO Nº2



$$Z(s) = \frac{s^2+s+1}{(s^2+2s+5)(s+1)} = \frac{s^2+s+1}{s^3+3s^2+7s+5}$$

$$Z(0) = 1/5 \quad y \quad Z(\infty) = 0$$

Aplico Cauer y remuevo en ∞:

$$Y(s) = \frac{s^3+3s^2+7s+5}{s^2+s+1}$$

$$Y_2(s) = Y(s) - K_{\infty_1} . s$$

$$K_{\infty_1} = \lim_{s\to\infty} \frac{Y(s)}{s} = \lim_{s\to\infty} \frac{s^3+3s^2+7s+5}{s^3+s^2+s} = 1$$

$$K_{\infty}.1.s = \left(Y(s) \right) = s.C \Rightarrow \boxed{C = 1}$$

$$Y_2(s) = Y(s) - K_{\infty_1}.s = \frac{s^3+3s^2+7s+5}{s^2+s+1} - s$$

$$Y_2(s) = \frac{\cancel{s^3}+3s^2+7s+5-\cancel{s^3}-s^2-s}{s^2+s+1} = \frac{2s^2+6s+5}{s^2+s+1}$$

NOTA

$Y_3(s) = Y_2(s) - K_{\infty_2}$.

$$K_{\infty_2} = \lim_{s \to \infty} Y_2(s) = \lim_{s \to \infty} \frac{2s^2+6s+5}{s^2+s+1} = 2$$

$$K_{\infty_2} \equiv \{Y(s)\} = \frac{1}{R_1} = 2 \Rightarrow \boxed{R_1 = 1/2}$$

$$Y_3(s) = \frac{2s^2+6s+5}{s^2+s+1} - 2 = \frac{\cancel{2s^2}+6s+5-\cancel{2s^2}-2s-2}{s^2+s+1}$$

$$Y_3(s) = \frac{4s+3}{s^2+s+1}$$

$$Z_3(s) = \frac{s^2+s+1}{4s+3}$$

$$Z_4(s) = Z_3(s) - K_{\infty_3} . s$$

$$K_{\infty_3} = \lim_{s \to \infty} \frac{Z_3(s)}{s} = \lim_{s \to \infty} \frac{s^2+s+1}{4s^2+3s} = \frac{1}{4}$$

$$K_{\infty_3} . s \equiv \{Z(s)\} = \frac{1}{4}.s \rightarrow \boxed{L_1 = \frac{1}{4}}$$

$$Z_4(s) = \frac{s^2+s+1}{4s+3} - \frac{1}{4}.s = \frac{s^2+s+1 - \left(s+\frac{3}{4}\right).s}{4s+3}$$

$$Z_4(s) = \frac{\cancel{s^2}+s+1-\cancel{s^2}-3/4\,s}{4s+3} = \frac{1/4.s+1}{4s+3}$$

$$Z_5(s) = Z_4(s) - K_{\infty_4}$$

NOTA

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$$K_{\infty 4} = \lim_{s \to \infty} Z_4(s) = \lim_{s \to \infty} \frac{1/4 s + 1}{4s+3} = \frac{\frac{1}{4}}{4} = \frac{1}{16}$$

$$K_{\infty 4} = \{Z(s)\} = \boxed{R_2 = \frac{1}{16}}$$

$$Z_5(s) = \frac{1/4 . s + 1}{4s+3} - \frac{1}{16}$$

$$Z_5(s) = \frac{\cancel{\frac{1}{4} s} + 1 - \cancel{\frac{1}{4} . s} - 3/16}{4s+3} = \frac{13/16}{4s+3}$$

$$Y_5(s) = \frac{4s+3}{13/16}$$

$$Y_6(s) = Y_5(s) - K_{\infty 5} . s$$

$$K_{\infty 5} = \lim_{s \to \infty} \frac{Y_5(s)}{s} = \lim_{s \to \infty} \frac{4s+3}{\frac{13}{16} . s} = \frac{64}{13}$$

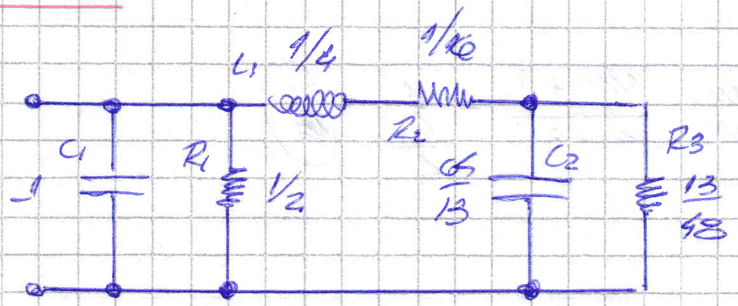
$$K_{\infty 5} . s = \{Y(s)\} = \frac{64}{13} . s \Rightarrow \boxed{C_2 = \frac{64}{13}}$$

$$Y_6(s) = \frac{4s+3}{\left(\frac{13}{16}\right)} - \frac{64}{13} . s = \frac{\cancel{4s} + 3 - \cancel{4s}}{\left(\frac{13}{16}\right)} = \frac{3}{\frac{13}{16}} = \frac{48}{13}$$

$$\frac{1}{R_3} = \frac{48}{13} \Rightarrow \boxed{R_3 = \frac{13}{48}}$$

NOTA

Finalmente:



NOTA