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

Foster. Serie

$$\boxed{k_0} = \lim_{s\to 0} s\,Z(s) = \lim_{s\to 0} \frac{(s^2+1)(s^2+3)}{\cancel{s}(s^2+2)(s^2+4)}\cdot\cancel{s} = \frac{1\cdot 3}{2\cdot 4} = \boxed{\frac{3}{8}}$$

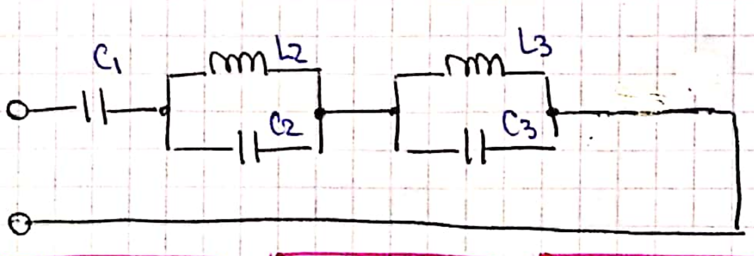
$$2k_1 = \lim_{s^2\to -2} \frac{s^2+2}{s} Z(s) = \lim_{s^2\to -2} \frac{\cancel{s^2+2}}{s}\cdot\frac{(s^2+1)(s^2+3)}{\cancel{(s^2+2)}(s^2+4)\,s} = \lim_{s^2\to -2} \frac{(s^2+1)(s^2+3)}{s^2(s^2+4)}$$

$$\boxed{2k_1} = \frac{(-2+1)(-2+3)}{-2(-2+4)} = \frac{(-1)(1)}{(-2)(2)} = \boxed{\frac{1}{4}}$$

$$2k_2 = \lim_{s^2\to -4} \frac{s^2+4}{s} Z(s) = \lim_{s^2\to -4} \frac{\cancel{s^2+4}}{s}\cdot\frac{(s^2+1)(s^2+3)}{(s^2+2)\cancel{(s^2+4)}\,s} = \lim_{s^2\to -4} \frac{(s^2+1)(s^2+3)}{s^2(s^2+2)}$$

$$\boxed{2k_2} = \frac{(-4+1)(-4+3)}{(-4)(-4+2)} = \frac{(-3)(-1)}{(-4)(-2)} = \boxed{\frac{3}{8}}$$

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




para altos

$$\boxed{C_1 = \frac{1}{k_0} = \frac{8}{3}} \quad \boxed{C_2 = \frac{1}{2k_1} = 4} \quad \boxed{C_3 = \frac{1}{2k_2} = \frac{8}{3}}$$

$$\boxed{L_2 = \frac{2k_1}{\omega_1^2} = \frac{1}{4}\cdot\frac{1}{2} = \frac{1}{8}} \quad \boxed{L_3 = \frac{2k_2}{\omega_2^2} = \frac{3}{8}\cdot\frac{1}{4} = \frac{3}{32}}$$

NOTA

~~Foster Paralelo~~ ~~El Foster Paralelo se puede obtener~~

~~$k_\infty = \lim_{s\to\infty} sY(s)$~~

## Foster Paralelo

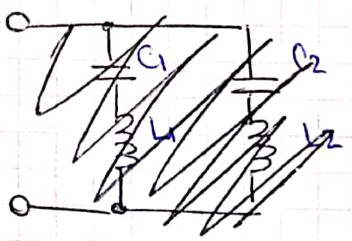
$$2k_1 = \lim_{s^2\to -1} \frac{\cancel{s}(s^2+2)(s^2+4)}{\cancel{(s^2+1)}(s^2+3)} \cdot \frac{\cancel{s^2+1}}{\cancel{s}} = \lim_{s^2\to -1} \frac{(s^2+2)(s^2+4)}{(s^2+3)} = \frac{(-1+2)(-1+4)}{(-1+3)}$$

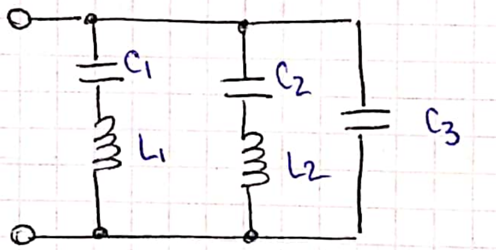
$$\boxed{2k_1 = \frac{(1)(3)}{2} = \frac{3}{2}}$$

$$2k_2 = \lim_{s^2\to -3} \frac{\cancel{s^2+3}}{\cancel{s}} \frac{\cancel{s}(s^2+2)(s^2+4)}{(s^2+1)\cancel{(s^2+3)}} = \lim_{s^2\to -3} \frac{(s^2+2)(s^2+4)}{(s^2+1)} = \frac{(-3+2)(-3+4)}{(-3+1)}$$

$$\boxed{2k_2 = \frac{(-1)(1)}{(-2)} = \frac{1}{2}}$$

$$\boxed{k_\infty = \lim_{s\to\infty} \frac{Y(s)}{s} = \frac{\cancel{s}(s^2+2)(s^2+4)}{\cancel{s}(s^2+1)(s^2+3)} = 1.}$$




paralelos

$$\boxed{C_1 = \frac{2k_1}{w_1^2} = \frac{3}{2}\cdot\frac{1}{1} = \frac{3}{2}} \qquad \boxed{L_1 = \frac{1}{2k_1} = \frac{2}{3}}$$

$$\boxed{C_2 = \frac{2k_2}{w_2^2} = \frac{1}{2}\cdot\frac{1}{3} = \frac{1}{6}} \qquad \boxed{L_2 = \frac{1}{2k_2} = 2}$$

$$\boxed{C_3 = k_\infty = 1}$$

✓

## CAUER II

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

$3+4s^2+s^4$ | $8s+6s^3+s^5$

$-\;3+\frac{9}{4}s^2+\frac{3}{8}s^4$ → $\frac{3}{8}\,\frac{1}{s}$

$\frac{7}{4}s^2+\frac{5}{8}s^4$

$8s+6s^3+s^5$ | $\frac{7}{4}s^2+\frac{5}{8}s^4$

$-\;8s+\frac{20}{7}s^3$ → $\frac{32}{45}\,\frac{1}{s}$

$\frac{7}{4}s^2+\frac{5}{8}s^4$ | $\frac{22}{7}s^3+s^5$

$-\;\frac{7}{4}s^2+\frac{49}{88}s^4$ → $\frac{49}{685}\,\frac{1}{s}$

$\frac{22}{7}s^3+s^5$ | $\frac{3}{44}s^4$

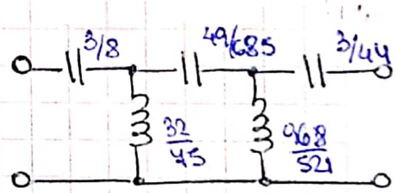
$-\;\frac{22}{7}s^3$ → $\frac{968}{521}\,\frac{1}{s}$

$\frac{3}{44}s^4$ | $s^5$

$-\;\frac{3}{44}s^4$ → $\frac{3}{44}\,\frac{1}{s}$

$0$

pasa altos




## CAUER I

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

$s^5+6s^3+8s$ | $s^4+4s^2+3$

$-\;s^5+4s^3+3s$ → $s$

$s^4+4s^2+3$ | $2s^3+5s$

$-\;s^4+\frac{5}{2}s^2$ → $\frac{1}{2}s$

$2s^3+5s$ | $\frac{3}{2}s^2+3$

$-\;2s^3+4s$ → $\frac{4}{3}s$

$\frac{3}{2}s^2+3$ | $s$

$-\;\frac{3}{2}s^2$ → $\frac{3}{2}s$

$s$ | $3$

$-\;s$ → $\frac{1}{3}s$

$0$

pasa bajos