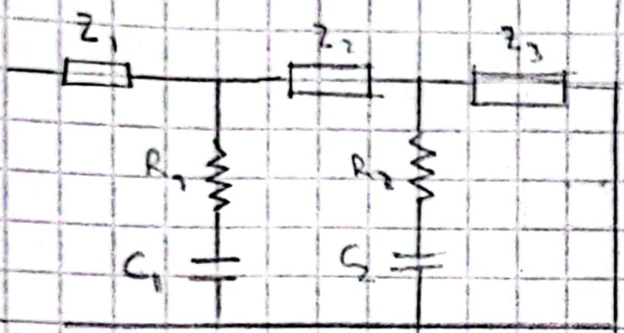
TS11

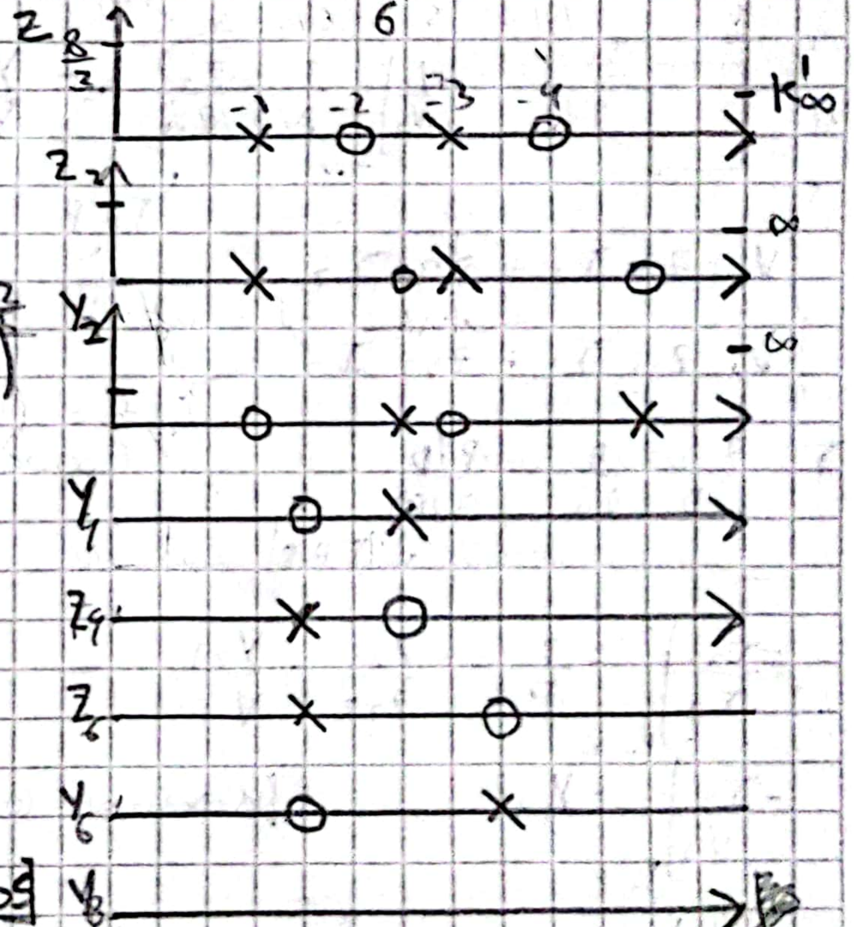


$R_1 C_1 = \frac{1}{6}$ $\qquad R_2 C_2 = \frac{2}{7}$

Cauer Para escalera

$$Z = \frac{s^2+6s+8}{s^2+4s+3} = \frac{(s+2)(s+4)}{(s+1)(s+3)}$$

En inf tiende a 1: $k_\infty = 1$, Busco Resonancia en $\frac{1}{6}$



$$Z_2(s=-6) = 0 : Z - k'_\infty = 0$$

$$k'_\infty = \frac{(-6+2)(-6+4)}{(-6+1)(-6+3)} = \frac{8}{15}$$

$$Z_2 = Z - \frac{8}{15} = \frac{s^2+6s+8}{s^2+4s+3} - \frac{8}{15} = \frac{\frac{7}{15}s^2 - \frac{58}{15}s + \frac{32}{15}}{15(s^2+4s+3)}$$

$$\lim_{s\to -6} \frac{(s+1)(s+3)15}{(s+6)(s+\frac{16}{7})7} \frac{s+6}{s} = \frac{75}{52}$$

$$Y_4 = \frac{(s^2+4s+3)15}{(s+6)(s+\frac{16}{7})7} - \frac{75}{52}\cdot\frac{s}{s+6}$$

$$Y_4 = \frac{780(s^2+4s+3) - 75\cdot s\cdot 7(s+16/7)}{(s+6)(s+\frac{16}{7})\cdot 7\cdot 52}$$

$$Y_4 = \frac{75\,[52s^2+208s+156-35s^2-80s]}{364\,(s+6)(s+\frac{16}{7})}$$

$$Y_4 = \frac{75}{364}\,\frac{77s^2+328s+156}{(s+6)\left(s+\frac{26}{7}\right)} = \frac{255}{364}\,\frac{\left(s+\frac{39}{77}\right)}{s+\frac{26}{7}}\,\frac{\cancel{(s+6)}}{\cancel{s+6}}$$

Barrer polo en $\frac{2}{7}$

$$Z_4\left(s=-\frac{7}{2}\right) = 0 = Z_4 - k_2' = 0 \rightarrow k_2 = \frac{364}{255}\,\frac{-\frac{7}{2}+\frac{39}{77}}{-\frac{7}{2}+\frac{26}{7}} = \frac{884}{1005}$$

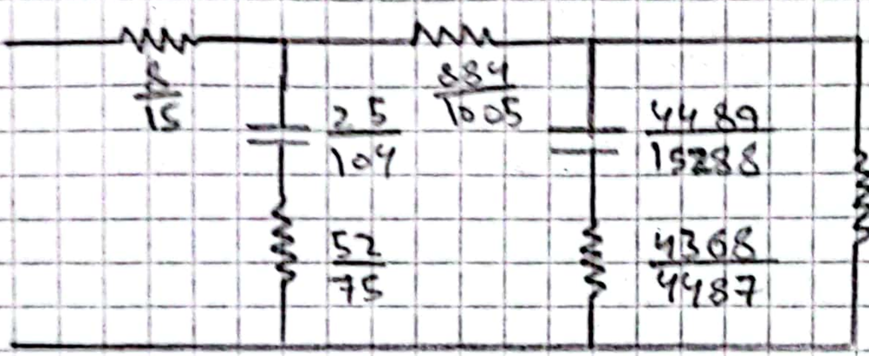
$$Z_6 = \frac{364s+832}{255s+390} - \frac{884}{1005} = \frac{\frac{2360}{67}s + \frac{32760}{67}}{1005 \cdot 255\left(s+\frac{26}{17}\right)}$$

$$Z_6 = \frac{7 \cdot 4680\,(2s+7)}{67 \cdot 1005 \cdot 255\,(17s+26)} = \frac{312}{67}\,\frac{(2s+7)}{(17s+26)}$$

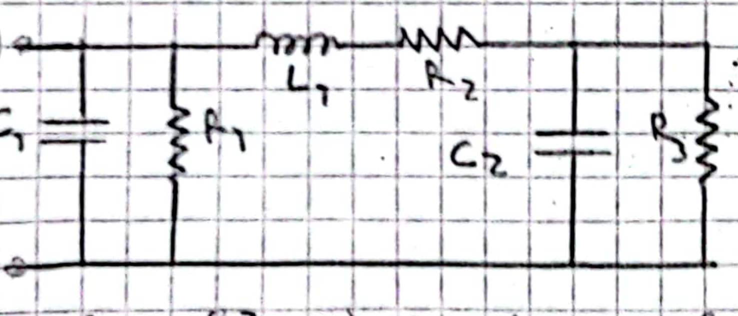
$$\lim_{s\to -\frac{7}{2}} \frac{67}{624}\,\frac{(17s+26)}{\cancel{\left(s+\frac{7}{2}\right)}}\,\frac{\cancel{s+7/2}}{s} = \frac{4489}{4368}$$

$$Y_8 = \frac{67\,(17s+26)}{624\left(s+\frac{7}{2}\right)} - \frac{4489}{4368}\,\frac{s}{s+\frac{7}{2}} = \frac{(1139s+1742)\,7 - 4489s}{7 \cdot 624\left(s+\frac{7}{2}\right)}$$

$$Y_8 = \frac{3484s+12194}{624\left(s+\frac{7}{2}\right)\cdot 7} = \frac{1742\,\cancel{(2s+7)}}{312 \cdot 7\,\cancel{(2s+7)}} = \frac{67}{84}$$



2)



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

C_1 Representa polo en ∞

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

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

Solo puedo remover esta

Menor admitancia $\lim_{s\to\infty} \frac{2s^2+6s+5}{s^2+s+1} = 2$; $\lim_{s\to 0} \frac{2s^2+6s+5}{s^2+s+1} = 5$

$$Y_4 = \frac{2s^2+6s+5}{s^2+s+1} - 2 = \frac{4s+3}{s^2+s+1} \rightarrow Z_4 = \frac{s^2+s+1}{4s+3}$$

$$K_{L_1} = \lim_{s\to\infty} \frac{s^2+s+1}{4s+3}\,\frac{1}{s} = \frac{s^2+s+1}{4s^2+3s} = \frac{1}{4}$$

$$Z_6 = \frac{s^2+s+1}{4s+3} - \frac{1}{4}s = \frac{\frac{1}{4}s+1}{4s+3}$$

Menor impedancia $\lim_{s\to 0} \frac{\frac{1}{4}s+1}{4s+3} = \frac{1}{3}$ $\qquad \lim_{s\to\infty} \frac{\frac{1}{4}s+1}{4s+3} = \frac{1}{16}$

$$Z_8 = \frac{s+4}{16s+12} - \frac{1}{16} = \frac{16s+64-16s-12}{(16s+12)\cdot 16} = \frac{52}{(16s+12)16} = \frac{13}{16(4s+3)}$$

$$K_{C_1} = \lim_{s\to\infty} \frac{16(4s+3)}{13}\,\frac{1}{s} = \frac{64}{13}$$

$$Y_{10} = \frac{16(4s+3)}{13} - \frac{64}{13}s = \frac{3\cdot 16}{13} = \frac{48}{13}$$