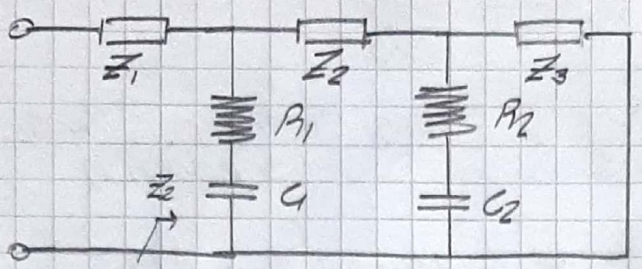
HOJA Nº

FECHA

T5 10 : Funciones de excitación disipativas

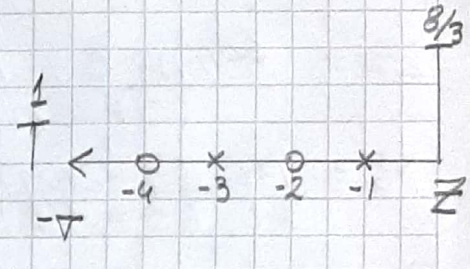
1)



$R_1 C_1 = 1/6$

$R_2 C_2 = 2/7$

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



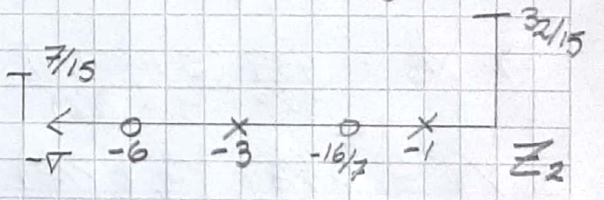
$$Z_2 = Z - Z_1\Big|_{s=-6} = 0 \Rightarrow 0 = \frac{(-2)(-4)}{(-5)(-3)} - Z_1$$

$$Z_1 = 8/15$$

$$Z_2 = \frac{s^2+6s+8 - 8/15\,(s^2+4s+3)}{s^2+4s+3} = \frac{7/15\,s^2 + 58/15\,s + 32/5}{s^2+4s+3}$$

$$Z_2 = 7/15\,\frac{(s^2 + 58/7\,s + 96/7)}{s^2+4s+3}$$

$$Z_2 = 7/15\,\frac{(s+16/7)(s+6)}{(s+1)(s+3)}$$



$$Y_2 = \frac{15}{7}\,\frac{(s+1)(s+3)}{(s+16/7)(s+6)} \longrightarrow$$ Remuevo el polo en 6 que corresponde al tanque serie 1

$$Y_4 = Y_2 - \frac{s\,K_1}{s+6}$$

$$K_1 = \lim_{s\to -6} Y_2 \cdot \frac{(s+6)}{s} = \frac{15}{7}\,\frac{(-5)(-3)}{(-2\,4/7)(-6)}$$

$$K_1 = 75/52$$

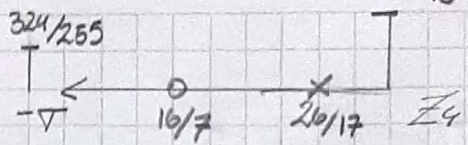
$$Y_4 = \frac{15/7\,(s^2+4s+3) - 75/52\,s\,(s+16/7)}{s^2+4s+3}$$

$$Y_4 = \frac{255/364\,s^2 + 480/91\,s + 45/7}{(s+16/7)(s+6)} = \frac{255/364\,(s^2 + 128/17\,s + 150/17)}{(s+16/7)(s+6)}$$

$$Y_4 = 255/364\,\frac{(s+26/17)\cancel{(s+6)}}{(s+16/7)\cancel{(s+6)}}$$

NOTA

$$Z_4 = \frac{364}{255}\,\frac{(5+16/7)}{(5+26/17)}$$



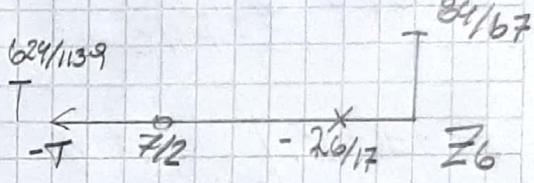
$$Z_6\Big|_{5=-7/2} = Z_4 - Z_2 = 0 \Rightarrow \frac{364}{255}\,\frac{(-17/14)}{-67/34} - Z_2 = 0$$

$$\Rightarrow Z_2 = \frac{884}{1005}$$

$$Z_6 = \frac{364}{255}\,\frac{(5+16/7)}{(5+26/17)} - \frac{884}{1005} = \frac{364/255\,(5+16/7) - 884/1005\,(5+26/17)}{(5+26/17)}$$

$$Z_6 = \frac{624/1139\,5 + 1,9175}{(5+26/17)} = \frac{624/1139\,(5+7/2)}{(5+26/17)}$$

$$Y_6 = \frac{1139}{624}\,\frac{(5+26/17)}{(5+7/2)}$$



$$Y_8 = Y_6 - \frac{5R_2}{5+7/2} \rightarrow \text{remuevo el polo en } 7/2 \text{ que corresponde al tanque serie 2}$$

$$R_2 = \lim_{5\to -7/2} Y_6 \cdot \frac{(5+7/2)}{5} = \frac{1139}{624}\,\frac{(-67/34)}{-7/2} = \frac{4489}{4368}$$

$$\Rightarrow Y_8 = \frac{1139}{624}\,\frac{(5+26/17)}{(5+7/2)} - \frac{5\,\frac{4489}{4368}}{5+7/2} = \frac{67/84\,5 + 67/24}{5+7/2}$$

$$Y_8 = 67/84\,\frac{(5+7/2)}{5+7/2} \Rightarrow Y_8 = \frac{1}{Z_3} = \frac{67}{84}$$

$$\circ Z_1 = 0,533\,\Omega \;;\; \circ Z_2 = 0,880\,\Omega \;;\; \circ Z_3 = 1,254\,\Omega$$

$$Y_3 = \frac{5R_1}{5+T_1} = \frac{1}{\left(\frac{1}{R_1} + \frac{T_1}{R_1 5}\right)_Z} \Rightarrow \begin{cases} R_1 = \frac{1}{R_1} = 0,693\,\Omega \\ C_1 = R_1/6 = 0,240\,F \end{cases}$$

$$\begin{cases} R_2 = Y_{R_2} = 0,973\,\Omega \\ C_2 = R_2/7/2 = 0,294\,F \end{cases}$$

NOTA