KALENDAE

MANAGEME
THAT YOU
NEED

D
D/S

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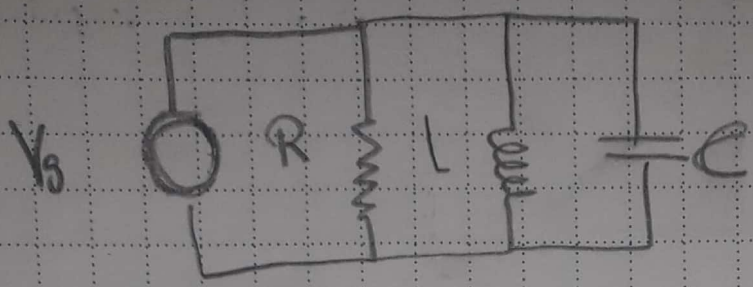
RA: 18.00477-6



$R = 4 + 1 = 5$

$L = 7 + 1 = 8$

$C = 7 + 1 = 8$

1.

$$i_R + i_L + i_C = i_g(t)$$

$$\boxed{\frac{V(t)}{R} + \frac{1}{L}\int V(t)\,dt + C\frac{dv}{dt} = i_g(t)}$$

2

$$G(s) = \frac{V(s)}{i(s)} = Z(s) = \frac{R\left(\frac{SL \cdot \frac{1}{SC}}{SL + 1/SC}\right)}{R + \left(\frac{SL \cdot \frac{1}{SC}}{SL + 1/SC}\right)}$$

Pela análise da tabela 3.2

$$\frac{R\left(\frac{L}{CSL + \frac{1}{S}}\right)}{R + \left(\frac{L}{CSL + \frac{1}{S}}\right)} = \frac{RL}{RCSL + \frac{R}{S} + L} = \frac{R}{CSR + \frac{R}{LS} + 1}$$

S T Q Q S S D
L/M M/T M/W J/T V/F S/S D/S

3. Como dito na aula do dia 16/4

$Z(j\omega) \rightarrow R \Rightarrow R$

$Z(j\omega) \rightarrow C \Rightarrow \frac{1}{j\omega C}$

$Z(j\omega) \rightarrow L \rightarrow Lj\omega$

$$G(j\omega) = \frac{V(j\omega)}{I(j\omega)} = Z(j\omega) = \frac{R}{Cj\omega R + \frac{R}{Lj\omega} + 1}$$

$$= \frac{5}{40j\omega + \frac{5}{8j\omega} + 1}$$

Z+

S	T	Q	Q	S	S	D
L/M	M/T	M/W	J/T	V/F	S/S	D/S

4. $G(z) = G(s)\Big|_{s=\frac{2}{T}\left(\frac{1-z^{-1}}{1+z^{-1}}\right)}$

transformada bilinear

$$G(z) = \frac{R}{\frac{2RC}{T}\left(\frac{1-z^{-1}}{1+z^{-1}}\right) + \frac{RT}{2L\left(\frac{1-z^{-1}}{1+z^{-1}}\right)} + 1}$$

$$G(z) = \frac{R}{\frac{2RC - 2RCz^{-1}}{T + Tz^{-1}} + \frac{T^2R - 2Lz^{-1}RT}{2L + 2Lz^{-1}} + 1}$$

$T_s = 12$

$R = 5$

$C = 8$

$L = 8$

$$\frac{5}{\frac{80 - 80z}{12 + z} + \frac{960 - 960z}{1 + z} + 1}$$

$$G(z) = \frac{5\left((80 - 80z)(1+z) + (960 - 960z)(12+z)\right)^{*}}{(12+z)(1+z)}$$

$^{*} + (z+1)(12+z)$

Resposta em Freq:

$$G(s) = \frac{5}{40s + \frac{5}{8s} + 1}$$

$$40s + \frac{5}{8s} + 1 = 0$$

não possui 0

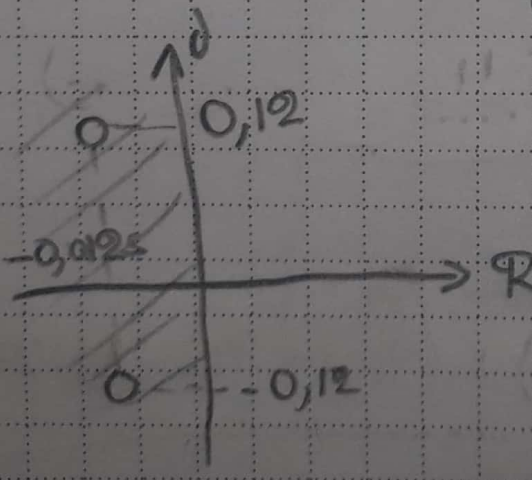
$$40s + \frac{5}{8s} = -1$$

$$5 = -8s - 320s^2$$

$$0 = -5 - 8s - 320s^2$$

polos ⇒ $p1 = -0,0125 - 0,12j$

$p2 = -0,0125 + 0,12j$

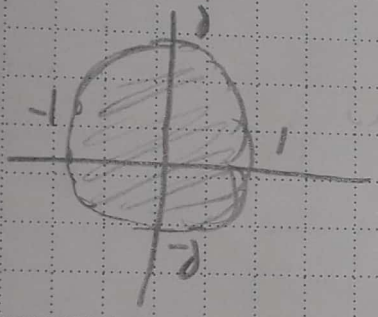


→ É um sistema estável

$$G(z) = \frac{5((80-80z)(1+z)+(960-960z)(12+z))+(z+1)(z+1)}{(12+z)(1+z)}$$

polos → $z_1 = -12$

$z_2 = -1$

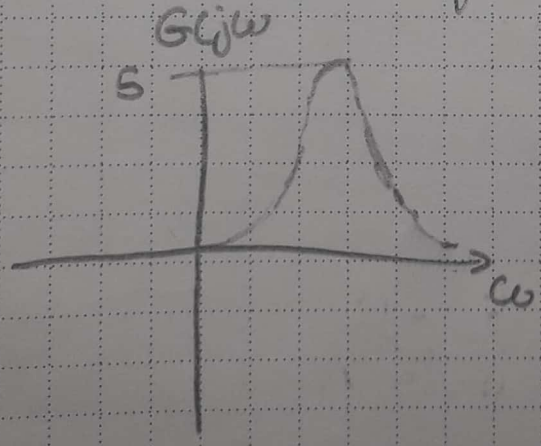


P/ z_2 :

sistema estavel

2.

$$G(j\omega) = \frac{5}{4(j\omega)^2 + \frac{5}{8}j\omega + 1}$$



→ filtro passa alta

S T Q Q S S D
L/M M/T M/W J/T V/F S/S D/S

NEED

Resposta ao degrau

$$G(s) = \frac{40s}{320s^2 + 8s + 5} \qquad \varepsilon(t) = \frac{1}{s}$$

$$\varepsilon(t).G(s) = \frac{40s}{(320s^2 + 8s + 5)s}$$

$$= \frac{40}{320s^2 + 8s + 5}$$

os pólos são

$$p_1 = -0{,}0125 + 0{,}12j$$

$$p_2 = -0{,}0125 - 0{,}12j$$

$$A = -B$$

$$= 40\left[\frac{A}{s + p_1} + \frac{B}{s + p_2}\right] \qquad p_1^* = p_1$$

$$A = \lim_{s \to p_1^*} \frac{(s + 0{,}0125 - 0{,}12j)}{(s + 0{,}0125 + 0{,}12j)(s + 0{,}0125 - 0{,}12j)}$$

$$A = \lim_{s \to p_1} \frac{1}{(s + 0{,}0125 + 0{,}12j)} = \frac{1}{-0{,}0125 + 0{,}0125 + 0{,}12j + 0{,}12j}$$

$$A = \frac{1}{0{,}24j} \qquad B = -\frac{1}{0{,}24j}$$

$$G(t) = \frac{40\,\varepsilon(t)}{0{,}24j}\left[e^{-(0{,}0125+0{,}12j)t} - e^{-(0{,}0125-0{,}12j)t}\right]$$

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$$G(j\omega)\cdot E(\omega) = \left(\frac{40j\omega}{320(j\omega)^2 + 8j\omega + 5}\right)\frac{1}{j\omega}$$

$$G(t) = 40\,F^{-1}\left\{\frac{1}{320(j\omega)^2 + 8j\omega + 5}\right\} =$$

$$\frac{40}{0{,}24j}\,\theta(t)\left[e^{-(0{,}0125+0{,}12j)t} - e^{-(0{,}0125-0{,}12j)t}\right]$$

//

$$G(z) = 5\,\frac{((80-80z)(z+1) + (920-920z)(z+1) + (z+1)(z+12))}{(z+1)(z+12)}$$

$$E(z)G(z) = G(z)\cdot\left(\frac{-1s}{2}\right)\left(\frac{(3+z)}{(1-z)}\right)$$

$$G(t) = -\frac{100}{3}\cdot 1^t\,(13.12^t + 276)\,(1-\theta(-1)) - 4995\,\theta(-1)$$