TP - Semanal - 3

1) Datos:

$\alpha_{max}[dB] = 1 \qquad f_p = 1500hz$

$\alpha_{min}[dB] = 12 \qquad f_s = 3000hz$

(1) $|T(j\omega)|^2 = \frac{1}{1 + \omega^{2n}\varepsilon^2}$

$\varepsilon^2 = 10^{\frac{\alpha_{max}}{10}} - 1 = 0.2589$

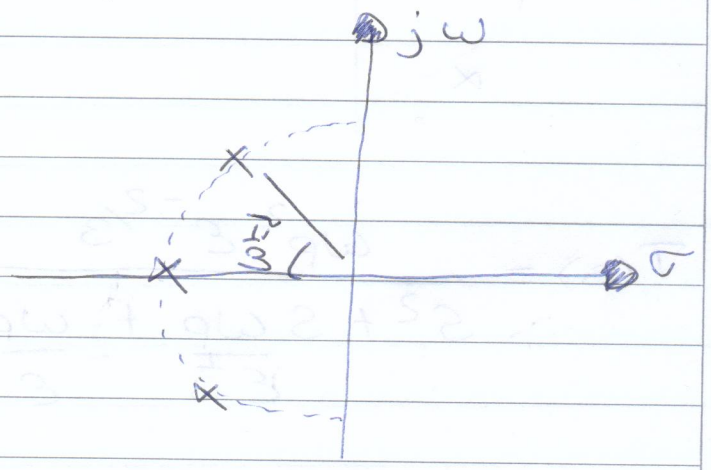
$\varepsilon = 0.5088$

$\alpha_{min} = 10 \log(1 + \varepsilon^2 \phi^{2n})$

$\phi = \frac{\omega}{\omega_p} \rightarrow \phi_s = \frac{\omega_s}{\omega_p}$

$n_{min} = 3$

~~Ya Listo~~



$T'(s) = \frac{1}{(s+1)} \cdot \frac{1}{s^2 + s2\omega\frac{\pi}{3} + 1}$

$\frac{\pi}{3}$

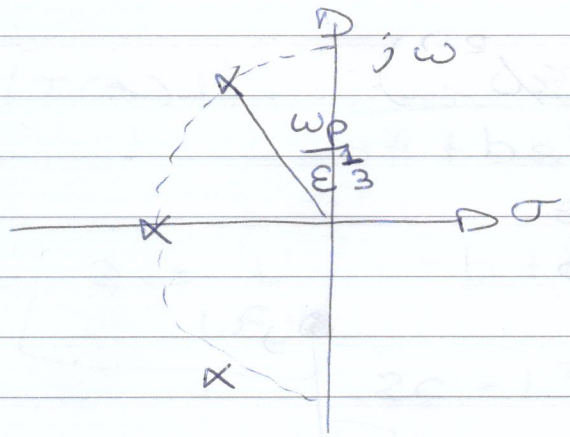
1

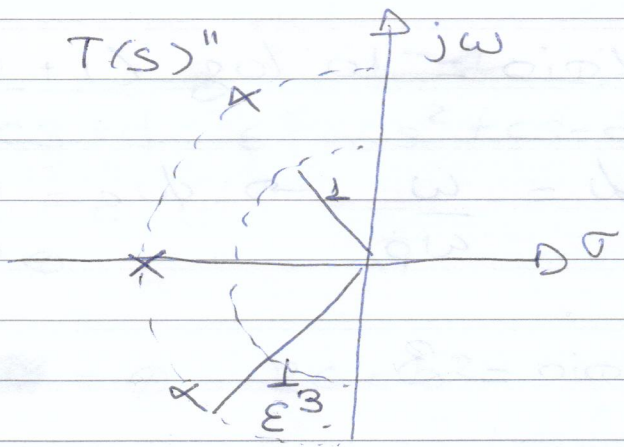
$$T(s)'' = \frac{1}{\varepsilon^{\frac{1}{3}} s + 1} \circ \frac{1}{\varepsilon^{\frac{2}{3}} s^2 + \varepsilon^{\frac{1}{3}} s + 1}$$

$$T(s)'' = \frac{\varepsilon^{-2/3}}{\left(s^2 + s\varepsilon^{-\frac{1}{3}} + \varepsilon^{-\frac{2}{3}}\right)\left(\varepsilon^{-\frac{1}{3}} s + \varepsilon^{-\frac{2}{3}}\right)}$$

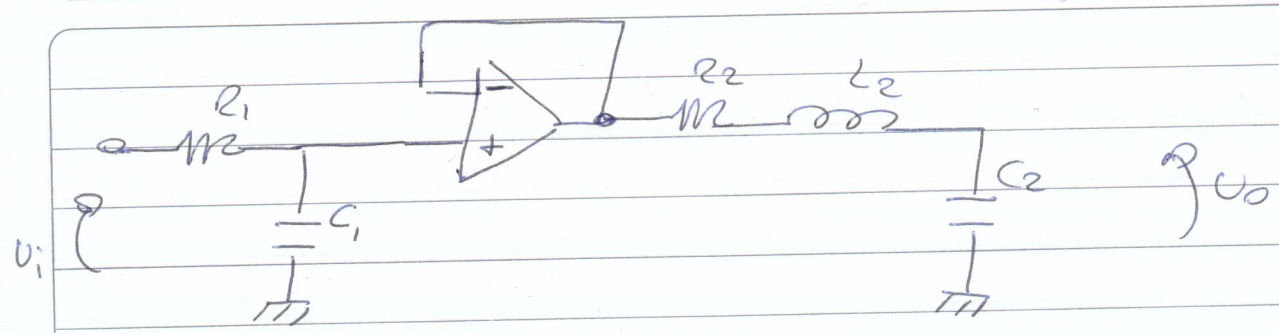
$$T(s)'' = \frac{\varepsilon^{-\frac{1}{3}}}{\left(s + \varepsilon^{-\frac{1}{3}}\right)\left(s^2 + s\varepsilon^{-\frac{1}{3}} + \varepsilon^{-\frac{2}{3}}\right)}$$

$$T(s)'' = \frac{\varepsilon^{-\frac{2}{3}}}{\left(s^2 + s\varepsilon^{-\frac{1}{3}} + \varepsilon^{-\frac{2}{3}}\right)} \cdot \frac{\varepsilon^{-\frac{1}{3}}}{\left(s + \varepsilon^{-\frac{1}{3}}\right)}$$





$$T(s) = \frac{\omega_p^2 \varepsilon^{-2/3}}{s^2 + s\frac{\omega_p}{\varepsilon^{\frac{1}{3}}} + \frac{\omega_p^2}{\varepsilon^{2/3}}} \circ \frac{\omega_p \varepsilon^{-\frac{1}{3}}}{s + \frac{\omega_p}{\varepsilon^{\frac{1}{3}}}}$$



$$\omega_0 = \frac{1}{C_1 R_1} \qquad \omega_0^2 = \frac{1}{L_2 C_2} \qquad \omega_0 = \frac{1}{R_2 C_2} = \frac{\omega_p}{\varepsilon^{\frac{1}{3}}}$$

Si $R_1 = 1 \Rightarrow \omega_0 = \frac{1}{C_1}$

$R_2 = Q = 1 \Rightarrow C_2 = \frac{1}{\omega_0}$

$C_1 = C_2 \Rightarrow \omega_0 = \frac{1}{L_2}$

Circuito normalizado $\Rightarrow L_2 = C_1 = C_2 = 1$

Si $C = C_1 = C_2 = 1000\,f$

$$R_1 = \frac{1}{C_1 \omega_0} \qquad L_2 = \frac{1}{C_2 \omega_0^2} \qquad R_2 = \frac{1}{\omega_0 C_2} = R_1$$