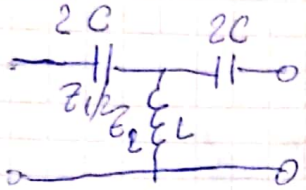
Tarea semanal 15

Cero de Y en $0{,}8\ \frac{rad}{s}$

a)



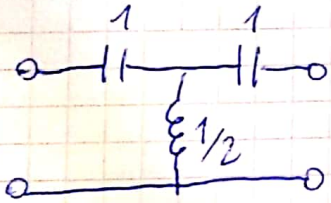
$$z_{OT} = z_1 \| z_2 = \sqrt{z_1 z_2 \left(1 + \frac{z_1}{4z_2}\right)}$$

$$z_1 = \frac{1}{sC} \qquad z_2 = sL$$

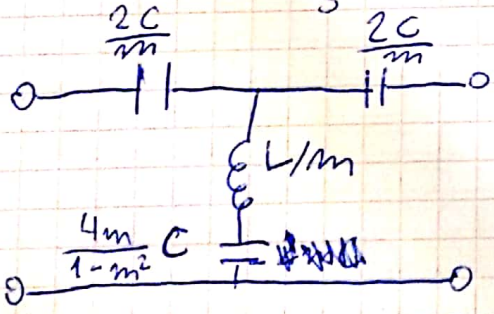
$$z_2 + \frac{z_1}{4} = sL + \frac{1}{4sC} = 0$$

$$s^2 = \frac{1}{4LC}$$

$$\omega_0 = 1 = \frac{1}{2\sqrt{LC}} \Rightarrow C = L = 1/2$$



b) $\omega_z = 0{,}8\ \frac{rad}{s}$



$$C_1' = \frac{5}{3}$$

$$C_2' = 1{,}875$$

$$L' = 5/6$$

z_1' del Banque

$$z_1' = m z_1 \qquad z_2' = \frac{z_2}{m} + z_1 \frac{1-m^2}{4m}$$

$$\omega_z = \frac{1}{\sqrt{L'C'}} = \frac{1}{\sqrt{\frac{L}{m} \cdot C \frac{4m}{1-m^2}}}$$

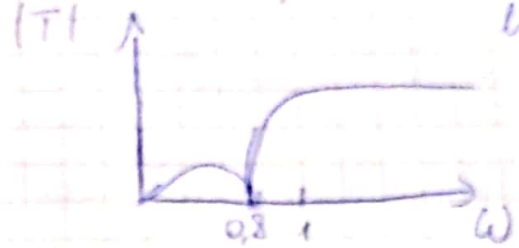
$\omega_c = 1$

$$\omega_z = \frac{1}{\sqrt{4LC}\sqrt{\frac{1}{1-m^2}}}$$

$$\omega_z = \sqrt{1-m^2}$$

$$[m = 0{,}6]$$

c) S., se puede ya que tenemos la impedancia adaptada y el cero



d) Desnormalizo a 50Ω y $\omega_c = 2\pi\, 10^6 \frac{rad}{s}$

$R_g = R_L = 50\Omega$

$L = \frac{0,5 \cdot 50\Omega}{\omega_c} = 4\,\mu H$

$L' = 6,63\,\mu H$

$C = \frac{1}{50\Omega\,\omega_c} = 3,183\,nF$

$C_2' = 5,97\,nF$

$C_1' = 5,31\,nF$