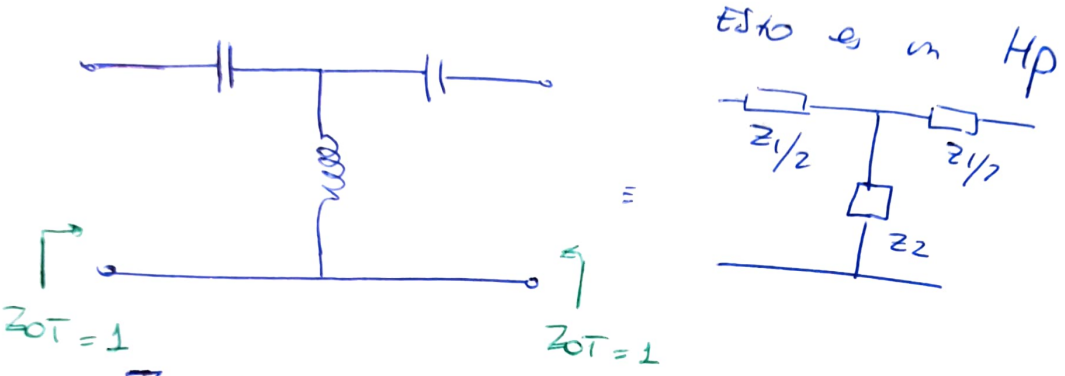
TAREA SEMANAL 15

Diseñar un filtro Hp normalizado a frec e imp.
Z_T @ 0,7 r/s

1. K - cte



$Z_1 \cdot Z_2 = 1$ → normalizado en Imp.

$\omega_c = 1$ r/s → normalizado en frec

$$Z_{oT} = \sqrt{Z_1 \cdot Z_2 + Z_1^2/4} = \frac{Z_1}{4}$$

$$Z_{oT}^2 = \frac{Z_1}{4}\left(Z_2 \cdot 4 + Z_1\right)$$ => Trabajando dejando de lado, encontrar el pasaje de Impedancia $\mathbb{R} \rightarrow \mathbb{I}m$

$$Z_2 \cdot 4 + Z_1$$

$$j\omega L \cdot 4 + \frac{1}{j\omega c} = \frac{(j)^2 \omega^2 LC 4 + 1}{j\omega c} = \frac{4LC}{jC}\left(\frac{-\omega^2}{\omega} + \frac{1}{4LC\omega}\right)$$

$$\Rightarrow \frac{\omega^2}{j\omega} = \frac{1}{4LC\omega} \Rightarrow \omega^2 = \frac{1}{4LC} \Rightarrow \boxed{\omega = \frac{1}{\sqrt{4LC}}}$$

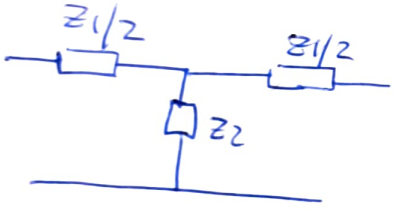
$$\frac{1}{j\omega C} \cdot j\omega L = 1 \longrightarrow \text{Normalizo en impedancia}$$

$$\omega_{c=1} = \frac{1}{2\sqrt{LC}} \longrightarrow \text{Normalizo en frecuencia}$$

$$\frac{L}{C} = 1 \Rightarrow L = C$$

$$1 = \frac{1}{2\sqrt{L \cdot C}} \Rightarrow 2 = \frac{1}{L} \Rightarrow \boxed{L = 1/2 \wedge C = 1/2}$$

Ojo que si quiero sintetizar la red K



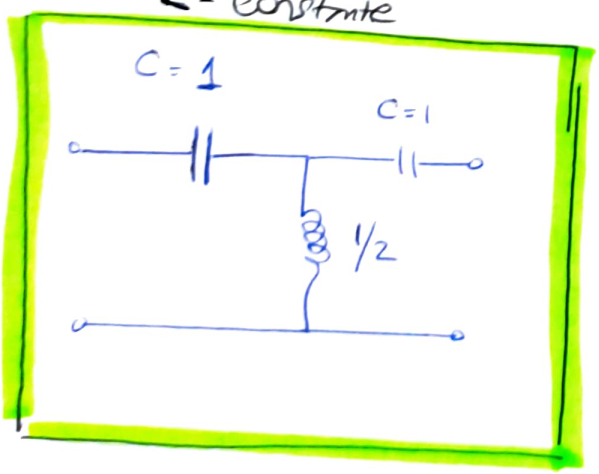
→ yo calculé con Z_1

$$\Rightarrow Z_1 = \rho C$$

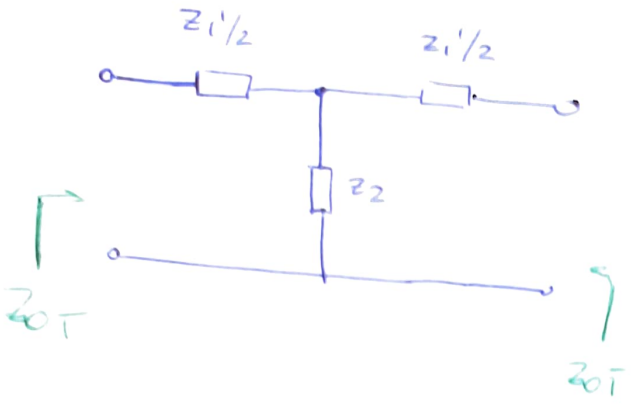
$$Z_1 = \frac{1}{j\omega C} = \frac{1}{j\omega \cdot 1/2}$$

$$\frac{Z_1}{2} = \frac{1}{j\omega \cdot C} \cdot \frac{1}{2}$$

K - constante



2. M- derivada → Me aporta el Z_1

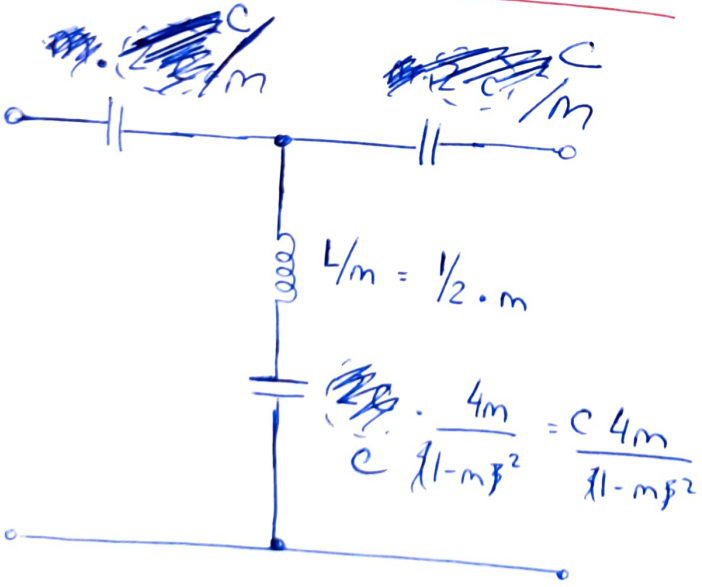


$Z_1' = m \cdot Z_1$

$Z_2' = ?$; $Z_{0T} = Z_{0T}'$

$$\sqrt{Z_1 \cdot Z_2 + \frac{Z_1^2}{4}} = \sqrt{Z_1' \cdot Z_2' + \frac{Z_1'^2}{4}}$$

$$\Rightarrow \boxed{Z_2' = \frac{Z_2}{m} + Z_1 \cdot \frac{1-m^2}{4m}}$$



$$\omega_T = \frac{1}{\sqrt{L \cdot C}}$$

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

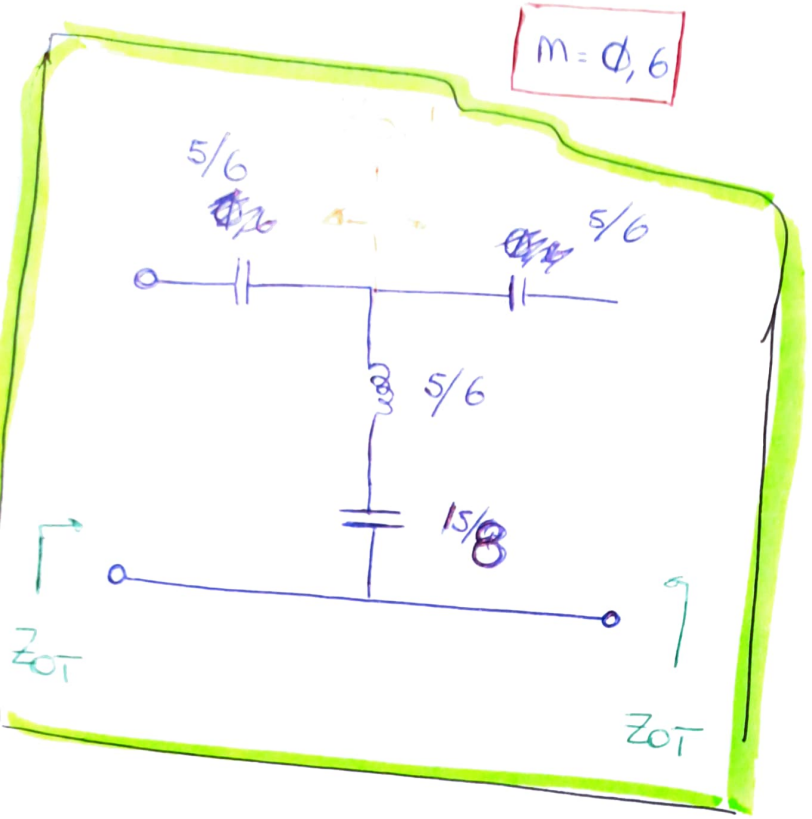
$$\omega_T = \frac{1}{2\sqrt{LC}} \sqrt{1-m^2}$$

$\Phi,45 \cdot \Phi,95 =$

$\omega_T = \omega_c \cdot \sqrt{1-m^2}$

$\Phi,8 = 1 \cdot \sqrt{1-m^2} \Rightarrow m = \sqrt{\Phi,8^2 - 1}\ \sqrt{2-\Phi,8^2}$

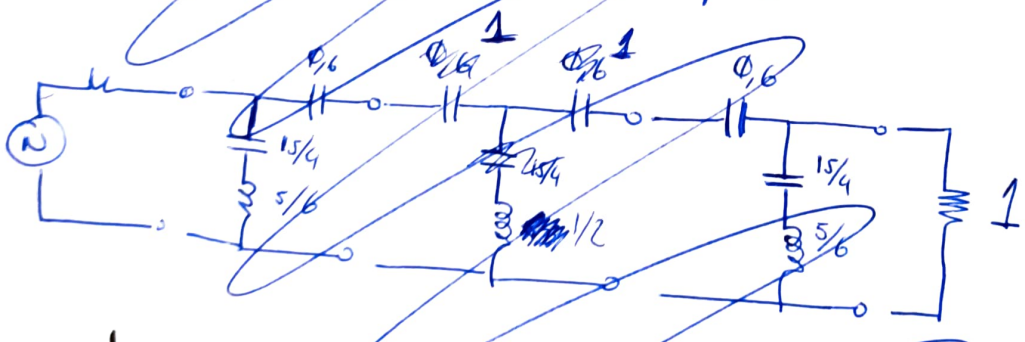
$m = \Phi,6$

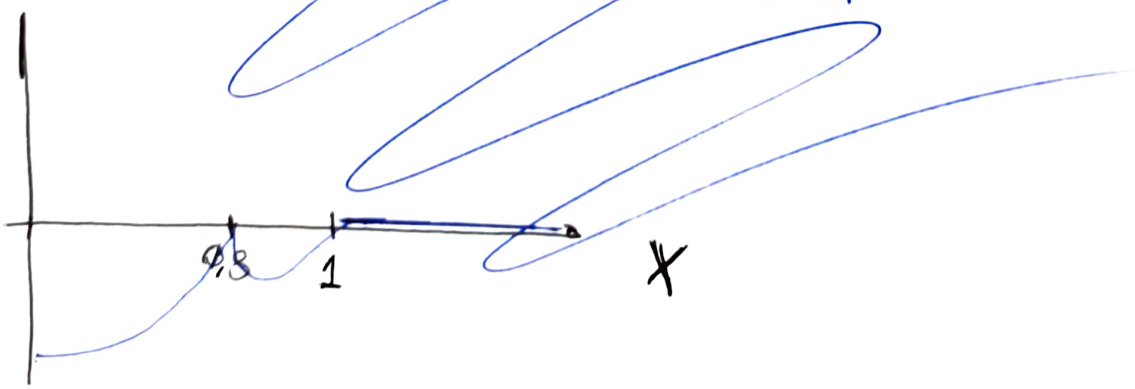


M-Derivado

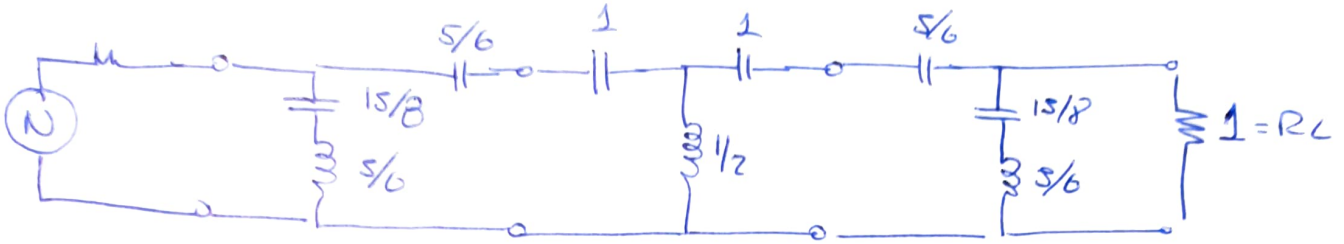
3.

Se podría por ej lo mismo Sección m - derivada para Adaptar se puede aprovechar la

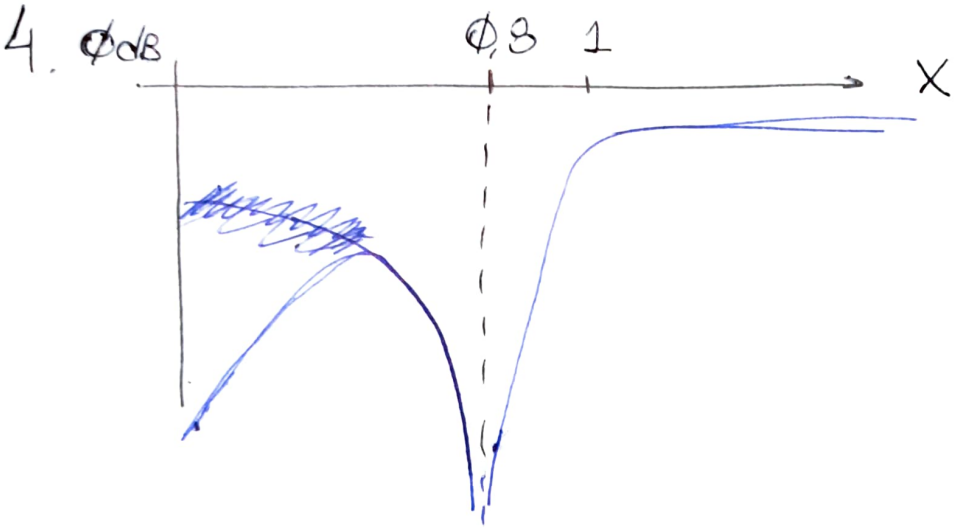




3. Se podría intercalar para que pueda aprovechar la adaptación del $n = 0,6$

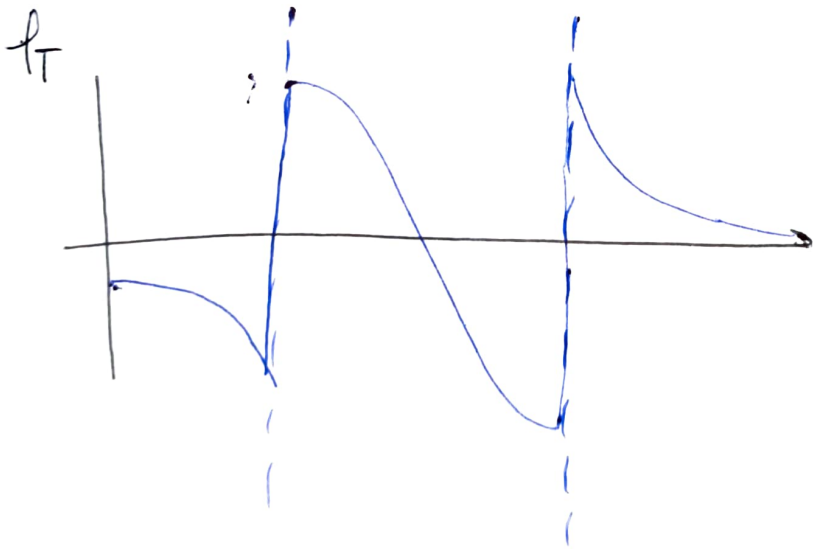


4. $|T|$



El módulo presenta un ~~Ecco~~ de TRANSMISIÓN en 0,8 r/s

Y la banda de PASO es plana desde los "1 r/s"



5. $\omega_c = 2\pi \cdot 10 \times 10^6$ r/s ; $R_L = 50\,\Omega$

$\Rightarrow$

$$L_n = \frac{L}{\Omega_z} \cdot \Omega_\omega \Rightarrow L = L_n \cdot \frac{\Omega_z}{\Omega_\omega}$$

$$C_n = C \cdot \Omega_z \cdot \Omega_\omega \Rightarrow C = \frac{C_n}{\Omega_z \cdot \Omega_\omega}$$

$\Rightarrow \Omega_z = 50\,\Omega$

$\Omega_\omega = 2\pi \cdot 10 \times 10^6$ r/s

$\Rightarrow$