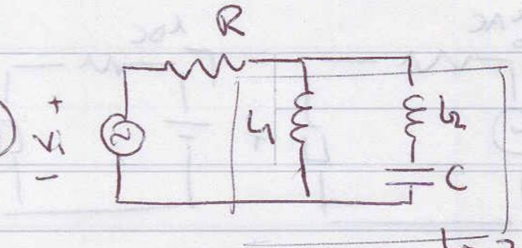
③ 

$v_i(t) = V_I \cos(\omega t) \Rightarrow \hat{V}_i = V_i$

$$\hookrightarrow Z = \frac{j\omega L_1 (j\omega L_2 + 1/j\omega C)}{j\omega(L_1+L_2) + 1/j\omega C} = j\omega L_1 \frac{(1-\omega^2 L_2 C)}{1-\omega^2 C(L_1+L_2)}$$

$L_1 \| (L_2 + C)$

imaginario puro !

a) $i(t) = ?$

$$\hat{I} = \frac{V_I}{Z_{TOT}} = \frac{V_I}{R+Z} = \frac{V_I}{R + j\omega L_1 \cdot \frac{(1-\omega^2 L_2 C)}{1-\omega^2 C(L_1+L_2)}} = \frac{[1-\omega^2 C(L_1+L_2)]\, V_I}{\underbrace{R[1-\omega^2 C(L_1+L_2)] + j\omega L_1 (1-\omega^2 L_2 C)}_{\text{denominador}}}$$

$$= \frac{[\;]\cdot V_I}{W \cdot e^{j\varphi}}$$

$1 < \omega^2 L_2 C$ y $1 \gtrless \omega^2 C(L_1+L_2)$

en cuadrantes I y IV si $1 > \omega^2 L_2 C$.

$$\text{con } \varphi = \begin{cases} \operatorname{atan}(\alpha) & \text{si } 1 < \omega^2 L_2 C \\ \pi + \operatorname{atan}(\alpha) & \text{si } 1 > \omega^2 C(L_1+L_2) \\ \pi - \operatorname{atan}(\alpha) & \text{si } 1 < \omega^2 C(L_1+L_2) \end{cases}$$

si $1 < \omega^2 L_2 C$ y $1 < \omega^2 C(L_1+L_2)$

y $1 > \omega^2 L_2 C$

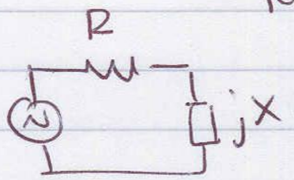
$$\alpha = \frac{\omega L_1 (1-\omega^2 L_2 C)}{[1-\omega^2 C(L_1+L_2)] R}$$

$$\Rightarrow i(t) = \frac{1-\omega^2 C(L_1+L_2)\; V_I}{\sqrt{R^2[1-\omega^2 C(L_1+L_2)]^2 + (\omega L_1)^2 (1-\omega^2 L_2 C)^2}} \cos(\omega t - \varphi)$$

$\rightarrow I_0$

$i(t) = \operatorname{Re}\{\hat{I} e^{j\omega t}\}$

b) $P_m = R \cdot I_0^2 / 2$ (la potencia que entrega la fuente la disipa la resistencia)

c) circuito : 

← circuito tipo RLC serie.

$\Downarrow$

ω_{min} si $I = 0 \Leftrightarrow$ "$X = \infty$" $\Leftrightarrow 1 = \omega^2 C(L_1+L_2) \Leftrightarrow \omega_{min} = \frac{1}{\sqrt{(L_1+L_2)C}}$

ω_{max} si $X = 0 \Leftrightarrow \omega_{max} = 0$, $\omega_{max} = \frac{1}{\sqrt{L_2 C}}$