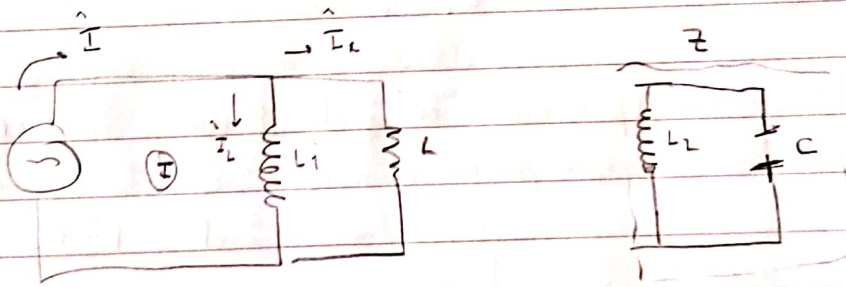


EJ 10



$$R = 4,7 \text{ k}\Omega$$

$$\cos \phi = 0,65 \Rightarrow \phi = 49,45^\circ$$

$$f = 1 \text{ MHz} \rightarrow 63 \times 10^5 \text{ rad/s}$$

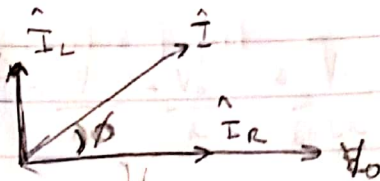
$$L_2 = 2L_1$$

Kirchoff $V_0 - \hat{V}_L \hat{I}_L = 0 \Rightarrow V_0 - i\omega L_1 \hat{I}_L = 0$

$$V_0 - R \hat{I}_R = 0$$

$$i\omega L_1 \hat{I}_L - R \hat{I}_R = 0$$

$$\hat{I} = \hat{I}_L + \hat{I}_R$$



$$|\hat{I}| \sin \phi = |\hat{I}_L|$$

$$|\hat{I}| \cos \phi = |\hat{I}_R|$$

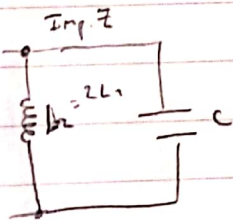
$$\tan \phi = \frac{|\hat{I}_L|}{|\hat{I}_R|} = \frac{|V_0|}{|Z_L|} = \frac{Z}{\omega L_1}$$

$$\Rightarrow \text{Boxed: } L_1 = 6,4 \cdot 10^{-4} \text{ Henry}$$

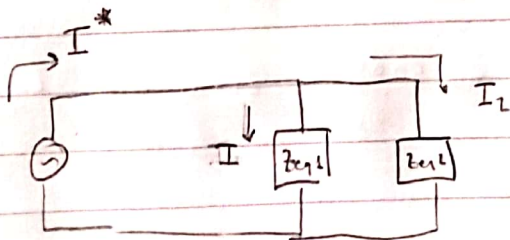
$$i \frac{R \omega L_1}{\omega L_1}$$

$$\frac{1}{Z_{eq1}} = \frac{1}{R} + \frac{1}{i\omega L_1} \Rightarrow \frac{1}{Z_{eq1}} = \frac{i\omega L_1 + R}{iR\omega L_1}$$

$$\text{Boxed: } Z_{eq1} = \frac{iR\omega L_1}{i\omega L_1 + R}$$



$$Z = Z_L \omega i - \frac{i}{\omega C} \Rightarrow \text{Boxed: } Z_{eq2} = i \left(2L_1\omega - \frac{1}{\omega C} \right)$$



$$\text{Boxed: } \hat{I}^* = \hat{I} + \hat{I}_2$$

corriente circuito original

$$\textcircled{1} V_0 - Z_{eq1} \hat{I} = 0$$

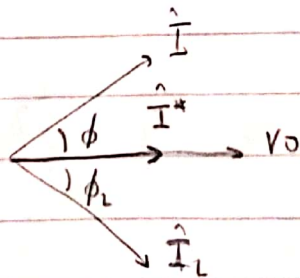
$$\text{Boxed: } \cos \varphi = 1 \Rightarrow \text{Boxed: } \varphi = 0$$

$$\Rightarrow \text{Boxed: } |\hat{I}| = \frac{V_0}{|Z_{eq1}|}$$

② Nella exterior

$$V_0 - \hat{I}_2 Z_{eq2} = 0$$

$$\Rightarrow |\hat{I}_2| = \frac{V_0}{|Z_{eq2}|}$$



$$|\phi| = |\phi_2|$$

\hat{I}^* es puramente real porque $\varphi = 0$

$$|\hat{I}^*| \cos \varphi = |\hat{I}| \cos \phi + |\hat{I}_2| \cos \phi_2$$

$$|\hat{I}^*| \cos \varphi = |\hat{I}| \sin \phi + |\hat{I}_2| \sin \phi \Rightarrow |\hat{I}| = |\hat{I}_2|$$

0

$$\rightarrow \frac{V_0}{|Z_{eq1}|} = \frac{V_0}{|Z_{eq2}|} = |Z_{eq1}| = |Z_{eq2}|$$

$$\rightarrow Z_{eq1} = \frac{i\omega L_1}{i\omega L_1 + R} \cdot \frac{R - j\omega L_1}{R - j\omega L_1} = \frac{iR^2\omega L_1 + R\omega^2 L_1^2}{R^2 + \omega^2 L_1^2}$$

$$= \frac{R\omega^2 L_1^2}{R^2 + \omega^2 L_1^2} + i \left(\frac{R^2\omega L_1}{R^2 + \omega^2 L_1^2} \right)$$

1992,5

$$R\omega^2 L_1^2 = 7,64 \times 10^{10}$$

$$R^2 + \omega^2 L_1^2 = 38347024$$

$$R^2\omega L_1 = 8,9 \times 10^{10}$$

$$Z_{eq1} = 1992,5 + 2322,65 i$$

$$|Z_{eq1}| = 3060,2$$

$$\rightarrow |Z_{eq1}| = |Z_{eq2}| = 3060,2 = \left(2L_1\omega - \frac{1}{\omega C} \right)^2$$

$$\rightarrow \frac{1}{\omega C} = 2L_1\omega - 3060,2 = 5003,8$$

$$C = \frac{1}{\omega \cdot 5003,8}$$