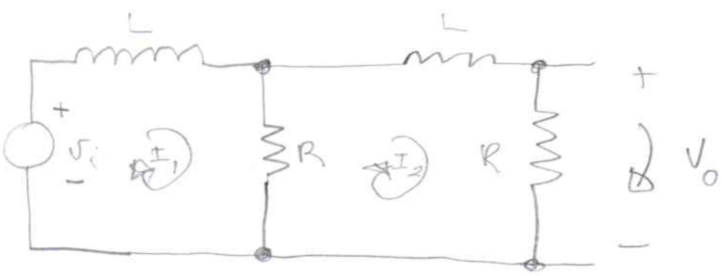
1 f)



$\frac{V_0(s)}{V_i(s)}$, considerando $(\omega_0 = R/L)$

$$\begin{cases} v_i(t) = L \frac{d}{dt} i_1(t) + R\, i_1(t) - R\, i_2(t) \\ 0 = R\, i_2(t) + L \frac{d}{dt} i_2(t) + R\, i_2(t) - R\, i_1(t) \\ V_0(t) = R\, i_2(t) \\ i_3 = I_1 - I_2 \end{cases}$$

$\mathcal{L}$; condições iniciais nulas.

$$\begin{cases} V_i(s) = L s\, I_1(s) + R\, I_1(s) - R\, I_2(s) = (sL + R) I_1(s) - R\, I_2(s) \\ R\, I_1(s) = R\, I_2(s) + L s\, I_2(s) + R\, I_2(s) = (sL + 2R) I_2(s) \\ V_0(s) = R\, I_2(s) \\ I_3(s) = I_1(s) - I_2(s) \end{cases}$$

$$I_1(s) = \frac{(sL+2R)}{R} I_2$$

$$V_i(s) = \frac{(sL+R)(sL+2R)}{R} I_2 - R\, I_2(s)$$

$$= \frac{(sL+R)(sL+2R) - R^2}{R} I_2(s)$$

$$I_2(s) = \frac{R}{(sL+R)(sL+2R) - R^2} V_i(s)$$

$$V_0(s) = R \times \frac{R}{(sL+R)(sL+2R) - R^2} V_i(s)$$

$$\frac{V_0(s)}{V_i(s)} = \frac{R^2}{(sL+R)(sL+2R) - R^2}$$

$$= \frac{R^2}{s^2L^2 + 2sLR + sLR + 2R^2 - R^2} = \frac{R^2}{s^2L^2 + 3sLR + R^2} \frac{(\frac{1}{L})^2}{(\frac{1}{L})^2}$$