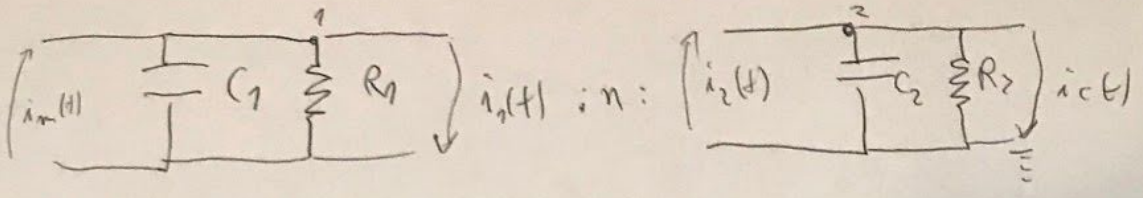
NATHAN DALEFFI RODRIGUES RAYES 10772585

1) a)

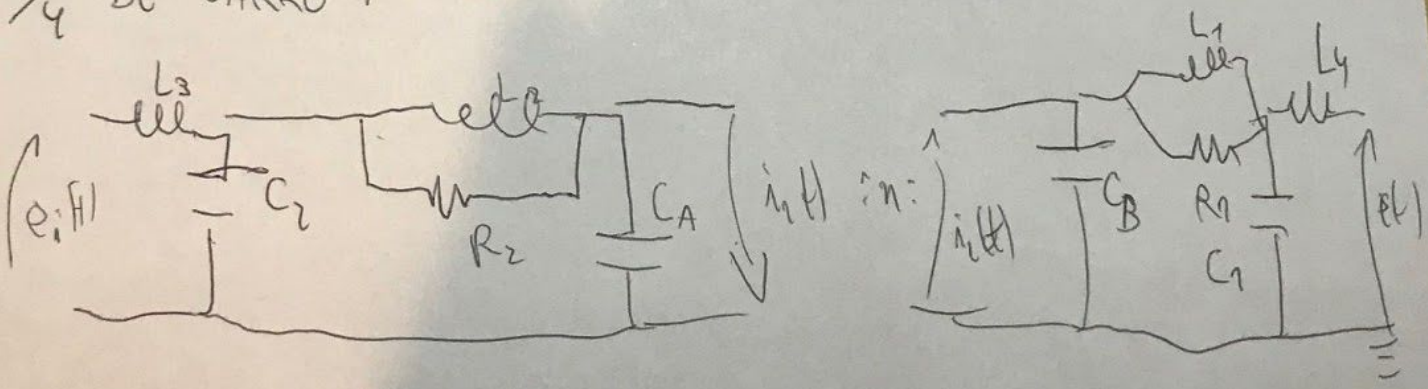


$$n = \frac{V_1}{V_2} \Rightarrow \begin{cases} V_1\left(\frac{1}{R_1} + C_1 D\right) = i_m - i_1 \\ V_2\left(\frac{1}{R_2} + C_2 D\right) = i_2 - i_c \end{cases}$$

$$\Rightarrow \begin{cases} n^2 V_1\left(C_1 D + \frac{1}{R_1}\right) + V_1\left(\frac{1}{R_2} + C_2 D\right) = n^2\left(i_m - i_1\right) \\ V_1\left(\frac{1}{R_1} + C_2 D\right) + V_1 \cdot \left(\frac{1}{n^2}\right)\left(C_2 D + \frac{1}{R_2}\right) = n^2 i_1 - n i_c \end{cases}$$

$$\Rightarrow \begin{cases} J_1 \dot{m}_1 + B_1 m_1 + \frac{J_2}{n^2}\dot{m}_1 + \frac{B_2}{n^2} m_1 = T_m - \frac{T_c}{n} \\ \dot{m}_1\left(J_1 + \frac{J_2}{n^2}\right) + m_1\left(B_1 + \frac{B_2}{n^2}\right) = T_m - \frac{T_c}{n} \end{cases}$$

b) 1/4 DE CARRO :



$$\Rightarrow \left(\frac{\dot{x}_4 - \dot{x}_3}{L_1 + L_2}\right)\frac{J}{2} + \left(\frac{\dot{x}_3 L_2 + \dot{x}_4 L_1}{L_1 + L_2}\right)\frac{M}{2} \quad \text{com } J = J_6$$