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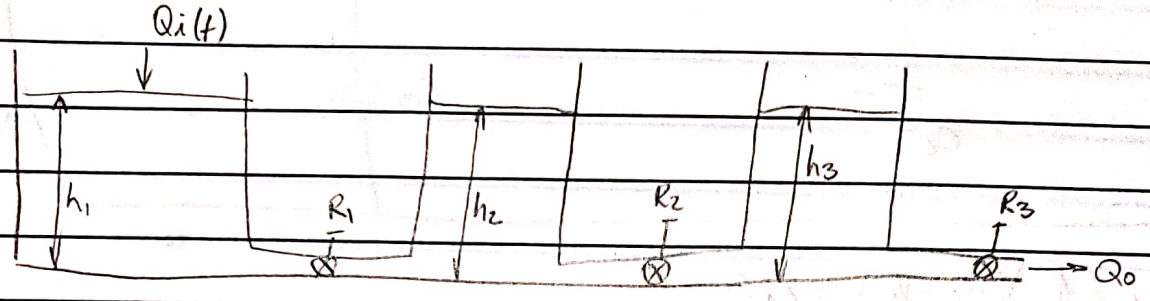
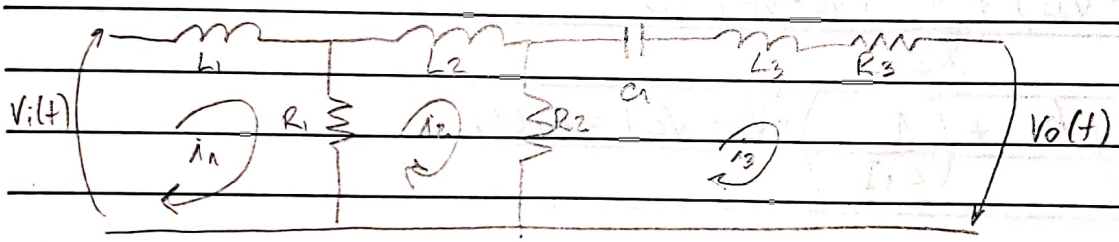
Exercício



a) Analogia tipo 1:

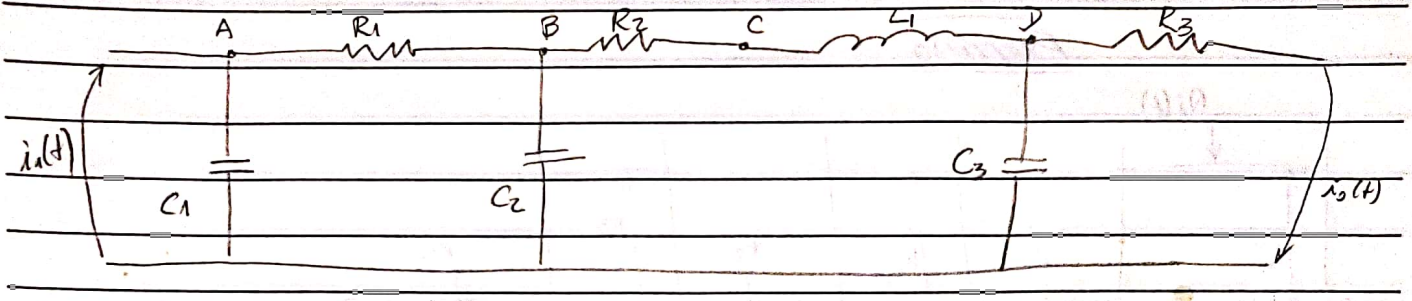


Malha 1: $(L_1 D) i_1 + R_1 (i_1 - i_2) = V_i(t)$

Malha 2: $(L_2 D) i_2 + R_2 (i_2 - i_3) + R_1 (i_2 - i_1) = 0$

Malha 3: $\left(\frac{1}{C_1 D} + L_3 D + R_3\right) i_3 + R_2 (i_3 - i_2) = V_o(t)$

b) Analogia tipo 2:



Nó A: $(C_1 D)V_A + \left(\frac{1}{R_1}\right)(V_A - V_B) = i_i(t)$

Nó B: $(C_2 D)V_B + \left(\frac{1}{R_1}\right)(V_B - V_A) + \frac{1}{R_2}(V_B - V_C) = 0$

Nó C: $\left(\frac{1}{L_1 D}\right)(V_C - V_D) + \frac{1}{R_2}(V_C - V_B) = 0$

Nó D: $\left(\frac{1}{R_3} + C_3 D\right)V_D + \left(\frac{1}{L_1 D}\right)(V_D - V_C) = i_o(t)$

c) Modelo Hidráulico

$$\begin{cases} \dot{h}_1 A_1 + \frac{1}{R_{f1}}(h_1 - h_2) = Q_i(t) \\ \dot{h}_2 A_2 + \frac{1}{R_{f2}}(h_2 - h_3) + \frac{1}{R_{f1}}(h_2 - h_1) = 0 \\ \dot{h}_3 A_3 + \frac{1}{R_{f3}} h_3 + \frac{1}{R_{f2}}(h_3 - h_2) = Q_o(t) \end{cases}$$

$$\begin{cases} A_1 \dot{h}_1 + \frac{1}{R_{f1}}(h_1 - h_2) = Q_i(t) \\ A_2 \dot{h}_2 + \frac{1}{R_{f1}}(h_2 - h_1) + \frac{1}{R_{f2}}(h_2 - h_3) = 0 \\ A_3 \dot{h}_3 + \frac{1}{R_{f3}} h_3 + \frac{1}{R_{f2}}(h_3 - h_2) = Q_o(t) \end{cases}$$