

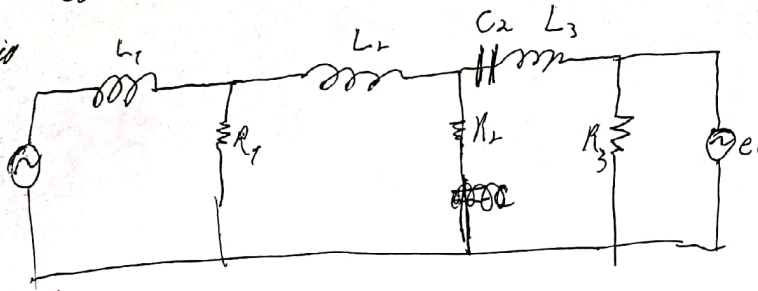
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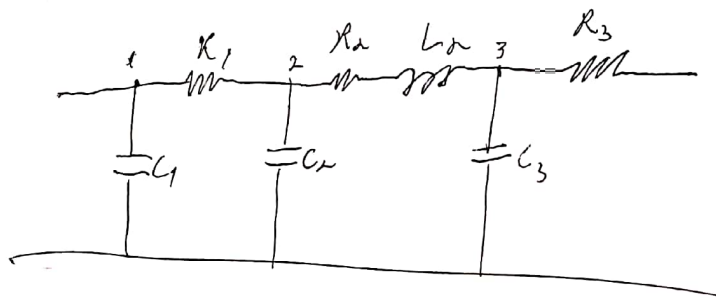
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Circuito

Analogia
Tipo 1



Analogia
Tipo 2



Resolução:
Tipo 1

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

$$\text{II } 2: 0 = (R_1 + L_2 D + R_2) i_2 - R_2 (i_3) - R_1 i_1$$

$$\text{III } 3: V_o(t) = (L_3 D + R_3 + R_2 + \frac{1}{C_2 D}) i_3 - (R_2) i_2$$

$$\Rightarrow \dot{h}_1 A_1 + \frac{1}{R_1} (h_1 - h_2) = Q_i(t)$$

$$0 = \dot{h}_2 A_2 + \frac{1}{R_1} (h_2 - h_1) + \frac{1}{R_2} (h_2 - h_3)$$

$$Q_o(t) = \dot{h}_3 A_3 + \frac{1}{R_2} (h_3 - h_2) + \frac{1}{R_3} (h_3) + Q_a(t)$$

Tipo 2:

equações:

$$i(t) = (C_1 D + \frac{1}{R_1}) V_1 - (\frac{1}{R_1}) V_2 \quad (1)$$

$$0 = (C_2 D + \frac{1}{R_1} + \frac{1}{R_2}) V_2 - (\frac{1}{R_2}) V_1 - (\frac{1}{R_2}) V_3 \quad (2)$$

$$0 = (\frac{1}{R_2} + \frac{1}{L_3 D}) V_3 - (\frac{1}{L_3 D}) V_2 - (\frac{1}{R_2}) V_2 \quad (3)$$

$$\dot{h}_o(t) = (C_3 D + \frac{1}{L_3 D} + \frac{1}{R_3}) V_3 - (\frac{1}{L_3 D}) V_2$$

$$\Rightarrow Q_i(t) = A_1 h_1 + \frac{1}{R_1} (h_1 - h_2)$$

$$0 = A_2 h_2 + \frac{1}{R_1} (h_2 - h_1) + \frac{1}{R_2} (h_2 - h_3)$$

$$0 = \frac{1}{R_3} (h_3 - h_2) + Q_a - Q_2$$

$$Q_o(t) = A_3 h_3 + Q_3 - Q_a + \frac{1}{R_3} h_3$$