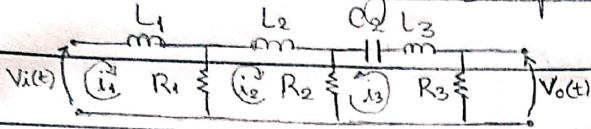


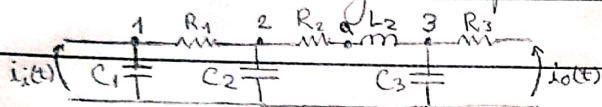
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Exercício da Aula 22/09

a) Circuito análogo do tipo 1:



b) Circuito análogo do tipo 2:



c) Analogia tipo 1:

Malha 1: $V_i(t) = (L_1 D + R_1) i_1 + R_1 i_2 \Rightarrow Q_1(t) = C_{f1} \dot{p}_1 + \bar{R}_{f1} p_1 - \bar{R}_{f1} p_2$

Malha 2: $0 = (R_1 + L_2 D + R_2) i_2 - R_1 i_1 - R_2 i_3 \Rightarrow 0 = \bar{R}_{f1} p_2 + C_{f2} \dot{p}_2 + \bar{R}_{f2} p_2 - \bar{R}_{f2} p_3 - \bar{R}_{f1} p_1$

Malha 3: $V_o(t) = (L_3 D + R_3 + R_2 + \frac{1}{C_3 D}) i_3 - R_2 i_2 \Rightarrow Q_0(t) = C_{f3} \dot{p}_3 + \bar{R}_{f3} p_3 + \bar{R}_{f2} p_3 + \frac{1}{L_3} \int p_3 dt - \bar{R}_{f2} p_2$

$L_f = \frac{qs}{A}$	$\Rightarrow \begin{cases} Q_1(t) = h_1 A_1 + \frac{(h_1 - h_2)}{R_{f1}} \\ 0 = h_2 A_2 + \frac{(h_2 - h_1)}{R_{f1}} + \frac{(h_2 - h_3)}{R_{f2}} \\ Q_0(t) = h_3 A_3 + \frac{(h_3 - h_2)}{R_{f2}} + \frac{h_3}{R_{f3}} + \dot{Q}_2(t) \end{cases}$
$C_f = \frac{A}{qs}$	
$\bar{R}_f = \frac{1}{qs R_f}$	

Analogia tipo 2:

Nó 1: $i_1(t) = (C_1 D + \frac{1}{R_1}) V_1 - \frac{1}{R_1} V_2 \Rightarrow Q_1(t) = C_{f1} \dot{p}_1 + \frac{p_1}{R_{f1}} - \frac{p_2}{R_{f2}}$

Nó 2: $0 = (C_2 D + \frac{1}{R_1} + \frac{1}{R_2}) V_2 - \frac{1}{R_1} V_1 - \frac{1}{R_2} V_a \Rightarrow 0 = C_{f2} \dot{p}_2 + \frac{p_2}{R_{f1}} + \frac{p_2}{R_{f2}} - \frac{p_1}{R_{f1}} - \frac{p_a}{R_{f2}}$

Nó 3: $i_0(t) = (C_3 D + \frac{1}{R_3} + \frac{1}{L_3 D}) V_3 - \frac{1}{L_3 D} V_a \Rightarrow Q_0(t) = C_{f3} \dot{p}_3 + \frac{p_3}{R_{f3}} + \frac{p_3}{L_3 D} - \frac{p_a}{L_3 D}$

Nó a: $0 = (\frac{1}{R_2} + \frac{1}{L_3 D}) V_a - \frac{1}{L_3 D} V_3 - \frac{1}{R_2} V_2 \Rightarrow 0 = \frac{p_a}{R_{f2}} + \frac{p_a}{L_3 D} - \frac{p_3}{L_3 D} - \frac{p_2}{R_{f2}}$

$\begin{cases} Q_1(t) = h_1 A_1 + \frac{(h_1 - h_2)}{R_{f1}} \\ 0 = h_2 A_2 + \frac{(h_2 - h_1)}{R_{f1}} + \frac{(h_2 - h_a)}{R_{f2}} \\ Q_0(t) = h_3 A_3 + \dot{Q}_3 + \frac{h_3}{R_{f3}} \\ 0 = \frac{h_a - h_2}{R_{f2}} + \dot{Q}_a - \dot{Q}_2 \end{cases}$
