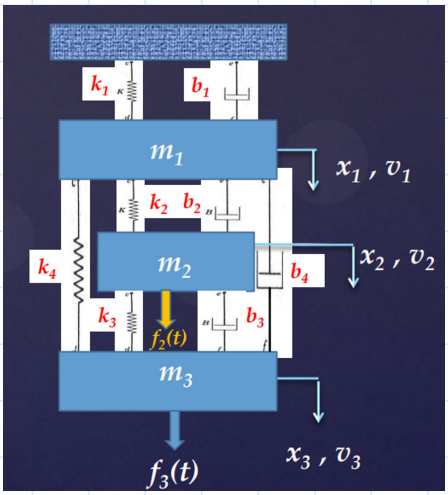
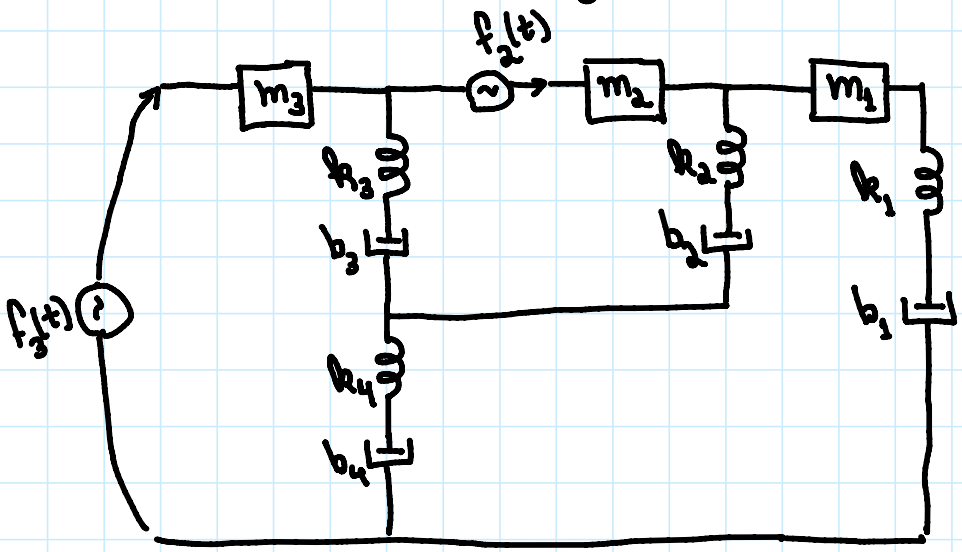
Exercício 2 - Slide analogia tipo 2

segunda-feira, 4 de outubro de 2021 16:37

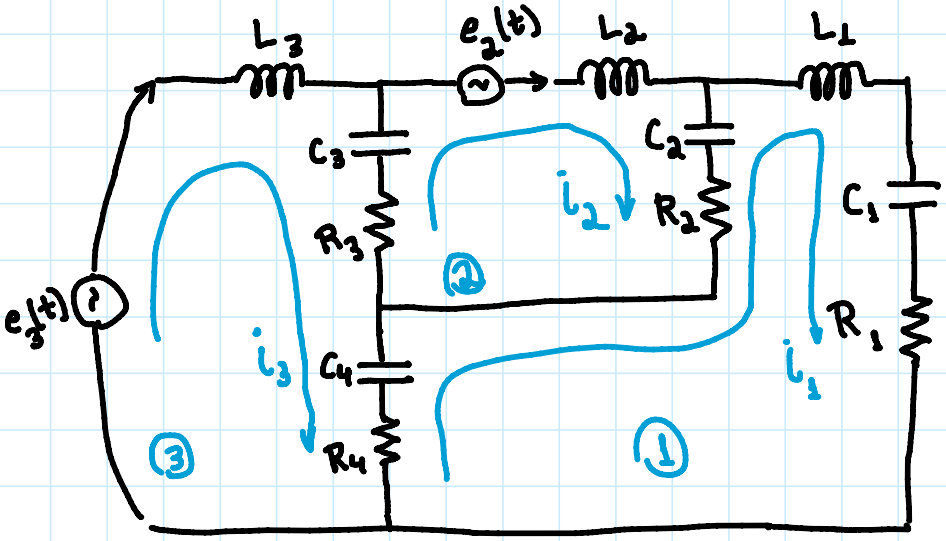
Ex.2)



b) • Circuito mecânico (Analogia tipo 1):



c) • Circuito elétrico análogo:



d) • Malha ①:

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$$\left(L_1 D + R_1 + R_2 + R_4 + \frac{1}{C_1 D} + \frac{1}{C_2 D} + \frac{1}{C_4 D}\right) i_1 - \left(R_2 + \frac{1}{C_2 D}\right) i_2 - \left(R_4 + \frac{1}{C_4 D}\right) i_3 = 0 \quad \text{(I)}$$

· Malha ②:

$$\left(L_2 D + R_2 + R_3 + \frac{1}{C_2 D} + \frac{1}{C_3 D}\right) i_2 - \left(R_2 + \frac{1}{C_2 D}\right) i_1 - \left(R_3 + \frac{1}{C_3 D}\right) i_3 = e_2(t) \quad \text{(II)}$$

· Malha ③:

$$\left(L_3 D + R_3 + R_4 + \frac{1}{C_3 D} + \frac{1}{C_4 D}\right) i_3 - \left(R_4 + \frac{1}{C_4 D}\right) i_1 - \left(R_3 + \frac{1}{C_3 D}\right) i_2 = e_3(t) \quad \text{(III)}$$

e) · Da analogia tipo 1:

→ Eq (I) se torna:

$$m_1 \ddot{x}_1 + (b_1 + b_2 + b_3)\dot{x}_1 + (k_1 + k_2 + k_3) x_1 = b_2 \dot{x}_2 + b_4 \dot{x}_3 + k_2 x_2 + k_4 x_3$$

→ Eq (II) se torna:

$$m_2 \ddot{x}_2 + (b_2 + b_3)\dot{x}_2 + (k_2 + k_3) x_2 = f_2(t) + b_2 \dot{x}_1 + b_3 \dot{x}_3 + k_2 x_1 + k_3 x_3$$

→ Eq (III) se torna:

$$m_3 \ddot{x}_3 + (b_3 + b_4)\dot{x}_3 + (k_3 + k_4) x_3 = f_3(t) + b_4 \dot{x}_1 + b_3 \dot{x}_2 + k_4 x_1 + k_3 x_2$$