Exercício Aula - 15/09/2020

① $J_1\dot{\omega}_1 + B_1\omega_1 + T_1 = T_m$

$J_2\dot{\omega}_2 + B_2\omega_2 + T_c = T_2 = n T_1$

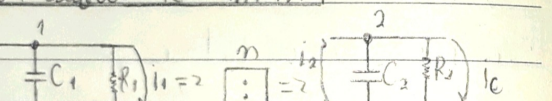
$J_2\dot{\omega}_2 + B_2\omega_2 + T_c = n(T_m - J_1\dot{\omega}_1 - B_1\omega_1)$

$J_2\dot{\omega}_2 + B_2\omega_2 + T_c = n(T_m - J_1 n\dot{\omega}_2 - B_1 n\omega_2)$

$\dot{\omega}_2(J_2 + n^2 J_1) + \omega_2(B_2 + n^2 B_1) + T_c = n T_m$

$\boxed{J_{eq2}\dot{\omega}_2 + B_{eq_2}\omega_2 + T_c = T_m \cdot n}$

② a)

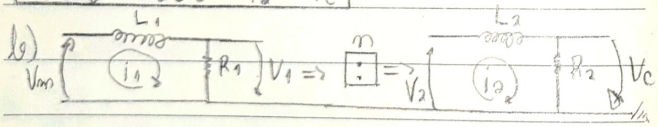


- Nó 1: $(C_1 D + \frac{1}{R_1})V_1 = i_m - i_1$
- Nó 2: $(C_2 D + \frac{1}{R_2})V_2 = i_2 - i_c$

$\boxed{J_1\dot{\omega}_1 + B_1\omega_1 = T_m - T_1}$

$\boxed{J_2\dot{\omega}_2 + B_2\omega_2 = T_2 - T_c}$

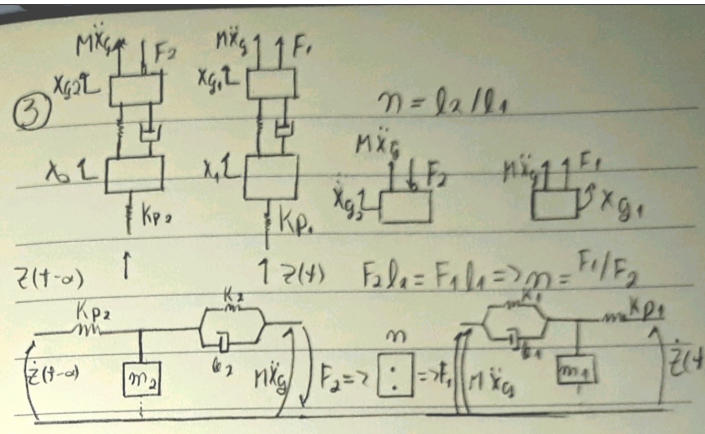
b)

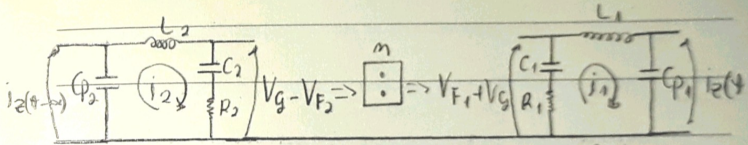


- Malha 1: $L_1 D \cdot i_1 + R_1 \cdot i_1 = V_m - V_1$
- Malha 2: $L_2 D \cdot i_2 + R_2 \cdot i_2 = V_2 - V_c$

$\boxed{J\dot{\omega}_1 + B_1\omega_1 = T_m - T_1}$; $\boxed{J_2\dot{\omega}_2 + B_2\omega_2 = V_2 - V_c}$

③





- Malha 1: $i_1(L_1 D + R_1 + \frac{1}{C_1 D} + \frac{1}{C_{p1} D}) - i_2(t)(\frac{1}{C_{p1} D}) = V_{F_1} + V_g$
- Malha 2: $i_2(L_2 D + R_2 + \frac{1}{C_2 D} + \frac{1}{C_{p2} D}) - i_1(t)(\frac{1}{C_{p2} D}) = V_g - V_{F_2}$

$\boxed{m_1\ddot{x}_1 + b_1\dot{x}_1 + K_1 x_1 + K_{p1} x_1 - K_{p1} \cdot z(t) = F_1 + M\ddot{x}_g}$

$\boxed{m_2\ddot{x}_2 + b_2\dot{x}_2 + K_2 x_2 + K_{p2} x_2 - K_{p2} \cdot z(t-\omega) = -F_2 + M\ddot{x}_g}$