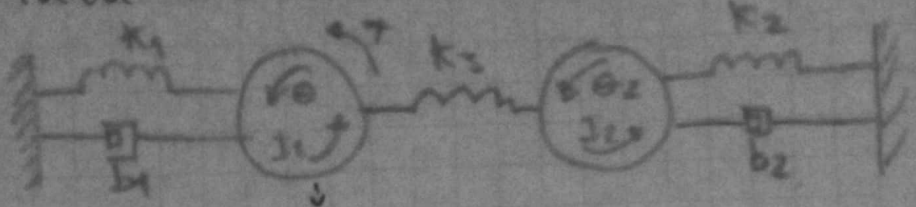
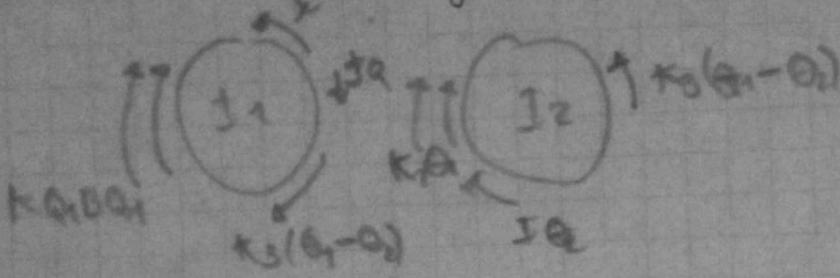
Tarea #1



hace girar I_2.



$$J_1\ddot{\theta} + B_1\dot{\theta}_1 + K_1\theta_1 + K_3(\theta_1 - \theta_2) = T$$

$$\ddot{\theta}_1 = -\frac{B_1\dot{\theta}_1}{J_1} - \frac{K_1\theta_1}{J_1} - \frac{K_3\theta_1}{J_1} + \frac{K_2\theta_2}{J_1} + \frac{T}{J_1}$$

$$\ddot{\theta}_1 = -\frac{B_1\dot{\theta}_1}{J_1} - \frac{\theta_1(K_3+K_1)}{J_1} + \frac{K_2\theta_2}{J_1} + \frac{T}{J_1} \quad (1)$$

$$K_3(\theta_1 - \theta_2) - K_2\theta_2 - B_2\dot{\theta}_2 - J_2\ddot{\theta}_2 = 0$$

$$\frac{K_3\theta_1}{J_2} - \frac{\theta_2(K_3+K_2)}{J_2} - \frac{B_2\dot{\theta}_2}{J_2} = \ddot{\theta}_2 \quad (2)$$

$$q_1 = \theta_1 \; ; \; q_2 = \dot{q}_1 = \dot{\theta}_1 \; ; \; \dot{q}_2 = \ddot{q}_1 = \ddot{\theta}_1$$

$$q_3 = \theta_2 \; ; \; q_4 = \dot{q}_3 = \dot{\theta}_2 \; ; \; \dot{q}_4 = \ddot{q}_3 = \ddot{\theta}_2$$

$$\begin{bmatrix} \dot{q}_1 \\ \dot{q}_2 \\ \dot{q}_3 \\ \dot{q}_4 \end{bmatrix} = \begin{bmatrix} 0 & 1 & 0 & 1 \\ \frac{-(K_3+K_1)}{J_1} & \frac{-B_1}{J_1} & \frac{K_2}{J_1} & 0 \\ 0 & 0 & 0 & 1 \\ \frac{K_3}{J_2} & 0 & \frac{(K_3+K_2)}{J_2} & \frac{-B_2}{J_2} \end{bmatrix} \begin{bmatrix} q_1 \\ q_2 \\ q_3 \\ q_4 \end{bmatrix} + \begin{bmatrix} 0 \\ \frac{1}{J_1} \\ 0 \\ 0 \end{bmatrix} [T]$$

$$\begin{bmatrix} \theta_1 \\ \theta_2 \end{bmatrix} = \begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{bmatrix} \begin{bmatrix} q_1 \\ q_2 \\ q_3 \\ q_4 \end{bmatrix}$$