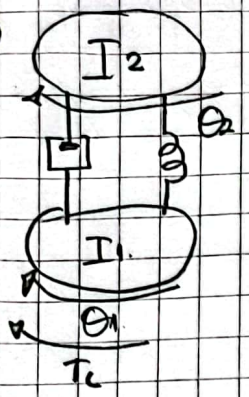

$$T_c - K(\theta_1 - \theta_2) - B(\dot{\theta}_1 - \dot{\theta}_2) = I\ddot{\theta}_1$$

$$B(\dot{\theta}_1 - \dot{\theta}_2) + (\theta_1 - \theta_2) = I_2\ddot{\theta}_2$$

Salidas θ_1 y θ_2

$$T_c - K\theta_1 + K\theta_2 - B\dot{\theta}_1 + B\theta_2 = I_1\ddot{\theta}_1$$

$$B\dot{\theta}_1 + K\theta_1 - B\dot{\theta}_2 - K\theta_2 = I_2\ddot{\theta}_2$$

$$x_1 = \theta_1 \quad x_2 = \theta_1 \quad x_3 = \theta_2 \quad x_4 = \theta_2$$

$$\dot{x}_2 = \ddot{\theta}_1 = \frac{T_c}{I_1} - \frac{K}{I_1}\theta_1 - \frac{B}{I_1}\dot{\theta}_1 + \frac{K}{I_1}\theta_2 + \frac{B}{I_1}\dot{\theta}_2$$

$$\dot{x}_2 = \frac{1}{I_1}T_c + \frac{Kx_3}{I_1} - \frac{B}{I_1}x_2 - \frac{K}{I_1}x_1 + \frac{B}{I_1}x_4$$

$$\dot{x}_4 = \ddot{\theta}_2 = \frac{B}{I_2}\dot{\theta}_1 - \frac{B}{I_2}\dot{\theta}_2 + \frac{K}{I_2}\theta_1 - \frac{K}{I_2}\theta_2$$

$$= \frac{B}{I_2}x_2 - \frac{B}{I_2}x_4 + \frac{K}{I_2}x_1 - \frac{K}{I_2}x_3$$

$$\begin{bmatrix}\dot{x}_1\\ \dot{x}_2\\ \dot{x}_3\\ \dot{x}_4\end{bmatrix} = \begin{bmatrix}0 & 1 & 0 & 0\\ -K/I_1 & -B/I_1 & K/I_1 & B/I_1\\ 0 & 0 & 0 & 1\\ K/I_2 & B/I_2 & -K/I_2 & -B/I_2\end{bmatrix}\begin{bmatrix}x_1\\ x_2\\ x_3\\ x_4\end{bmatrix} + \begin{bmatrix}0\\ 1/I_1\\ 0\\ 0\end{bmatrix}T_c$$

$$\begin{bmatrix}\theta_1\\ \theta_2\end{bmatrix} = \begin{bmatrix}1 & 0 & 0 & 0\\ 0 & 0 & 1 & 0\end{bmatrix}\begin{bmatrix}x_1\\ x_2\\ x_3\\ x_4\end{bmatrix} + [0]T_c$$