

* Pers Keadaan

$$\dot{x}_1 = -\frac{R_r}{L_a} x_1 - \frac{K_b}{L_a} x_2 + \frac{1}{L_a} u$$

$$\dot{x}_2 = +\frac{K_m}{J} x_1 - \frac{B}{J} x_2$$

$$\dot{x}_3 = x_2$$

* Pers Keluaran

$$y_1 = x_2$$

$$y_2 = x_3$$

$$\dot{x} = \begin{bmatrix} \dot{x}_1 \\ \dot{x}_2 \\ \dot{x}_3 \end{bmatrix} = \begin{bmatrix} -\frac{R_r}{L_a} & -\frac{K_b}{L_a} & 0 \\ \frac{K_m}{J} & -\frac{B}{J} & 0 \\ 0 & 1 & 0 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix} + \begin{bmatrix} \frac{1}{L_a} \\ 0 \\ 0 \end{bmatrix} u$$

$A[3 \times 3]$ $B[3 \times 1]$

$$y = \begin{bmatrix} y_1 \\ y_2 \end{bmatrix} = \begin{bmatrix} 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix} + \begin{bmatrix} 0 \\ 0 \end{bmatrix} u$$

$C[2 \times 3]$ $D[2 \times 1]$