

* Model Matematika (Pers. Differensial)

$$(1) \quad e_a(t) - e_b(t) = R_a i_a(t) + L_a \frac{di_a(t)}{dt}$$

$$(2) \quad T(t) = J \frac{d\omega(t)}{dt} + B \omega(t)$$

$$(3) \quad T(t) = K_m i_a(t)$$

$$(4) \quad e_b(t) = K_b \omega(t)$$

state assignment:

$$x_1 \triangleq i_a(t)$$

$$x_2 \triangleq \omega(t)$$

$$u \triangleq e_a(t)$$

$$y \triangleq \omega(t) = x_2$$

Pers. Keadaan:

$$\frac{di_a(t)}{dt} = -\frac{R_a}{L_a} i_a(t) - \frac{K_b}{L_a} \omega(t) + \frac{1}{L_a} e_a(t)$$

$$\frac{d\omega(t)}{dt} = \frac{K_m}{J} i_a(t) - \frac{B}{J} \omega(t)$$