

$$(2) \rightarrow J s \omega(s) = K_m I_a(s) - B \omega(s)$$

$$[Js + B] \omega(s) = K_m I_a(s)$$

$$\swarrow \quad I_a(s) = \frac{Js + B}{K_m} \omega(s)$$

$$(1) \quad s \left[\frac{Js + B}{K_m} \right] \omega(s) = \frac{1}{L_a} \left[E_a(s) - K_b \omega(s) - \underbrace{R_a \left(\frac{Js + B}{K_m} \right) \omega(s)}_{\frac{K_m}{R_a} (Js + B) \omega(s)} \right]$$

$$s [J L_a s + B L_a] \omega(s) = K_m \left[E_a(s) - K_b \omega(s) - \underbrace{R_a (Js + B) \omega(s)}_{\frac{K_m}{R_a} (Js + B) \omega(s)} \right]$$

$$= K_m E_a(s) - K_b K_m \omega(s) - \frac{K_m}{R_a} (Js + B) \omega(s)$$