

Model Nisbah Alih (Transfer Function)

$$E_a(s) \rightarrow \boxed{G(s)} \rightarrow \omega(s)$$

$$E_a(s) \rightarrow \boxed{H(s)} \rightarrow I_a(s)$$

$$G(s) = \frac{K_m J}{s^2 + \left(\frac{B L_a + J R_a}{L_a J}\right)s + \left(\frac{B R_a + K_m K_b}{L_a J}\right)}$$

$$= \frac{K_o}{s^2 + 2\zeta \omega_n s + \omega_n^2}$$

$$H(s) = \frac{J s + B}{s^2 + 2\zeta \omega_n s + \omega_n^2}$$

Verifikasi
validasi

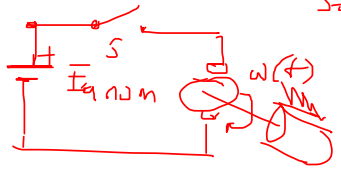
TUGAS 2

* For Analysis Only:

Saklar S ditutup pada
 $t=0$, $e_a(t) = E_{anon} u(t)$

$$E_a(s) = \int_0^\infty e_a(t) dt$$

$$= \frac{E_{anon}}{s}$$



$$\omega(s) = G(s) \cdot E_a(s)$$

$$= \frac{K_o E_{anon}}{s(s^2 + 2\zeta \omega_n s + \omega_n^2)}$$

$$\omega(t) = \mathcal{L}^{-1} \omega(s) \rightarrow \text{VERIFIKASI}$$

$\omega(0) \rightarrow$ putaran motor
pada $t=0 \rightarrow \omega(0) = 0$

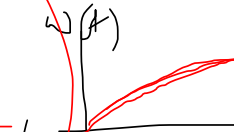
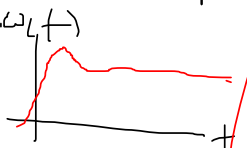
$\omega(\infty) \rightarrow$ putaran motor
pada $t \rightarrow \infty \rightarrow \omega(\infty) = \omega_{nom} [\text{RPM}]$

KONDISI AWAL
KONDISI AKHIR

$0 < \zeta < 1$
underdamped

$\zeta = 1$
critically damped

$\zeta > 1$
overdamped



$$\omega(s) = \frac{K_o E_{anon}}{s(s+a)^2}$$

$$\omega(s) = \frac{K_o E_{anon}}{s(s+a)(s+b)}$$

$$I_a(s) = H(s) E_a(s) \rightarrow i_a(t) = \mathcal{L}^{-1} I_a(s) \rightarrow \text{VERIFIKASI}$$

Kondisi Awal $t=0 \rightarrow i_a(0) = 0$

$t \rightarrow \infty \rightarrow i_a(\infty)$

Kondisi Akhir

$I_{a nom}$

REFERENSI

Simulink

NUMERIC

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font
ekref.