Respostas – Lista do Cap. 3

Questão 1:

(a) $\frac{C(s)}{R(s)} = \frac{2}{s^2+2\,s+2}$

(b) $c(\infty) = 1$

(c) $t_r \simeq 1{,}5\ s$

(d) $t_{s(5\%)} \simeq 3\ s$

(e) $M_P = 4{,}3\%$

Questão 2:

(a) $K_m = J \cdot \omega_{n^2}$ $\qquad K_t = \frac{(2\zeta\omega_n \cdot J) - B}{K_m}$

(b) $K_m \simeq 608{,}4\ N.m$ $\quad K_t \simeq$ 154 ms

(c) $t_r \simeq$ 243 ms $\quad t_{s(5\%)} \simeq$ 641 ms

Questão 3:

$e_{SS} = 33{,}3\%$

Questão 4:

(a) $F = 10$

(b) $t_r \simeq 0{,}19\ s$ $\quad t_{s(5\%)} \simeq 0{,}5\ s$

Questão 5:

(a) $FTMA(s) = \frac{k.s+b}{s.(s+(a-k))}$

(b) $e_{SS} = \frac{1}{K_V} = \frac{a-k}{b}$

Questão 6:

(a) $\frac{C(s)}{R(s)} = \frac{2{,}25}{s^2+2\,s+3{,}25}$

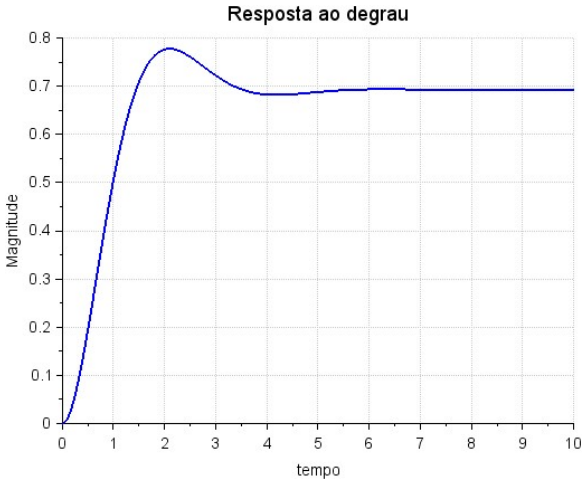
(b) $c(\infty) = 0{,}692$

(c) $t_r \simeq 1\ s$

(d) $t_{s(5\%)} \simeq 3\ s$

(e) $M_P = 12{,}3\%$

(f)



Questão 7:

(a) $A = 200$

(b) $B = 2{,}5$

Questão 8:

$\zeta \cong 0{,}456 \qquad \omega_n = 7{,}8\frac{\text{rad}}{s} \qquad L = 4{,}78mH \qquad C = 995{,}44\mu F$

Questão 9:

(a) $K = 5{,}986$

(b) $c(\infty) = 0{,}692$

Questão 10:

$\frac{C(s)}{R(s)} = \frac{2s}{s^2+0{,}2\,s+2} \qquad t_{s(5\%)} \simeq 60\ s \qquad M_P = 80\% \qquad t_r \simeq 108\ ms \qquad (t_{r\,(simulado)} = 469ms)$