Control Automático
EM-720

Tarea #4

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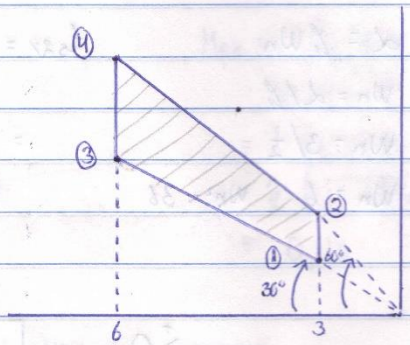
(6pm - 9pm)

Segundo Cuatrimestre 2018

Tarea # 4



Punto ①

$\zeta = \cos(30)$

$\zeta = \sqrt{3}/2$

$\alpha = \zeta \omega_n$

$\omega_n = \alpha / \zeta$

$\omega_n = 3 / \frac{\sqrt{3}}{2}$

$\omega_n = 2\sqrt{3} \quad \wedge \quad \omega_n^2 = 12$

$$M_{p_1} = -\left(\frac{\zeta \pi}{\sqrt{1-\zeta^2}}\right)$$

$$e$$

$$M_{p_1} = -\left[\frac{(\sqrt{3}/2)\pi}{\sqrt{1-(\sqrt{3}/2)^2}}\right]$$

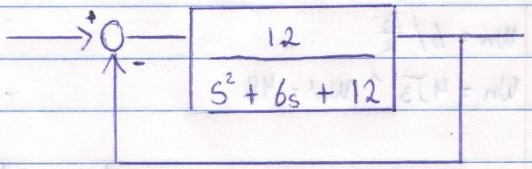
$$e$$

$$M_{p_1} = 0,0043$$

$$t_{s2\%} = \frac{4}{\zeta \omega_n}$$

$$= \frac{4}{(\sqrt{3}/2)(2\sqrt{3})}$$

$$= 4/3$$



Punto ②

$\zeta = \cos(60)$

$\zeta = 1/2$

$\alpha = \zeta \omega_n$

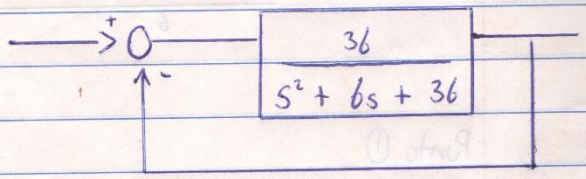
$\omega_n = \alpha / \zeta$

$\omega_n = 3 / \frac{1}{2}$

$\omega_n = 6 \;\hat{}\; \omega_n^2 = 36$

$t_{s2\%} = \frac{4}{\zeta \omega_n} = \frac{4}{(1/2)(6)} = 4/3$

$$M_{p2} = -e^{\left(\frac{\zeta \pi}{\sqrt{1-\zeta^2}}\right)} = -e^{\left[\frac{(1/2)\pi}{\sqrt{1-(1/2)^2}}\right]} = 0,16$$



Punto ③

$\zeta = \cos(30)$

$\zeta = \sqrt{3}/2$

$$M_{p3} = -e^{\left(\frac{\zeta \pi}{\sqrt{1-\zeta^2}}\right)} = -e^{\left[\frac{(\sqrt{3}/2)\pi}{\sqrt{1-(\sqrt{3}/2)^2}}\right]} = 0,0043$$

$\alpha = \zeta \omega_n$

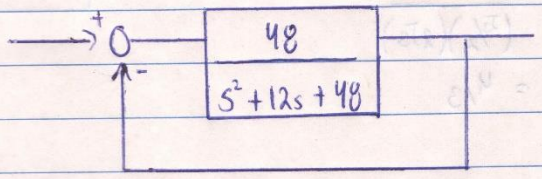
$\omega_n = \alpha / \zeta$

$\omega_n = 6 / \frac{\sqrt{3}}{2}$

$\omega_n = 4\sqrt{3} \;\hat{}\; \omega_n^2 = 48$

$t_{s2\%} = \frac{4}{(\sqrt{3}/2)(4\sqrt{3})}$

$t_{s2\%} = \frac{2}{3}$



Punto (4)

$\zeta = \cos(60)$

$\zeta = 1/2$

$\alpha = \zeta \omega_n$

$\omega_n = \alpha / \zeta$

$\omega_n = 6 / 1/2$

$\omega_n = 12 \quad \omega_n^2 = 144$

$$t_{s2\%} = \frac{4}{\zeta \omega_n}$$

$$= \frac{4}{(1/2)(12)}$$

$$= 2/3$$

$$M_{p4} = -\left(\frac{\zeta \pi}{\sqrt{1-\zeta^2}} \right)$$

$$e$$

$$= -\left[\frac{(1/2)\pi}{\sqrt{1-(1/2)^2}} \right]$$

$$e$$

$$= 0,16$$