POR.

I

26 04 23

- $Gp(s) = \dfrac{19.42\, e^{-0.00167\, s}}{(0,056\ s + 1)}$

$N = \dfrac{0,001167}{0,001} = \dfrac{\theta'}{T}$

$N = 1,67$

$N = 1$

Transferencia pulso expresa $\dfrac{Gp(s)}{s}$

$\dfrac{Gp(s)}{(s)} = \dfrac{19.42\, e^{-0,00167\, s}}{(0,056\ s + 1)(s)}$

- $\theta = \theta' - NT$

$\theta = (0,001167) - (1)(0.001)$

$\theta = 0,000167$ $\quad \theta = 0.00017$

- $\dfrac{Gp(s)}{(s)} = \dfrac{19.42}{0,056} \cdot \left(\dfrac{e^{-0,00167\, s}}{(s + \frac{1}{0,056})(s)} \right)$

- $m = 1 - \theta/T$

$m = 0,83$ $\quad 0.83$

- $\mathcal{Z}m\left\{\dfrac{Gp(s)}{s}\right\} = \dfrac{19.42}{0,056}\, \mathcal{Z}m\left\{\dfrac{1}{(s + \frac{1}{0,056})(s)}\right\}$

- $\tau ao = 5.3056 / 1000$

$\tau ao = 0,0053056\ s$

Por tablas, $\dfrac{a}{s(s+a)} \rightarrow \dfrac{1}{z-1} - \dfrac{e^{-amT}}{z - e^{-aT}}$.

expresando

$\mathcal{Z}m\left\{\dfrac{Gp(s)}{s}\right\} = \dfrac{19.42}{0,056}\, \mathcal{Z}m\left\{\dfrac{1 \cdot \frac{1/0,056}{1/0,056}}{(s + 1/0,056)(s)}\right\}$

$\mathcal{Z}m\left\{\dfrac{Gp(s)}{s}\right\} = \dfrac{19.42}{0.056} \cdot \left(\dfrac{1}{1/0,056}\right) \mathcal{Z}m\left\{\dfrac{1/0,056}{(s + 1/0,056)(s)}\right\}$ ○

Por

II

25 04 23

$$\mathcal{Tm}\left\{\frac{Gp(s)}{s}\right\} = \frac{19.42\ (1)}{0.056\ (1/0.056)} \cdot \mathcal{Tm}\left\{\frac{\frac{1}{0.056}}{\left(s+\frac{1}{0.056}\right)(s)}\right\}$$

por tablas $\frac{a}{s(s+a)} \rightarrow \frac{1}{z-1} - \frac{e^{-amT}}{z-e^{-aT}}$

$$\mathcal{Tm}\left\{\frac{Gp(s)}{s}\right\} = 19.42 \left[\frac{1}{z-1} - \frac{e^{-(1/0.056)(0.33)(0.001)}}{z-e^{-(1/0.056)(0.001)}}\right]$$

→ corrección sebastián es 0.33

$$\mathcal{Tm}\left\{\frac{Gp(s)}{s}\right\} = 19.42 \left[\frac{1}{z-1} - \frac{0.98529}{z-0.9823}\right]$$

$$\mathcal{Tm}\left\{\frac{Gp(s)}{s}\right\} = 19.42 \left[\frac{(z-0.9823)-(z-1)(0.98529)}{z^2-0.9823z-z+0.9823}\right]$$

$$\mathcal{Tm}\left\{\frac{Gp(s)}{s}\right\} = 19.42 \left[\frac{(z-0.9823)-(0.98529z-0.98529)}{z^2-1.9823z+0.9823}\right]$$

$$\mathcal{Tm}\left\{\frac{Gp(s)}{s}\right\} = 19.42 \left[\frac{z-0.9823-0.98529z+0.98529}{z^2-1.9823z+0.9823}\right]$$

$$\mathcal{Tm}\left\{\frac{Gp(s)}{s}\right\} = 19.42 \left[\frac{0.01471z+0.00299}{z^2-1.9823z+0.9823}\right]$$

$$\mathcal{Tm}\left\{\frac{Gp(s)}{s}\right\} = \frac{0.28567z+0.05807}{z^2-1.9823z+0.9823}$$

Versión compensada

$$G(z) = \frac{\left(19.42\ \frac{1}{0.056}\right)}{0.056} \cdot \left[\frac{0.01471z+0.00299}{z^2-1.9823z+0.9823}\right]$$

$$\mathcal{Tm}\left\{\frac{Gp(s)}{s}\right\} = \frac{91.09318z+18.51588}{z^2-1.9823z+0.9823}$$

→ Si el sistema presenta retardo

P01

V2

$$Hg(z) = \left(\frac{z-1}{z}\right) z^{-n} \cdot \left(\frac{0.28567\,z + 0.05807}{z^2 - 1.9823\,z + 0.9823}\right)$$

$$Hg(z) = \left(\frac{0.28567\,z^2 - 0.22760\,z - 0.05807}{z^4 - 1.9823\,z^3 + 0.98237z^2}\right)$$

Funcion transferencia pulso

Dead Beat

Nota: $\frac{z^{2-m}}{z^{3-n}} \Rightarrow \frac{z^{(-5)}}{z^{-5}}$ → m+n

$$Hg(z) = \left(\frac{0.28567\,z^2 - 0.22760\,z - 0.05807}{z^4 - 1.9823\,z^3 + 0.98237z^2}\right) \times \frac{z^{-6}}{z^{-6}}$$

$$\cdot\ Hg(z) = \frac{0.28567\,z^{-4} - 0.22760\,z^{-5} - 0.05807\,z^{-6}}{z^{-2} - 1.9823\,z^{-3} + 0.9823\,z^{-4}}$$

$$\cdot\ Hg(z) = \frac{z^{-2}}{z^{-2}} \cdot \left(\frac{0.28567\,z^{-2} - 0.22760\,z^{-3} - 0.05807\,z^{-4}}{1 - 1.9823\,z^{-1} + 0.9823\,z^{-2}}\right)$$

$$\cdot\ Hg(z) = \frac{0.28567\,z^{-2} - 0.22760\,z^{-3} - 0.05807\,z^{-4}}{1 - 1.9823\,z^{-1} + 0.9823\,z^{-2}} \quad \frac{B}{A}$$

$a_1 = -1.9823$
$a_2 = 0.9823$

$b_1 = 0.28567$
$b_2 = -0.22760$
$b_3 = -0.05807$

$\cdot \sum b_i = ?$

$\cdot\ q_0 = \frac{1}{\sum b_i}$