Lab 12

miercuri, 18 decembrie 2024 08:55

$$R_1:\begin{cases}\dot{x}_1(t)=\dfrac{e(t)}{T_1}-\dfrac{x_1(t)}{T_2}\\ u(t)=c_1[x_1(t)+e(t)]\end{cases}\longrightarrow \wedge\ x_1(s)=\frac{e(s)}{T_1}-\frac{x_1(s)}{T_2}\Rightarrow x_1$$

$$u(s)=c_1[x_1(s)+e(s)]$$

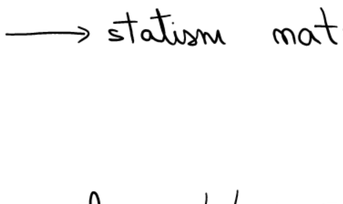
$$H(s)=\frac{u(s)}{e(s)}$$

① $\dot{I}$ (ET-I, ET-PI)

$u_\infty = 0$

$y_\infty = ct$

② D (ET-DT$_1$)

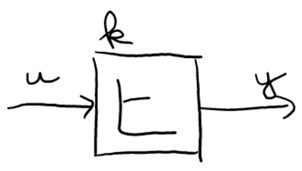


$u_\infty = ct$

$y_\infty = 0$

$$H(s)=\frac{k(1+sT_d)}{1+T_f\cdot s}$$

③ P(ET-P , ET-PT1 , ET-PDT$_1$)



$$y_\infty = k_p\cdot u_\infty = \lim_{s\to 0} s\cdot y(s) = \lim_{s\to 0} s\cdot H(s)\cdot u(s) = \lim_{s\to 0} \not{s}\cdot H(s)\cdot\frac{u_\infty}{\not{s}} = H(0)\cdot u_\infty = k_p\cdot u_\infty$$

sau $\left.f_M(s)=\frac{z_\infty}{v_\infty}\right|_{w_\infty=6}$

⟶ statism natural ① $\left.f_M(y)=\frac{y_\infty}{v_\infty}\right|_{w_\infty=0}$

② $f_M(y)=\frac{k_N(y)}{1+k_0}$ sau $f_M(z)=\frac{k_N(z)}{1+k_0}$

Exemplu : Lab_4_TS

SC-4

$w_\infty = 7$

$v_\infty = 1.25$

① RG-PDT$_1$: $e_\infty \neq 0$, $e_\infty = w_\infty - y_\infty$ $\Rightarrow e = 7 - y_\infty \to y_\infty = 7 - e$

$u_{c_\infty} = \underset{k_p}{2}\cdot e_\infty = 5,5716$

↳ inlocuim s cu 0 in H_{RG} sa gasim k_p

PT$_1$: $H_{PT_1}=\dfrac{k}{1+sT}$, $k=1$

$u_{1\infty} = 1\cdot u_{c\infty} = 2e_\infty = 5,5746$

PT$_1$: $m_\infty = 0,8\cdot u_{1\infty} = 1,6\,e_\infty = 4,4597$

Sumator : $p_\infty = m_\infty - v_\infty = 1,6e - 1,25 = 3,2097$

PT$_1$: $z_\infty = 1,25\cdot p_\infty = 2e_\infty - 1,5625 = 4,0121$

ET-P : $y_\infty = 1,05\cdot z_\infty = 2,1e_\infty - 1,6406$

$y_\infty = 7 - e_\infty = 4,2127$

$\Rightarrow 7 - e_\infty = 2,1e_\infty - 1,6404$

$3,1e_\infty = 8,6404$

$\Rightarrow \boxed{e_\infty = 2,7873}$

me intoarcem si calculam tot

RG-PI : $e_\infty = 0$, $e_\infty = w_\infty - y_\infty$ $\Rightarrow y_\infty = w_\infty = 7$

$u_{1\infty} = 1\cdot u_{c_\infty} = u_{c\infty} = 8,229$

$m_\infty = 0,8\cdot u_{1\infty} - 0,8u_{c_\infty} = 6,5833$

$p_\infty = m_\infty - v_\infty = 0,8u_{c_\infty} - 1,25 = 5,3333$

$z_\infty = 1,25\,p_\infty = u_{c\infty} - 1,5625 = 6,6667$

$y_\infty = 1,05\,z_\infty = 1,05\,u_{c\infty} - 1,6406 = 7$

$1,05\,u_{c\infty} = 8,6406$

$\boxed{u_{c\infty} = 8,2291}$

statism = $\boxed{f_M = 0}$ ⟶ regulatorul are componenta i

Pt statism

① $y_\infty = -e_\infty$ $(w_\infty = 0)$

$-e_\infty = 2,1e_\infty - 1,6406$

$-3,1e_\infty = -1,6406$

$\boxed{e_\infty = 0,5292}$

$\boxed{y_{e_\infty} = -0,5292}$

$\boxed{z_\infty = y/1,05 = -0,5040}$

$f_M(y) = \frac{-0,5292}{1,25} = -0,4234$

$f_M(z) = \frac{-0,5040}{1,25} = -0,4032$

oricare din astea

② $k_0 = k_R\cdot k_{PC}$, $k_R = 2$, $k_{PC} = 1\cdot 0,8\cdot 1,25\cdot 1,05 = 1,05$ $\Rightarrow \boxed{k_0 = 2,1}$

$k_N(y) = -1,25\cdot 1,05 = -1,3125$

$k_N(z) = -1,25$

$f_M(y) = \frac{-1,3125}{3,1} = -0,4234$

$f_M(y) = \frac{-1,25}{3,1} = -0,4032$