Carolina Carvalho Silva - 10705933

- Exercícios do dia 03/11 -

1- $\begin{cases} y = (I + GH)^{-1} GR \\ y = TR \end{cases} \Rightarrow TR = (I + GH)^{-1} GR$

$\Rightarrow T = (I + GH)^{-1} G$

$z = Hy \Rightarrow R - E = Hy \Rightarrow R - G^{-1} y = Hy$

$\Rightarrow y(H + G^{-1}) = R \Rightarrow y = R(H + G^{-1})^{-1}$

$\Rightarrow y = R \underbrace{(HGH + I)^{-1} G}_{T}$

$\therefore T = (I + GH)^{-1} G$

$G(I + HG)^{-1} = G(I + L)^{-1}$ com $L = HG$

2- $z = Hy \Rightarrow z = HGE \Rightarrow z = HG(R - z)$

$\Rightarrow (I + HG) z = HGR \Rightarrow z R^{-1} = (I + HG)^{-1} HG$

Como $y = GE$: $H^{-1} z = G(R - z)$

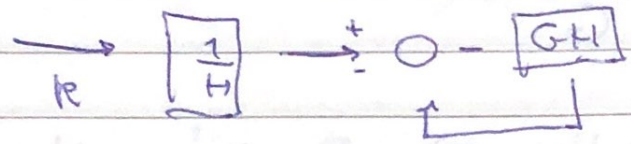
$\Rightarrow GR = (H^{-1} + G) z \Rightarrow GR = (I + GH) H^{-1} z$

$\therefore z R^{-1} = H(I + GH)^{-1} G$

Sendo $L = HG$: $\frac{y}{R} = \frac{L}{I+L} + \frac{GH}{I+GH}$

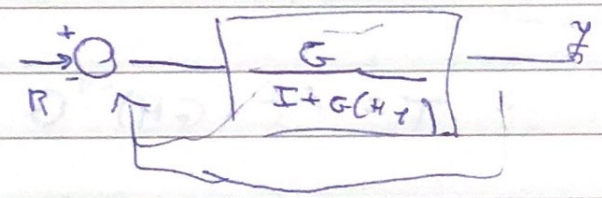
$\Rightarrow y = Hy \Rightarrow y = HG(R-y) \Rightarrow \frac{y}{R} = \frac{HG}{I+HG}$

3-



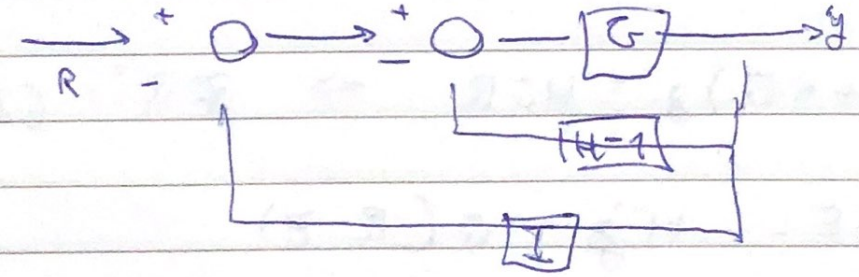
$y = \left(\frac{R}{H} - y\right) GH \Rightarrow y = \frac{GR}{I+GH}$

4-



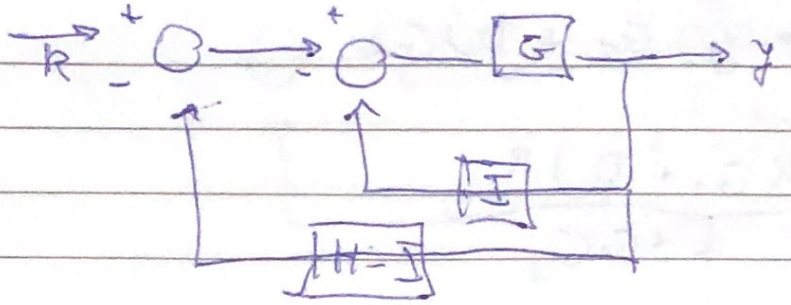
$y = \left(\frac{R}{H} - y\right) GH \Rightarrow y = \frac{GR}{I+GH}$

5-



$y = (R - I - y(H-1))\, G \Rightarrow y = \frac{GR}{1+HG}$

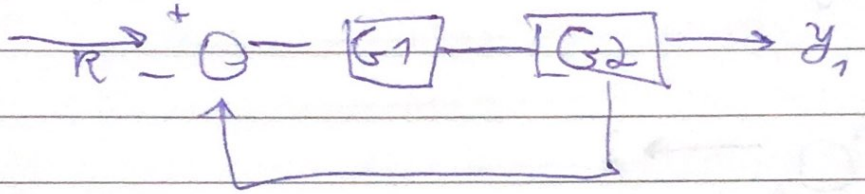
6-



$$y = (R - y(H-I) + yI)\,G$$

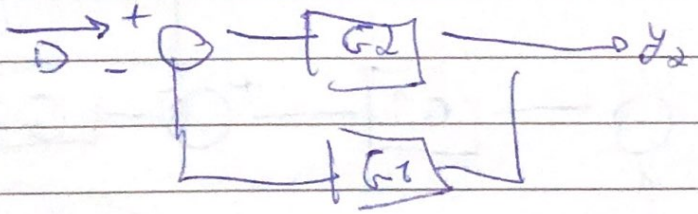
$$\Rightarrow y = \frac{GR}{I+GH}$$

7-



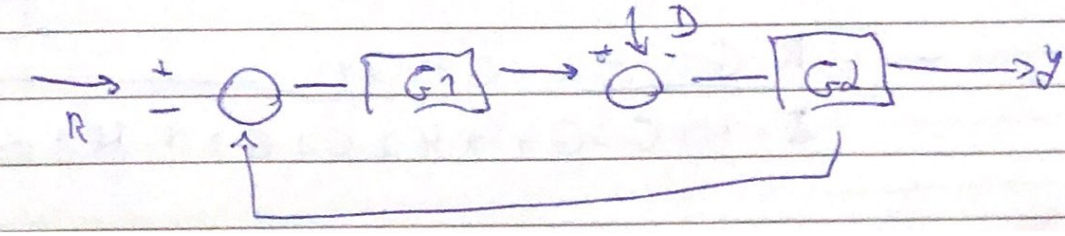
$$y_1 = (R - y_1)\,G_1G_2 \Rightarrow y_1 = \frac{RG + G_2}{I + G_1 + G_2}$$

8-



$$y_2 = (D - y_2 G_1)\,G_2 \Rightarrow y_2 = \frac{DG^2}{I + G_1}$$

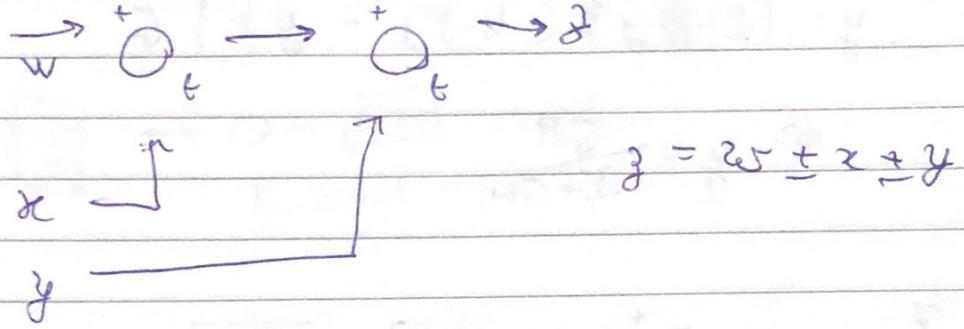
9-



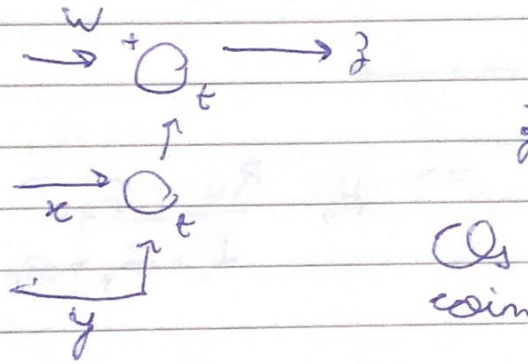
$$\Rightarrow y = ((R-y)G_1 + D)G_2$$

$$\Rightarrow y = \frac{(RG_1 + D)R}{I + G_1G_2}$$

10 -



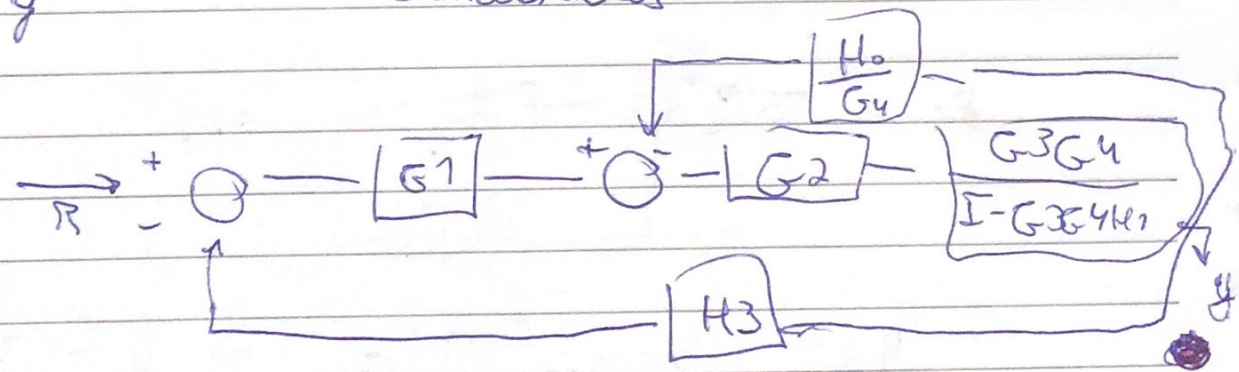
$$z = w \pm x \pm y$$



$$z = w \pm x \pm y$$

Os esquemas de blocos são coincidentes

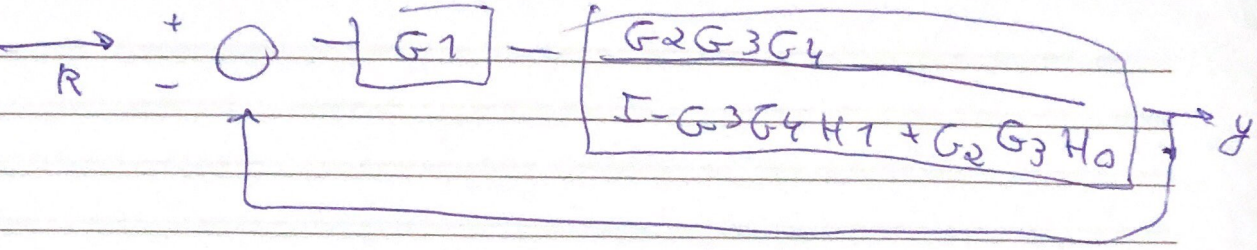
11 -



$$y = \left[(R - H3y)G1 - \frac{H_2}{G4}y\right]G2 \cdot \frac{G_3G_4}{I - G_3G_4H_1}$$

$$= \frac{RG1\,G2\,G3\,G4}{I - H1G3G4 + H2G2G3 + H3G1G2G3G4}$$

12-



$$y = (R-y)\, G_1 \cdot \frac{G_2 G_3 G_4}{I - G_3 G_4 H_1 + G_2 G_3 H_2}$$

$$\Rightarrow y = \frac{R G_1 G_2 G_3 G_4}{I - H_1 G_3 G_4 + H_2 G_2 G_3 + H_3 G_1 G_2 G_3 G_4}$$