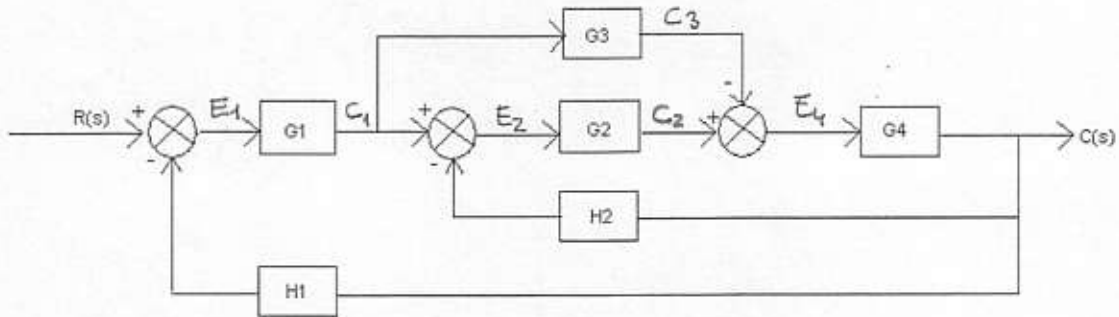


Simplifica el siguiente diagrama de bloques y obtén la función de transferencia global.



$$\begin{aligned} C &= G_4 \cdot E_4 \\ E_4 &= C_2 - C_3 \\ C_3 &= G_3 \cdot C_1 \\ C_2 &= G_2 \cdot E_2 \\ E_2 &= C_1 - H_2 \end{aligned}$$

$$E_4 = C_2 - C_3 = G_2 \cdot E_2 - G_3 C_1 = G_2 (C_1 - H_2 \cdot C) - G_3 C_1 \Rightarrow$$

$$\Rightarrow E_4 = G_2 C_1 - G_2 H_2 C - G_3 C_1$$

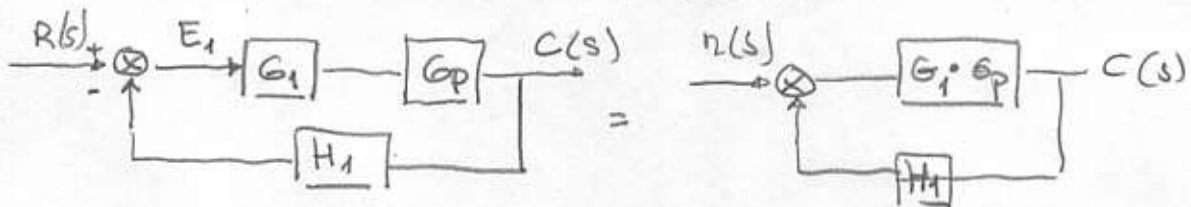
$$C = G_4 \cdot E_4 = G_4 (G_2 C_1 - G_2 H_2 C - G_3 C_1) =$$

$$C = G_4 G_2 C_1 - G_4 G_2 H_2 C - G_4 G_3 C_1$$

$$C + G_4 G_2 H_2 C = G_4 G_2 C_1 - G_4 G_3 C_1$$

$$C (1 + G_4 G_2 H_2) = C_1 (G_4 G_2 - G_4 G_3)$$

$$G_p = \frac{C}{C_1} = \frac{G_4 G_2 - G_4 G_3}{1 + G_4 G_2 H_2}$$



$$G_1 \cdot G_p = \frac{G_1 G_2 G_4 - G_1 G_3 G_4}{1 + G_4 G_2 H_2} \Rightarrow \frac{R(s)}{M(s)} = C(s)$$

$$M(s) = \frac{C(s)}{R(s)} = \frac{\frac{G_1 G_2 G_4 - G_1 G_3 G_4}{1 + G_4 G_2 H_2}}{1 + \frac{G_1 G_2 G_4 - G_1 G_3 G_4}{1 + G_4 G_2 H_2} \cdot H_1} = \frac{G_1 G_4 (G_2 - G_3)}{1 + G_4 G_2 H_2 + G_1 G_4 H_1 (G_2 - G_3)}$$