UNIVERSIDAD POLITÉCNICA
DE LA ZONA METROPOLITANA DE GUADALAJARA

Control

Función de transferencia

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CARRERA:

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GRADO Y GRUPO:

8°-B

CUATRIMESTRE:

8°- cuatrimestre

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Subsecretaría de Educación Superior
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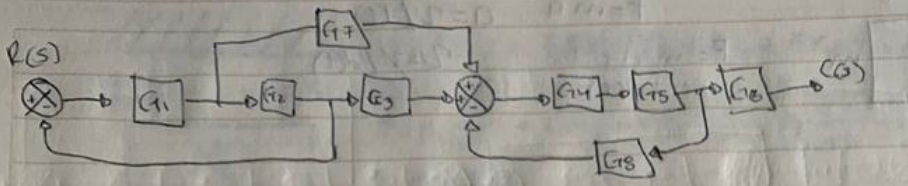
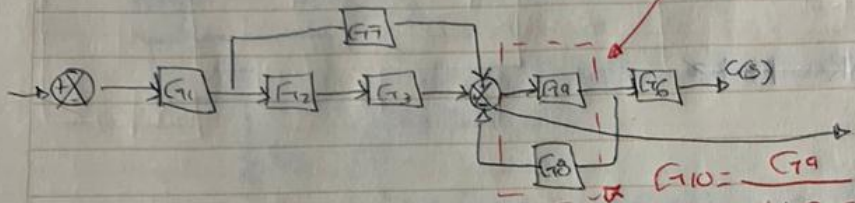
$$G(S) = \frac{B_F}{1 \pm B_F B_R}$$

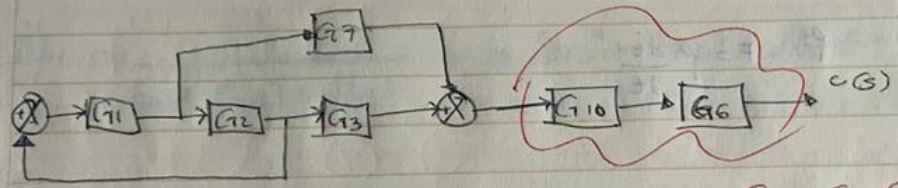


$G_9 = G_4 G_5$



$G_{10} = \frac{G_9}{1 + G_9 G_8}$

nota: si este signo es (−) será (+) y si es (+) se pondrá (−)

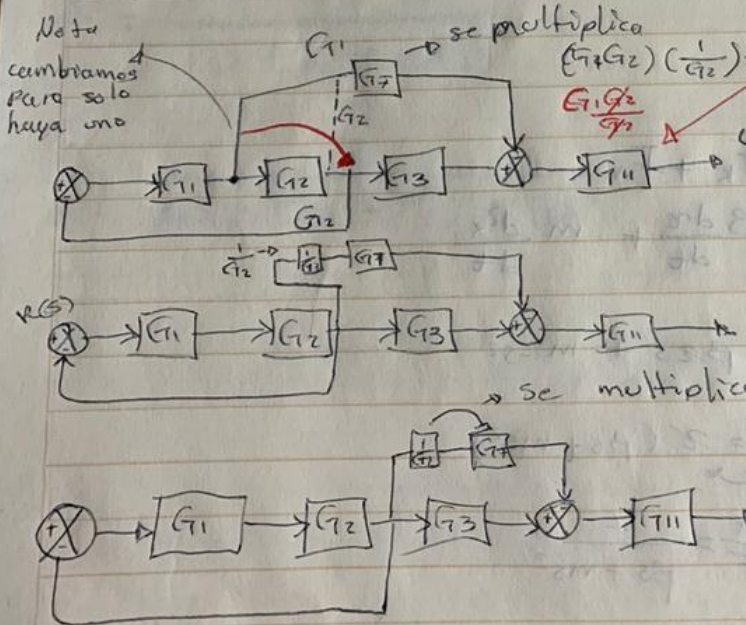


Nota cambiamos para solo haya uno

G_1 → se multiplica $(G_7 G_2)\left(\frac{1}{G_2}\right) = G_1$

$G_{11} = G_{10} G_6$

$\frac{G_1 G_2}{G_7}$



→ se multiplica $\frac{G_7}{G_2}$ y se suma con G_3

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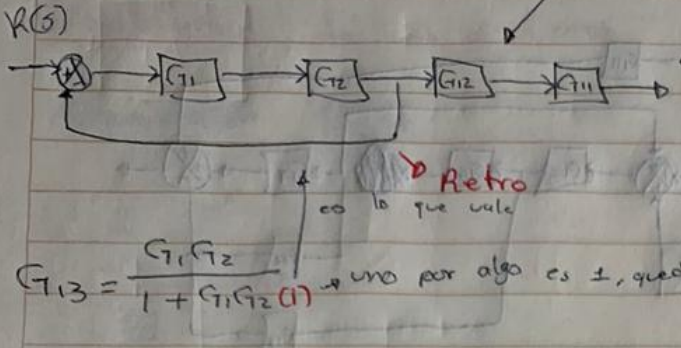
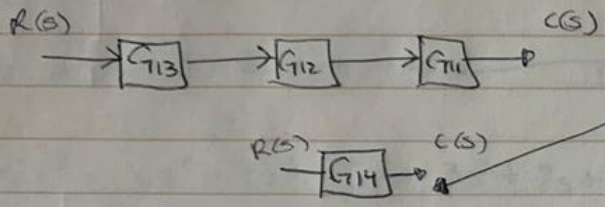
$G_{12} = \frac{G_7}{G_2} + G_3$



$G_{13} = \frac{G_1 G_2}{1 + G_1 G_2 (1)}$ → uno por algo es 1, queda igual.



$G_{14} = G_{13} G_{12} G_{11} =$ ~~[illegible]~~

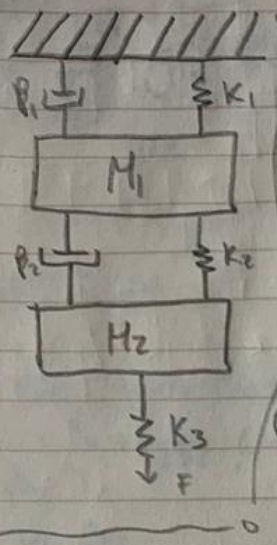
$G(s) = G_{11} G_{12} G_{13}$

$G(s) = (G_{10} G_6)\left(\frac{G_7}{G_2} + G_3\right)\left(\frac{G_1 G_2}{1 + G_1 G_2}\right)$

$G(s) = \left(\frac{G_9}{1 + G_9 G_8}\right)(G_6)\left(\frac{G_7}{G_2} + G_3\right)\left(\frac{G_1 G_7}{1 + G_1 G_2}\right)$

$G(s) = \left(\frac{G_4 G_5}{1 + G_4 G_5 G_8}\right)(G_6)\left(\frac{G_7 + G_3 G_2}{G_2}\right)\left(\frac{G_1 G_2}{1 + G_1 G_2}\right)$

$G(s) = \frac{G_4 G_5 G_6 G_1 G_2 (G_7 + G_3 G_2)}{(1 + G_4 G_5 G_8)(G_2)(1 + G_1 G_2)}$



①

$$F = F_{\beta_1} + F_{K_1} + F_{M_1} + F_{\beta_2} + F_{K_2} + F_{M_2} + F_{K_3}$$

①

$$F = \beta_1 \frac{dx}{dt} + K_1 \frac{d^2x}{dt} + M_1 \frac{d^3x}{dt} + \beta_2 \frac{d^4x}{dt} + K_2 \frac{d^5x}{dt} + M_2 \frac{d^6x}{dt} + K_3 \frac{d^7x}{dt}$$

③

$$F = \beta_1 x s + K_1 x_1 s^2 + M_1 x_1 s^3 + \beta_2 x s^4 + K_2 x s^5 + M_2 x s^6 + K_3 x_2 s^7$$

④

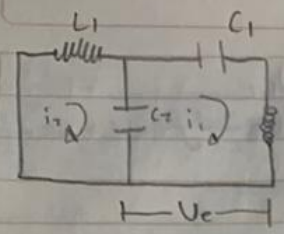
$$F = X_1(\beta_1 s + K_1 s^2 + M_1 s^3) + X_2(\beta_2 s^4 + K_2 s^5 + M_2 s^6 + K_3 s^7)$$

⑤

$$\frac{X_1}{F} = \frac{1}{B_1 s + K_1 s^2 + M_1 s^3} + h_2(\beta_2 s^4 + K_2 s^5 + M_2 s^6 + K_3 s^7)$$

$$\frac{X}{F} = \frac{1}{\beta_1 s + K_1 s^2 + M_1 s^3}$$

$$\frac{X}{F} = \frac{1}{\beta_2 s + K_2 s^2 + M_2 s^3 + K_3 s^4}$$



$V_e = V_{c2} + V_{c1} + V_{L2}$

$V_e = \frac{1}{C_2}\int (i_1 - i_2)\,dt + \frac{1}{C_1}\int i_1\,dt + L_2\frac{di_2}{dt}$

$0 = V_{L1} + V_{c2}$ $\qquad 0 = L_1\frac{di_1}{dt} + \frac{1}{C_2}\int (i_2 - i_1)\,dt$

$V_s = \frac{1}{C_1}\int i_1\,dt$

1 $V_e = \frac{1}{C_2 s}(I_1 - I_2) + \frac{1}{C_1 s} I_1 + L_2 s I_1$

2 $0 = I_1 s I_2 + \frac{1}{C_2 s}(I_2 - I_1)$

3 $V_s = \frac{1}{C_1 s} I_1$

4 $I_1 = V_s C_1 s$

$0 = -\frac{1}{C_2 s} I_1 + I_2\left(\frac{1}{C_2 s} + L_1 s\right)$

$I_2\left(\frac{1}{C_2 s} + L_1 s\right) = -\frac{1}{C_2 s} I_1$

$I_2 = \frac{1}{C_2 s} I_1\left(\frac{1}{C_2 s} + L_1 s\right)$

$I_2 = \frac{1}{C_2 s} V_s C_1 s\left(\frac{1}{C_2 s} + L_1 s\right)$

$V_e = \frac{1}{C_2 s}\left(\frac{1}{C_2 s} V_s C_1 s\left[\frac{1}{C_2 s} + L_1 s\right] - V_s C_1 s\right) + \frac{1}{L_1 s}(V_s C_1 s) + L_2 s (V_s C_1 s)$

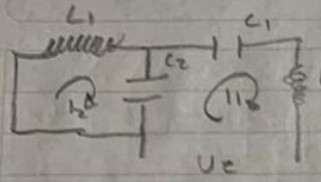
$V_e = V_s\left(\frac{1}{C_2 s}\left[\frac{1}{C_2 s} C_1 s\left[\frac{1}{C_2 s} + L_1 s\right] - C_1 s\right] + L_2 s\,(C_1 s)\right)$

$$\frac{V_s}{V_e} = \frac{1}{\frac{1}{C_2 s}\left[\frac{1}{C_2 s} C_1 s\left(\frac{1}{C_2 s} + L_1 s\right) - C_1 s\right] + L_1 s\,(L_1 s)}$$

$$\frac{V_s}{V_e} = \frac{1}{L_2 s\,(L_2 s\, L_1 s\left[L_2 s + L_1 s\right] - L_1 s) + L_2 s\,(L_1 s)}$$

$$\frac{V_s}{V_e} = \frac{1}{L_2 s + L_2 s\, L_1 s + L_2 s + L_1 s - L_1 s + L_2 s + L_1 s}$$

$$\frac{V_s}{V_e} = \frac{1}{L_2 s + L_2 s\, L_1 s + L_2 s + L_1 s - L_1 s + L_2 s + L_1 s}$$



$V_e = V_{c2} + V_{c1} + V_{L2}$

$V_e = \frac{1}{C_2}\int (I_1 - I_2)\,dt + \frac{1}{C_1}\int I_1\,dt + L_2\frac{dI_1}{dt}$

$0 = V_{L_1} + V_{C2}$

$0 = L_1\frac{di_2}{dt} + \frac{1}{C_2}\int (i_2 - i_1)\,dt$

$V_s = \frac{1}{C_1}\int i_1\,dt$

1 $V_e = \frac{1}{C_{2S}}(I_1 - I_2) + \frac{1}{C_{1S}} I_1 + L_{2S} I_1$

2 $0 = L_{1S} I_2 + \frac{1}{C_{2S}}(I_2 - I_1)$

3 $V_S = \frac{1}{C_{1S}} I_1$

4 $I_1 = V_S C_{1S}$

$0 = -\frac{1}{C_{2S}} I_1 + I_2\left(\frac{1}{C_{2S}} + L_{1S}\right)$

$I_2\left(\frac{1}{C_{2S}} + L_{1S}\right) = -\frac{1}{C_{1S}} I_1 = -I_2 = \frac{1}{C_{1S}} I_1\left(\frac{1}{C_{2S}} + L_{1S}\right)$

$I_2 = \frac{1}{C_{2S}} V_S C_{1S}\left(\frac{1}{C_{2S}} + L_{1S}\right)$

$V_e = \frac{1}{C_{2S}}\left(\frac{1}{C_{2S}} V_S C_{1S}\left[\frac{1}{C_{2S}} + L_{1S}\right] - V_S C_{1S}\right) + \frac{1}{C_{1S}}(V_S C_{1S}) + L_{2S}(V_S C_{1S})$

$V_e = V_S\left(\frac{1}{C_{2S}}\left[\frac{1}{C_{2S}} C_{1S}\left\{\frac{1}{C_{2S}} + L_{1S}\right) - C_{1S}\right] + L_{2S}(C_{1S})\right)$

$\frac{V_S}{V_e} = \frac{1}{\frac{1}{C_{2S}}\left[\frac{1}{C_{2S}} C_{1S}\left(\frac{1}{C_{2S}} + L_{1S}\right) - C_{1S}\right] + L_{2S}(C_{1S})}$

$\frac{V_S}{V_e} = \frac{1}{C_{2S}\left(C_{2S} C_{1S}\left[C_{2S} + L_{1S}\right] - C_{1S}\right) + L_{2S}(C_{1S})}$

$\frac{V_S}{V_e} = \frac{C_{2S} C_{1S}}{C_{2S} + C_{2S} + C_{2S} + L_{1S} - C_S + L_{1S} + C_{1S}}$

$C_{2S}\ C_{1S}$