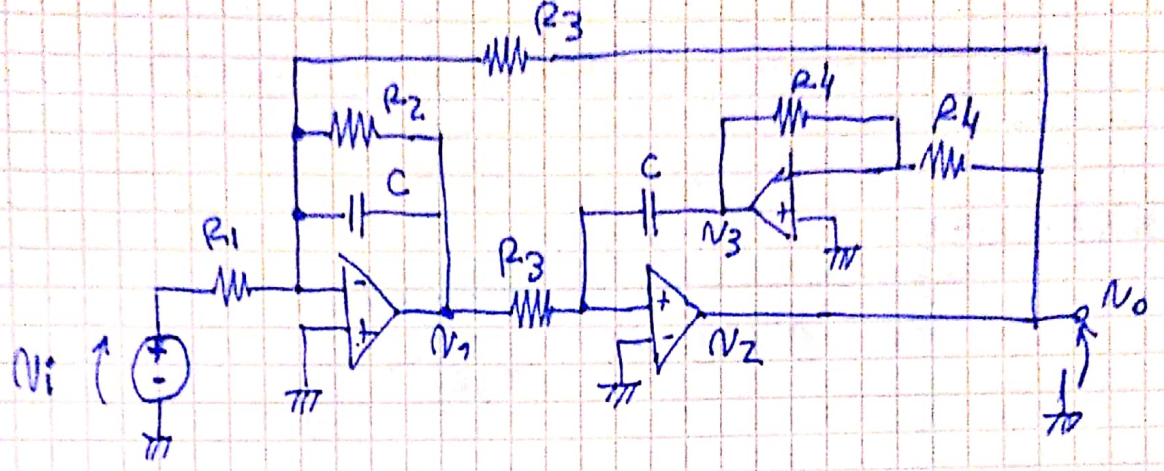
① Hallar transferencia



- $V_i G_1 + V_1 SC + V_1 G_2 + V_2 G_3$
- $V_1 \cdot G_3 + V_3 SC = 0$
- $(V_2 \cdot G_4 + V_3 G_4) = 0$.
- $V_2 = V_o$.

$\therefore V_3 = -V_o \frac{G_4}{G_4} = -V_o$.

$V_1 = -V_3 \frac{SC}{G_3} = +V_o \frac{SC}{G_3}$.

$\therefore V_o \left(\frac{(SC)^2}{G_3} + \frac{G_2}{G_3} SC + G_3 \right) = -V_i G_1$.

$$H(s) = -\frac{G_1}{G_3} \cdot \frac{G_3}{\frac{(SC)^2}{G_3} + \frac{G_2}{G_3} SC + G_3}$$

$$H(s) = -\frac{G_1}{G_3} \cdot \frac{G_3^2/C^2}{s^2 + s\frac{G_2}{C} + \frac{G_3^2}{C^2}}$$

$\therefore$ 4

$$H(s) = -\frac{R_3}{R_1} \cdot \frac{1/(R_3C)^2}{s^2 + s\frac{1}{R_2C} + \frac{1}{(R_3C)^2}}$$

$\therefore$ $K = -\frac{R_3}{R_1}$ $\quad \omega_0 = \frac{1}{R_3C}$ $\quad \frac{\omega_0}{Q} = \frac{1}{R_2C}$.

$\rightarrow Q = \frac{R_2C}{\omega_0^{-1}} = \frac{R_2C}{(1/R_3C)^{-1}} = \frac{R_2}{R_3}$

$$K = -\frac{R_3}{R_1} \quad \omega_0 = \frac{1}{R_3C} \quad Q = \frac{R_2}{R_3}$$

$\rightarrow$ Parametrizo los valores $R_3 = R = R_4$

$\therefore$

- $R_1 = \frac{R}{K}$
- $R_2 = Q \cdot R$.
- $C = \frac{1}{\omega_0 R}$.

NOTA

HOJA N°

FECHA

Si $\omega_0 = 1$ / $Q = 3$.

- $R_1 = \frac{R}{K} = \frac{R}{10}$
- $R_2 = QR = 3R$
- $R_3 = R$
- $R_4 = R$
- $C = \frac{1}{\omega_0 R} = \frac{1}{R}$

Si $R = 1\Omega$ →
- $R_1 = 0{,}1\Omega$
- $R_2 = 3\Omega$
- $R_3 = 1\Omega$
- $R_4 = 1\Omega$
- $C = 1F$.

- Sensibilidad.
- Butterworth

→ Si $V_6 = V_1$.

$$V_i G_1 + V_0 SC + V_0 G_2 + V_0 G_3^2 / SC.$$

$$SCV_i G_1 = -V_0 (S^2 + G_2 SC + G_3^2)$$

$$H(S) = \frac{-SCG_1}{S^2 + G_2 SC + G_3^2} = \frac{-\frac{G_1}{C} \cdot S}{S^2 + S\frac{G_2}{C} + \frac{G_3^2}{C^2}}$$

$$\boxed{H(S) = -\frac{G_1}{G_2} \cdot \frac{G_2/C \; S}{S^2 + S G_2/C + G_3^2/C^2}}$$

NOTA

$$H(s) = k \cdot \frac{Q s}{s^2 + Q s + \omega_0^2}$$

$$\rightarrow k = -\frac{R_2}{R_1} \qquad \omega_0 = \frac{1}{R_3 C} \qquad Q = \frac{R_2}{R_3}$$

ω_0 y Q del filtro se mantienen. Solo a k. que pasa de $-\frac{R_3}{R_1}$ a $-\frac{R_2}{R_1}$