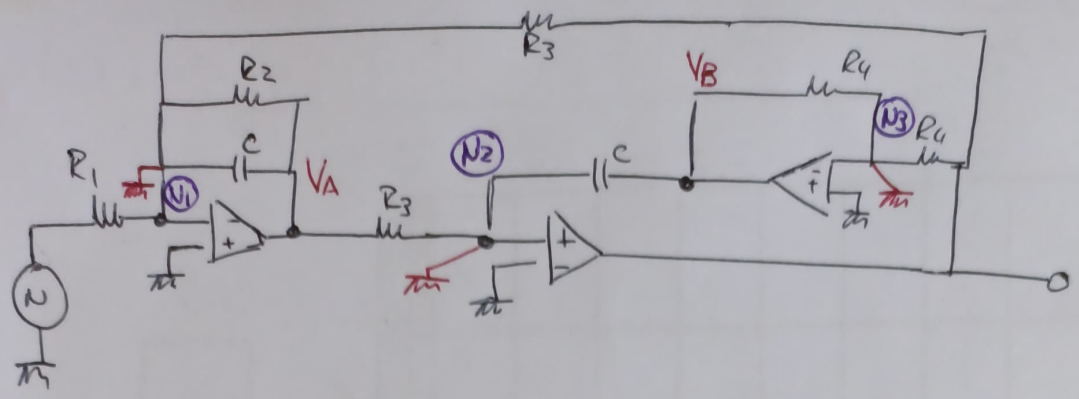


Transferencia

(N1) $-V_1\left(\frac{1}{R_1}\right) - V_A\left(\frac{1}{R_2} + \$C\right) - V_O\left(\frac{1}{R_3}\right) = \emptyset$

(N2) $-V_A\left(\frac{1}{R_3}\right) - V_B(\$C) = \emptyset \Rightarrow V_B(\$C) = -V_A\left(\frac{1}{R_3}\right)$

(N3) $-V_B\left(\frac{1}{R_4}\right) - V_O\left(\frac{1}{R_4}\right) \Rightarrow V_B = -V_O$

$\frac{V_A}{V_B} = -\$C \cdot R_3$

$V_O(1/R_3) + V_A(1/R_2 + \$C) = \frac{V_1}{R_1}$

$-V_O$

$V_O(1/R_3) + V_B\frac{V_A}{V_B}(1/R_2 + \$C) = \frac{V_1}{R_1} \Rightarrow V_O(1/R_3) - V_O(-\$CR_3)\left(1/R_2 + \$C\right) = \frac{V_1}{R_1}$

$\Rightarrow V_O\left(\frac{1}{R_3} + \$C R_3\,\frac{\$C \cdot R_2 + 1}{R_2}\right) = \frac{V_1}{R_1}$

$V_O\,\frac{R_2 + \$C \cdot R_3^2(\$CR_2 + 1)}{R_3 \cdot R_2} = \frac{V_1}{R_1}$

$$T(\$) = \frac{R3 \cdot R2}{R1} \frac{1}{\$^2 \cdot C^2 \cdot R3^2 \cdot R2 + \$ \cdot C \cdot R3^2 + R2}$$

$R \cdot C = \Omega \cdot \frac{S}{\Omega} \cdot S$

$$\left[\Omega \frac{1}{\frac{1}{S^2} \frac{S^2}{\Omega^2} \cdot \Omega^2 \cdot \Omega + \frac{1}{S} \cdot \frac{S}{\Omega} \cdot \Omega^2 + \Omega} = \right] = [\Omega] \cdot \left[\frac{1}{\Omega}\right]$$

Tiene lógicas las unidades

$$T(\$) = \frac{R3 \cdot R2}{R1} \frac{1}{C^2 \cdot R3^2 \cdot R2} \frac{1}{\$^2 + \$ \; 1/C \cdot R2 + 1/C^2 \cdot R3^2}$$

$$T(\$) = \frac{R3 \cdot R2}{R1 \cdot R2} \frac{1/C^2 \cdot R3^2}{\$^2 + \$ \cdot 1/C \cdot R2 + 1/C^2 \cdot R3^2}$$

$$T(\$) = \underbrace{\frac{R3}{R1}}_{K} \frac{\overbrace{1/C^2 R3^2}^{\omega_0^2}}{\$^2 + \$ \underbrace{1/C \cdot R2}_{\frac{\omega_0}{Q}} + \overbrace{1/C^2 \cdot R3^2}^{\omega_0^2}}$$

Si lo normalizo $\Omega\omega = \omega_0 = 1/C \cdot R3 \Rightarrow C = 1F$, $R3 = 1\Omega$

$$T(\$) = K \frac{1}{\$^2 + \$ \; 1/Q + 1} \quad ; \quad \omega_0^2 = \frac{1}{C^2 R3^2} \Rightarrow \omega_0 = \frac{1}{C \cdot R3}$$

$$Q = \frac{R2}{R3}$$

$$\frac{\omega_0}{Q} = \frac{1}{C \cdot R2} = \frac{1/C \cdot R3}{Q}$$

$$\frac{1}{C \cdot R2} = \frac{1}{C \cdot R3} \frac{1}{Q} \Rightarrow Q = R2/R3$$

$\omega = 2\pi f$

1

$\Rightarrow$ Si $Q = 10$ $\therefore$ $Q = \frac{R2}{R3} \longrightarrow 10$

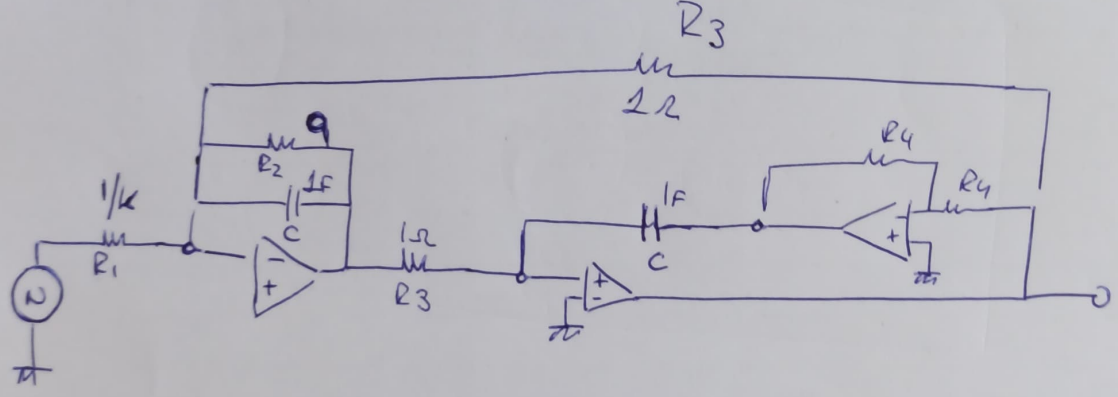
$\Rightarrow$

$\omega_0 = 1$	$C = 1F$
$Q = 10$	$R3 = 1\Omega$
	$R2 = 10\Omega$

$T(\phi) = 20\ dB$; $20\ dB = 20 \log(10)$

$T(\phi) = T(\$)\Big|_{\$=\phi} = k = \frac{R3 \longrightarrow 1}{R1 \longrightarrow 0{,}1}$

$\Rightarrow$ $k = 10$ $\therefore$ $R1 = 0{,}1$



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