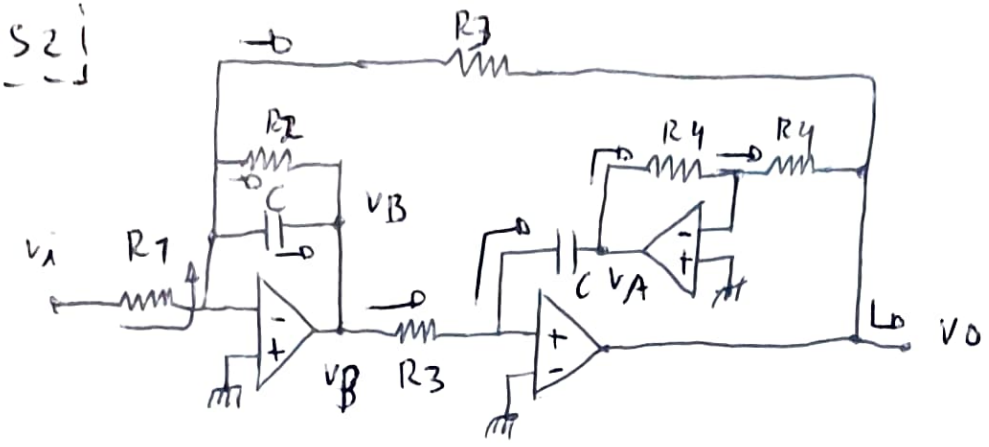
TS 21



$$H(S)=\frac{V_o}{V_i}\;;\quad \begin{cases} V_A=-V_o \\ V_B G3 = C\,S\,(-V_A) \end{cases} \rightarrow V_B\cdot G3 = -V_A\,SC \rightarrow V_B = V_o\frac{SC}{G3}$$

$$\rightarrow V_i G1 = -V_B SC - V_B G2 - V_o G3$$

$$V_i G1 = -V_o\left(S^2\frac{C^2}{G3} + SC\frac{G2}{G3} + G3\right) = -V_o\left(\frac{S^2C^2+SCG2+G3^2}{G3}\right)$$

$$\rightarrow H(S) = -\frac{G1\cdot G3}{C^2}\cdot\frac{G3}{G3}\cdot\frac{1}{S^2+S\frac{G2}{C}+\frac{G3^2}{C^2}} = -\frac{R3}{R1}\cdot\frac{1}{R3^2C^2}\cdot\frac{1}{S^2+S\frac{1}{R2C}+\frac{1}{R3^2C^2}}$$

ω_o^2 $\quad$ $\frac{\omega_o}{Q}$ $\quad$ ω_o^2

$$\begin{cases} \omega_o^2 = \frac{1}{R3^2C^2} \\ K = \frac{R3}{R1} \end{cases};\quad \frac{\omega_o}{Q} = \frac{1}{R2\cdot C} \rightarrow H(S) = -K\cdot\frac{\omega_o^2}{S^2+S\frac{\omega_o}{Q}+\omega_o^2}$$