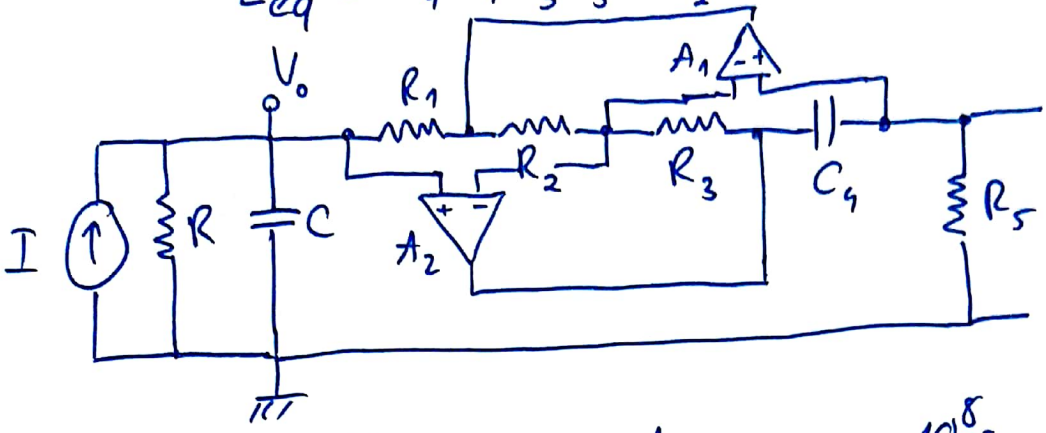
ANALOG ELECTRONICS

QUIZ # 7.1

① Choose $C_4 = 100pF$, $R_1 = R_3 = R_5 = 1k\Omega$, $R_2 = 10\Omega$

$$L_{eq} = C_4 R_1 R_3 R_5 / R_2 = 10mH$$



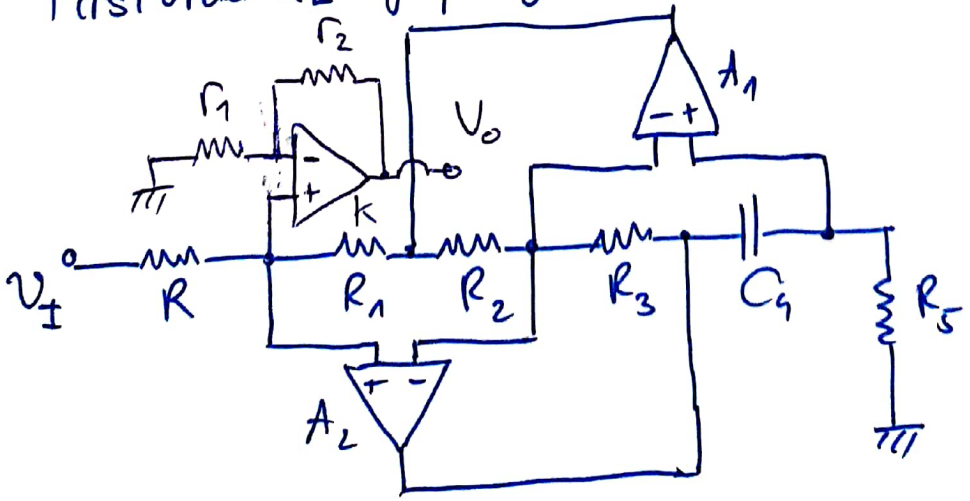
a) $T(s) = \frac{V_o}{I} = Z_{eq} = \frac{1}{1/R + 1/sL + sC} = \frac{10^8 s}{s^2 + 10^4 s + 10^{10}}$

b) $w_o = \frac{1}{\sqrt{LC}} = 100 \text{ krad/s}$

c) $Q = w_o RC = 10$

d) $BW = \frac{1}{RC} = 10 \text{ krad/s}$

② First order RL high pass filter



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$$\omega_{3dB} = 10\ krad/s = \frac{R}{L} \Leftrightarrow L = 0.01\ (H)$$

$$L_{eq} = R_1 R_3 R_5 C_4 / R_2 \Rightarrow \begin{cases} C_4 = 1\ \mu F \\ R_1 = R_3 = R_5 = 100\ \Omega \\ R_2 = 100\ \Omega \end{cases}$$

non-inverting amplifier $\rightarrow$ $K = 1 + \frac{r_2}{r_1} = 5$

$$\Rightarrow \text{Choose} \begin{cases} r_2 = 400\Omega \\ r_1 = 100\Omega \end{cases}$$

r_2 is series of 4 - 100Ω resistors

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