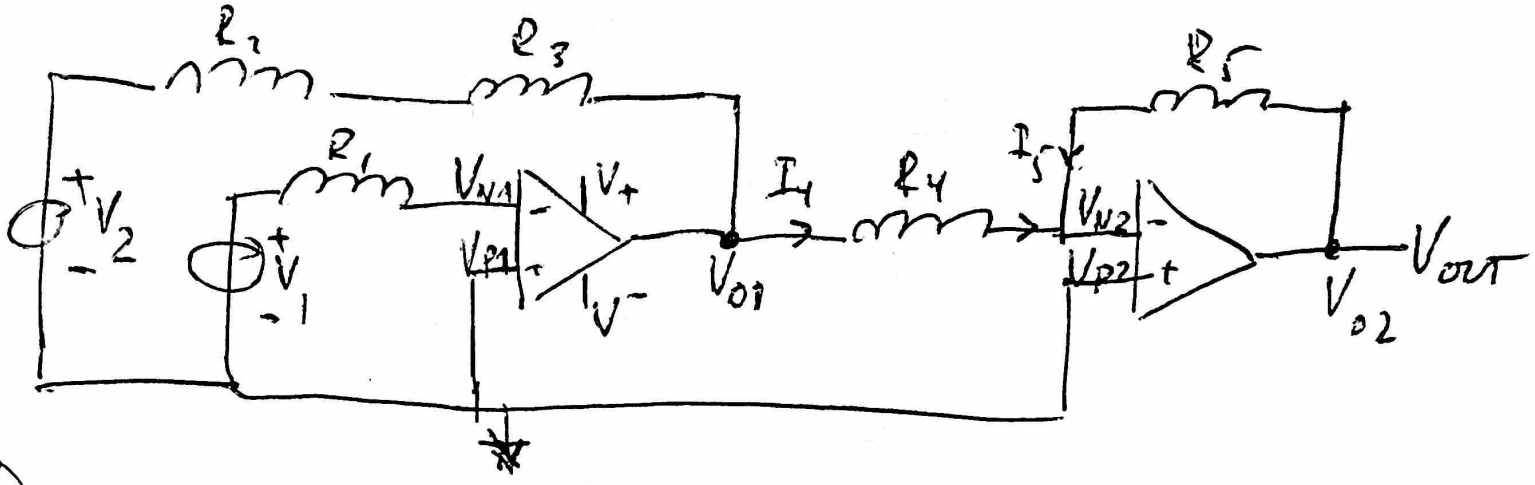
PROBLEM 2

$V_1 = 2\ V$

$V_2 = 3\ V$

$R_1 - R_5 = 2000\ k\Omega$



(A)

$$V_o - \left(-\frac{V_1}{R_1} - \frac{V_2}{R_2}\right) \cdot R_3 = 0$$

KCL: V_{N2} $\quad I_4 + I_5 = 0 \Rightarrow I_4 = \frac{V_{O1} - V_{N2}}{R_4} = \left(-\frac{V_1}{R_1} - \frac{V_2}{R_2}\right)\frac{R_3}{R_4}$

$$I_5 = \frac{V_{O2} - V_{N_2}}{R_5} = \frac{V_{O2} - 0}{R_5} = \frac{V_{O2}}{R_5}$$

$$\frac{V_{O2}}{R_5} + \left(-\frac{V_1}{R_1} - \frac{V_2}{R_2}\right)\frac{R_3}{R_4} = 0 \Rightarrow V_{O2} = \left(\frac{V_1}{R_1} + \frac{V_2}{R_2}\right)\frac{R_3 \cdot R_5}{R_4}$$

$$V_{OUT} = \left(\frac{V_1}{R_1} + \frac{V_2}{R_2}\right) \cdot \frac{R_3 \cdot R_5}{R_4}$$

(B)

$$V_{OUT} = \left(\frac{2}{2000} + \frac{3}{2000}\right) \cdot \frac{2000 \cdot 2000}{2000}$$

$$V_{OUT} = 5\ V$$