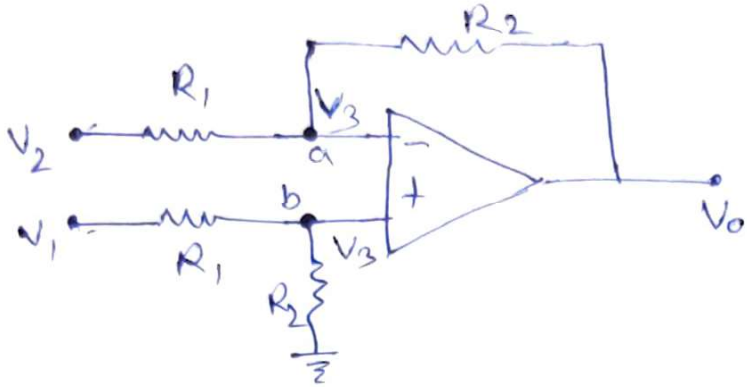
Differential Amplifier



→ At 'a'

$$\frac{V_3 - V_2}{R_1} + \frac{V_3 - V_o}{R_2} = 0$$

→ At 'b'

$$\frac{V_3 - V_1}{R_1} + \frac{V_3}{R_2} = 0$$

→ Rearranging, we get $\left(\frac{1}{R_1} + \frac{1}{R_2}\right)V_3 - \frac{V_2}{R_1} = \frac{V_o}{R_2}$

$$\left(\frac{1}{R_1} + \frac{1}{R_2}\right)V_3 - \frac{V_1}{R_1} = 0$$

→ On subtracting these equations

$$\frac{1}{R_1}(V_1 - V_2) = \frac{V_o}{R_2}$$

→ Therefore $V_o = \frac{R_2}{R_1}(V_1 - V_2)$