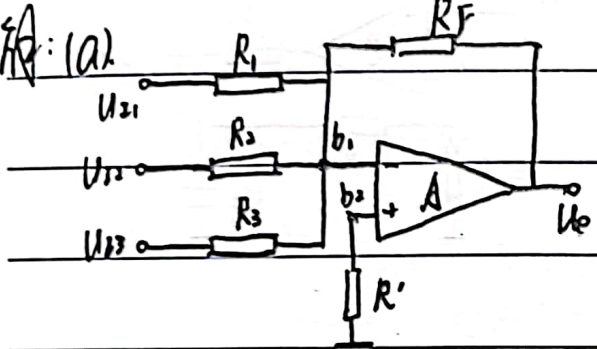


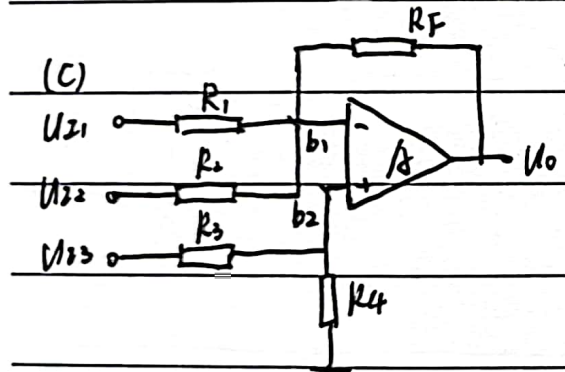
7.11



由虚短虚断: $U_{b1} = U_{b2} = 0$

$$\therefore \frac{U_o - 0}{R_F} = -\frac{U_{21}}{R_1} - \frac{U_{22}}{R_2} - \frac{U_{23}}{R_3}$$

$$\therefore U_o = -\left(\frac{R_F}{R_1} U_{21} + \frac{R_F}{R_2} U_{22} + \frac{R_F}{R_3} U_{23}\right)$$

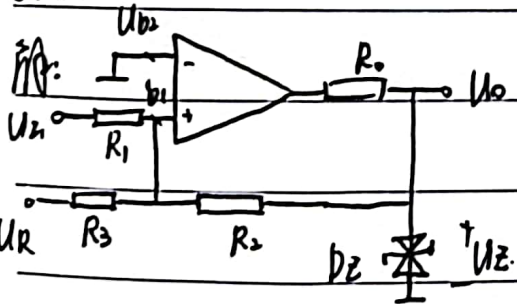


由虚短 $U_{b1} = U_{b2} = \frac{R_4}{R_3 + R_4} U_{23}$

由虚断:
$$\frac{U_o - U_{b1}}{R_F} = \frac{U_{b1} - U_{21}}{R_1} + \frac{U_{b1} - U_{22}}{R_2}$$

$$\therefore U_o = -\frac{R_F}{R_1} U_{21} - \frac{R_F}{R_2} U_{22} + R_F \left(\frac{1}{R_1} + \frac{1}{R_2}\right) \frac{R_4}{R_3 + R_4} U_{23} + \frac{R_F}{R_3 + R_4} U_{23}$$

8.25



运放处于反相状态 电路为同相电压迟滞比较器

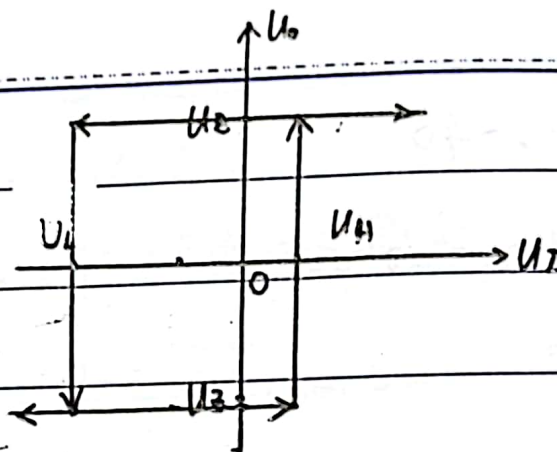
$$U_{b2} = 0 \quad U_{b1} = \frac{R_1 // R_3}{R_3 + R_1 // R_2} U_R + \frac{R_2 // R_3}{R_2 + R_2 // R_3} U_2 + \frac{R_1 // R_3}{R_2 + R_1 // R_3} U_o$$

令 $U_{b1} = U_{b2}$ 得

$$\frac{R_2 // R_3}{R_1 + R_2 // R_3} U_2 = -\frac{R_1 // R_2}{R_3 + R_1 // R_2} U_R \pm \frac{R_1 // R_3}{R_2 + R_1 // R_3} U_2$$

$$\therefore \begin{cases} U_L = \frac{R_1}{R_2} U_2 - \frac{R_1}{R_3} U_R \\ U_H = -\frac{R_1}{R_2} U_2 - \frac{R_1}{R_3} U_R \end{cases}$$

作出传输特性曲线:



8.→6分: (a) $U_{b1} = U_1$ $U_{b2} = \frac{1}{2} U_0$

令 $U_{b1} = U_{b2} \Rightarrow U_1 = \pm \frac{1}{2} U_0$

$\therefore U_L = -3V$ $U_H = 3V$

反相迟滞比较器

