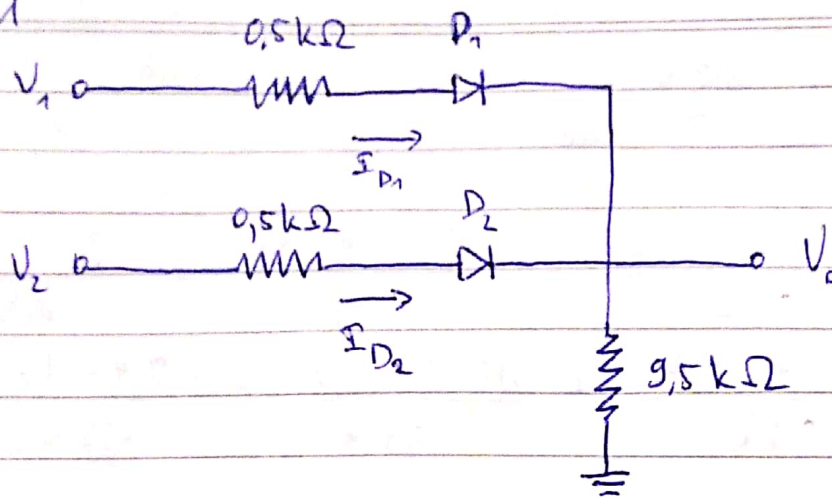


Bài 2.1



a) $V_1 = 10 \text{ V}, V_2 = 0$

D_1 mở, D_2 đóng

$$I_{D_1} = \frac{V_1 - V_f}{10k} = \frac{10 - 0,6}{10k} = 0,94 \text{ mA} \Rightarrow D_1 \text{ mở}$$

$$V_o = I_{D_1} \cdot 9,5k = 0,94 \cdot 9,5 = 8,93 \text{ V}$$

$$V_o > V_2 \Rightarrow D_2 \text{ đóng} \Rightarrow I_{D_2} = 0$$

b) $V_1 = 5 \text{ V}, V_2 = 0$

D_1 mở, D_2 đóng

$$I_{D_1} = \frac{V_1 - V_f}{10k} = \frac{5 - 0,6}{10k} = 0,44 \text{ mA} \Rightarrow D_1 \text{ mở}$$

$$V_o = I_{D_1} \cdot 9,5k = 0,44 \cdot 9,5 = 4,18 \text{ V}$$

$$V_o > V_2 \Rightarrow D_2 \text{ đóng} \Rightarrow I_{D_2} = 0$$

c) $V_1 = 10 \text{ V}, V_2 = 5 \text{ V}$

D_1 mở, D_2 đóng

$$I_{D_1} = \frac{V_1 - V_f}{10k} = \frac{10 - 0,6}{10k} = 0,94 \text{ mA} \Rightarrow D_1 \text{ mở}$$

$$V_o = I_{D_1} \cdot 9,5k = 0,94 \cdot 9,5 = 8,93 \text{ V}$$

$$V_o > V_2 \Rightarrow D_2 \text{ đóng} \Rightarrow I_{D_2} = 0$$

$$1) \quad V_1 = V_2 = 10V$$

$$D_1 \text{ mở}, D_2 \text{ mở}$$

$$I_{D_1} = \frac{V_1 - V_f - V_o}{0,5k} = \frac{10 - 0,6 - V_o}{0,5k} = \frac{9,4 - V_o}{0,5k}$$

$$I_{D_2} = \frac{V_2 - V_f - V_o}{0,5k} = \frac{10 - 0,6 - V_o}{0,5k} = \frac{9,4 - V_o}{0,5k}$$

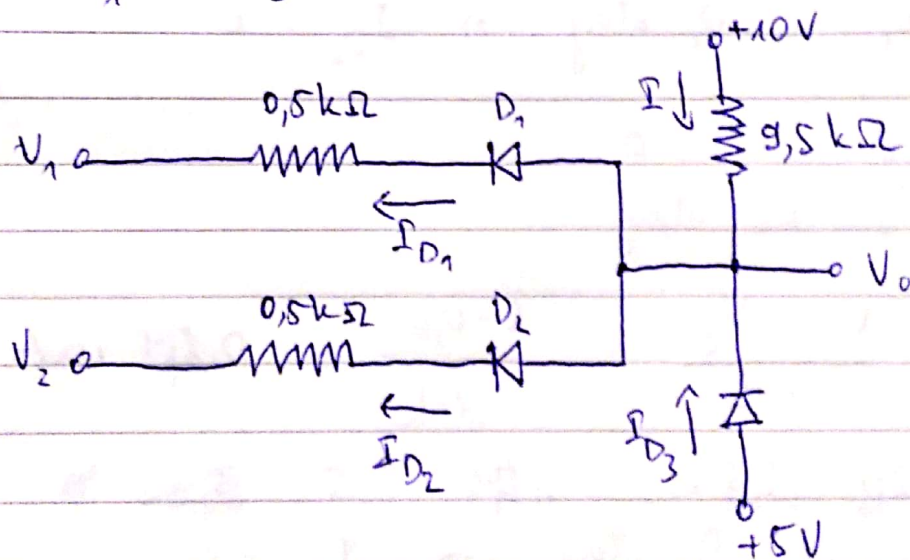
$$\text{Ta có: } \frac{V_o}{9,5k} = I_{D_1} + I_{D_2}$$

$$\Rightarrow \frac{V_o}{9,5k} = 2 \cdot \frac{9,4 - V_o}{0,5k}$$

$$\Rightarrow V_o = 9,159 \text{ V}$$

$$\Rightarrow I_{D_1} = I_{D_2} = 0,482 \text{ mA}$$

Bài 2.2



$$a) \quad V_1 = V_2 = 0$$

$$D_1 \text{ mở}, D_2 \text{ mở}, D_3 \text{ mở}$$

$$V_o = V_3 - V_f = 5 - 0,6 = 4,4 \text{ V}$$

$$\Rightarrow I = \frac{10 - V_o}{9,5k} = \frac{10 - 4,4}{9,5k} = 0,59 \text{ mA}$$

$$I_{D_1} = \frac{V_0 - V_f - V_1}{0,5k} = \frac{4,4 - 0,6 - 0}{0,5k} = 7,6 \text{ mA}$$

$$I_{D_2} = \frac{V_0 - V_f - V_2}{0,5k} = \frac{4,4 - 0,6 - 0}{0,5k} = 7,6 \text{ mA}$$

} $\Rightarrow$ đúng

$$\Rightarrow I_{D_3} = I_{D_1} + I_{D_2} - I = 7,6 + 7,6 - 0,59 = 14,61 \text{ mA}$$

$\Rightarrow$ đúng

b) $V_1 = V_2 = 5 \text{ V}$

D_1 mở, D_2 mở, D_3 đóng

$$I = \frac{10 - V_0}{9,5k}$$

$$I_{D_1} = \frac{V_0 - V_f - V_1}{0,5k} = \frac{V_0 - 5,6}{0,5k}$$

$$I_{D_2} = \frac{V_0 - V_f - V_2}{0,5k} = \frac{V_0 - 5,6}{0,5k}$$

$$I = I_{D_1} + I_{D_2}$$

$\Rightarrow$

$$\Rightarrow \frac{10 - V_0}{9,5k} = 2 \cdot \frac{V_0 - 5,6}{0,5k}$$

$$\Rightarrow V_0 = 5,71 \text{ V}$$

$$\Rightarrow I_{D_1} = I_{D_2} = \frac{5,71 - 5,6}{0,5k} = 0,22 \text{ mA}$$

$$I = 2 I_{D_1} = 0,44 \text{ mA}$$

$V_0 > 5 \Rightarrow D_3$ đóng

$$\Rightarrow I_{D_3} = 0$$

$$c) V_1 = 5V, V_2 = 0$$

$$D_1 \text{ đang}, D_2 \text{ mở}, D_3 \text{ mở}$$

$$V_0 = 5 - V_f = 5 - 0,6 = 4,4 \text{ V}$$

$$V_0 < V_1 \Rightarrow D_1 \text{ đang} \Rightarrow I_{D_1} = 0$$

$$I = \frac{10 - V_0}{9,5k} = \frac{10 - 4,4}{9,5} = 0,59 \text{ mA}$$

$$I_{D_2} = \frac{V_0 - V_f - V_2}{0,5k} = \frac{4,4 - 0,6 - 0}{0,5k} = 7,6 \text{ mA}$$

$$I + I_{D_3} = I_{D_2}$$

$$\Rightarrow I_{D_3} = I_{D_2} - I = 7,6 - 0,59 = 7,01 \text{ mA}$$

$\Rightarrow \text{đang}$

$$d) V_1 = 5V, V_2 = 2V$$

$$D_1 \text{ đang}, D_2 \text{ mở}, D_3 \text{ mở}$$

$$V_0 = 5 - V_f = 5 - 0,6 = 4,4 \text{ V}$$

$$V_0 < V_1 \Rightarrow D_1 \text{ đang}$$

$$I = \frac{10 - V_0}{9,5k} = \frac{10 - 4,4}{9,5k} = 0,59 \text{ mA}$$

$$I_{D_2} = \frac{V_0 - V_f - V_2}{0,5k} = \frac{4,4 - 0,6 - 2}{0,5k} = 3,6 \text{ mA}$$

$$\Rightarrow I_{D_3} = I_{D_2} - I = 3,6 - 0,59 = 3,01 \text{ mA}$$

$\Rightarrow \text{đang}$