

加上

1-3. 解: 当正向电压时, PN 结会变窄, 有利于多子扩散运动, 容易导电; 当加上反向电压时, PN 结变宽, 不利于多子扩散, 反向电流很小, 所以 PN 结具有单向导电性。

若反向电压过大使得反向电流突然增加, 此时 PN 结被击穿, 失去单向导电性。

温度升高会使正向特性左移, 反向特性下移, 击穿特性出现情况变化。

1-6. 解: ① 1.  $V_D$  为硅管

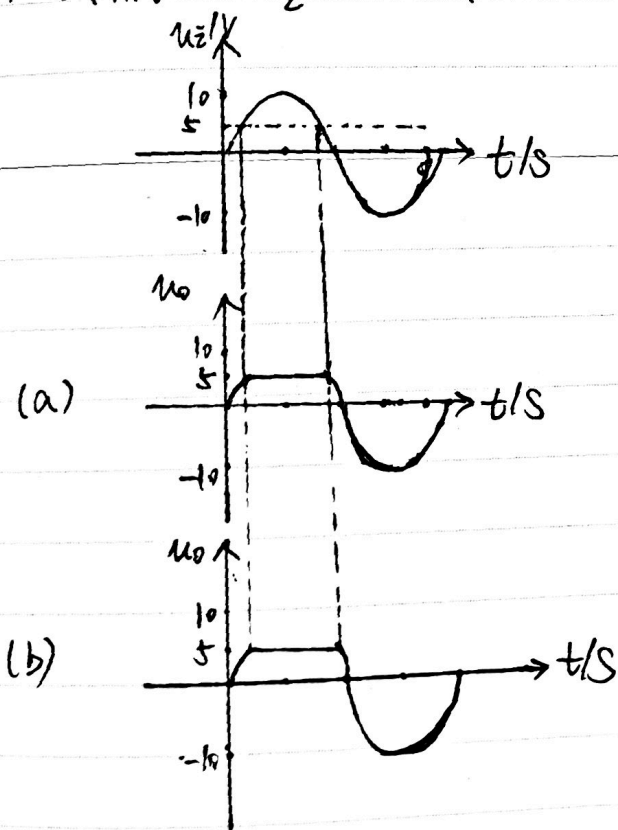
$$\therefore V_D = 0.7 \text{ V}$$

$$\therefore I = \frac{10 - V_D}{5.1} \text{ mA}$$

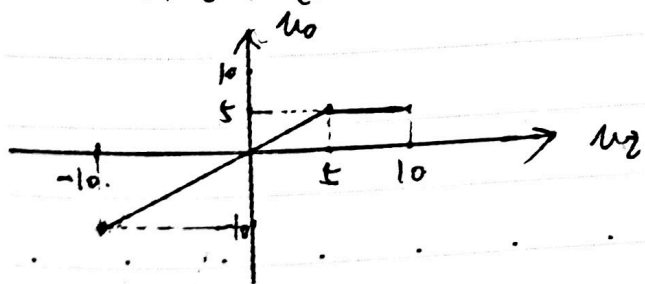
$$= 1.824 \text{ mA}$$

2. 当温度升高时,  $I$  增大,  $V_D$  减小。

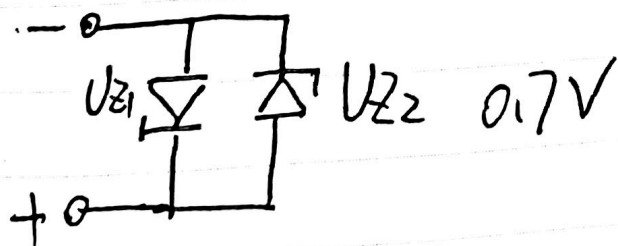
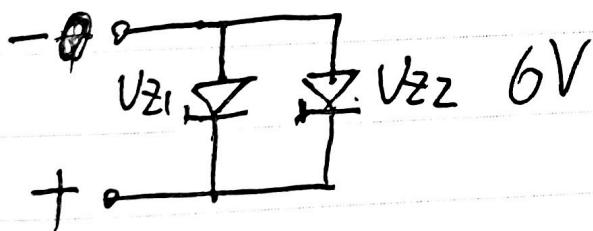
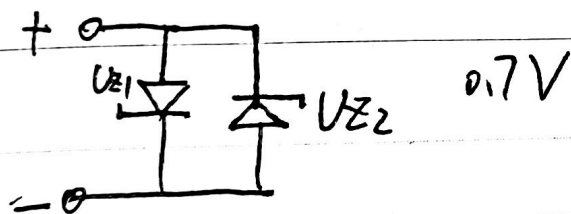
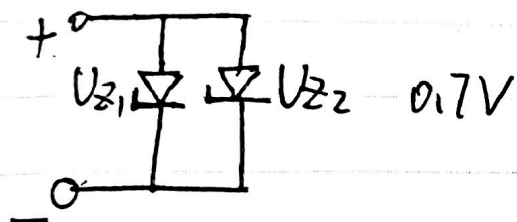
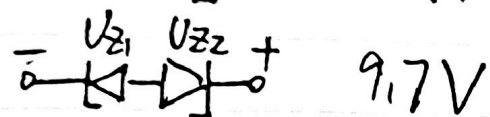
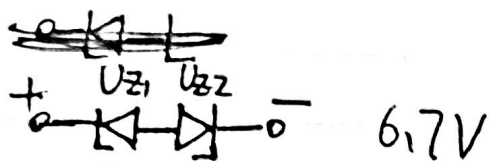
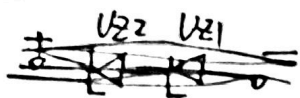
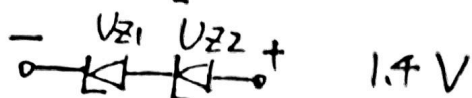
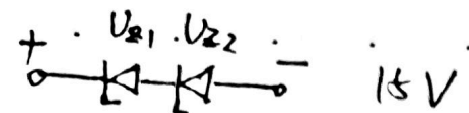
1-8. 解:  $u_2 = 10 \sin 100\pi t \text{ V}$



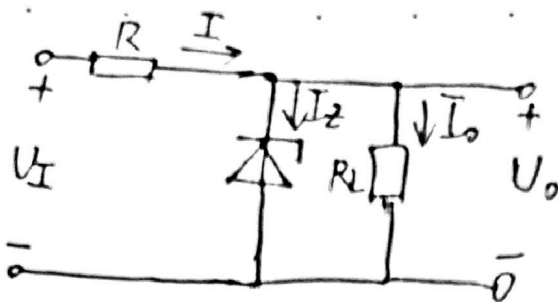
由 (a)、(b) 可知, 两个电路的传输特性曲线一样:



1-9, 解:



1-10 解: ①



1.  $\because U_I = 20V, R_L = 1k\Omega$

由题意:  $U_O = U_Z = 6V$

~~$I_Z = 10mA$~~

若  $U_O = U_Z = 6V$  (稳压管电流足够)

则  $I_O = \frac{U_O}{R_L} = 6mA$

$I = \frac{U_I - U_O}{R} = 28mA$

$\therefore I_Z = I - I_O = 22mA$

又  $I_{Zmax} = \frac{P_{ZM}}{U_Z} \approx 33.33mA$

$\therefore 10mA < 22mA < 33.33mA$

$\therefore U_O = 6V$

2. ② 设  $U_O = U_Z = 6V$

则  $I_O = \frac{U_O}{R_L} = 6mA$

$I = \frac{U_I - U_O}{R} = 28mA$

$\therefore I_Z$  方向与假设不符

$\therefore U_O = \frac{R_L}{R_L + R} U_I = 3.33V$

3.  $\because R_L$  开路

$\therefore I_Z = \frac{U_I - U_Z}{R} = 28mA$

$\therefore 10mA < 28mA < 33.33mA$

$\therefore$  电路稳压性能正常。

4.  $\because U_I = 7V$ ,  $R_L$  变化

$$\text{Q2} \because I = I_Z + I_0$$

$$I = \frac{U_I - U_0}{R} = 2 \text{ mA}$$

$\therefore$  当  $I_0 = 0$  时,

$$I_{Z\max} = I = 2 \text{ mA} < 10 \text{ mA}$$

$\therefore$  无法正常稳压。