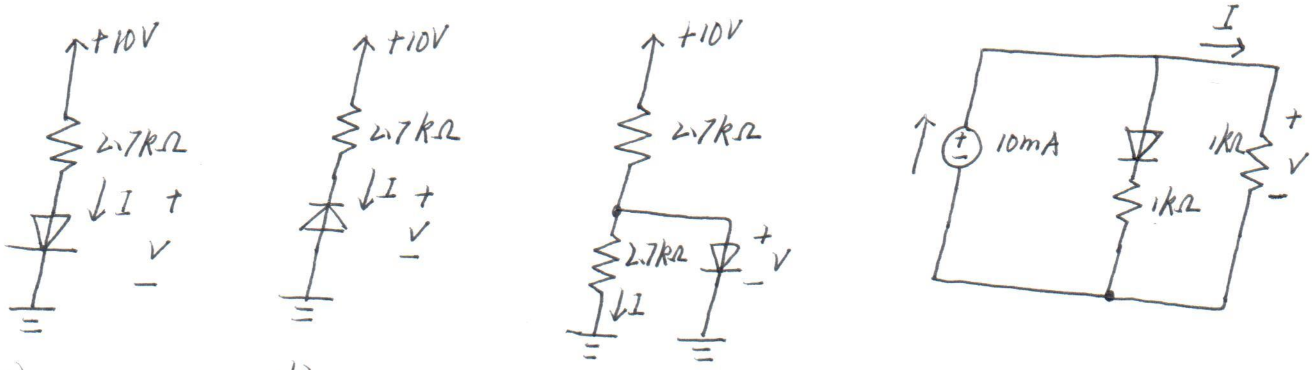
chapter 1

1.15.



(a) (b) (c) (d)

(a) $I = \frac{10V}{2.7k\Omega} = 3.7mA$

$V = 0V$

(b) $I = 0A$

$V = 10V$

(c) $I = 0A$

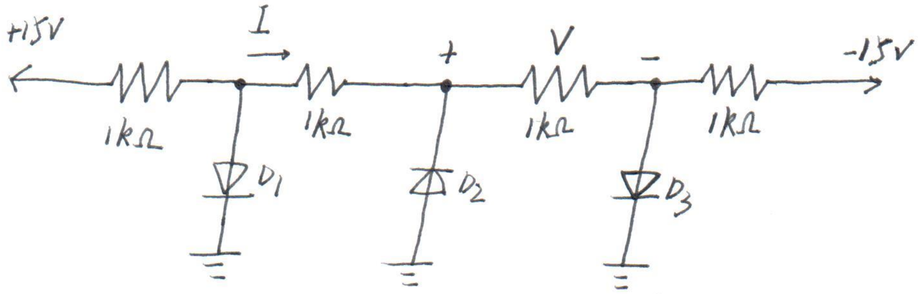
$V = 0V$

(d) $\therefore I = \frac{1}{2} \times 10mA = 5mA$

$V = 1k\Omega \times 5mA = 5V$

1.17

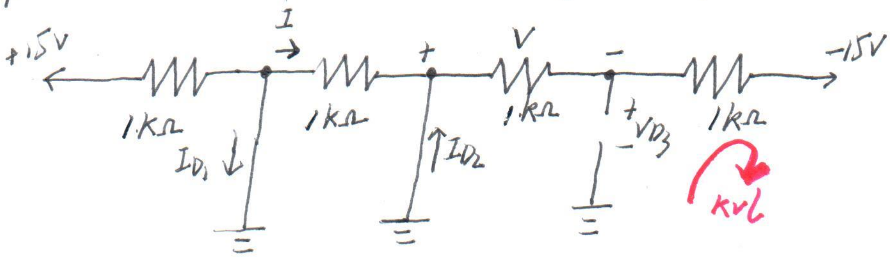
(a)



SOLUTION

Step1: assuming that D_1 & D_2 are on and D_3 is off

Step2: with D_1 & D_2 on and D_3 off the equivalent circuit is shown below.



$I_{D_1} = 15\,V/1k\Omega = 15mA$

$I = (0-0)\,V/1k\Omega = 0A$

$I_{D_2} = 15V/((1+1)k\Omega) = 7.5mA$

According to Kirchhoff's voltage law:

$$\begin{cases} V_{D_3} = 1k\Omega \times I_{D_2} - 15V \\ I_{D_2} = 7.5\,mA \end{cases}$$

$\therefore V_{D_3} = -7.5V$

$V = 1k\Omega \times I_{D_2} = 1k\Omega \times 7.5mA = 7.5V$

step3:

$I_{D_1} = 15mA > 0$

$I_{D_2} = 7.5mA > 0$

$V_{D_3} = -7.5V < 0$

$\therefore$ The assumption above is right, and $I = 0A$, $V = 7.5V$