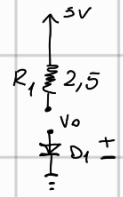
Diyot Çözümlü Sorular

1) 

D_1 diyotlu idealken v_o=?

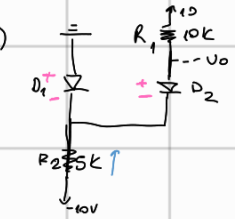
$v_o = 0$ kısa devre

$V_{R_1} + V_{D_1} = 5$

0 akım geçmiyor → 5V

ideal old. için kısa devre yaptık $v_o = 0$

Diyot silisyum olsaydı $v_o = 0,7V$ olurdu

2) 

Diyot akımlarını bul.

$-10 = V_{R_2} - V_{D_1}$

$20 = i \cdot 15K$

$i = \frac{20}{15K}$ A

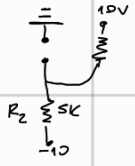
$V_{R_2} = 5K \cdot \frac{20}{15K}$

$V_{R_2} = \frac{-20}{3}$

$-10 + \frac{20}{3} = -V_{D_1}$

$V_{D_1} = \frac{10}{3}$

10+10



$10 = V_{R_1} + V_{D_2}$

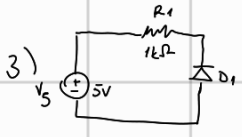
$V_{D_2} = 10 \geq 0$

D_2 iletimde

$i_1 = \frac{10}{5K}$

$i_{d_1} = i_1 - i_{d_2} = 1mA$

V_o toprağa bağlı olduğu için direk $V_o = 0$ deriz

3) 

-5

$-V_5 + V_{R_1} - V_{D_1} = 0$

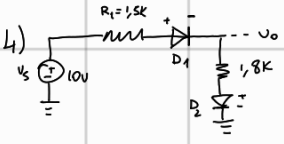
$V_{D_1} = -5 < 0$

Diyot tıkalı

Diyot tıkanmadığından $i = 0$

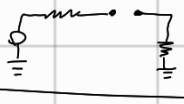
$V_{D_1} = 5$ diğer yönde ve iletimde

$\frac{5}{1K} = 5mA = i_D$

4) 

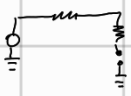
$-10 + V_{R_1} + V_{D_1} + V_{R_2} = 0$

$V_{D_1} = 10 > 0$ iletimde



$-10 + V_{R_1} + V_{R_2} + V_{D_2} = 0$

$V_{D_2} = 10 > 0$ iletimde

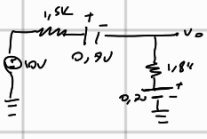


$10 = i(1,8K + 1,5K)$

$i = \frac{10}{3,3K}$

$V_o = \frac{10}{3,3K} \cdot 1,8K = \frac{18}{3,3} V_{//}$

toprakla V_o arasına bak



Diyotlar yerine 0,7V bağladık

$10V - 2(0.7)V = 8,6$

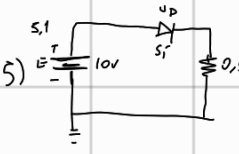
$V = i \cdot R$

$8,6 = i \cdot (3,3K)$

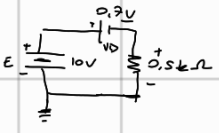
$i = \frac{8,6}{3,3K}$ A

$V_o = 1,8 \cdot \frac{8,6}{3,3K} + 0,7$

Silisyum diyotu olsaydı böyle hesaplardık.

5) 

Si old. için yerine 0,7V koy

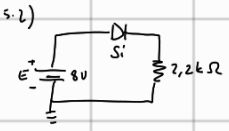


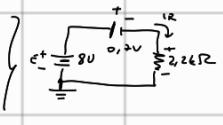
$V_D = 0,7V$

$i_D = \frac{9,3}{500}$ A

$10 - 0,7$

$V_R = i \cdot R = \frac{9,3}{500} \cdot 500 = 9,3V$

5.2) 

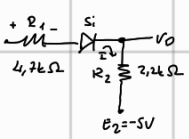


$V_D = 0,7V$

$i_D = \frac{7,3V}{2,2k}$ A

$8V - 0,7V = 7,3V$

$V_R = 7,3V$

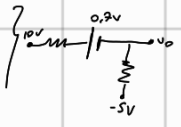
6) $E_1 = 10V$ 

$V_1 + V_D + V_2 = 15$

$V_D = 15V$

başlangıç - bitiş = aradaki elemanların toplamı

iletimde mi tıkama mı old. anlamak için açık diyip $V_1, V_2 = 0$ diyoruz.



$15 = i \cdot 4,7k + 0,7 + i \cdot 2,2k$

$i = \frac{14,3}{6,9k}$ A

$V_2 = i \cdot 2,2k = \frac{14,3}{6,9k} \cdot 2,2k$

$V_1 = i \cdot 4,7k = \frac{14,3}{6,9k} \cdot 4,7k$

$V_o + 5 = V_2$

$V_o = V_2 - 5V$

$-v_i + v_R + v_D + V = 0$

$v_D = v_i - V \geq 0$

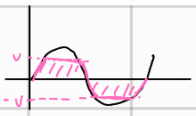
$v_i \geq V$ iletim

$V_o = V$

tıkama $V_o = v_i$

↓

tıkamada R üstünden akım geçmiyor bu yüzden R almadık



Böyle alıp V_o= bulunur