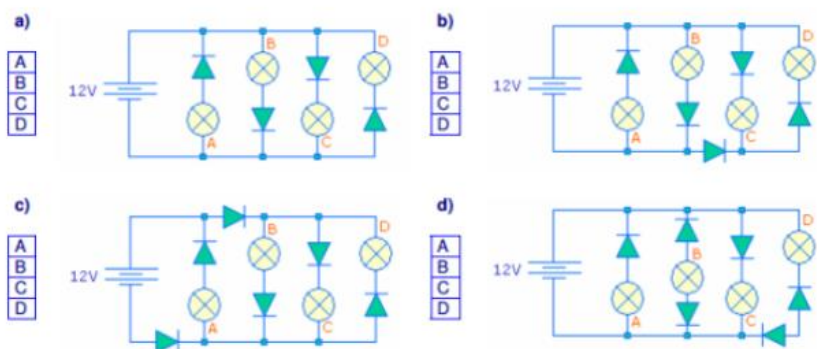
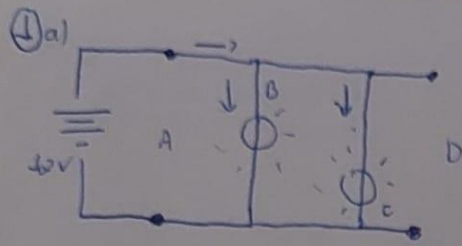




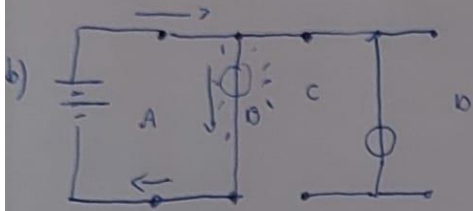
Lista de exercícios – Diodo (Básica)

1. Qual Lâmpada acenderá?

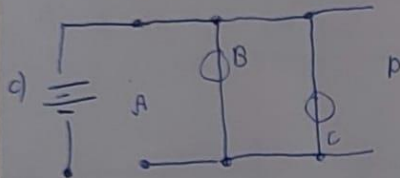




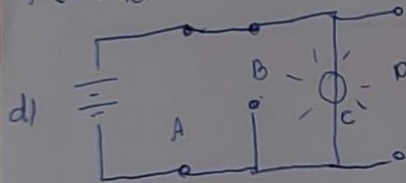
B e C



Apenas a B



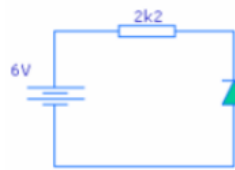
Nenhuma



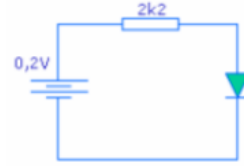
Apenas a D

2. Qual corrente que circula pelos diodos de silício? Justifique.

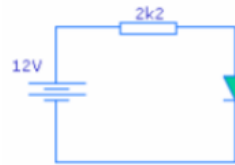
a)



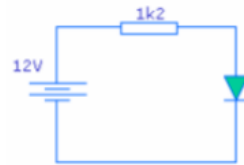
b)



c)



d)



② a) Não há corrente

$$b) I = \frac{V}{R}$$

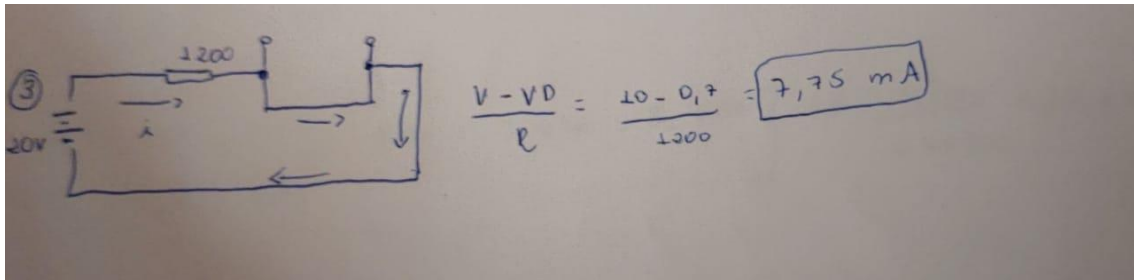
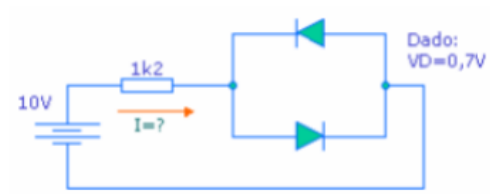
$$I = \frac{0,2 - 0,7}{2 \cdot 200} = \text{Não há corrente}$$

$$c) I = \frac{12 - 0,7}{2200} = \frac{11,3}{2200} = 5,14 \text{ mA}$$

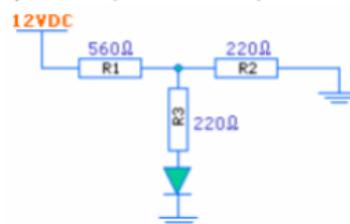
$$d) = \frac{11,3}{1200} = 9,42 \text{ mA}$$

- a) Não há corrente pois o diodo está reversamente polarizado.
 b) Não há corrente pois o diodo de silício precisa de 0,7 V para funcionar, mas a fonte só fornece 0,2V.

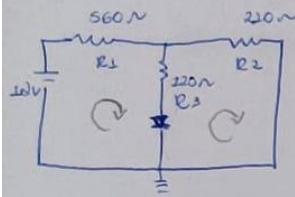
3. Determine a corrente I representada no circuito abaixo.



4. Quais as tensões e correntes nos componentes. (Diodo de silício).



4)



Malhas

$$1) \rightarrow -12V + 560 i_1 + 220 (i_1 - i_2) + 0,7V = 0$$

$$2) \rightarrow -0,7V + 220 i_2 + 220 (i_2 - i_1) = 0$$

$$-11,3 + 560 i_1 + 220 i_2 - 220 i_1 = 0$$

$$-0,7 + 220 i_2 + 220 i_2 - 220 i_1 = 0$$

$$\begin{cases} 780 i_1 - 220 i_2 = 11,3 \\ -220 i_1 + 440 i_2 = 0,7 \end{cases} \quad \textcircled{1} \quad \textcircled{2}$$

$$\text{DET} \quad \begin{vmatrix} 780 & -220 \\ -220 & 440 \end{vmatrix} = 343200 - 18400 = 294800 \quad \left. \begin{matrix} 343200 - 18400 = 294800 \\ 4,972 \times 104 = 5,126 \end{matrix} \right\} i_1 = \frac{5,126}{294800} = 17,4 \text{ mA}$$

$$I_1 \Rightarrow \begin{vmatrix} +11,3 & -220 \\ 0,7 & 440 \end{vmatrix} =$$

$$I_2 \Rightarrow \begin{vmatrix} 780 & 11,3 \\ -220 & 0,7 \end{vmatrix} = 546 + 2486 = 3032 \quad \left. \begin{matrix} 546 + 2486 = 3032 \\ 2 = \frac{3,032}{294800} = 10,3 \text{ mA} \end{matrix} \right\}$$

$$I_3 = I_1 - I_2$$

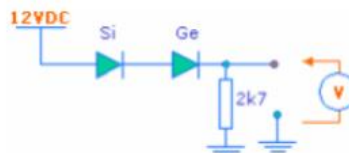
$$I_3 = 17,4 - 10,3 = 7,1 \text{ mA}$$

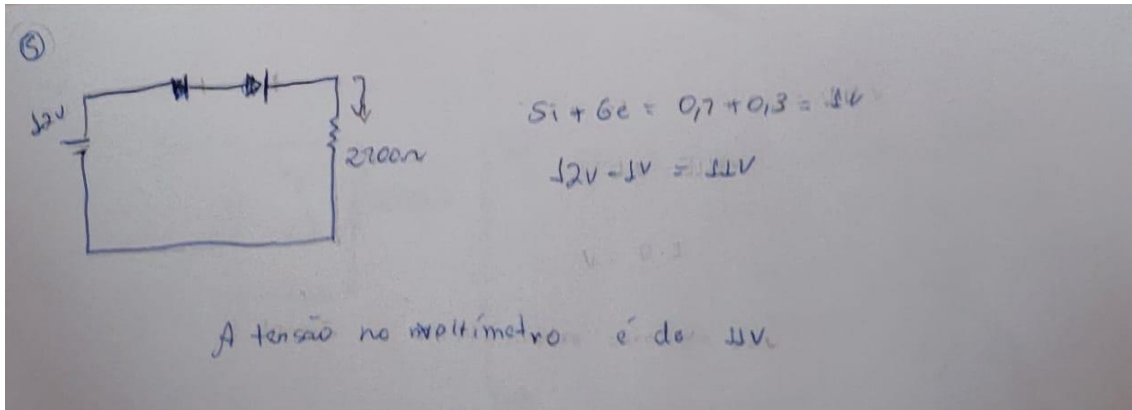
$$E_{R1} = I_1 \cdot R_1 = 17,4 \cdot 560 = 9,74 \text{ V}$$

$$E_{R2} = I_2 \cdot R_2 = 10,3 \cdot 220 = 2,27 \text{ V}$$

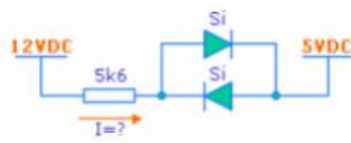
$$E_{R3} = I_3 \cdot R_3 = 7,1 \cdot 220 = 1,56 \text{ V}$$

5. Qual a tensão no voltímetro?





6. Determine a corrente I indicada no circuito



6

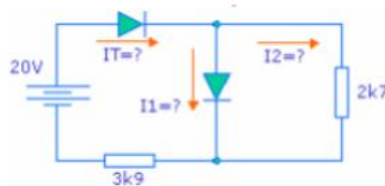
$$I_1 = \frac{V}{R} = \frac{11,3}{5600} = 2,017 \text{ mA}$$

$$I_2 = \frac{V}{R} = \frac{4,3}{5600} = 0,767835 \text{ mA}$$

$$I = 1,25 \text{ mA}$$

$\left. \begin{array}{l} I_1 = 2,017 \text{ mA} \\ I_2 = 0,767835 \text{ mA} \end{array} \right\} = 2,017 - 0,7678 = 1,25 \text{ mA}$

7. Quais as correntes I_T , I_1 e I_2 no circuito abaixo. (Diodo Silício).



Handwritten circuit analysis for a diode circuit.

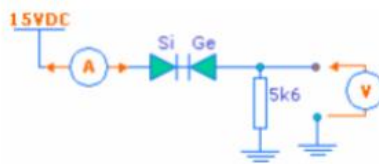
Circuit Diagram: A 20V DC source is connected in series with a 3900Ω resistor. This is followed by a node where the current splits into I_T (through a diode) and I_1 (through a 3900Ω resistor). The circuit then splits again into I_2 (through a diode) and I_3 (through a 2700Ω resistor). The voltage across the 2700Ω resistor is labeled V_2 .

Equations and Calculations:

① $-20 + V_{D1} + V_{D2} + V(3900) = 0$
 $3900I_1 = 20 - V_{D1} - V_{D2}$
 $I_1 = \frac{20 - 0,7 - 0,7}{3900} = 4,769$
 $I_1 = 4,77 \text{ mA}$

② $I_2 \cdot 2700 + V_{D2} = 0$
 $V(2700)I_2 = 0,7$
 $I_2 = \frac{0,7}{2700} = 259,26 \mu\text{A}$
 $I_T = I_2 - I_1 = 4,769 - 0,259$
 $I_T = 4,77 - 0,259 = 4,51 \text{ mA}$
 $I_T = 4,51 \text{ mA}$

8. Qual a tensão e corrente medida pelos instrumentos.



③ - A tensão V é zero.
 A corrente também é zero.