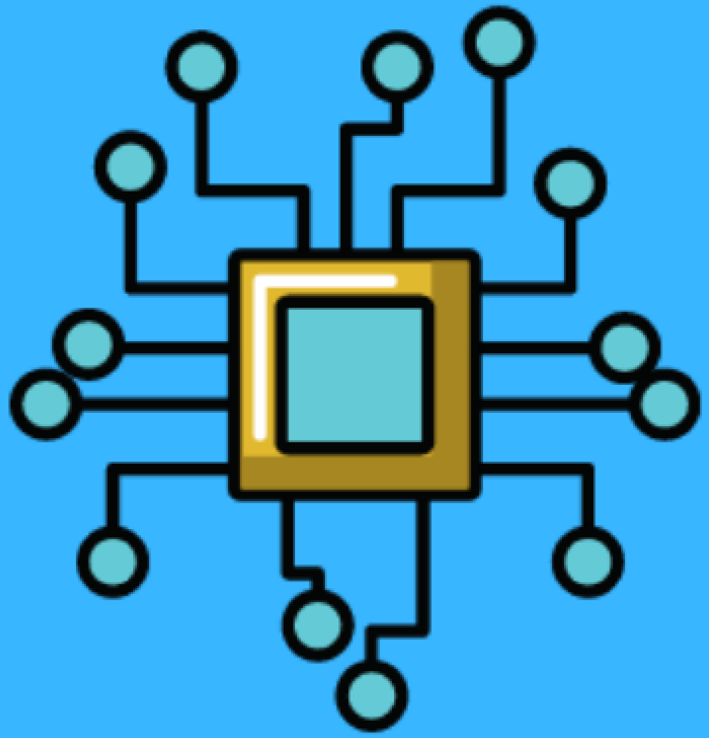
Electronics



Lab 1
Diode

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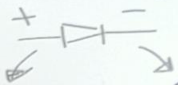
Diode

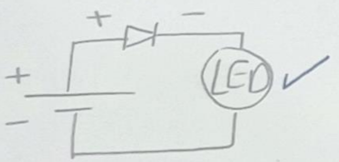


Anode   cathode

* Allow Electric current to Pass in one direction only

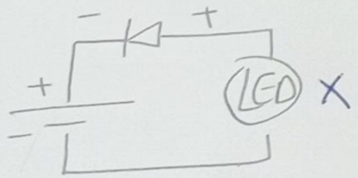
* if ($V_{Anode} > V_{cathode}$)

Forward Bias = on — wire



else

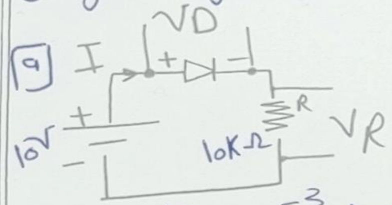
Reverse Bias = off



* Diode modes

① Ideal mode

[a]

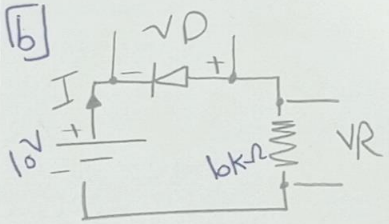


$I = \frac{V}{R} = \frac{10}{10*10^{3}} = 10^{-3} = 1mA$

$V_D = Zero$ (like a wire)

$V_R = IR = 10^{-3} * 10 * 10^{3} = 10V$

[b]

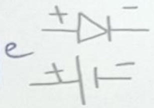


$I = Zero$ (open circuit)

$V_D = V_{source}$

$V_R = Zero$

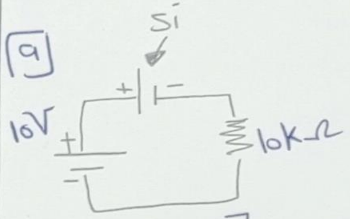
② Pratical mode



→ $Si = 0.7V$

→ $Ge = 0.3V$

[a]



$I = \frac{V}{R} = \frac{10-0.7}{10*10^{3}} = 0.93mA$

$V_D = 0.7V$

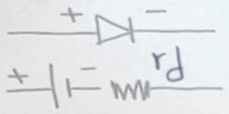
$V_R = IR = 0.93*10^{-3}*10*10^{3} = 9.3V$

or $10-0.7 = 9.3V$

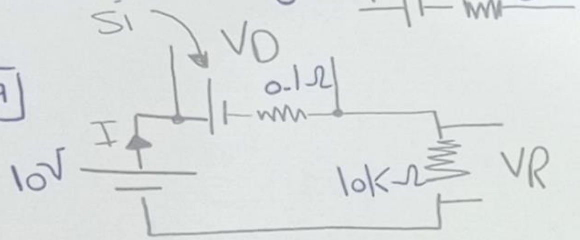
[b]

Same Case

3) Complete mode



[a]



$$I = \frac{V}{R} = \frac{10-0.7}{0.1 + 10 * 10^3} = \underline{0.92 \ mA}$$

$$VD = 0.7 + I \, rd$$
$$= 0.7 + 0.92 * 10^{-3} * 0.1 = \underline{0.8V}$$

$$VR = 10 - 0.8 = 9.2 \, V$$
$$= IR = 0.92 * 10^{-3} * 10 * 10^3 = 9.2 \, V$$

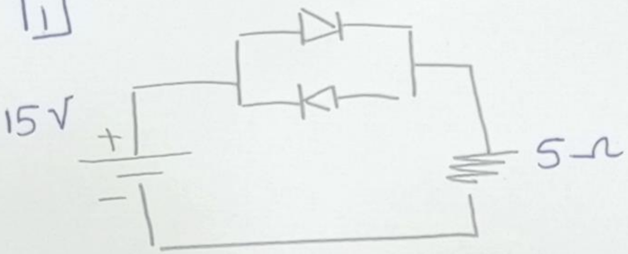
[b]

same
Case

* Try to solve this

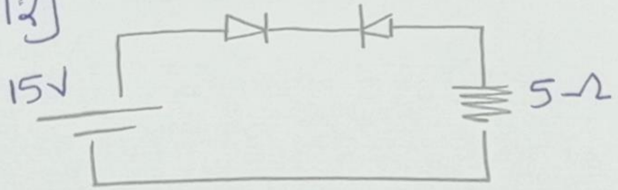
Ge , rd = 0.6 Ω

[1]



Find I, VD, VR in Ideal, Pratical, Complete modes

[2]



Find I, VD, VR in Ideal, Pratical Complete modes

Thank You