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Subject : Physics

Subject Code : 1020012 13

Class : 2-CE-1

Enrollment No : 1 2 0 0 2 0 4 0 7 0 1 0 6 7

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★ Experiment -1

Objective : Study of characteristics of Silicon diode in forward bias.

Equipments needed : Measurement unit, patch coards.

Procedure:

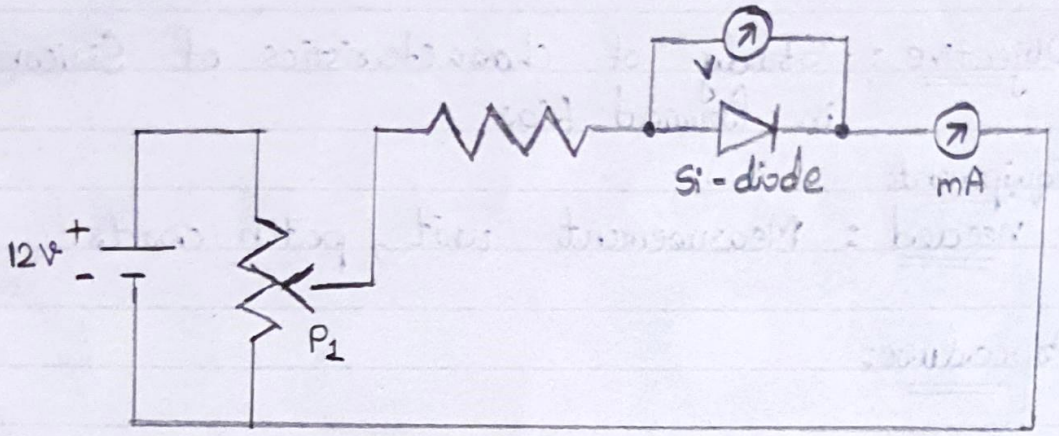
1. Before switch 'ON' measurement unit, connect the circuit as shown in circuit diagram-1.
2. Switch 'ON' the powers supply.
3. Rotate potentiometer P_1 fully in counter clockwise direction.
4. Vary the potentiometer P_1 fully in counter clockwise direction so as to increase the value of diode V_D from 0 to 1V in step 8 measure the corresponding values of diode current I_D in an Observation Table 1.
5. Plot a curve between diode voltage V_D & current I_D as should shown in nature of graph.

Conclusion :-

We can conclude that how Silicon diode works in forward bias. And how we can calculate the values from the graph.

VISION

Circuit Diagram :- Si- forward bias



Observation Table :-

Sr. No.	Diode Voltage V_D (Volts)	Diode Current I_D (mA)
1	0.1	0.0
2	0.21	0.0
3	0.33	0.27
4	0.38	2.19
5	0.42	6.17

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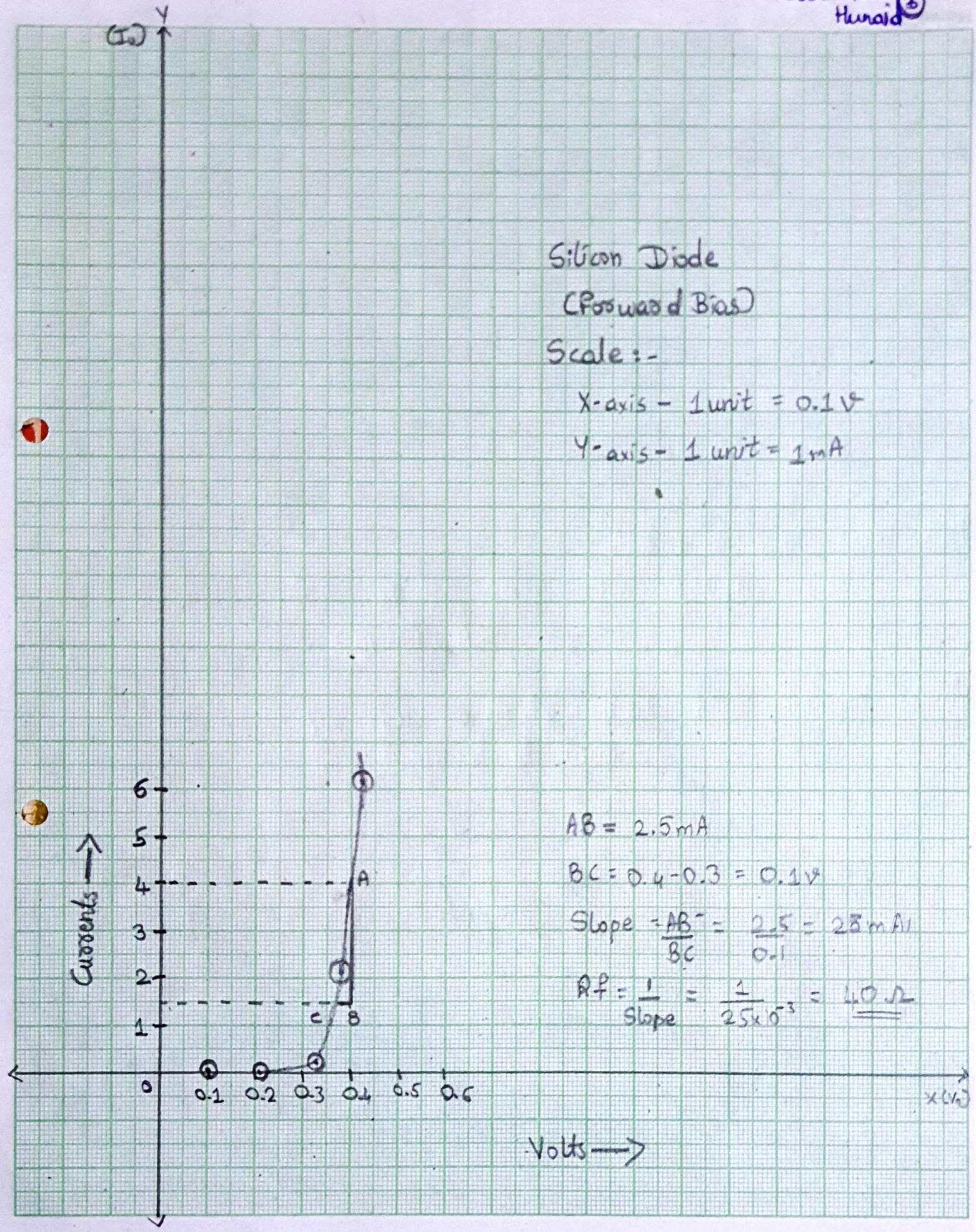

Silicon Diode
(Forward Bias)

Scale :-

X-axis - 1 unit = 0.1 V

Y-axis - 1 unit = 1 mA

AB = 2.5 mA

BC = 0.4 - 0.3 = 0.1 V

$$\text{Slope} = \frac{AB}{BC} = \frac{2.5}{0.1} = 25\ \text{mA/V}$$

$$R_f = \frac{1}{\text{Slope}} = \frac{1}{25 \times 10^{-3}} = 40\ \Omega$$