JADAVPUR UNIVERSITY

Faculty of Engineering & Technology

Electronics Engg. Laboratory

Name TATHAGATA SUR

Class CSE - VCG1 Sec A1 Roll No 002310501030

Date of Experiment ..... Date of Submission .....

Marks Obtained ..... Signature of Examiner .....

NAME	CO-WORKER	ROLL
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Experiment No. 02 - A

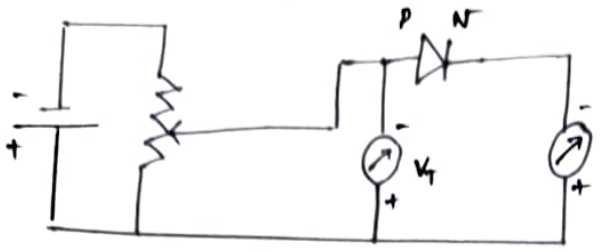
Commence at 11:00 AM Completed at 2:00 pm

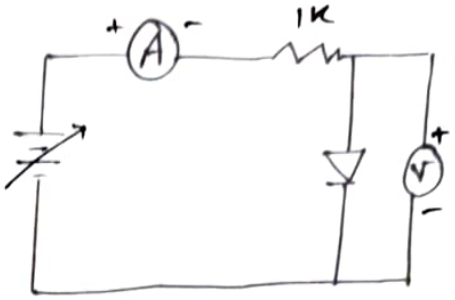
Name of Teacher concerned

TITLE : I-V Characteristics of Semiconductor diodes (Si and Ge) under forward and reverse-biased conditions.

OBJECT : To plot I-V characteristic curve to become familiar with the operating characteristic of Ge and Si diodes under both forward and reverse biased conditions.

Circuit Diagram:-





Apparatus:- Bread board, Silicon diode, Germanium diode, DC power supply, Ammeter, Voltmeter, Connection wires.

Observation Table and Graphs:

1. Silicon diode

a) Forward Bias:

No. of obs.	Forward Voltage (V_F) (in V)	Forward Current (I_F) (in mA)
1)	0	0
2)	0.498	0.1
3)	0.535	0.4
4)	0.548	0.6
5)	0.715	27.5

b) Reverse Bias:

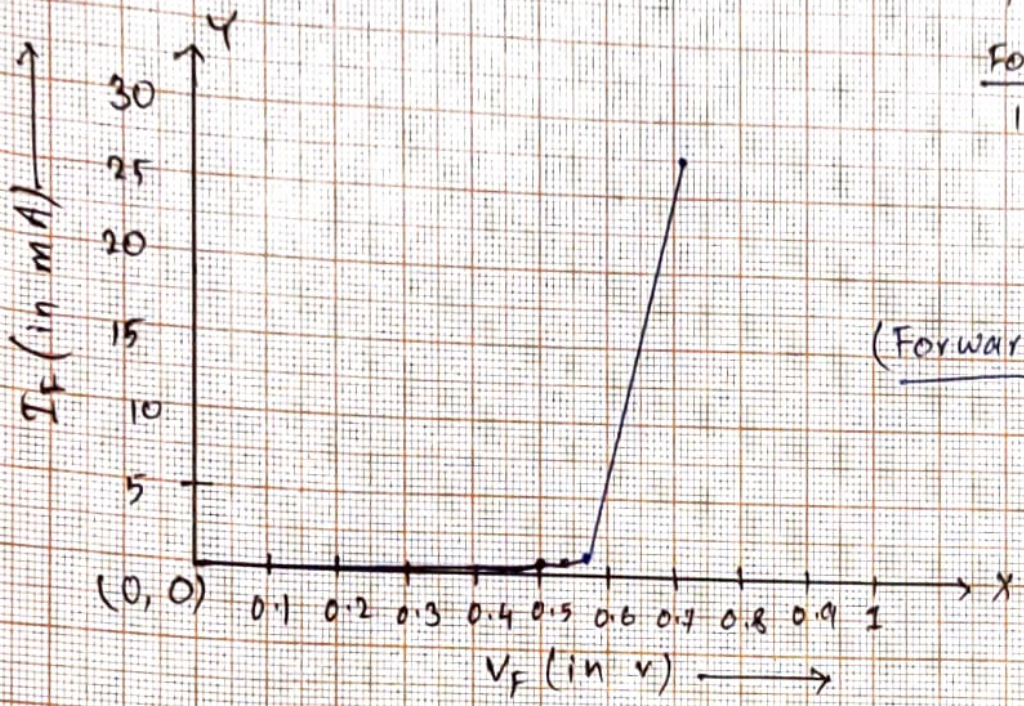
No. of. obs.	Reverse Voltage (V_R) (in V)	Reverse Current (I_R) (in μA)
1)	5.8	0.4
2)	10	0.8
3)	15.6	1.4
4)	20.3	1.9
5)	25.2	2.4

Si-diode

Scale:-

For X-axis,
1 S.S.d. = 0.01 V

For Y-axis,
1 S.S.d. = 05 mA

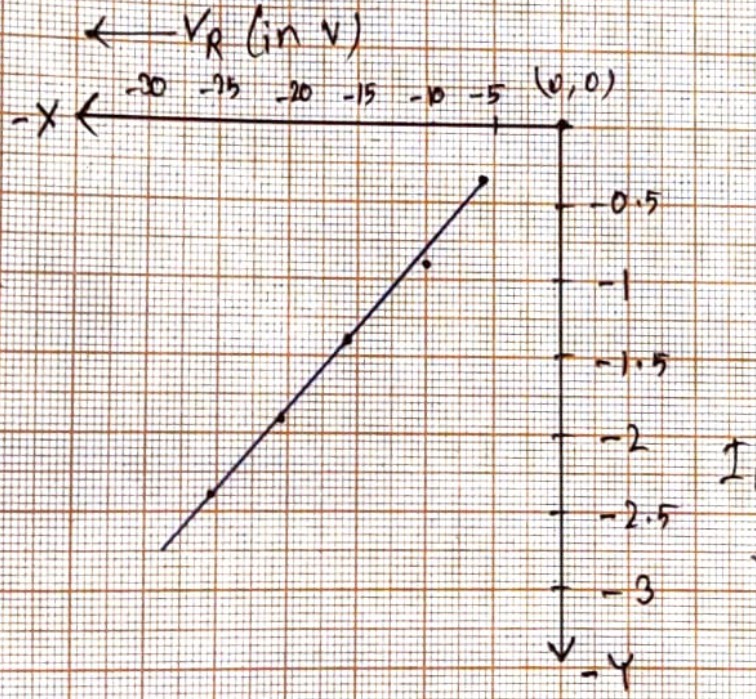


(Forward-bias)

Scale:-

For X-axis,
1 S.S.d. = 0.5 V

For Y-axis,
1 S.S.d. = 0·05 μA



(Reverse-bias)

I-V graph of Si-diode in F.B. and R.B.

2. Germanium Diode

a) Forward bias:

No. of obs.	Forward voltage (V_F) (in V)	Forward Current (I_F) (in mA)
1)	0	0
2)	0.28	0.5
3)	0.3	1
4)	0.5	2.7
5)	0.7	4.8
6)	0.9	7.1
7)	1.1	11
8)	1.8	17
9)	2	29

b) Reverse bias:

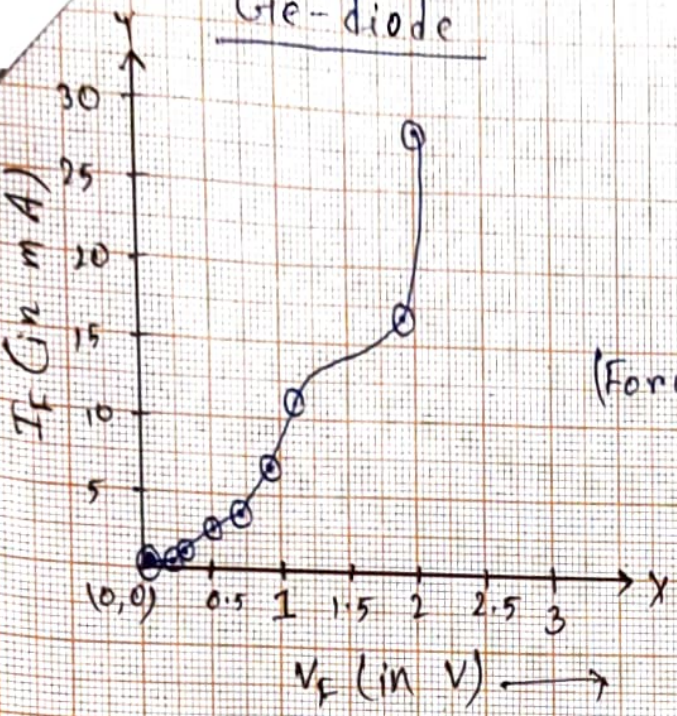
No. of obs.	Reverse voltage (V_R) (in V)	Reverse Current (I_R) (in μA)
1)	5	0.13
2)	10	0.55
3)	15	0.8
4)	20	1.3
5)	25	1.4

Conclusion:- We find that:-

a) For Si-diode, the turn-on and cut-off voltage are about 0.48 and 0.6 V respectively

b) For Ge-diode, these are about 0.25 and 0.78 V

Ge-diode

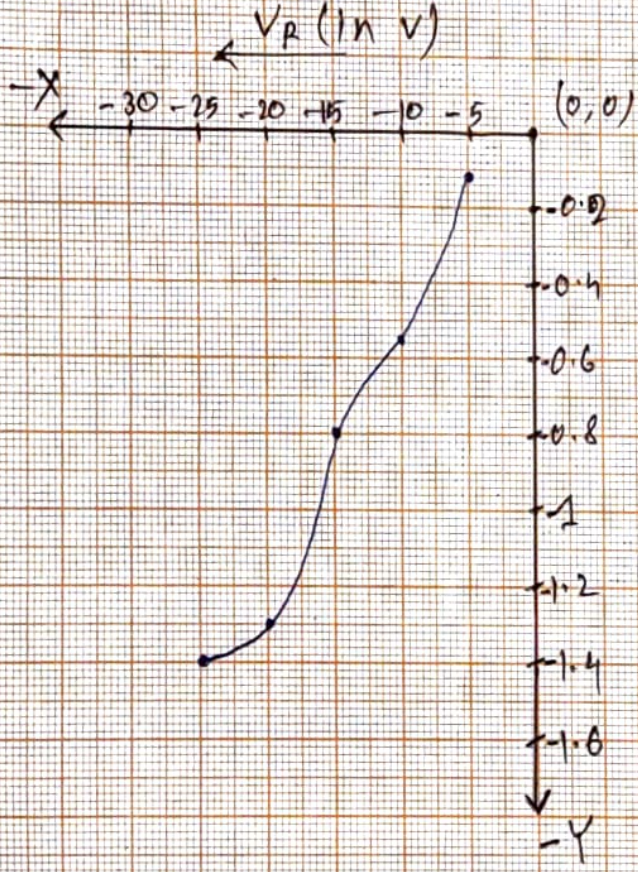


(Forward-bias)

Scale:-

For X-axis,
1 s.s.d ≡ 0.05 V

For Y-axis,
1 s.s.d. ≡ 0.5 mA



(Reverse-bias)

Scale:-

For X-axis,
1 s.s.d. ≡ 0.5 V

For Y-axis,
1 s.s.d. ≡ 0.02 μA

I-V graph of F.B. and R.B. for Ge-diode

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