JADAVPUR UNIVERSITY

Faculty of Engineering & Technology

...Electronics... Engg. Laboratory

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Date of Experiment 08/01/2024 Date of Submission 15/01/2024

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

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Experiment No. 02-B

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

Name of Teacher concerned

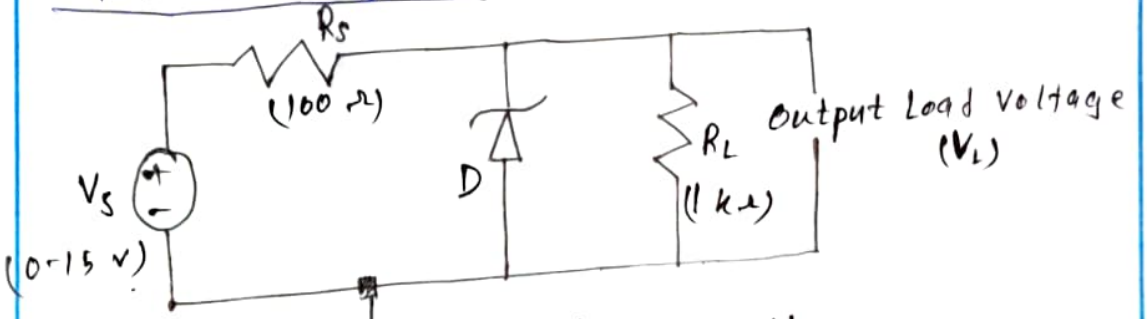
TITLE : I-V characteristics of zener-diode under reverse biased condition.

OBJECT : To study the current-voltage characteristics of a reverse biased zener diode by plotting I-V graph and to become familiar with its breakdown char. and measure the zener breakdown voltage.

Theory :-

A zener diode is constructed for operation in the reverse breakdown region. It is used as a voltage regulator. The relation between I-V is almost linear in this case.
After reaching a certain voltage, called the 'Breakdown Voltage', the current increases widely even for a small change in the voltage. This happens due to "Avalanche Breakdown" and the "Zener-effect" of the Zener Diode. However, there is no appreciable change in voltage. After the Zener-potential (V_Z), current increases exponentially.

Circuit Diagram :-



Zener voltage Regulator Circuit

Apparatus Used :-

1) DC power supply
2) Ammeter
3) Bread Board
4) Zener-Diode
5) Voltmeter
6) Connection Wires

Observation Table:-

Zener Diode

No. of obs.	Reverse Voltage (V_R) (in V)	Reverse Current (I_R) (in μA)
1)	2.7	0.1
2)	3	0.2
3)	4.2	0.3
4)	5.4	0.5
5)	6	160
6)	6.3	180

Conclusion:-

The Reverse Breakdown Voltage for Zener diode = 5.2 V

(It depends on several factors like semiconductor material, doping level, etc.)

Zener Diode

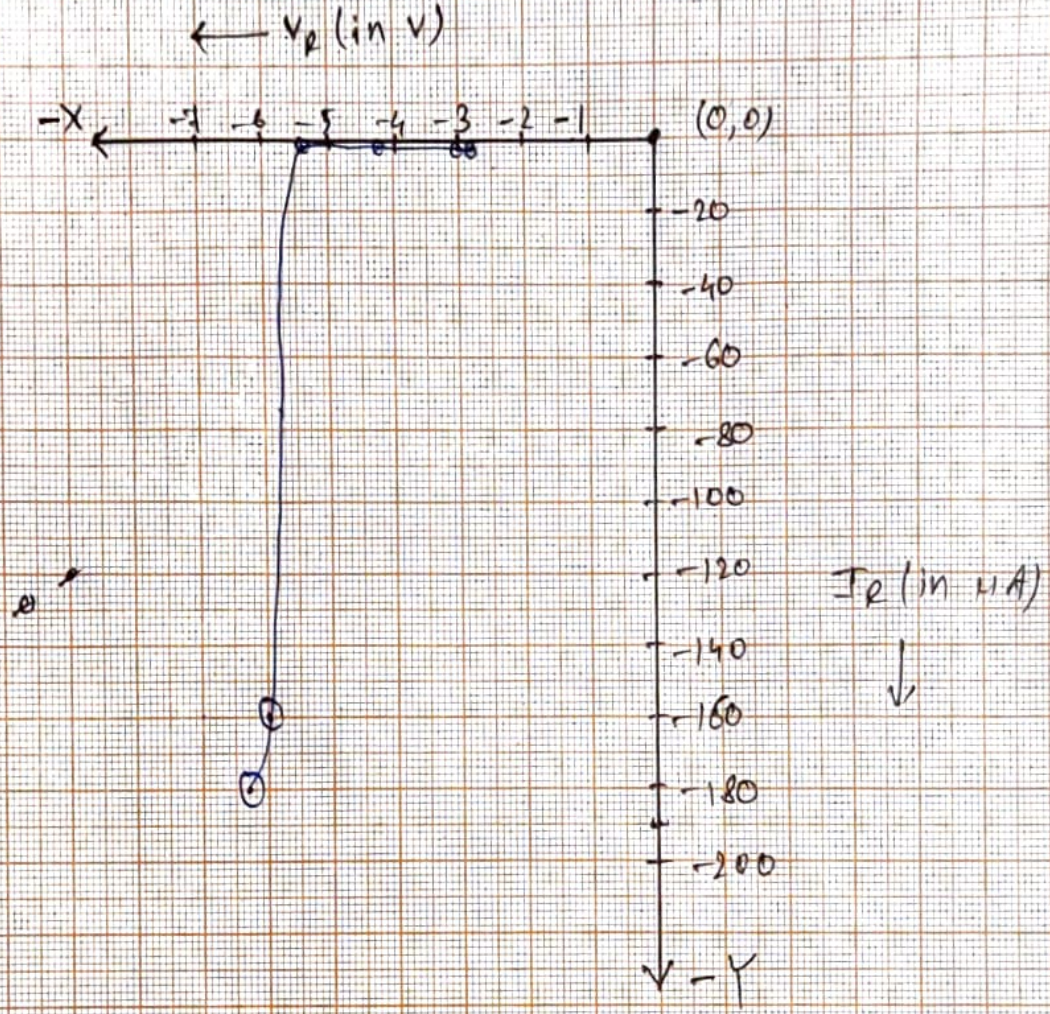
Scale:-

Along x-axis,

1 s.d = 0.1 V

Along y-axis,

1 s.d = 2 μA



I-V graph of Zener Diode in R.B.