

Experiment No. 3

Aim: - To draw the reverse characteristics of Zener diode.

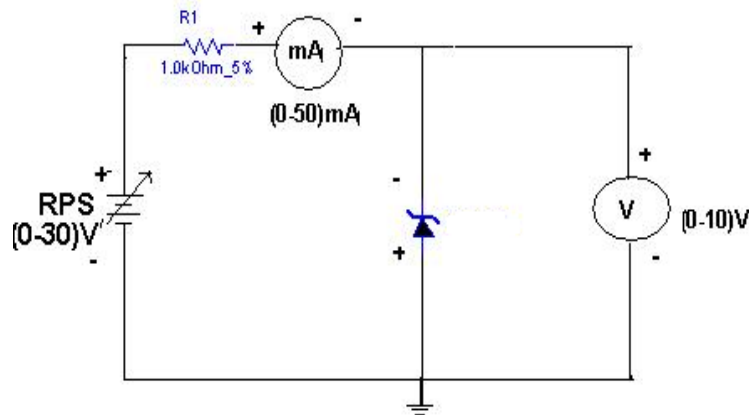
List of Equipment Used:

Table 1: List of Equipments

S.N.	Equipment	Range	Quantity
1.	Regulated Power Supply	0-30V	1
2.	Zener diode	3v/5V/9V	3
3.	Voltmeter	0-30V	1
4.	Ammeter	250mA	1
5.	Connecting wires	NA	4
6.	Resistance	1Kohm	3

Introduction/Theory: -A Zener diode is heavily doped p-n junction diode, specially made to operate in the break down region. A p-n junction diode normally does not conduct when reverse biased. But if the reverse bias is increased, at a particular voltage it starts conducting heavily. This voltage is called Break down Voltage. High current through the diode can permanently damage the device. To avoid high current, we connect a resistor in series with zener diode. Once the diode starts conducting it maintains almost constant voltage across the terminals whatever may be the current through it, i.e., it has very low dynamic resistance. It is used in voltage regulators.

Circuit Diagram:-



Zener diode reverse characteristic circuit diagram

Precautions:

1. Excessive flow of current may damage the diode.
2. Current for sufficiently long time may change the characteristics.
3. Connections should be made neat and clean.

Procedure:-

1. Connect the circuit as shown in figure.
2. Vary RPS gradually in steps and note down the corresponding readings of V_{Zr} and I_{Zr} .
3. Tabulate different reverse currents obtained for different reverse voltages.
4. Plot graph between voltage and current.

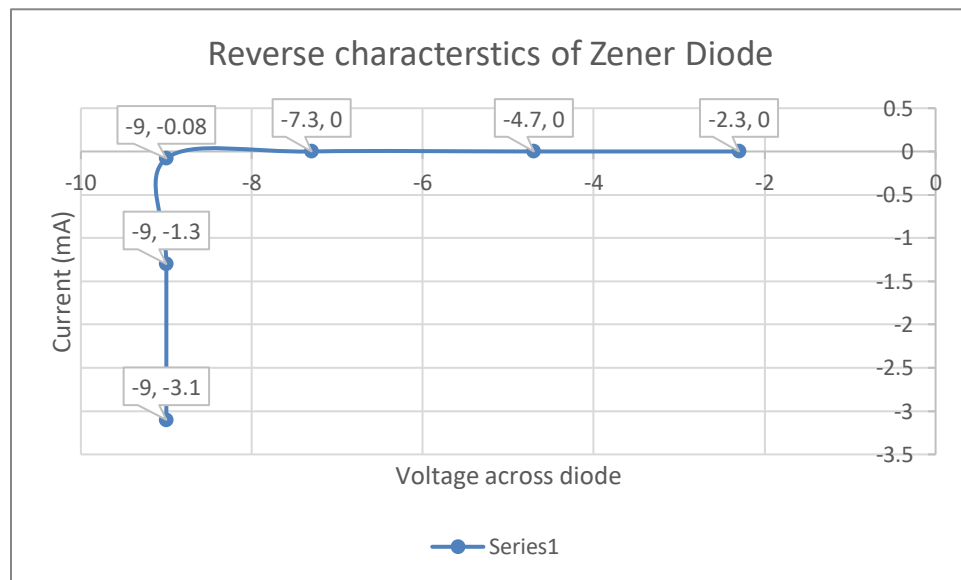
Observations & Calculations:

Table2:

Sr. No.	Reverse Voltage Across the diode V_{zr} (Volts)	Reverse Current through the diode I_{zr} (mA)
1		
2		
3		
4		

From graph breakdown voltage =V.

Graph:



Result (s): The value of breakdown voltage from graph is...

Conclusion: The Zener diode, with its accurate and specific reverse breakdown voltage, allows for a simple, inexpensive voltage regulator. Combined with the right resistor, fine control over both the voltage and the supply current can be attained. However, the low power ratings of standard Zener diodes and resistors make this solution impractical for high power devices.