Ex.No.7 Date: 2-12-2021	V - I CHARACTERISTICS OF PN JUNCTION DIODE

AIM:

To plot the VI characteristics of a PN junction diode in both forward and reverse biased condition.

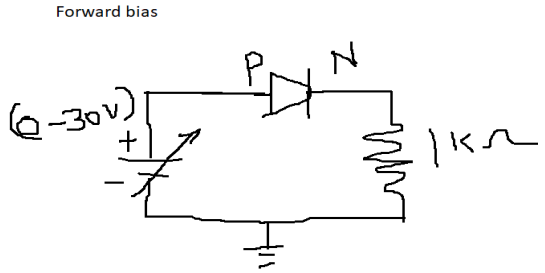
To calculate its cut- in voltage or threshold voltage, forward resistance and reverse resistance.

Components and Equipment required :

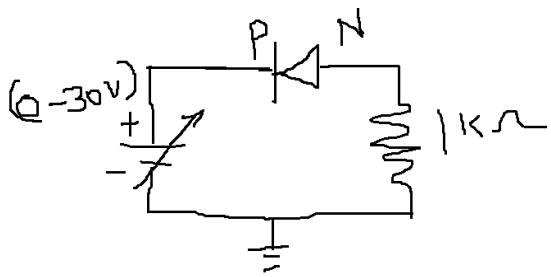
SL. NO.	NAME OF THE APPARATUS	RANGE	TYPE	Qunantity
1	Regulated power supply	0-30 V		1 No
2	Volt meter	0-30V		1 No
3	Ammeter	(0-50mA), (0-50μA)		Each1 NO
4	Diode	-	1N4007	1No
5	Breadboard	-	-	1 No

CIRCUIT DIAGRAM:

FORWARD BIAS



REVERSE BIAS



PROCEDURE:

FORWARD BIAS:

1. **The connections are made as shown in the circuit diagram.**
2. **For forward bias the positive terminal of power supply is connected to anode of the diode, negative terminal to cathode.**
3. **The power supply is switched on.**
4. **The forward voltage V_f across the diode is increased in small steps and the forward current is noted.**
5. **The readings are tabulated.**
6. **A graph is drawn between V_f and I_f by taking V_f along x-axis.**
7. **The inverse of the slope of the linear portion of the graph gives the forward resistance R_f of the diode $R_f=V_f/ I_f$.**

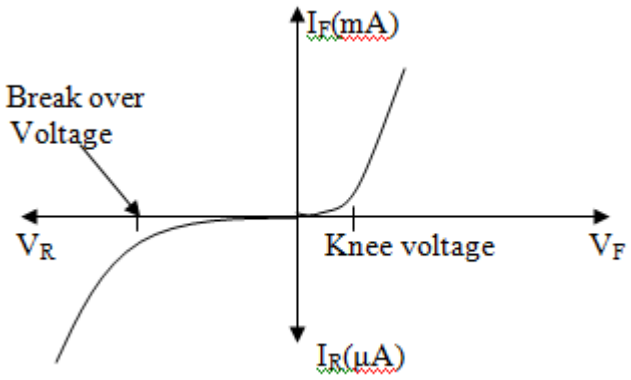
REVERSE BIAS:

1. **For reverse bias the positive terminal of the power supply connected to cathode of the diode and the negative terminal to the anode of the diode.**
2. **The power supply is switched on.**
3. **The reverse bias voltage V_r is increased in steps and reverse current I_r is noted in each step.**
4. **The readings are tabulated.**
5. **A graph is drawn between V_r and I_r taking V_r on x-axis. The reverse characteristics curve is approximately a straight line .**

TABULATIONS:

	FORWARD BIAS		REVERSE BIAS	
V_{supply}	V_f (V)	I_f(mA)	Vr (V)	Ir (μA)
0.1				
0.2				
0.5				
0.7 V				
1 V				
2 V				
3V				
4V				
5V				
6V				
7 to 15v				

GRAPH:



RESULT:

The forward and reverse characteristics of the semiconductor diode has been plotted

The forward resistance of the diode = ---------

The cut-in voltage of the diode = ---------

PRECAUTIONS:

1. **Always connect the voltmeter in parallel & ammeter in series as shown in figure.**
2. **Connection should be proper & tight.**
3. **Switch 'ON the supply after completing the circuit.**
4. **DC supply should be increased slowly in steps.**
5. **Reading of voltmeter and ammeter should be accurate.**