EXPERIMENT NO-3

01. AIM OF THE EXPERIMENT: -

To study the V-I characteristics graph of P-N junction diode.

02. APPARATUS REQUIRED: -

- Patch chords
- V-I characteristics board
- Multi-meter
- Ammeter (mA, µA)

03. OBJECTIVE: -

To plot graph for forward and reverse biased condition of a P-N junction diode.

04. THEORY: -

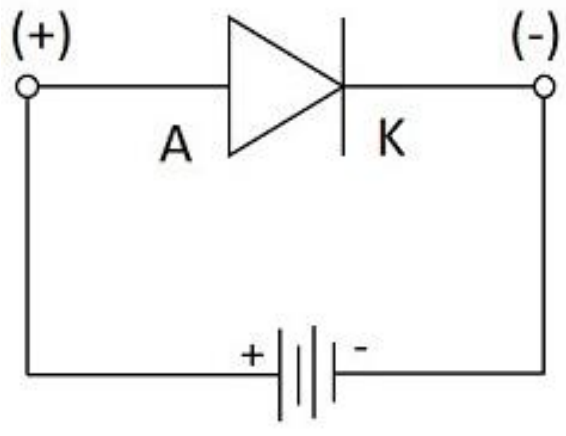
4.1. BIASING

The process by which an external DC voltage is applied to the electric circuit in P-N junction biasing is called dc analysis.

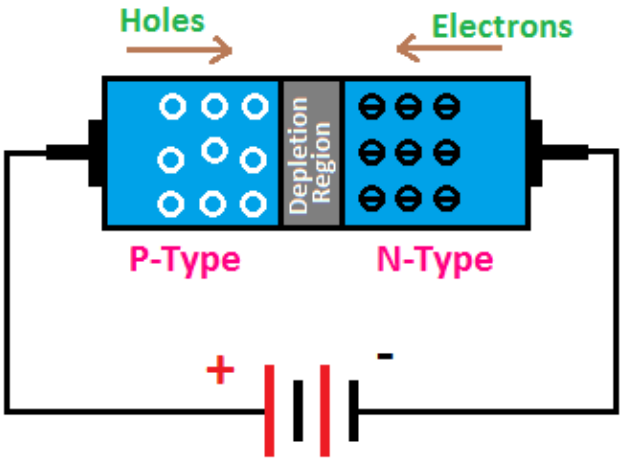
4.1.1 Forward Biasing

A diode is said to be forward biasing if the P-side is connected to positive terminal and N-side is connected to negative terminal of the supply voltage.

At a particular voltage the width of the depletion region vanished and there is a sharp rise in current and voltage as threshold or knee voltage.



Forward biased Connection



PN Junction Diode Forward Biasing

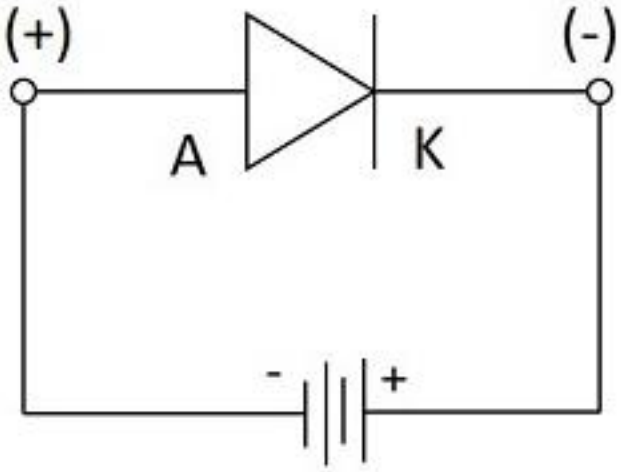
4.1.2 Reverse Biasing

A diode is said to be forward biasing if the N-side is connected to positive terminal and P-side is connected to negative terminal of the supply voltage.

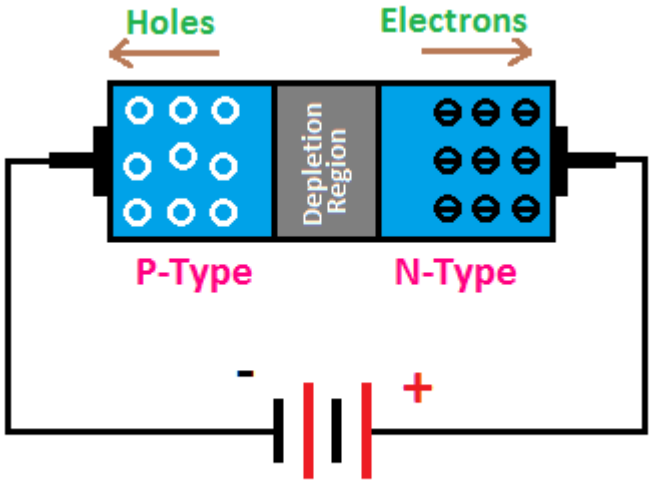
Due to this more no of –Ve ions are generated in P-side and more no. of +Ve ions are generated in N-side as a result width of the depletion region increases.

When the applied voltage is increased, as a particular point the diode will enter into breakdown region and this negative voltage is known as peak inverse voltage (PIV)

So, the PIV is maximum reverse voltage that can be given to a diode just before entering to the breakdown region.



Reverse biased Connection



PN Junction Diode Reverse Biasing

05. PROCEDURE: -

For forward biased: -

- Connect the circuit in such a way that the positive side of the external DC is connected to the P-side of the diode and negative side is connected to the N-side of the diode.
- Ammeter and multi-meter are connected to the diode. The ammeter used here is mile-ampere ammeter.
- Vary the DC voltage on steps up to 8V (up to knee voltage) and note down the corresponding ammeter reading.

For reverse biased: -

- Connect the positive side of the external DC to N-side and negative side to P-side of the diode.
- Vary the applied Va voltage to breakdown voltage.
- Note down the corresponding ammeter reading.

06. OBSERVATIONS: -

Forward Biased

Sl No.	Voltage (V) in volt	Current (I) in mA
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		

Reverse Biased

Sl No.	Voltage (V) in volt	Current (I) in µA
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		

07. CONCLUSION: -