Bipolar Junction Transistor(BJT)

1.What is transistor.

The transistor is a solid-state device , whose operation depends upon the flow of electric charge carriers within the solid. The main difference between the two is that the transistor is a current controlled device whereas vacuum triode is a voltage controlled device. When in between two thick semiconductor a thin semiconductor is fused, then arranged is so formed is known as transistor. It is a bijunction device.

2. TRANSISTOR TERMINALS-

Transistor is a single crystal in which there are two P-N junction. The idea behind is to have first section to supply the charges (either holes or electrons) to be controlled by the third section through the middle section. One side section supply free charges is called the collector and the middle section which is formed between the emitter and collector is called the base.

1.Emitter : It is left hand section (or region) of thr transistor and its main function is to supply majority charge carriers (electrons in case of NPN transistor and holes in case of PNP transistor) to the base. The emitter is always forward biased w.r.t base so that it is able to supply majority charge carriers to the base. The emitter is heavily doped so that it may be able to inject a large number of charge carriers.

2.Collector : It is the right hand section of transistor and its main function is to collect majority charge carriers. Collector is always revers biased So as to remove the charge carriers away from its junction with the base. It is moderately doped.

3.Base : The middle layer of the transistor is called base. It is very thin and lightly doped.

3.How many types of transistor.

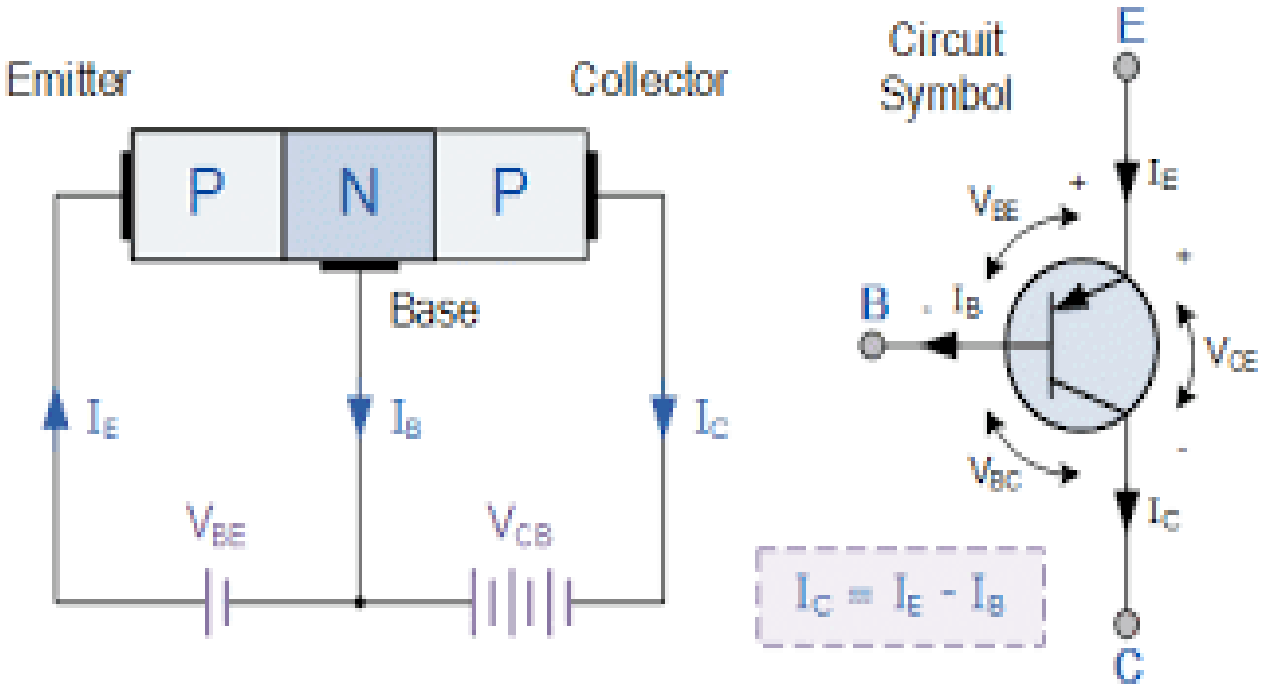
There are two types of transistor.

1.PNP transistor

2.NPN transistor

1.<u>PNP transistor :</u> when in between two thick P-type semiconductor, a thin N-type semiconductor is fused thin the transistor so formed is known as PNP transistor.

<u>Working of PNP transistor</u> :

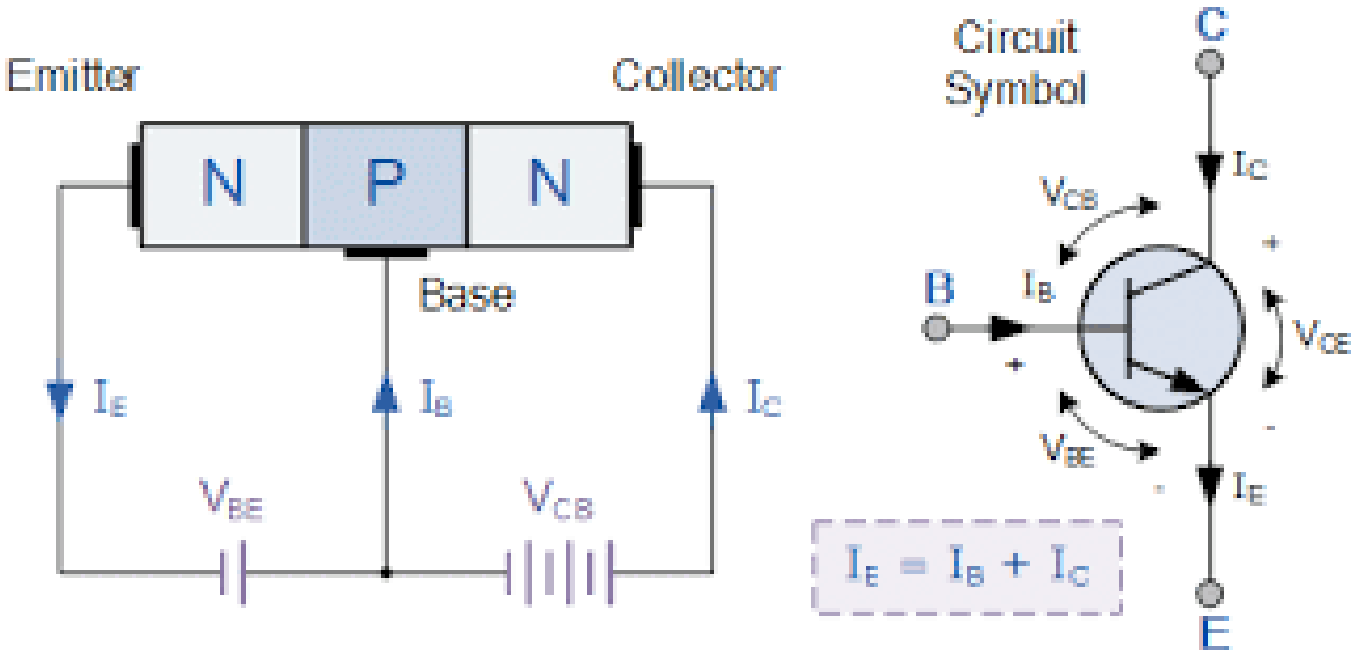


Forward biase causes the holes in the P-type emitter to flow towards the base this constitute a current I_E as this holes cross into N-type base they tents to combine with

the electrons as the base is lightly doped and very thin there are for a only a few holes combine with electrons. The remaining holes cross the collector region to constitute a current Ic in this junction almost entire emitter current flows in the collector circuit.

2.<u>NPN transistor :</u> When in between two thick N-type semiconductor, a thin P-type semiconductor is fused thin the transistor so formed is known as NPN transistor.

<u>Working of NPN transistor :</u>



In PNP transistor J1 is forward biase that is (emitter base junction is FB and collector base junction is RB).Fb cause

the electrons in the N-type emitter to flow towards the base. This constitute a emitter current I_E as this electrons flow through the P-type base they tents to combine with holes as base the is lightly doped and very thin. The only few electrons combine with holes to constitute base current I_B remaining charge (electrons) cross over into the collector region (Ic). Now from this circuit emitter current is the sum of base collector current.