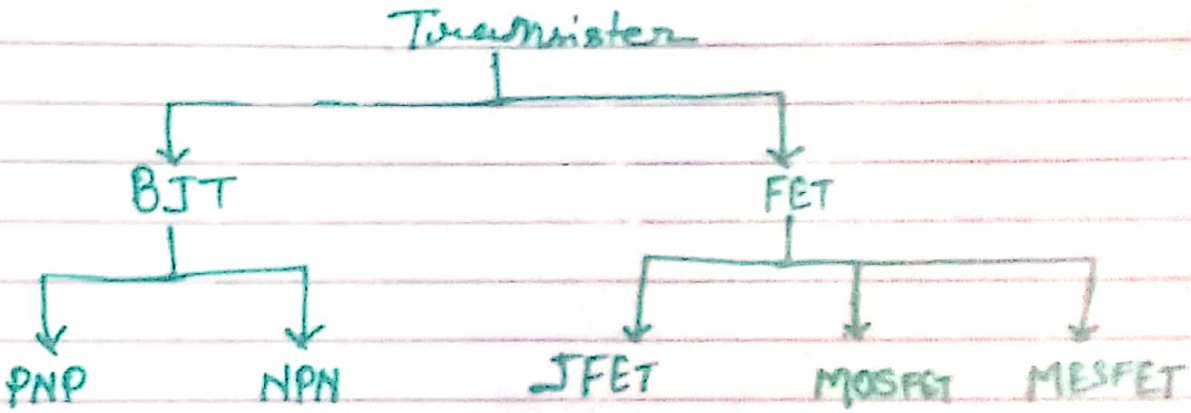
Date
20/02/2024

B.Sc 'III'
VI 'B'

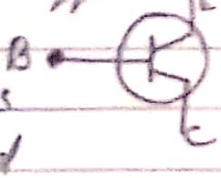
## Transistor →

A transistor is a miniature device that is used to control or regulate the flow of electronic signals. (Basically it acts as a switch and amplifier). It is a type of semiconductor device.

## Type of transistor →:




**BJT (Bipolar junction transister) →:** It is a current controlled device. → A BJT consists of three differently doped regions. They can have the configuration of NPN or PNP and the various layers can either be parallel or perpendicular to the surface. Consider a PNP BJT, with three differently doped regions.




(a) Emitter region – This is usually a heavily doped region ($P^+$). The emitter 'emits' the carriers into the base.

(b) Base region → This is lightly doped n-region. The base region is also physically thin so that carriers can pass through with minimal recombination.

(c) Collectar region → This is a P-type region. The collectar region has a larger width that the other two region since charge is accumulated here from the base.

Thus a transistar consists of two Pn junction, each with its own deplation region.

(i) Emitter base junction → Since the emitter is usually heavily doped the depletion region lies almost entirely in the base.

(ii) Base collectar junction → The depletion region at this junction is usually divided between base and collectar since they are comparebly doped.

There are three different configuration in which the BJT can function — Common base, common emitter and common collector

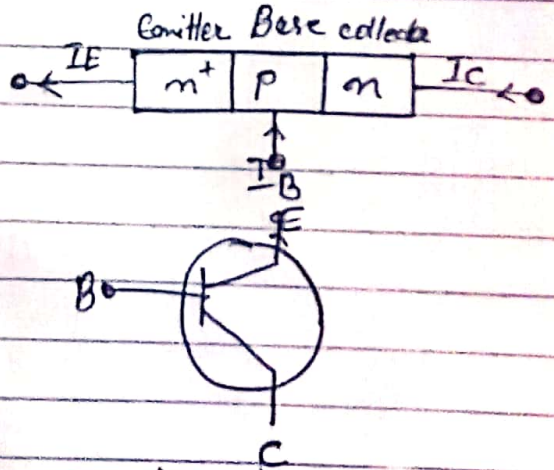



Fig of 'npn' BJT

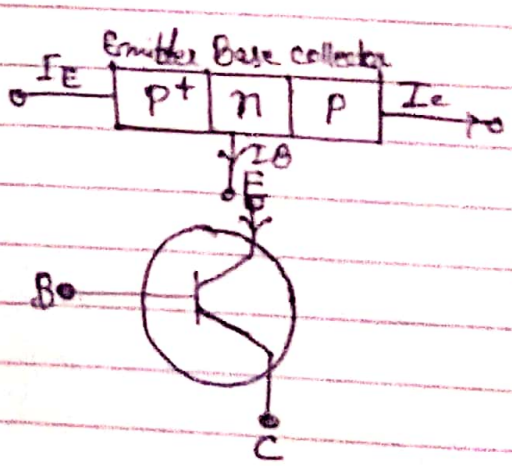



Fig of 'PnP' BJT

The BJT consists of three regions emitter, base and collectar. The emitter and collectar are usually of one type of doping. The base is another doping type.