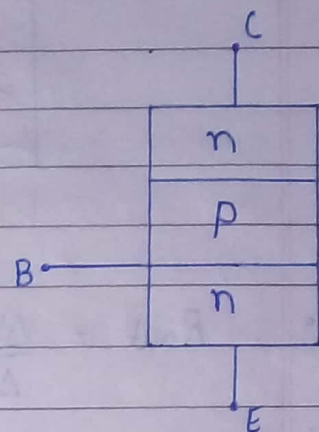
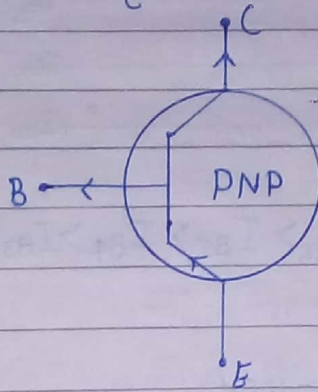
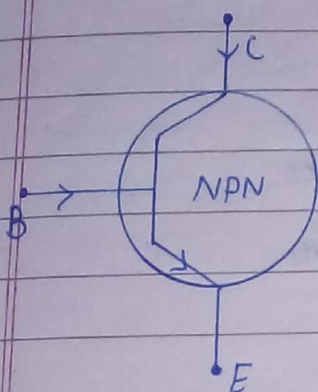
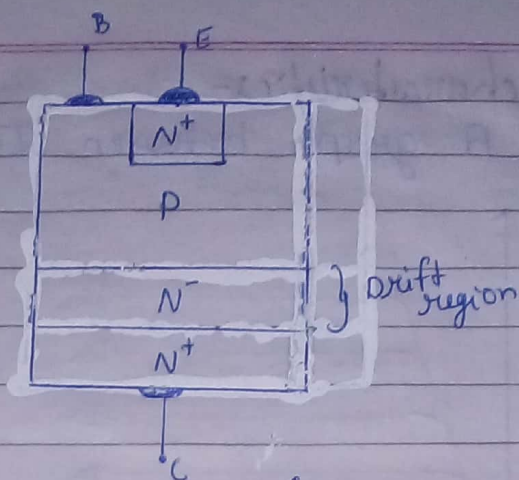


Power BJT

(Power Bipolar Junction Transistor)

A transistor is a device that regulates current or voltage flow & acts as a switch or gate for electronic signals. It consists of three layers of a semiconductor material, each capable of carrying a current.

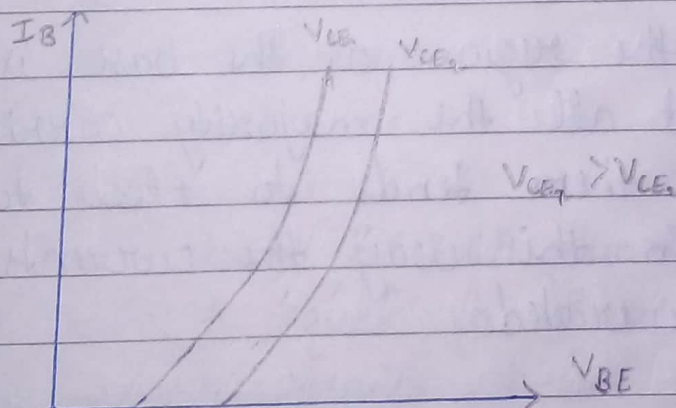
The BJT blocks a high voltage in OFF-state & high current carrying capacity in the ON-state. The power handling capacity is very high.



Common Emitter (CE) & npn transistor is most widely used.

* Input characteristics-

The graph between I_B & V_{BE} . when V_{CE} constt.

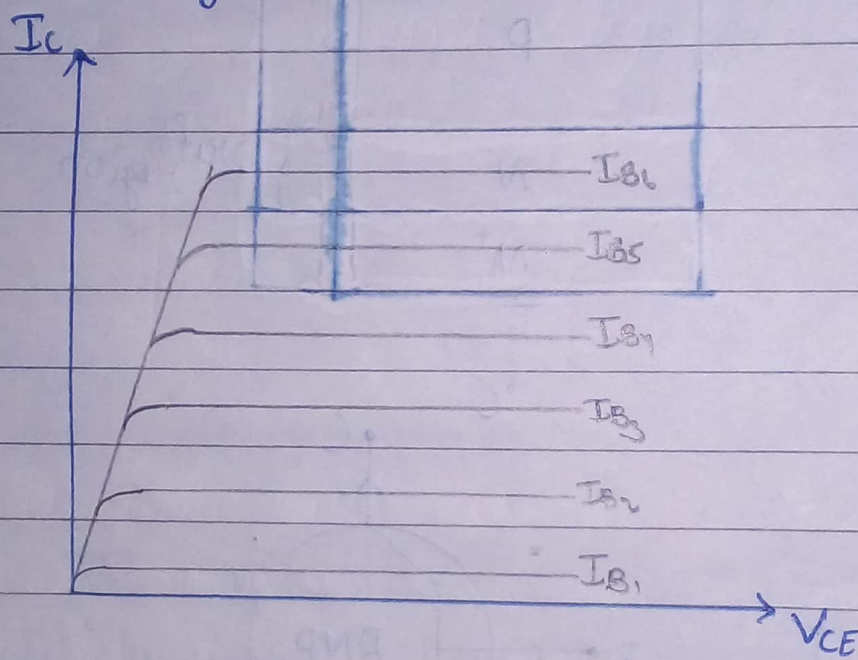


Input resistance.

$$R_{in} = \frac{\Delta V_{BE}}{\Delta I_B} \Big|_{V_{CE} = \text{constt}}$$

Output characteristics-

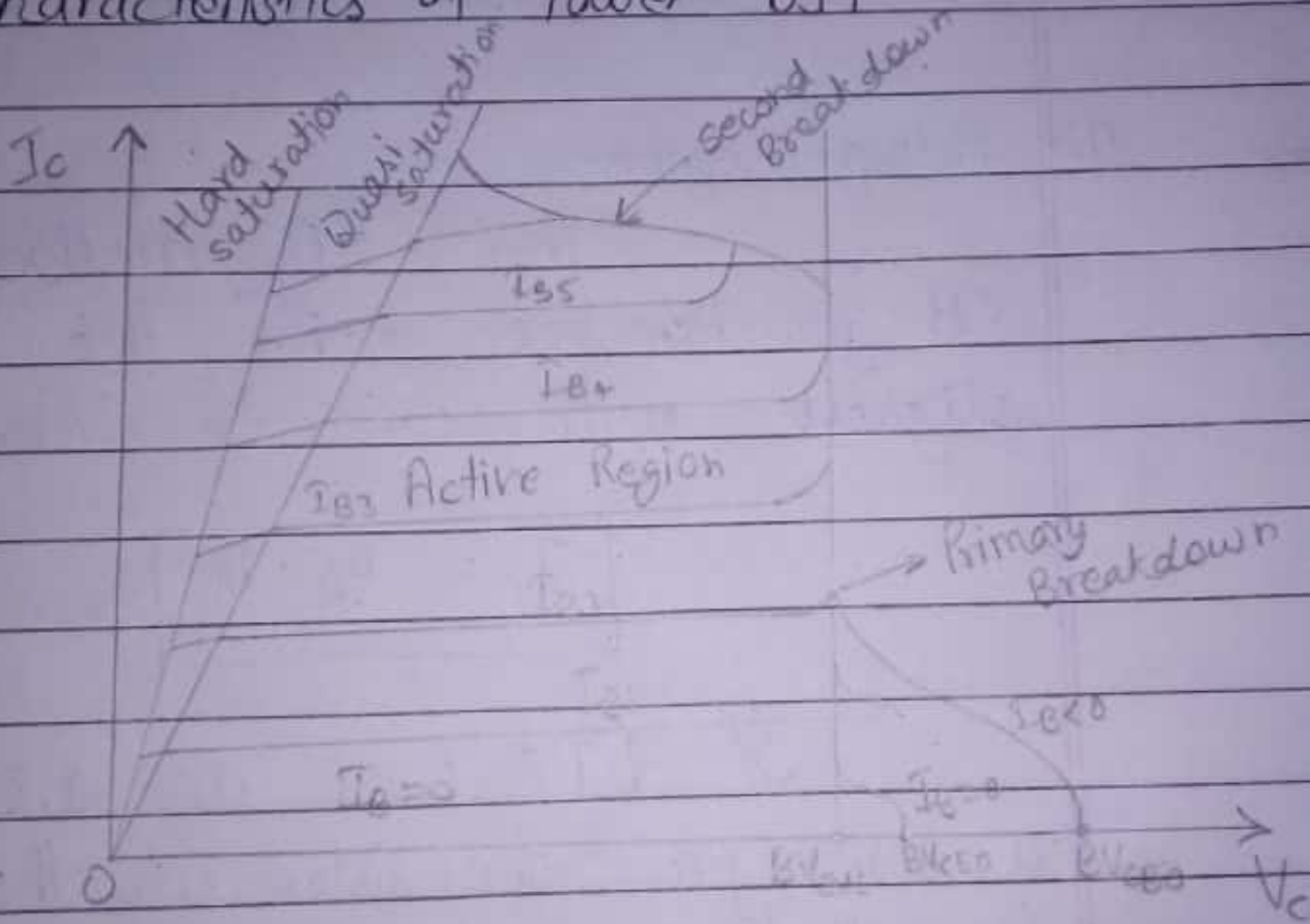
A graph between I_c & V_{ce} . When I_B const.



$$I_{B6} > I_{B5} > I_{B4} > I_{B3} > I_{B2} > I_{B1}$$

$$R_{out} = \frac{\Delta V_{ce}}{\Delta I_c} \Big|_{I_B = \text{const.}}$$

I - Characteristics of Power BJT -

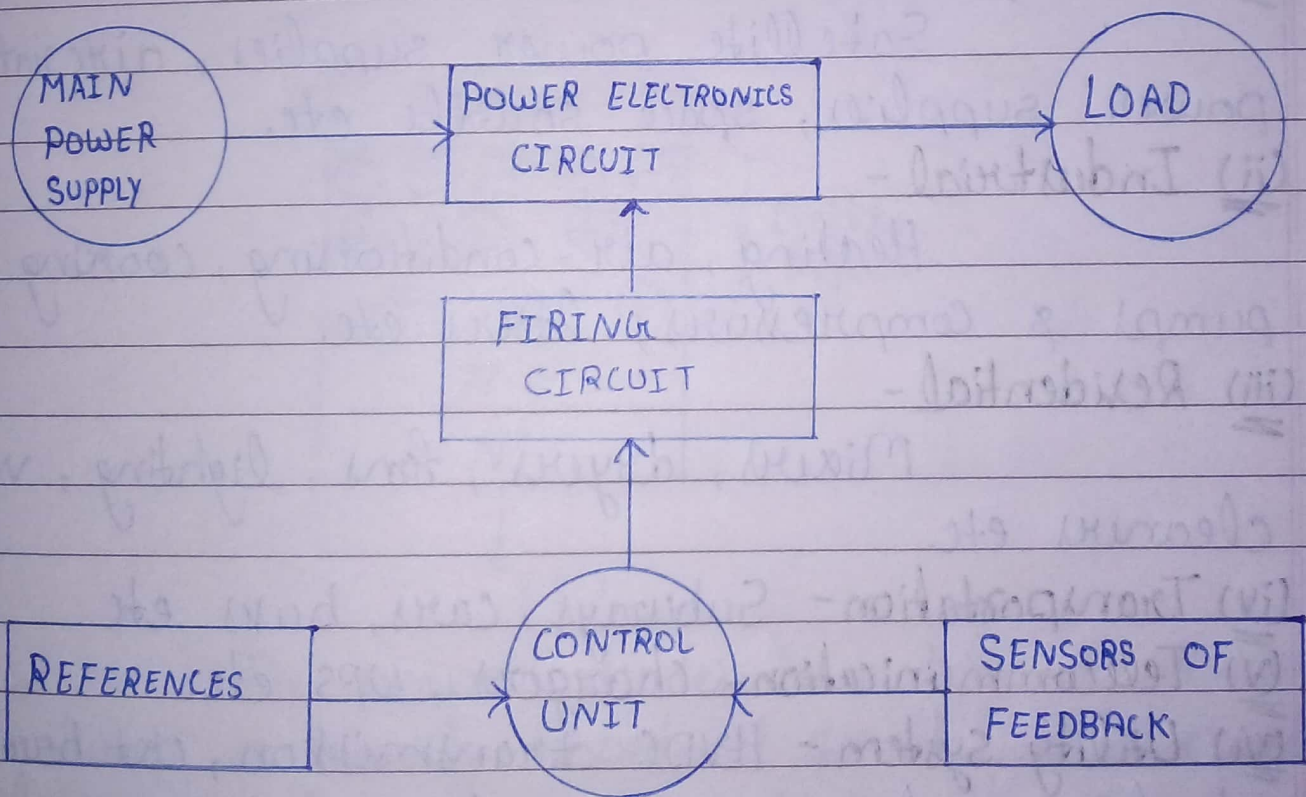


→ Power Electronics-

Power electronics belongs mostly to power engineering & partly to electronics engineering.

Power electronics is defined as a subject that deals with the apparatus & equipment working on the principle of electronics but rated at power level rather than signal level.

Ex- Thyristors, GTO, BJT, MOSFET etc.



* There are five types of power electronics circuit:-

- (a) Rectifier
- (b) Chopper
- (c) Inverter
- (d) AC voltage controller
- (e) Cycloconverter.

* Application of power electronics devices-

(i) Aerospace -

Satellite power supplies, aircraft power supplies, space shuttle etc.

(ii) Industrial -

Heating, air-conditioning, cooking, pumps & compressors, lasers etc.

(iii) Residential -

Mixers, dryers, fans, lighting, vacuum cleaners etc.

(iv) Transportation - Subways, cars, buses etc.

(v) Telecommunication - chargers, UPS etc.

(vi) Utility system - HVDC transmission, ckt breaker, boilers, solar power system etc.