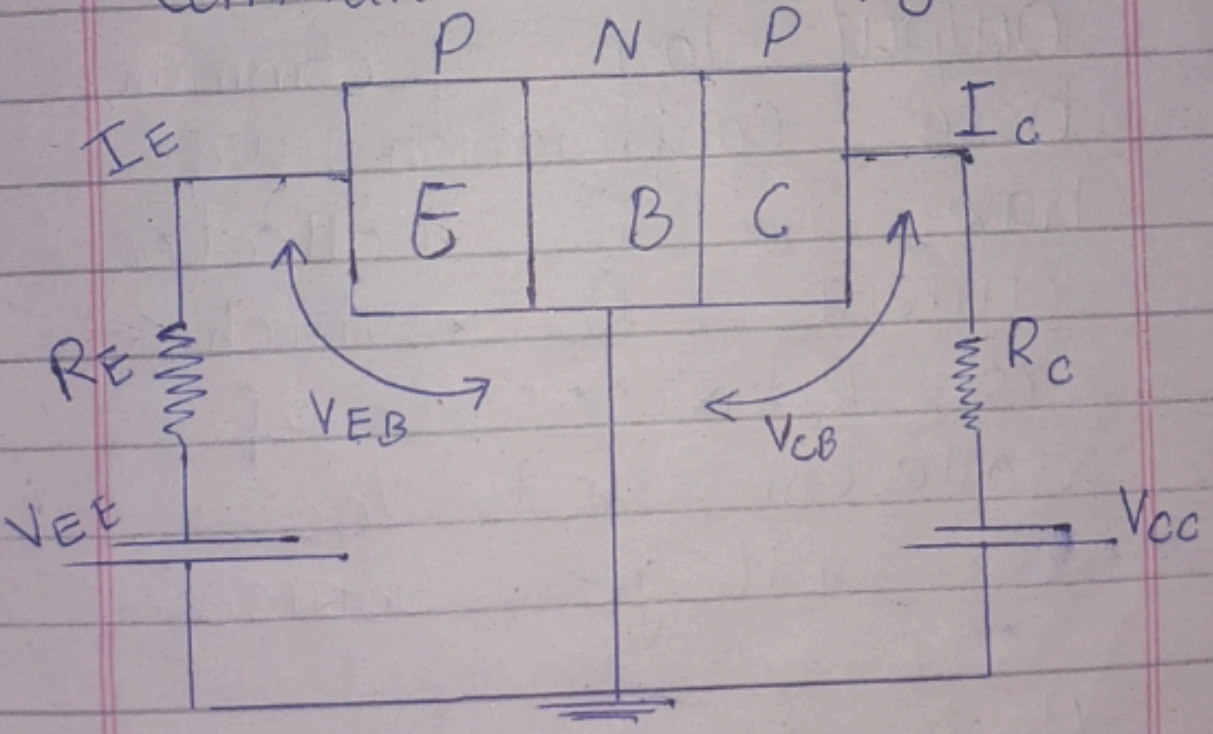
Tmp
L/8

Comman Base Configration

The configration of transistor in which base terminal are comman between emitter and collector is known as comman base configration.



Input:-

In Input loop of comman base Configration we have

Resistance of emmiter.

$$V_{EE} = I_E R_E + V_{EB}$$

$$I_E = \frac{V_{EE} - V_{EB}}{R_E}$$

Output loop.

In Output loop of comman base Configration we have I_c is collector current, R_c which is Resistance of collector and V_{cc} is voltage Saurse.

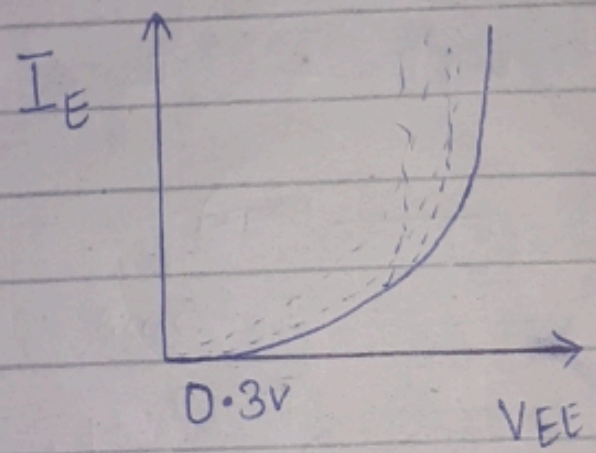
Using ohm's law

$$V_{cc} = I_c R_c + V_{CB}$$

$$I_c = \frac{V_{cc} - V_{CB}}{R_c}$$

Input characlistics:

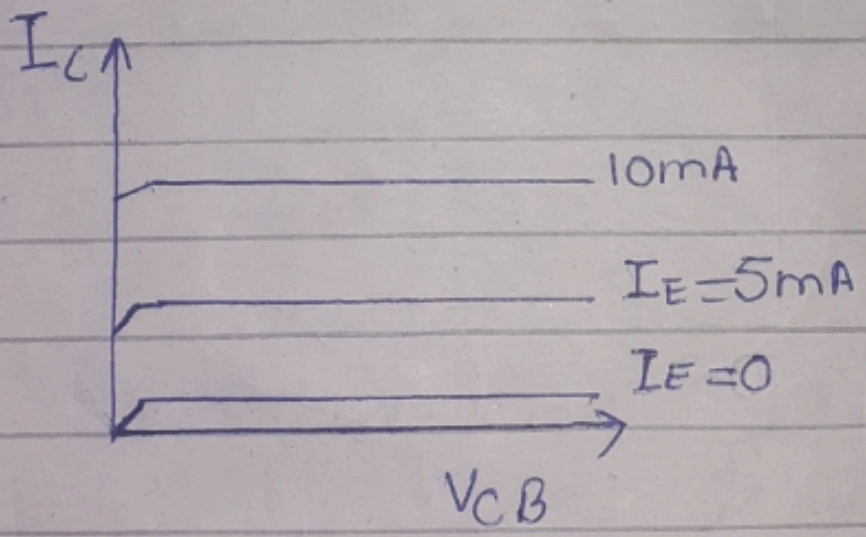
The graph between I_E and V_{EE} of comman base Configration is Known as Input characlistics.



We used germinum voltage which is 0.3V

Output charactictis

The graph between I_C and V_{CB} in comman base configration is known as output charactistics.



Input Resistance

The opposition force offerd to input signal in Input loop.

$$R_{in} = \left(\frac{V_{EB}}{I_E}\right)_{V_{BC}}$$

Input Conductance :-

The Reciprocal of Input Resistance is known as Input conductance.

=> It is denoted by G

$$G_{in} = \frac{1}{R_{in}}$$

$$G_{in} = \frac{1}{\left(\frac{V_{EB}}{I_E}\right)_{V_{BC}}}$$

Output Resistance

The opposition offered to ~~input~~ output signal in Output loop is known Out put Resistance.

$$R_{out} = \left(\frac{V_{CB}}{I_c}\right)_{I_E}$$

Output Conductance

~~Resist~~ The reciprocal of output Resistance is known as Output Conductance.

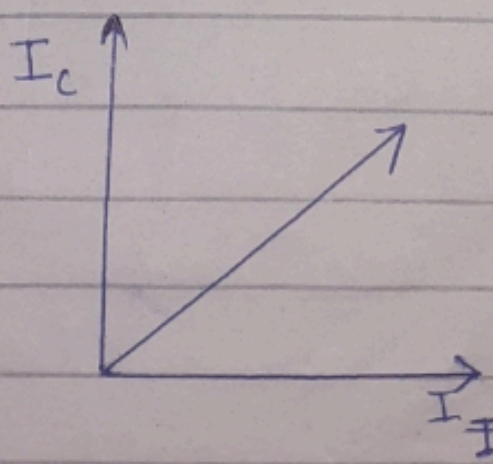
=> Denoted by G_{out}

$$G_{out} = \frac{1}{R_{out}}$$

$$G_{out} = \frac{1}{\left(\frac{V_{CB}}{I_C}\right)_{I_E}}$$

Current gain Charactistics:-

The graph between I_E and I_C at constant V_{CB} is called current gain charactistics, and graph between I_C and I_E gives stright line.



⇒ obey the ohm's law

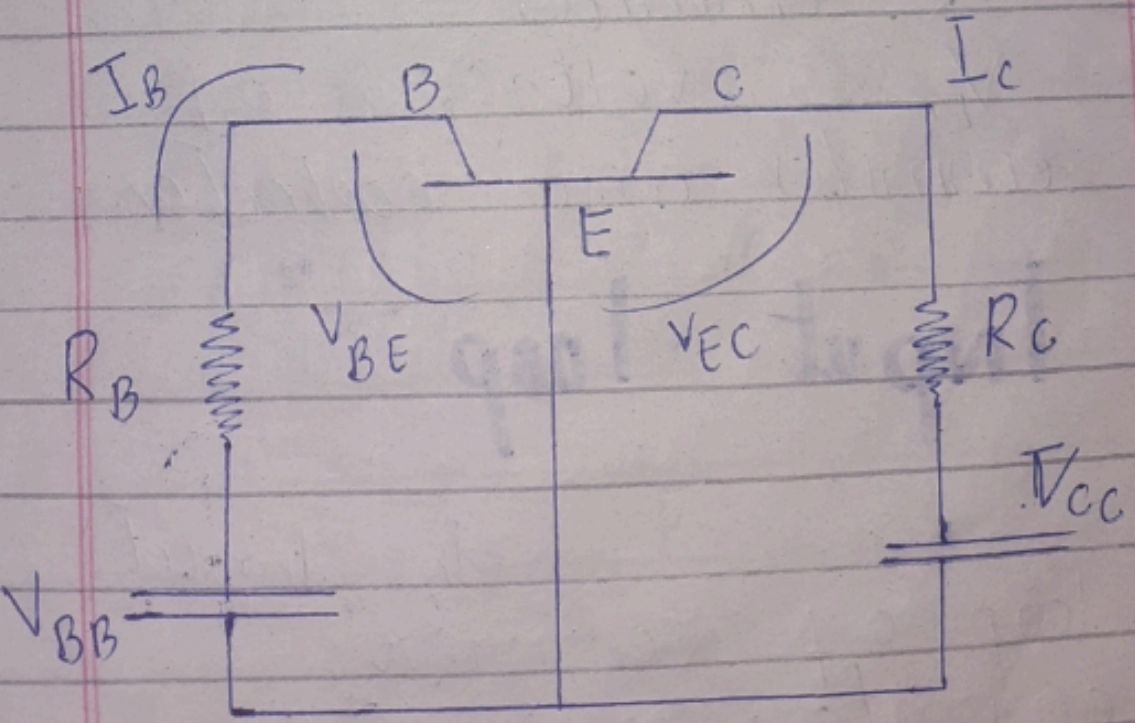
⇒ Represent by α

and

$$\alpha = \left(\frac{I_C}{I_E}\right)_{V_{CB}}$$

Comman Emmiter Configration

The Configration of Transistor in which emmiter terminal is comman between Base and collector is known as comman emmiter configration.



I_B ⟹ Current of Base
R_B ⇒ Resistance of Base
V_{BB} ⇒ external voltage of Base
I_c ⇒ current of collector
R_C ⇒ Resistance of collector.
V_{cc} ⇒ external voltage of collector
V_{BE} ⇒ voltage of Base & emmiter
V_{EC} ⇒ voltage of emmiter and collector.

Input loop

In Input loop of comman emmiter configration We I_B which is Base current

R_B is Resitance of Base and V_{BE} which is a Input voltage

$$V_{BB} = I_B R_B + V_{BE}$$
$$V_{BB} - V_{BE} = I_B R_B$$
$$I_B = \frac{V_{BB} - V_{BE}}{R_B}$$

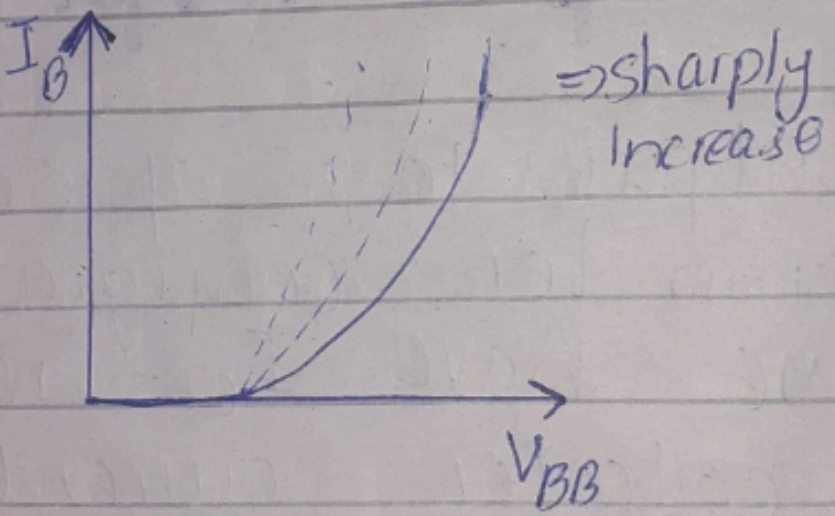
Output loop:-

In Output loop of comman emmiter configration we have I_c is collector current, R_c is Resistance of collector and V_{cc} is Oitput voltage.

$$V_{cc} = I_c R_c + V_{EC}$$
$$V_{cc} - V_{EC} = I_c R_c$$
$$I_c = \frac{V_{cc} - V_{EC}}{R_c}$$

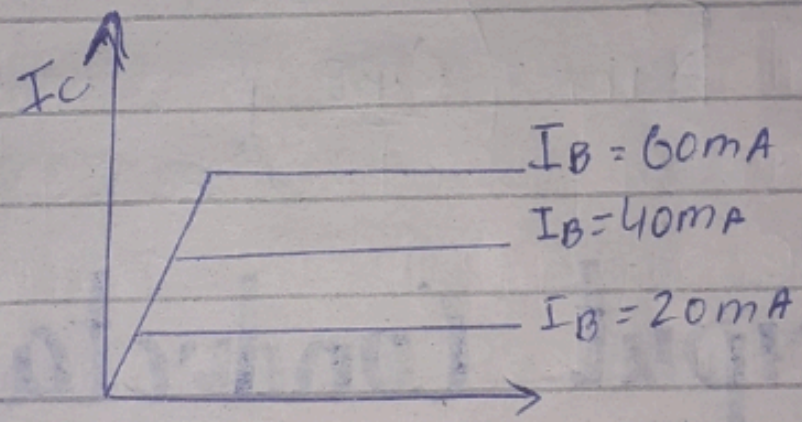
Input charactistics:-

The graph between I_B and V_{BB} in comman emmitter configration is known as Input charactistics.



Output charactistics

The graph between I_C and V_{CC} in comman emmitter configration is known as Output charactistics.



Input Resistance:-

The opposition force offerd to input signal in input loop is knoun as Input Resistance.

$$R_{in} = \left(\frac{V_{BE}}{I_B}\right)_{V_{BC}}$$

Input Conductance

The reciprocal of Input Resistance is knoun as input conductance.

$$G = \frac{1}{R_{in}}$$

$$G = \frac{1}{\left(\frac{V_{BE}}{I_B}\right)_{V_{BC}}}$$

$$G_{in} = \left(\frac{I_B}{V_{BE}} \right)_{V_{BC}}$$

Output Resistance :-

The opposition force offerd to output signal in output loop is known as Output Resistance.

$$R_{out} = \left(\frac{V_{EC}}{I_C} \right)_{I_B}$$

Output Reconductance

The reciprocal of output Resistance in comman emitter configration is known as output conductance.

=) Denoted by G_f

$$G_T = \frac{1}{R_{out}}$$

$$G_T = \frac{1}{\left(\frac{V_{cc}}{I_c}\right)_{I_B}} \left(\frac{I_c}{V_{cc}}\right)_{I_B}$$

choice of wavelength