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Subject

Basic Electronics

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Question \Rightarrow 01 (A)

An unloaded zener regulator has a source 24V, set a series resistance $470\ \Omega$ and a zener voltage of 15V. What is the zener current,

Ans:-

If Zener Voltage is 15V then the resistor voltage is

$$V = 24 - 15 = 9V$$

The zener and the resistor are connected in a series so their current are equal. The resistor current

$$I = V/R = 9/470 \approx 0.024 = 24\text{mA}$$

So the zener current is also 20mA.

Question No \Rightarrow 01 (B)

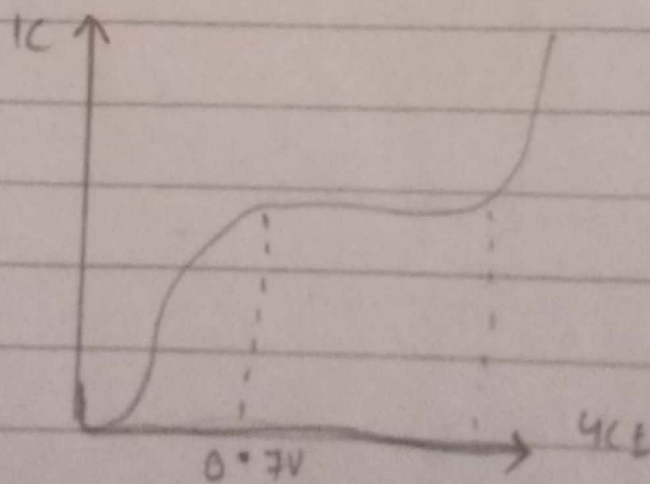
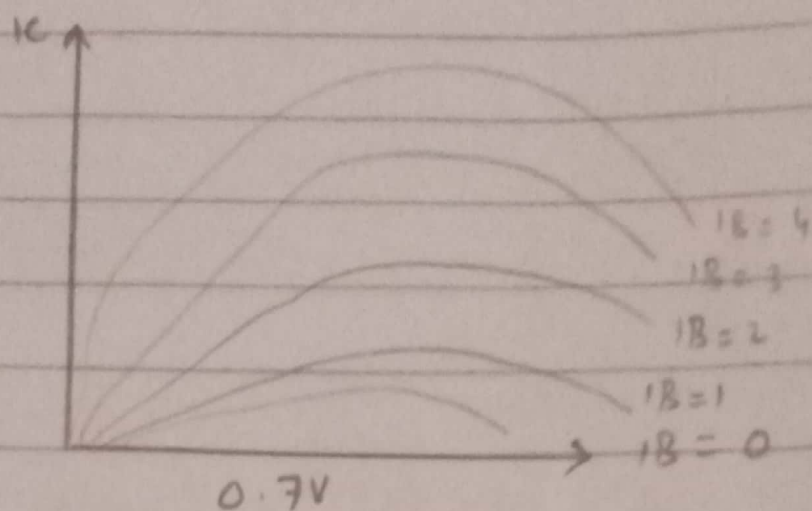
If the zener diode is disconnected the following figure what is the load voltage.

Ans

Assume the load takes a maximum current of 95mA. If the load current decrease the zener current increases by the exact same amount. With the load disconnected the zener current rises to 100mA. The behavior ensure that the voltage across the zener diode remains constant.

Question \Rightarrow 02:-

Draw a set of collector curves for BJT Transistor. The using these curves show where the four operating regions of a transistor are located?



Saturation
region

active region

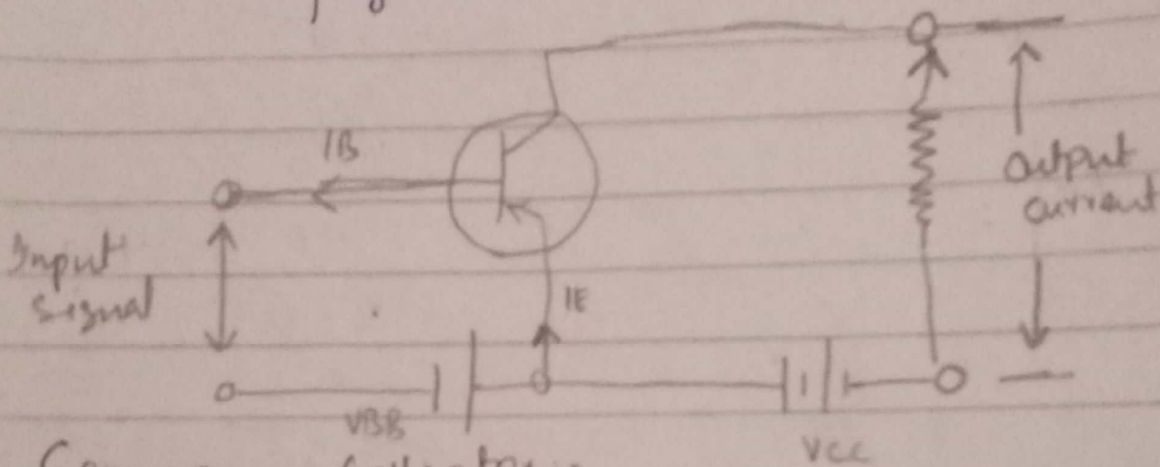
Breakdown
region

Question \Rightarrow 03:-

Draw and explain transistors connected in the following configurations:

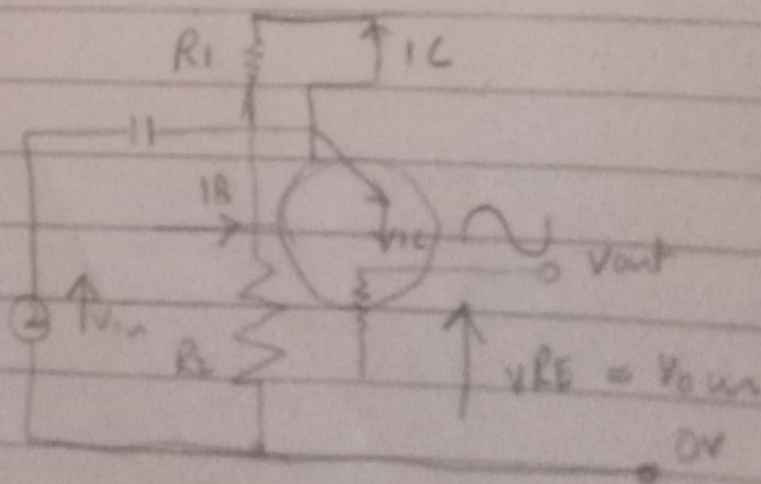
Common emitter:-

The configuration in which the emitter is connected between the collector and base is known as a common emitter configuration



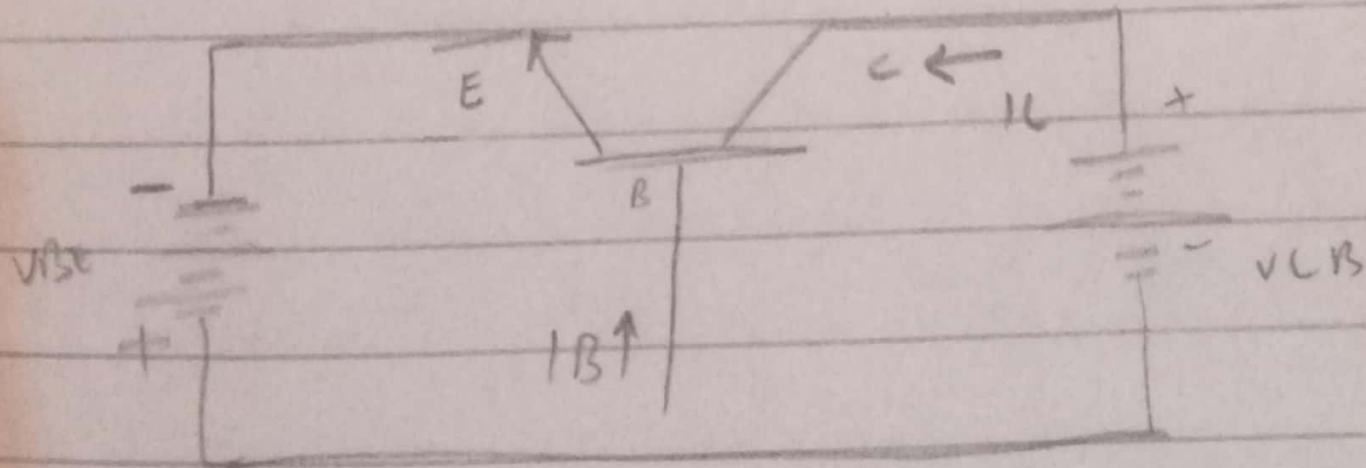
Common Collector:-

Common Collector Amplifiers produce an outputs voltage across its emitters load which is phase with the input signal



Common Base :-

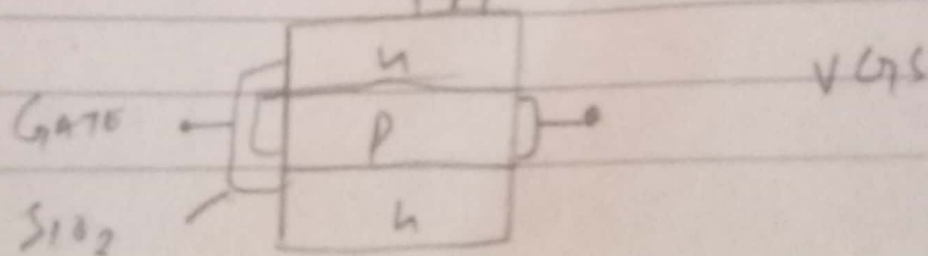
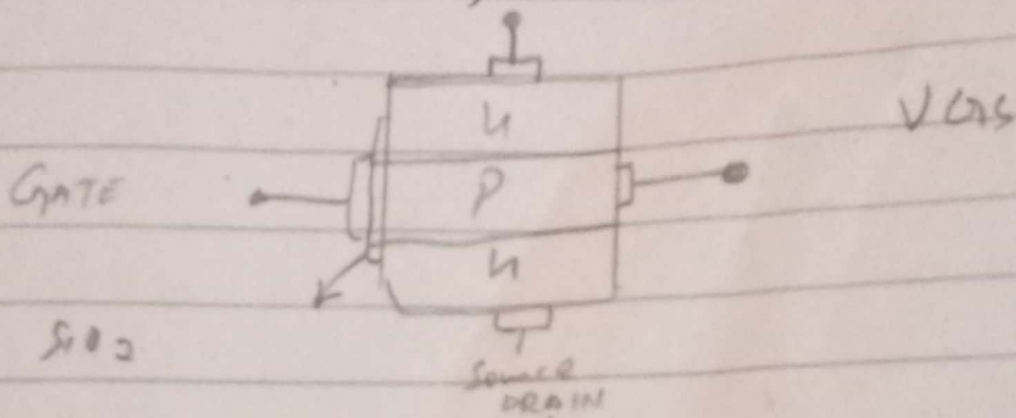
Common Base Configuration
emitter is the input terminal collector
is the output terminal connected as
a common terminal for both input
and output.



Question No \rightarrow 04:-

Draw an E-MOSFET showing the P and n regions the explain the off and on action:-

Ans:- E-MOSFET The substrate extends all the way to the silicon dioxide. The no longer is an n-channel between the sources and the drains.



Question No \rightarrow 05 (A)
List and compare the advantages and disadvantages of BJT and FET amplifiers?

Ans:- There are many advantages and disadvantages over BJTs and FET.

① \rightarrow BJTs are highly noisy devices than the JFET's

② \rightarrow FET's are faster switching devices than that of the BJT. Because FET is majority carries devices.

③ Thermal stability of FET's are higher than the BJTs. Because FET's are unipolar devices, is current flow in

Disadvantages of BJT and FET
Since the input impedance is considerable higher than that of BJTs, FETs are preferred over BJTs for use as the input stage to a multistage amplifier. One class of FETs (JFET) generates lower noise than BJTs and FETs are generally easier for fabricate than BJTs.

Question No \Rightarrow 05 (B)

Explain what happens when drain current starts to increase through a power FET.

Answer:-

The most transistor is biased within the saturation region to establish the desired drain current which will define the transistor's Q-point. As the instantaneous value of V_{GS} increases, the bias point moves up the curve as shown, allowing a larger drain current to follow as