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Subject

Basic electronic

Date.

No.

Q1: a:

An unloaded Zener regulator has a source voltage of 24V. a series resistance - - - - - what is the Zener current?

Ans: if Zener voltage is 15V, then the resistor voltage is  
 $U = 24 - 15 = 9V.$

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

$$I = U/R = 9/470 \approx 0.02A = 20mA$$

So the Zener current is also 20mA.

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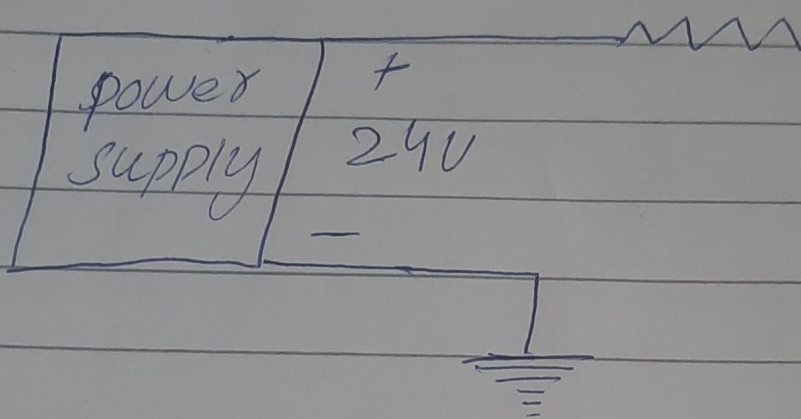
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part b Q1:-

Q IF the Zener diode is disconnected in the following figure. what is the load voltage?

Ans:-

$470 \Omega$



Assume the load takes a maximum current of  $95 \text{ mA}$ .

IF the load current decrease

the Zener current increases

by exact same amount

when the load disconnected the Zener current raise to  $100 \text{ mA}$

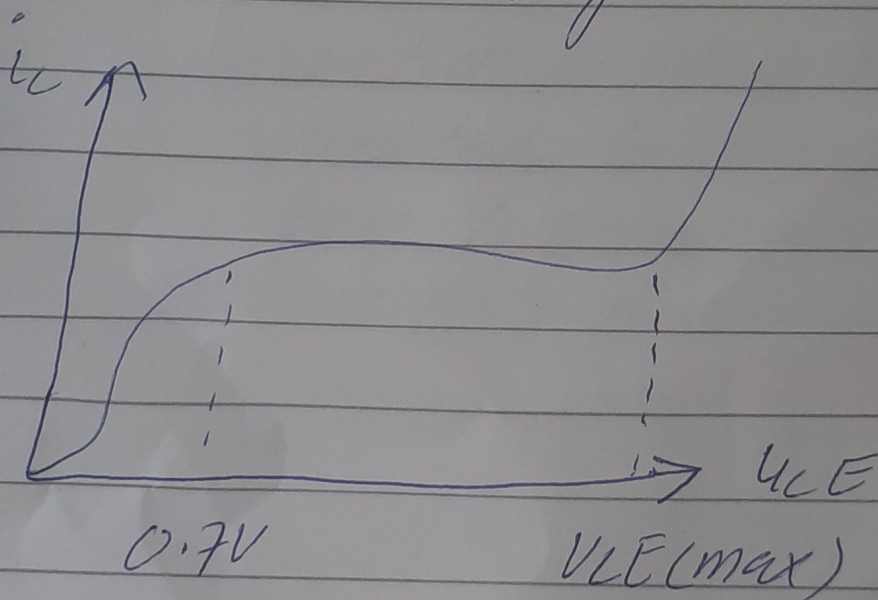
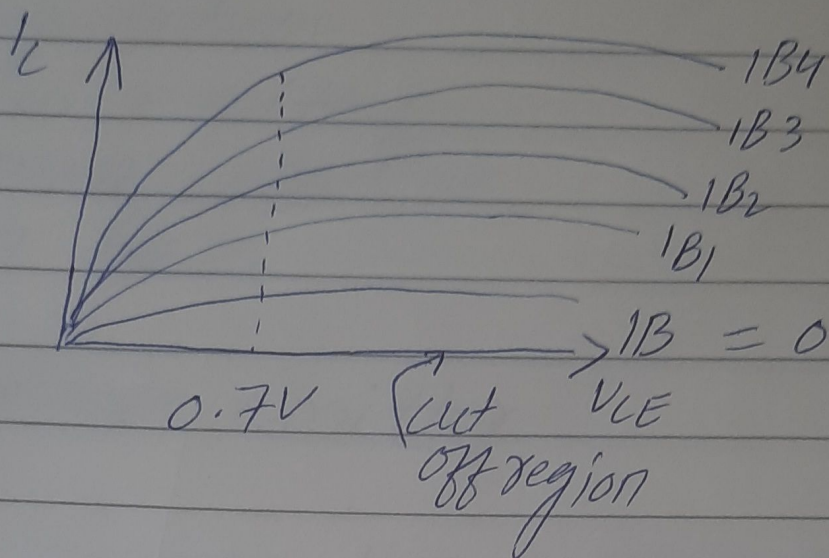
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Q2: Draw a set of collector curves for BJT Transistor. Then-----  
----- located:.

Ans:



Saturation  
region

active  
region

break down  
region.

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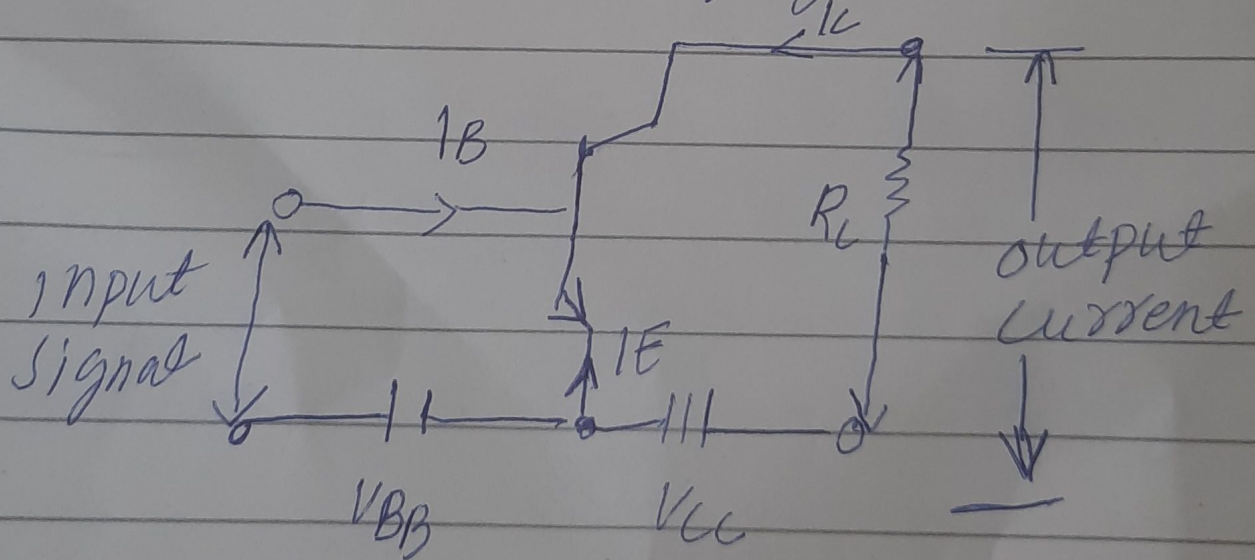
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Q3: Draw and explain Transistors connected in the following configurations

- (1) common emitter
- (2) common collector
- (3) Com base

Ans Common emitter

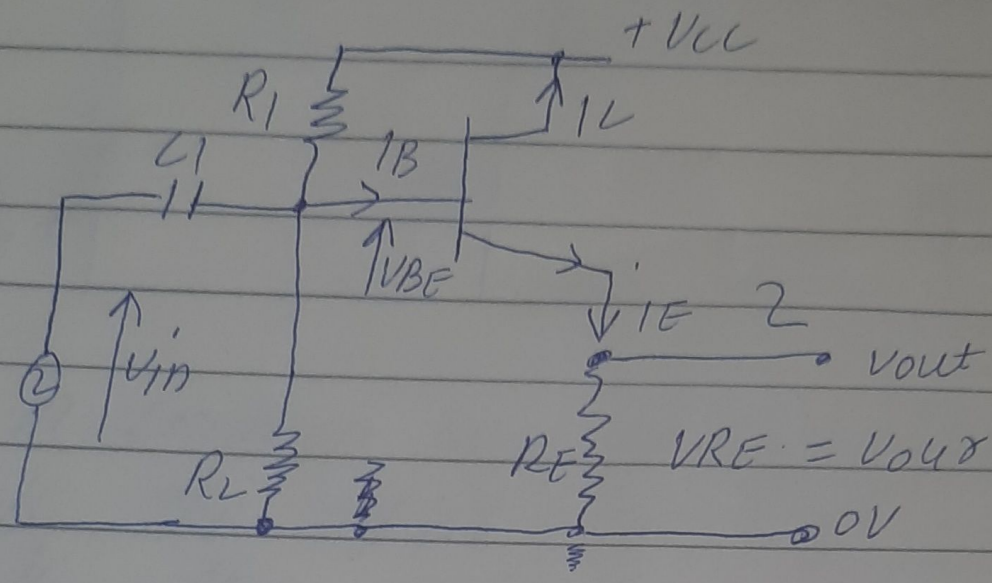
The configuration in which the emitter is connected between the collector and base is known as a common emitter configuration



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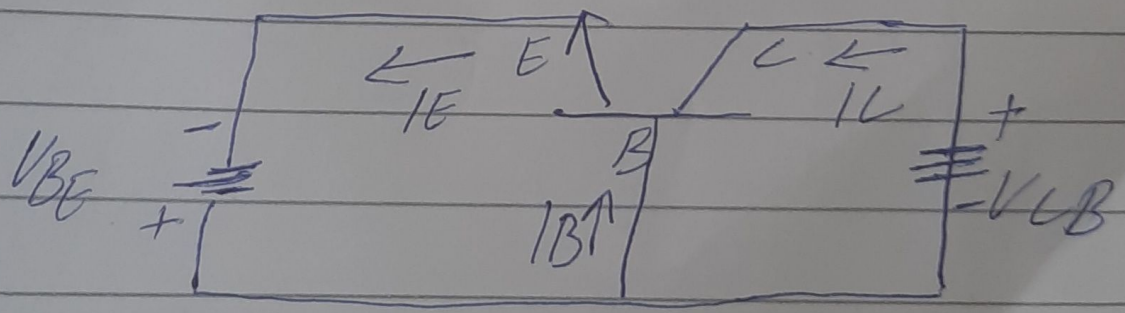
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a Common collector



Common Collector Amplifiers produce an output voltage across its emitter load which is in phase with the input signal

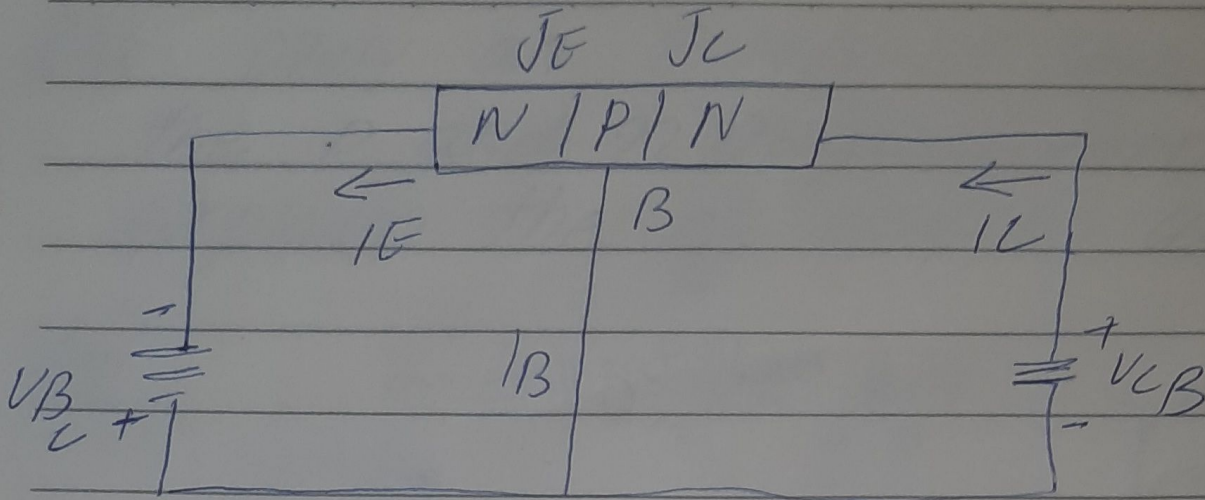
3 Common base configuration



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in common base configuration emitter is the input terminal collector is the output terminal and base terminal is connected as a common terminal for both input and output.

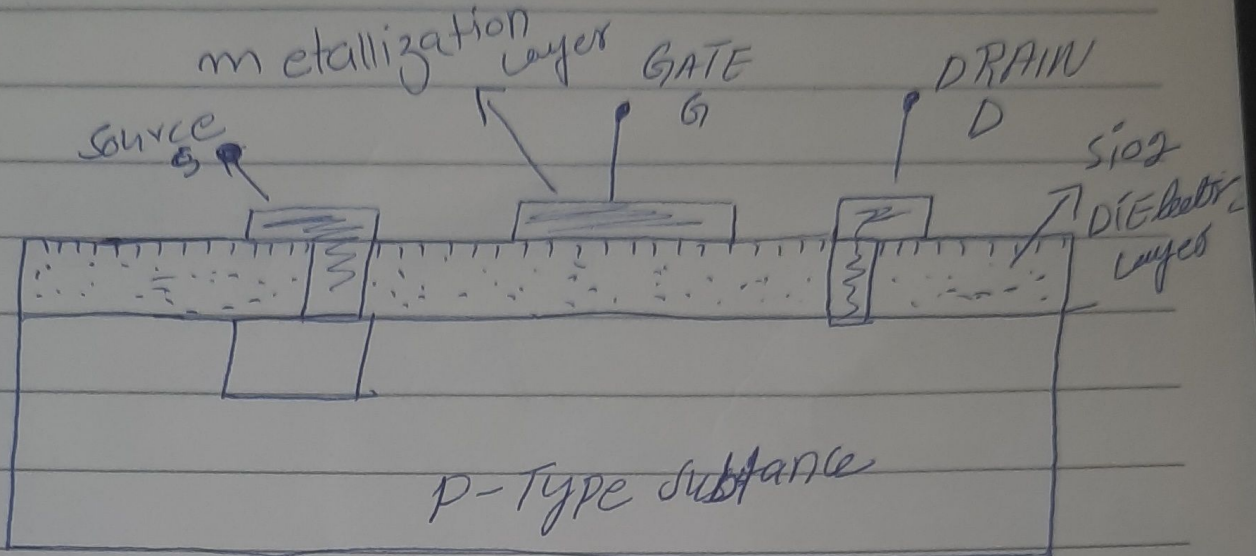
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Q4: Draw an E-MOSFET showing the p and n regions, then explain the off and on action?

Ans



N-channel E-MOSFET

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To turn the MOSFET on, we need to raise the voltage on the gate. To

turn it off we need to connect the

gate to ground p-channel. The source is connected to the power cell rail (V<sub>cc</sub>) in order to allow current to flow the



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Q5:

(a) List and compare the advantages and disadvantages of BJT and FET amplifiers.

Ans.

### BJT Advantages :

- They have better voltage gain
- They have a high current density
- They have a low forward voltage
- it can be operated in low to high power application
- BJT has a large gain bandwidth

### Disadvantage of BJT

- BJT has a low thermal stability
- BJT is most effective by radiation
- BJT has more noise produced
- BJT has a low switching frequency.

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## ② FET Advantages

- FET has a high input impedance of several megohms
- FET has less effect by radiations than BJT
- Temperature stable than BJT
- Less noise compare to BJT
- Smaller in size
- longer life
- High efficiency.

## FET Disadvantages:-

- They are more costly than junction transistor
- Smaller gain bandwidth product compare to BJT
- Transconductance is low hence voltage gain is low

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Q5b:

Explain what happens within drain current starts to increase through a power FET?

Ans The mos transistor is biased within the saturation region to establish the desired drain current which will define the transistors Q-point. As the instantaneous value of  $V_{GS}$  increase the bias point moves up the curve as shown allowing a larger drain current to flow as  $V_{DS}$  decrease.