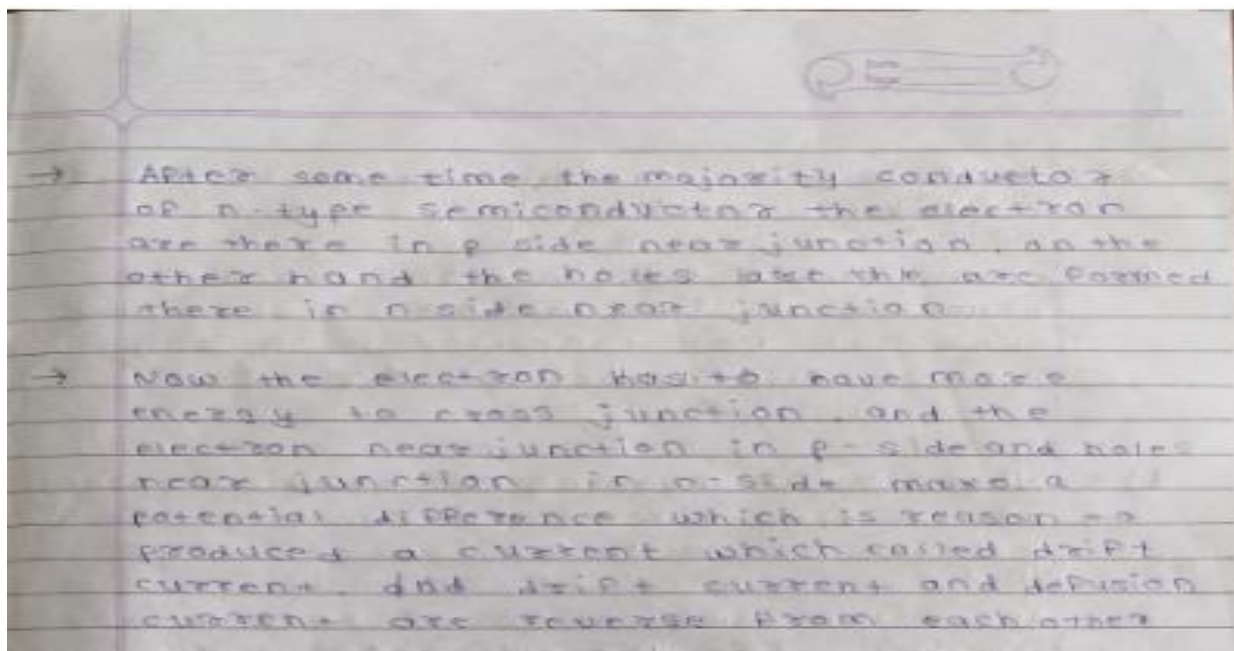
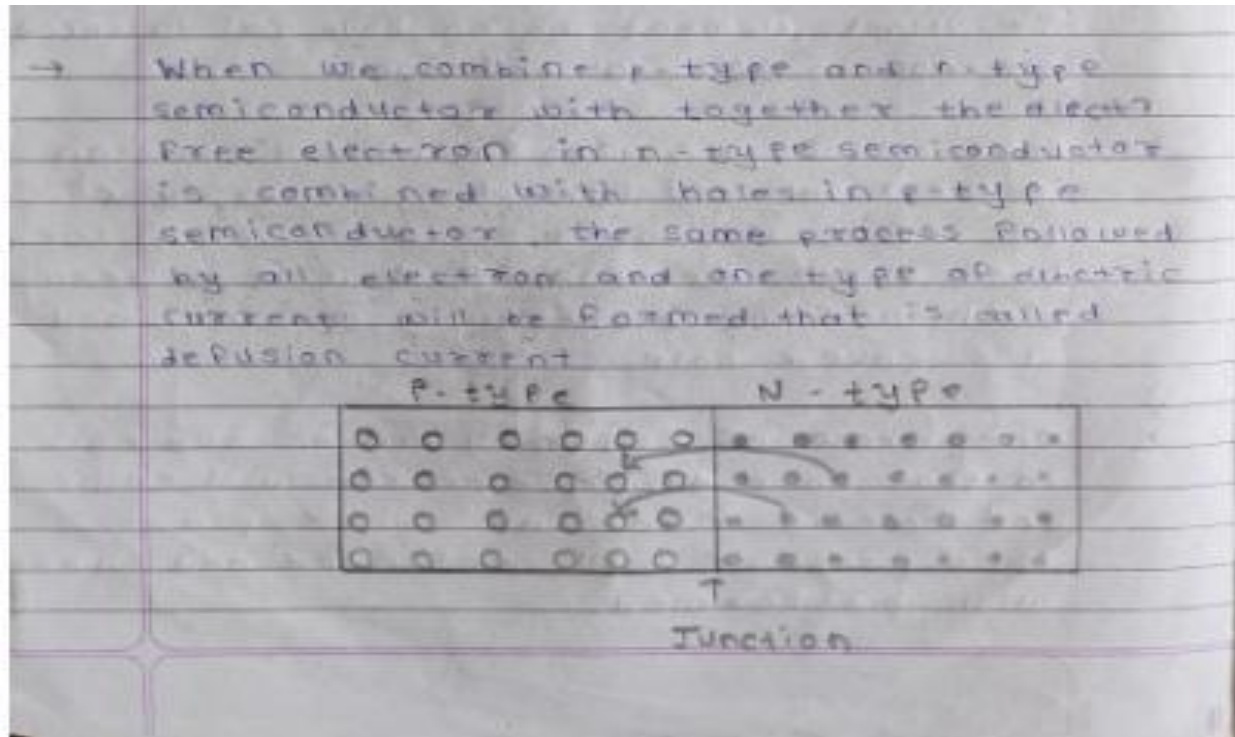
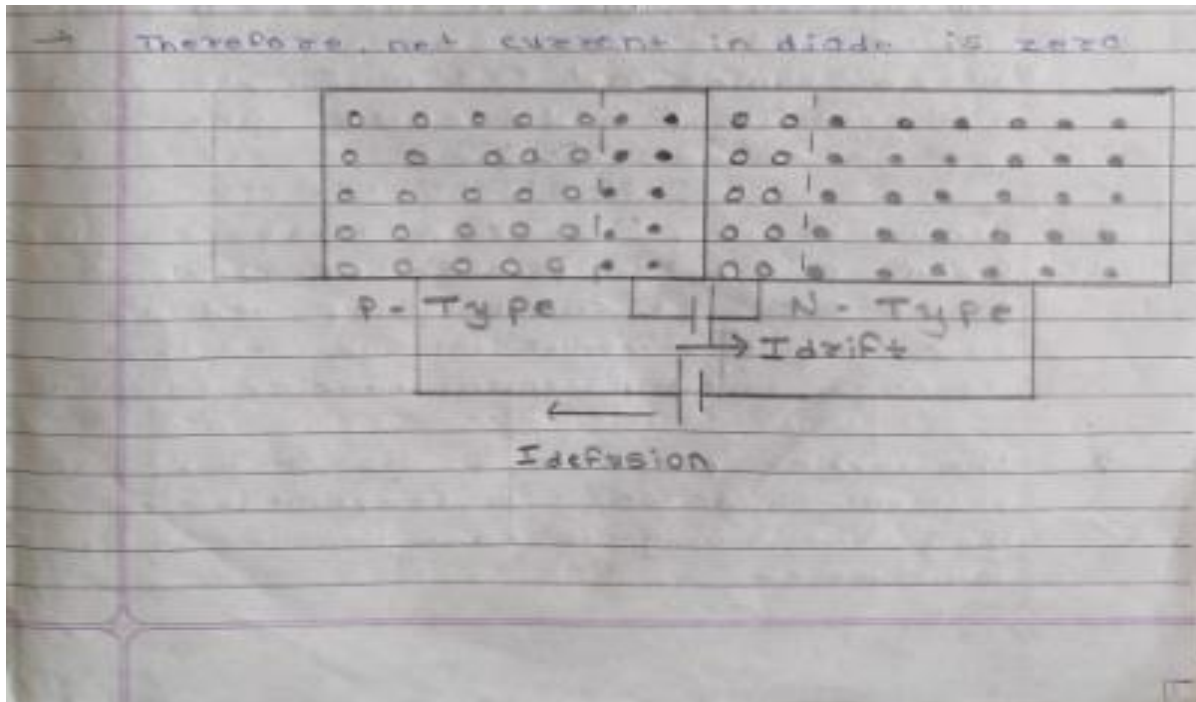




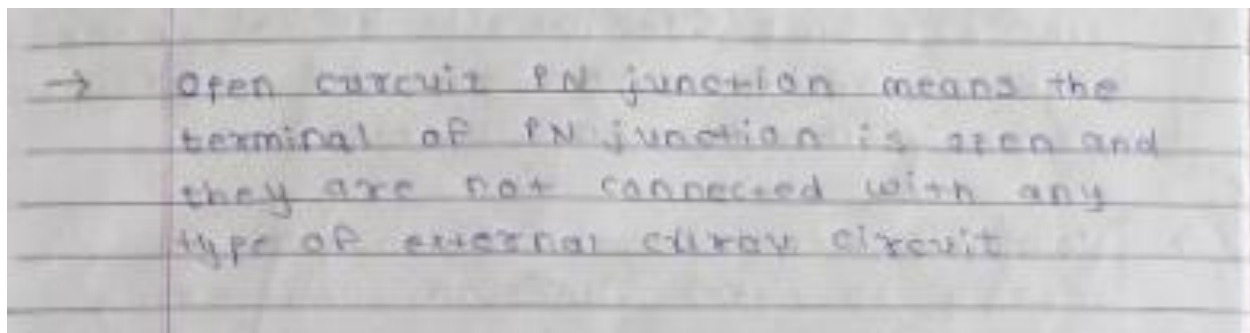
Assignment-Semiconductor Diode CO-1 and CO-2

- Q-1 What happens when we combine P-type material and N-type material? Briefly explain with necessary diagram.





Q-2 What do you understand by the term forward bias of PN junction diode and reverse bias of PN junction diode? What is the effect of such bias on depletion region in both cases.





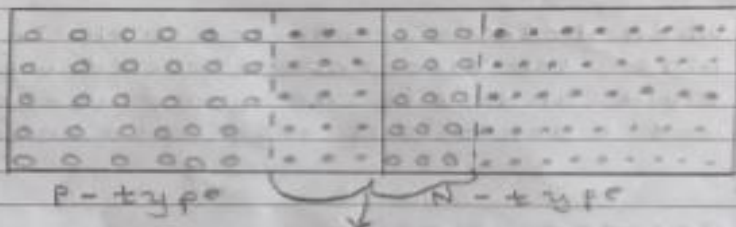
→ After the combination of P and n-type semiconductor, the electrons in n jump into p and gathered at junction after some time too many electrons gathered in p side near junction. It is called barrier.

→ Now, if any electron wants to jump from n side to p side, because of barrier. It can't jump and we have to give external voltage and that voltage called Potential barrier potential.

The barrier potential is also depended on physical condition like temperature etc. they that is why we can measure it by multimeter.

→ When n-type and p-type semiconductor combined with each other, the electron in n-type semiconductor goes into p side after some time too many electrons gathered at junction.

→ And too many holes are gathered at junction and make the potential and that region where electron and holes are gathered that is called depletion region.

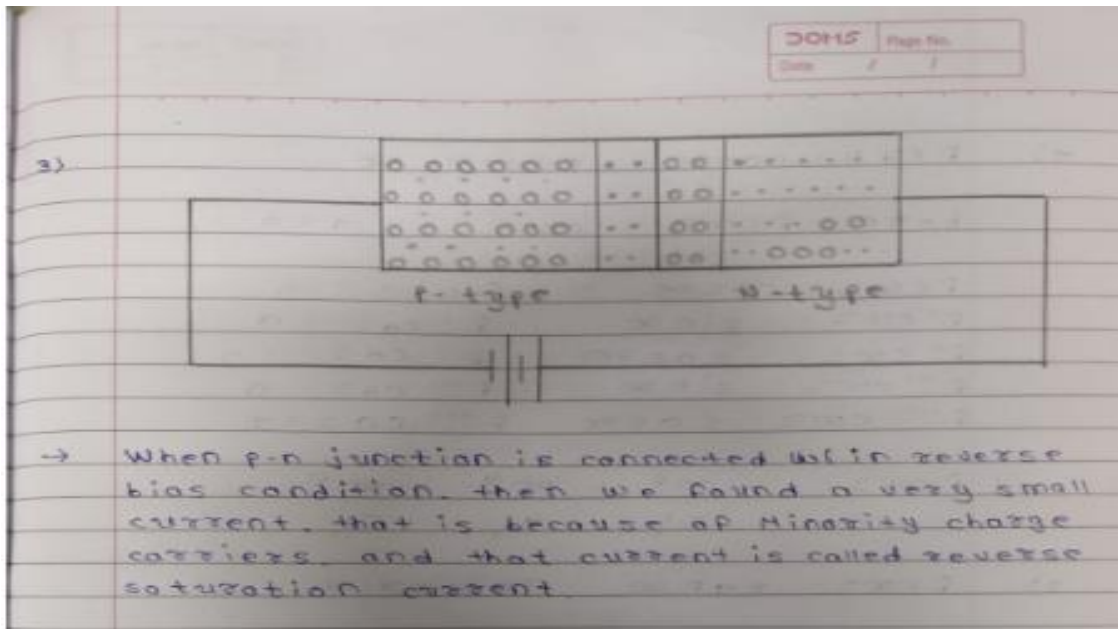


P-type N-type

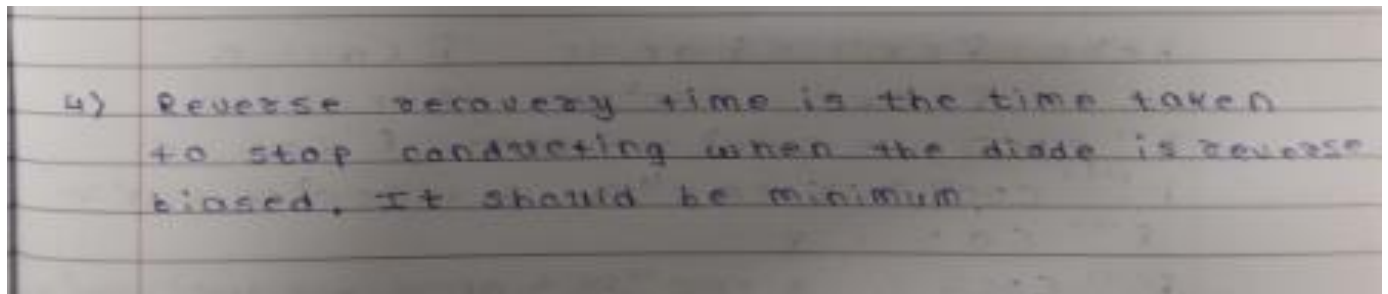
Depletion Region



Q-3 Define the term reverse saturation current of PN junction diode.



Q-4 What is reverse recovery time of a diode? What is its importance?



Q-5 What is the meaning of following diode specifications?
1. V_F 2. I_F 3. I_R 4. PIV 5. P_{Dmax}



5) i) V_F - V_F is the amount of voltage needed to get current to flow across a diode.

ii) I_F - I_F is the current when the forward voltage is applied.

iii)

iv) P_{IV} - A P_{IV} - Peak Inverse Voltage is defined as a maximum voltage a diode reverse voltage can a device withstand.

v) I_{Fmax} -

Q-6 What is limitations of Zener diode as a voltage regulator when we need to provide more current to load connected across Zener diode?



6) It has low efficiency for heavy load currents. It is because if the load current is large, there will be considerable power loss in the series limiting resistance. The output voltage slightly changes due to zener impedance.

Q-7 Where can we find the applications of clipper circuits and clamper circuits?

7) Clipper circuit used when we need to clip the unwanted portion of the waveform, and clamper circuit is used to add dc offset to the waveform.

Q-8 What is the importance of resistor connected in series with LED? What can happen if resistance is very less? What will happen if resistance is very high?

8) The resistor connected in the series is called the current limiting resistance that resistor is used to limit the current, the LED will burn out if the resistance is very low and LED will not glow if that is very high.



- Q-9 It is possible to get full wave rectification with both center tapped and bridge rectifier. Out of these two which will you prefer? Why?

9) the Full-wave bridge rectifier is preferable, because in center-tap we have to use center-tap transformer which is comparatively expensive, and PIV in center-tap is also high, so for dealing with that, we have to use high quality diode, which is also expensive, that is why bridge rectifier is preferable.

- Q-10 What is the meaning of line regulation and load regulation? Why should we know it?

10) Line regulation means to control the output to maintain the output if input differs. Zener is providing that facility. In our home, the electricity comes from power travels lakhs of kms, so it may vary, so we have to manage output accordingly. Other is load regulation. If we connected output to the TV, fridge, washing machine, fan, etc. it has variable load according to its functionality, so we have to manage output accordingly. We have to know load regulation and line regulation for to use devices comfortably and with safety.