



SNS COLLEGE OF ENGINEERING

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AN AUTONOMOUS INSTITUTION



Approved by AICTE, New Delhi and Affiliated to Anna University, Chennai.

UNIT -III SEMICONDUCTOR PHYSICS

TOPIC – X QUESTIONS DISCUSSION

Part – A

1. Explain semiconductor and draw its energy band diagram.
2. State the properties of a semiconductor.
3. Distinguish between elemental and compound semiconductor.
4. What happens when the temperature increases in the case of semiconductor ?
5. Difference between intrinsic and extrinsic semiconductor.
6. Compare n-type and p-type semiconductors.
7. Explain drift transport.
8. What is meant by diffusion transport?
9. Define ohmic contact.
10. The Hall coefficient of a specimen of a doped silicon is found to be $3.66 \times 10^{-4} \text{ m}^3/\text{C}$. The resistivity of the specimen is $8.93 \times 10^{-3} \text{ ohm-m}$. Find the density of charge carriers.

Part –B

1. Derive an expression for the density of electrons in conduction band of an intrinsic semiconductor.
2. Derive an expression for the density of holes in valence band of an intrinsic semiconductor.
3. Derive an expression for the carrier concentration in an intrinsic semiconductor.
4. Derive expressions for carrier concentration and Fermi energy in n-type semiconductor.
5. Explain the variation of Fermi level with temperature and donor impurity concentration
6. Discuss about the carrier concentration in p-type semiconductors and show that the Fermi level at 0°K lies at the middle of the acceptor energy level and the top of valence band.
7. With a neat sketch, describe the principle, construction and working of a solar cell with V-I characteristics.
8. With a neat sketch, describe the principle, construction and working of a photo detectors with V-I characteristics.