

TUTORIAL QUESTIONS

Code: 18PHY12

Subject: ENGG. PHYSICS

Divs: A, B, C, D, Semester: I Date: 18-02-2021

Duration: 90 minutes

Staff: Dr. ASP, SMJ,

Q. No.	QUESTIONS
1a.	Obtain an expression for electrical conductivity for an intrinsic semiconductor & obtain the expression for Fermi energy in terms of energy gap of intrinsic semiconductor.
1b.	What is Hall Effect? Obtain the expression for Hall voltage in terms of Hall co-efficient.
1c.	The conductivity and Hall coefficient of an n-type semiconductor are 112/ohm m and $1.25 \times 10^{-3} \text{ m}^3/\text{C}$ respectively. Calculate the charge carrier concentration and electron mobility.
2a.	What is Fermi factor. Explain the variation of Fermi factor with temperature and energy.
2b.	Give the features of quantum free electron theory & Show how quantum free electron theory overcomes the drawbacks of classical free electron theory.
2c.	Calculate the Fermi energy in eV for a metal at 0°K, given that its density is 10500 kg/m ³ , atomic weight 107.9 and it has only one conduction electron / atom
3a.	Define internal field in case of solid dielectrics. Derive Clausius-Mosotti equation
3b.	What is electric polarization? Explain the types of polarization in dielectric.
3c.	The atomic weight and density of sulphur are 32 and $2.08 \times 10^3 \text{ kg/m}^3$ respectively. The dielectric constant of the sulphur is 3.4. If sulphur solid has cubic structure, calculate its electronic polarizability.