IITE, Indus University
Engineering Physics (PH0011)
Academic year: 2022-23 Semester:2 (2022 batch)
Assignment

Unit III: Introduction to Quantum and Semiconductor Physics

1. **What is black body and black body radiation? Explain.**
2. **Discuss the Energy distribution curve for a Black body radiation with necessary diagram.**
3. **What is Compton Effect? Explain with diagram.**
4. **What is Photon? Mention the important Properties of Photon.**
5. **Derive the time independent and time dependent Schrodinger wave equation for a particle having mass m and velocity v.**
6. **Differentiate between conductors, semiconductors and Insulators.**
7. **What do you mean by Semiconductor?**
8. **Define: Conduction band, Valence band and band gap.**
9. **What are the types of semiconductor? Explain in detail with necessary diagrams and examples.**
10. **Mention a few differences between Intrinsic and Extrinsic semiconductors.**
11. **Explain band theory of solids in detail.**
12. **Define the terms: (i) Density of States (ii) Fermi level (iii) Occupation Probability**
13. **Derive equation for concentration of electrons of effective mass 'm' in a conduction band of an intrinsic semiconductor.**
14. **Derive equation for concentration of holes in a valence band of an intrinsic semiconductor.**

Numericals for practice:

15. **Calculate the number of photons emitted by a 100 watt sodium lamp. The wavelength of emitted light is 5893 Å.**
16. **Calculate the energy in eV for a photon of wavelength 0.1×10^{-9} m. What is the momentum of this photon?**