NEHRU INSTITUTE OF ENGINEERING AND TECHNOLOGY
Nehru Gardens, Thirumalayampalayam, Coimbatore – 641 105
Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai
An ISO 9001:2015 & 14001:2015 Certified Institution
Accredited by NAAC, Recognized by UGC with 2(F) & 12(B)
NBA Accredited UG Courses: AERO | CSE | MECH
DEPARTMENT OF SCIENCE AND HUMANITIES

PH3205– APPLIED PHYSICS

Most Important Anna University Part-B Questions

Unit-I

1. What are the basic assumptions of classical free electron theory? Based on the assumptions derive an expression for *electrical and thermal conductivity of metals*. What are the success and failures of this theory?
2. (i) Explain the concept of density of energy states. ii) Derive an expression for *density of electron states in a metal*. Hence deduce the expression for Fermi energy at 0 K.
3. Write down the Fermi Dirac distribution function. Explain how the function varies with temperature?

Unit II

4. Derive expression for the *carrier concentrations of electron and holes in an intrinsic semiconductor*. And also explain the variation of carrier concentration with temperature.
5. What is Hall Effect? Derive an expression for Hall coefficient. Describe an experimental setup for the measurement of the hall coefficient and mention its applications.
6. Briefly explain (i) Ohmic contact, (ii) Schottky diode

Unit III

7. Explain the different *types of polarization mechanisms in dielectric materials*. Derive an expression for Langevin Debye equation.
8. Derive an expression for *internal field* in dielectric and hence deduce Clausius – Mosotti equation.
9. Explain piezo, pyro and ferroelectric properties of crystals.
10. Briefly explain about (i). measurement of dielectric constant of a solid, (ii) behavior of dielectrics in an alternating field.

Unit IV

11. Describe (classify) dia, para, ferro, antiferro and ferrimagnetic materials and their properties with example
12. i) Explain domain theory of ferromagnetism. ii) What is hysteresis? Explain how magnetic materials are classified based on the hysteresis property (soft and hard magnetic materials)
13. Explain (i). BCS theory of superconductivity, (ii) Type-I and Type II superconductor
14. Give an account of High Tc superconductors and their applications.

Unit V

15. Explain non-linear effect of second harmonic generation, frequency mixing, phase matching and parametric oscillation.
16. Explain luminescence, phosphors and white LED
17. Explain optical anisotropy, uniaxial crystals, dichroism.
18. Explain electro-optic modulation based on Keer effect and Pockels effect.