Reg. No. : | | | | | | | | | | |

Question Paper Code: 52004

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2019

Second Semester

Computer Science and Engineering

01UPH204- APPLIED PHYSICS

(Common to EEE, ECE, EIE, ICE and IT branches)

(Regulation 2013)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions.

PART A - (10 x 2 = 20 Marks)

1. State Wiedemann - Franz law.
2. Write any two drawbacks of classical free electron theory.
3. The intrinsic carrier density is $1.5x10^{16}$ m^{-3}. If the mobility of electron and hole are 0.13 and $0.05m^2$ v^{-1} s^{-1} respectively, calculate the conductivity.
4. What is Hall Effect? Give any two uses?
5. What is Meissner effect?
6. What do you understand by the terms critical temperature and critical field of a superconductor?
7. Define dielectric constant.
8. Calculate the electronic polarizability of an isolated Se atom. The atomic radius of an atom is 0.12 *nm*.
9. List the applications of metallic glasses.
10. Write short note on carbon nano tubes.

PART - B (5 x 16 = 80 Marks)

11. (a) Derive an expression for electrical and thermal conductivities of a metal on the basis of classical free electron theory. (16)

Or

(b) Derive an expression for density of energy states in a metal and hence deduce the expression for carrier concentration in metals. (16)

12. (a) Derive the expression for the density of electrons in the conduction band, density of holes in the valence band of intrinsic semiconductor and also derive the expression for intrinsic carrier concentration. (16)

Or

(b) Explain in detail about variation of Fermi level with temperature. (16)

13. (a) (i) Explain the hysteresis on the basis of domain theory. (10)

(ii) Distinguish between soft and hard magnetic materials. (6)

Or

(b) (i) Define superconductivity. Give an account of BCS theory on superconductivity. (10)

(ii) Differentiate between type-I and type-II superconductors. (6)

14. (a) Describe the construction and working of liquid crystal displays. Mention its advantages and disadvantages. (16)

Or

(b) Derive an expression for local field in a dielectric material and hence deduce Claussius- Mosotti equation. (16)

15. (a) Describe the ball milling technique and chemical vapour deposition method for the synthesis of nanomaterials. (16)

Or

(b) Briefly explain about

(i) Chemical vapour deposition (8)

(ii) Electro deposition (8)