

Reg. No. :

--	--	--	--	--	--	--	--	--	--

**Question Paper Code: 31204**

B.E. / B.Tech. DEGREE EXAMINATION, NOVEMBER 2015

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. Briefly describe about Lorentz number.
2. Write quantum theory.
3. Calculate the conductivity of intrinsic germanium with a carrier concentration of  $2.4 \times 10^{19} \text{ m}^{-3}$  kept at 400K, if the mobilities of electrons and holes in it are  $0.41 \text{ m}^2/\text{V-s}$  and  $0.19 \text{ m}^2/\text{V-s}$  respectively.
4. What are p-type and n-type semiconductors?
5. What is Meissner effect?
6. List the types of super conductors.
7. What are colour centres? Give any two significances.
8. Calculate the electronic polarizability of an isolated Se atom. The atomic radius of an atom is  $0.12 \text{ nm}$ .
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 and hence deduce Wiedemann-Franz law. Also verify the Lorentz number using quantum 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) (i) Obtain an expression for carrier concentration in p-type semiconductor. (10)
- (ii) Explain the variation of Fermi level with temperature and impurity concentration in p-type semiconductor. (6)

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) (i) Derive an expression for electronic and ionic polarizability in dielectric materials. (10)
- (ii) Explain the frequency dependence of polarization in dielectric material. (6)

Or

- (b) Briefly explain about
- (i) Phosphorescence excitation (8)
- (ii) Fluorescence excitation (8)
15. (a) What are shape memory alloys? Explain their characteristics with necessary diagrams. Give its advantages. (16)

Or

- (b) Briefly explain about
- (i) Chemical vapour deposition (8)
- (ii) Electro deposition (8)