Question Paper Code: 31024

B.E. / B.Tech. DEGREE EXAMINATION, MAY 2017

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. Define the terms mean free path and mobility of charge carries.

2. Write quantum theory.

3. Compare elemental and compound semiconductors.

4. What are p-type and n-type semiconductors?

5. What is Bohr magnetron?

6. What do you understand by the terms critical temperature and critical field of a superconductor?

7. List the types of super conductors.

8. Define dielectric loss and loss tangent.

9. What are shape memory alloys?

10. List the applications of metallic glasses.

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) What is Hall effect? Derive an expression for Hall co-efficient. (16)

Or

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

13. (a) Write the theory of Ferromagnetic domains and discuss the various energies involved in ferromagnetic domains. Explain Hysteresis loop based on domain theory. (16)

Or

(b) (i) Explain type-I and type-II superconductor. (10)

(ii) Write any six applications of superconductor. (6)

14. (a) Derive an expression for electronic and ionic polarizability in dielectric materials.

(16)

Or

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

15. (a) What are shape memory alloys? Explain their characteristics with necessary diagrams. Give its advantages. (16)

Or

(b) Explain the principle, construction and working of ball milling method for synthesis of nanoparticles and write the advantages and disadvantages of the ball milling method. (16)

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