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**Question Paper Code: 30124**

B.E. / B.Tech. DEGREE EXAMINATION, MAY 2018

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. Compare elemental and compound semiconductors.
4. What are p-type and n-type semiconductors?
5. What is Meissner effect?
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. 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) (i) Derive the expression for density of states. (12)  
(ii) Use the Fermi distribution function to obtain the value of  $F(E)$  for  $E-E_F = 0.01$  eV at 350K. (4)

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

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

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) Briefly explain about

- (i) Chemical vapour deposition (8)

- (ii) Electro deposition \_\_\_\_\_ (8)