Reg. No. :

Question Paper Code: 42004

B.E. / B.Tech. DEGREE EXAMINATION, MAY 2022

Second Semester

Computer Science and Engineering

14UPH204 - APPLIED PHYSICS

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

(Regulation 2014)

Duration: Three hours   Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. Which statistical model is applicable for electrons?

    (a) Maxwell-Boltzmann   (b) Bose-Einstein
    (c) Fermi-Dirac   (d) None of the above

2. As per classical theory susceptibility is

    (a) Inversly proportional to temperature   (b) Directly proportional to temperature
    (c) Independent of temprature   (d) All the above

3. Which semiconductor is widely used in microelectronics?

    (a) Si   (b) Ge   (c) InP   (d) GaP

4. In intrinsic semiconductor at $0K$ Fermi level lies

    (a) Exactly between valence band and conduction band

    (b) Very near to the valence band

    (c) Very near to the conduction band

    (d) None of the above

5. In a Ferromagnetic materials which one is mentioned as easy direction

    (a) (111)   (b) (110)   (c) (100)   (d) All the above

6. Which magnetic material is used as a transformer core?

    (a) Dia   (b) Para   (c) Ferro   (d) Ferri

7. Bound electron is called as

    (a) Exciton   (b) Traps
    (c) Colour centre   (d) None of the above

8. For a given dielectric, as the temperature increases, the ionic polarizability
    (a) increases   (b) decreases   (c) remains unaltered   (d) zero

9. The width of carbon nanotube is_____ *nm*
    (a) 1   (b) 1.3   (c) 1.55   (d) 10

10. Which one is a high temperature phase

    (a) Austenite   (b) Marteniste
    (c) Twinned martensite   (d) Deformed martensite

PART - B (5 x 2 = 10 Marks)

11. Define Fermi energy.

12. Derive an expression for Hall coeffiecient.

13. What is cooper pair?

14. What are the factors that affects dielectric loss?

15. What is shape memory alloy?

PART - C (5 x 16 = 80 Marks)

16. (a) Derive an expression for electrical and thermal conductivity.   (16)

Or

(b) Derive an expression for density of energy states in a conducting material.   (16)

42004

17. (a) Derive the relation for carrier concentration of n-type semiconductor. Also sketch the variation of Fermi level with temperature in the case of 'n' type semiconductor.

(16)

Or

(b) What is Hall effect? Derive a Hall coefficient for P-type and N-type semiconductors.

(16)

18. (a) What are the various types of magnetic materials? With necessary sketches explain the domain theory of ferromagnetism.

(16)

Or

(b) List out the important properties of superconducting materials and explain them.

(16)

19. (a) Write short notes on thermography and its applications

(16)

Or

(b) Define dielectric breakdown. Explain five types of dielectric breakdown occur in dielectric materials.

(16)

20. (a) What are metallic glasses? Explain the melt spinning technique to prepare metallic glasses and mention some important properties of metallic glasses.

(16)

.   Or

(b) Describe any two different techniques of producing Nano particles and Mention few applications of Nano particles.

(16)

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42004

42004