KUMARAGURU
college of technology
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Register Number: …...……….

B.TECH DEGREE EXAMINATIONS: DEC 2014

(Regulation 2013)

Second Semester

U13PHT204: APPLIED PHYSICS

(Common to FT & TXT)

Time: Three Hours   **Maximum Marks: 100**

Answer all the Questions:-

PART A (10 x 1 = 10 Marks)

1. The unit of conductance is

   a) ohm-m   b) $(ohm\text{-}m)^{-1}$

   c) mho   d) m/ohm

2. The energy gap of a superconductor is maximum at ……………..

3. ZnO, MgO are examples of

   a) Intrinsic semiconductors   b) Elemental semiconductors

   c) Compound semiconductors   d) Oxide semiconductors

4. In n type semi conductor, added impurity is a ……………. valent atom

5. The critical temperature above which the ferromagnetic materials lose their magnetic property is known as

   a)   hysterisis   b) Curie temperature

   c) transition temperature   d) standard temperature

6. The value of Dielectric constant of vacuum (ε_0) is ……………..

7. Molten alloy is made to impinge on a fast rotating roller to form

   a) one – Way Shape Memory alloy   b) Two– Way Shape Memory alloy

   c) Metallic Glasses   d) Quantum wires

8. The word **'ceramic'** meant for ……………..

9. Milling and Lithographic techniques are examples of

   a) Top down processes   b) Bottom up processes

   c) Vapor Phase deposition methods   d) Plasma assisted deposition processes

10. The electrons are much hotter than the ions and neutrals in ……………..

PART B (10 x 2 = 20 Marks)

(Not more than 40 words)

11. State Wiedemann – Franz law.

12. What is Meissner Effect?

13. What are the properties of a semiconductor?

14. Mention Fermi level position in intrinsic and extrinsic semiconductors at 0K

15. What are ferrites? Mention its types.

16. What is ionic polarization?

17. Mention any four properties of NiTi alloy.

18. What are the applications of ceramics

19. What are the different structures of carbon nanotubes?

20. Explain the types of Plasma.

PART C (5 x 14 = 70 Marks)

(Not more than 400 words)

Q.No. 21 is Compulsory

21. (i) Derive an expression for both electrical conductivity and thermal conductivity of electrons in metals. (10)

    (ii) Discuss the type I and type II superconductors. (4)

22. a) (i) Obtain an expression for the intrinsic carrier concentration in an intrinsic semiconductor. (10)

    (ii) The intrinsic carrier density is 2.5 x 10^{16} / m^3. If the electron and hole mobilities are 0.13 and 0.05 $m^2v^{-1}s^{-1}$, calculate its electrical conductivity. (4)

(OR)

   b) (i) What is Hall effect? Derive an expression of Hall Coefficient. Describe an experimental set up for the measurement of Hall Coefficient. (10)

    (ii) Describe applications of Hall effect. (4)

23. a) Describe the ferromagnetic domain theory in detail and how will you account hysteresis of ferromagnetic material

(OR)

   b) (i) Discuss in detail the various types of breakdown mechanisms in dielectric material. (10)

(ii) Discuss about dielectric loss. (4)

24. a) (i) What are metallic glasses? How are they prepared? (7)
    (ii) Describe their properties and applications. (7)

(OR)

b) Give a detailed account on Shape Memory alloys their types , characteristics and applications

25. a) (i) Explain in detail the Sol gel technique for the production of nanoparticles (10)
    (ii) Give the properties and applications of nanoparticles. (4)

(OR)

b) (i) Explain in detail the production of glow discharge plasma. (10)
   (ii) Give the applications of plasma. (4)

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