KUMARAGURU
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Register Number: ………………..

B.TECH DEGREE EXAMINATIONS: JUNE 2015

(Regulation 2009)

Second Semester

PHY106: APPLIED PHYSICS

(Common to TXT/FT)

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. For Metals, Relaxation Time _____ Collision Time.
   a) is greater than
   b) is less than
   c) is equal to
   d) is greater than or equal to

3. Negative Temperature co-efficient of resistance means
   a) Resistance of semiconductor increases with the rise in temperature
   b) Resistance of the semiconductor decreases on lowering the temperature
   c) Resistance of the Semiconductor decreases with the rise in temperature
   d) Resistance of the semiconductor increases on lowering the temperature.

4. The electrons in the _____ orbit of an atom are _____ Bounded.
   a) Inner / loosely
   b) Outermost / loosely
   c) Outermost / tightly
   d) Inner / loosely or tightly

5. **Assertation (A) :** The materials which are easy to magnetize and demagnetize are called as soft magnetic materials

   Reason (R): In soft magnetic materials, the domain wall movement will be easy.
   a) Both A and B are False and R is not the correct explanation of A
   b) Both A and R are true and R is the correct explanation of A
   c) A is True and R is False
   d) A is false and R is True

6. In Polar Molecules

    (1) Do not possess centre of symmetry

    (2) Do not possess a net dipole moment in it

    (3) Centers of positive and charges will not coincide

    (4) Possess centre of symmetry. Give the correct statements.

    a) 1 and 2   b) 2 and 3

    c) 1 and 3   d) 3 and 4

7. In chemical vapour deposition technique the gas that carries the reactants is called as _____

    a) Carrier Gas   b) Molecular Gas

    c) Atomic Gas   d) Ideal gas

8. When the size of a material is continuously reduced from a bulk to microscopic size and if one dimension is reduced to the nano-range while the other dimensions remains large, then we obtain a structure known as

    a) Quantum Well   b) Quantum Dot

    c) Quantum Wire   d) Austenite

9. Ultrasonic waves are

    a) Sound waves   b) Electro magnetic waves

    c) Transverse waves   d) Bio-Magnetic waves

10. In Ultrasonic imaging of human body, B- scan is a

    a) One Dimensional mode   b) Two Dimensional mode

    c) Three Dimensional mode   d) Multi Dimensional mode

PART B (10 x 2 = 20 Marks)

11. Distinguish between Relaxation time and collision time.

12. What is meant by Meissner's Effect?

13. Mention any four advantages of semiconducting materials.

14. Compare n type and p type semiconductors

15. Define Magnetic permeability.

16. Distinguish Lorentz and Coulomb force in Dielectrics.

17. What are the two phases of Shape Memory Alloy?

18. What do you mean by Quantum Dot?

19. List the modes of display in the ultrasonic pulse echo system.

20. Give the principle of Ultrasonic testing.

PART C (5 x 14 = 70 Marks)

21. a) Derive an expression for electrical and thermal conductivity in a material and hence deduce Wiedemann – Franz Law.

(OR)

b) Explain the BCS theory of Superconductivity. Explain cryotron with a neat sketch.

22. a) Derive an expression for carrier concentration in a N-Type semiconductors.

(OR)

b) Derive an expression for Hall Voltage and explain an experimental method used to measure the hall co-efficient of a given specimen.

23. a) (i) Explain the Domain theory of Ferromagnetism. (10)
    (ii) Differentiate between Hard and Soft magnetic materials. (4)

(OR)

b) (i) Discuss in detail the different types of Polarization mechanisms in Dielectrics. (10)
   (ii) Sketch their dependence on the frequency of applied electric field. (4)

24. a) Explain the Chemical Vapour Deposition Technique of preparation of nano particles with a neat sketch.

(OR)

b) Give the Properties and applications of Carbon Nano Tubes.

25. a) Explain the working of Phonocardiography with a neat diagram

(OR)

b) Explain the working of Gamma Ray Camera with a neat sketch.

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