



B.E/B.TECH DEGREE EXAMINATIONS: JUNE 2015

Regulation 2013

Second Semester

U13PHT204: 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 electrical conductivities σ_{expt} and σ_{CFET} are related with temperature __
 - a) $\sigma_{\text{expt}} \propto T$ and $\sigma_{\text{CFET}} \propto 1/\sqrt{T}$
 - b) $\sigma_{\text{expt}} \propto 1/T$ and $\sigma_{\text{CFET}} \propto \sqrt{T}$
 - c) $\sigma_{\text{expt}} \propto 1/\sqrt{T}$ and $\sigma_{\text{CFET}} \propto 1/T$
 - d) $\sigma_{\text{expt}} \propto 1/T$ and $\sigma_{\text{CFET}} \propto 1/\sqrt{T}$
2. The magnetic permeability of super conductor is ____
 - A Zero
 - b Finite
 - c Infinite
 - d More than one
3. Donor energy level is ____ semi-conductor
 - a) Nearer to VB in P type
 - b) Nearer to VB in N type
 - c) Nearer to CB in P type
 - d) Nearer to CB in N type
4. The process of adding impurity in intrinsic semi-conductor is called ____
5. Metallic glasses are __ in nature
 - A Crystalline
 - b Poly crystalline
 - c Non crystalline
 - d All the above
6. __ magnetic material has negative susceptibility
7. The expression for Bohr magnetron is ____
 - a) $eh/(2\pi m)$
 - b) $eh/(4\pi m)$
 - c) $eh/(\pi m)$
 - d) $e\pi/(4hm)$
8. Pseudo elastic properties of ____ are used in eye glass frames
9. Ball milling and sol-gel techniques are __ and __ types of synthesis of nano materials.
 - a) Top down and Top down
 - b) Top down and bottom up
 - c) Bottom up and bottom up
 - d) Bottom up and Top down
10. Plasma is the state of matter at which ____

PART B (10 x 2 = 20 Marks)

(Answer not more than 40 words)

11. Define mobility of electrons
12. What is Meissner effect?
13. What is effective mass of an electron?
14. Distinguish between n-type and p-type semiconductors
15. What are ferrites?
16. What is dielectric loss in dielectric materials?
17. What are metallic glasses?
18. Define shape memory effect
19. What are nano materials?
20. Give few properties of plasma

Answer any FIVE Questions:-

PART C (5 x 14 = 70 Marks)

(Answer not more than 300 words)

Q.No. 21 is Compulsory

21. (i) On the basis of free electron theory, derive the expression for electrical conductivity of conductors (8)
- (ii) Distinguish the type I and II super conductors with example (6)

22. a) (i) Derive the expression for carrier concentration in an intrinsic semiconductor (10)
- (ii) Discuss the variation of Fermi energy level with temperature and impurity concentration in intrinsic semiconductor (4)
- (OR)**
- b) (i) What is hall effect? Derive an expression of hall coefficient (8)
- (ii) Describe an experimental setup for the measurement of hall coefficient (6)

23. a) (i) Distinguish dia, para and ferro magnetic materials with examples (7)
- (ii) Discuss the domain structure in ferromagnetic material. List out the different energies involved in domain growth (7)
- (OR)**
- b) (i) Briefly explain different types of polarization in dielectric materials (10)
- (ii) Explain the magnetic recording and readout mechanisms in magnetic tapes with diagram (4)
24. a) Explain the preparation, properties and applications of metallic glasses
- (OR)**
- b) Explain the fabrication, properties and applications of shape memory alloys
25. a) Explain the synthesis of nanomaterials by i) Sol-gel method and ii) Ball milling method
- (OR)**
- b) (i) Explain the production of glow discharge plasma (7)
- (ii) Write notes on the applications of plasma in textile and biomedical field (7)
