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Question Paper Code: U2P05

B.E./B.Tech. DEGREE EXAMINATION, NOV 2023

Second Semester

Computer science and Engineering

21UPH205- Physics For Information Science

(Regulations 2021)

(common to EEE,IT,CSD & AIDS)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. When the high resistivity material (Nichrome) is connected in AC current CO1-U
(a) Heat produced (b) Cool (c) No effect (d) Melt the wire
2. The low resistive materials are also generally called as materials CO1-U
(a) Conducting (b) Non conducting
(c) Semi conducting (d) Insulator
3. Semiconducting material has electrical conductivity between a good CO1-U
conductor and a
(a) Good insulator (b) Good dielectrics (c) Good alloys (d) None of these
4. ----- and silicon are two important elemental semiconductors. They CO1-U
are used in diodes and transistors
(a) Germanium (b) Aluminum (c) Copper (d) Dielectrics
5. How does ionic polarization occur? CO1-U
(a) Splitting of ions (b) Passing magnetic field
(c) Displacement of cations and anions (d) Never occurs
6. Which of the following easily adapt itself to store electrical energy? CO1-U
(a) Passive dielectric (b) Superconductor
(c) Active dielectric (d) Polar molecules

7. All the dielectric materials are materials CO1-U
 (a) Conducting (b) Semi conducting (c) None of these (d) Insulating
8. Emission of photon is achieved from the recombination process CO1-U
 of ----- in diode laser
 (a) Electrons and protons (b) Electrons and Electrons
 (c) Electrons and holes (d) None of these
9. What is the principle of fiber optics? CO1-U
 (a) Total internal reflection (b) Internal reflection
 (c) Total internal refraction (d) Internal refraction
10. What does acceptance angle depend on? CO1-U
 (a) Refractive index (b) Diffraction index (c) None of these (d) Reflection

PART – B (5 x 2= 10Marks)

11. Define mean free path. CO1-U
12. What are the properties of semiconductors? CO1-U
13. What are the applications of ferrites? CO1-U
14. Differentiate LED and LCD. CO1-U
15. Define acceptance angle. CO1-U

PART – C (5 x 16= 80Marks)

16. (a) Deduce mathematical expressions for electrical conductivity CO1-U (16)
 and thermal conductivity of a conducting material and hence
 obtain Wiedemann-Franz law.
 Or
 (b) Derive an expression for density of energy states in a metal. CO1-U (16)
 Hence deduce the expression for carrier concentration.
17. (a) Derive an expression for concentration of holes (absence of CO4-Ana (16)
 electrons) in intrinsic semiconductors.
 Or
 (b) What is Hall effect? Show that for a p – type semi CO6 -App (16)
 conductor the Hall coefficient R_H is given by $1/pe$.
18. (a) Describe the structure, properties and application of ferrites. CO3-App (16)
 Or
 (b) Derive an expression for Langevin-Debye equation. CO1-U (16)

19. (a) Explain the theory, construction and working of twisted nematic LCD display. CO1-U (16)
- Or
- (b) Describe the construction and working of light emitting diode. CO5-Ana (16)
20. (a) Describe the classification of optical fibers based on refractive index profile and propagation modes. CO1-U (16)
- Or
- (b) Explain fiber optical communication system with a neat block diagram. CO1-U (16)

