A **Reg. No. :** | | | | | | | | | | | | |

Question Paper Code: U2P05

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

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. Conducting materials are generally CO1-U

   (a) Metals only (b) Alloys only (c) Non metals (d) Metals and alloys

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 conductor and a CO1-U

   (a) Good insulator (b) Good dielectrics (c) Good alloys (d) None of these

4. ----- and silicon are two important elemental semiconductors. They are used in diodes and transistors CO1-U

   (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. The material which absorbs the visible light is termed as ----- CO1-U

   (a) Translucent (b) Transparent (c) Opaque (d) None of these

7. Emission of photon is achieved from the recombination process of ----- in diode laser CO1-U

(a) Electrons and protons (b) Electrons and Electrons

(c) Electrons and holes (d) None of these

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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. Numerical aperture (NA) is defined as being equal to ----- CO1-U

(a) n sin θ (b) n cos θ (c) n sin 2θ (d) n cos 2θ

PART – B (5 x 2= 10Marks)

11. Define electrical conductivity. CO1-App

12. What are the properties of semiconductors? CO2-App

13. What are the energies involved in the formation of domain? CO3-App

14. Define Forward bias and recombination process. CO6-R

15. Define acceptance angle. CO6-U

PART – C (5 x 16= 80Marks)

16. (a) Derive the expression for electrical conductivity and thermal conductivity in metals. Derive Lorentz number. CO2-Ana (16)

Or

(b) Derive an expression for density of energy states in a metal. Hence deduce the expression for carrier concentration. CO1- U (16)

17. (a) Derive an expression for the electrical conductivity of an intrinsic semiconductor. CO2-Ana (16)

Or

(b) What is Hall effect? Show that for a p – type semi conductor the Hall coefficient R_H is given by 1/pe. CO6 -App (16)

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)	Discuss in detail the classification of optical fiber based on materials, mode and refractive index profile.	CO1-U	(16)
		Or		
	(b)	Give an account on fiber optic temperature sensor and fiber optic displacement sensor.	CO1-U	(16)