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

Question Paper Code: 51003

B.E. / B.Tech. DEGREE EXAMINATION, MAY 2024

First Semester

Civil Engineering

15UPH103- ENGINEERING PHYSICS

(Common to ALL branches)

(Regulation 2015)

Duration: Three hours Maximum: 100 Marks

PART A - (10 x 1 = 10 Marks)

1. The atoms or molecules are arranged in a irregular fashion is called as CO1-R

   (a) Single crystal (b) Solid (c) Amorphous (d) Poly crystal

2. _____ crystal system has maximum number of Bravai's lattices. CO1-R

   (a) Cubic (b) monoclinic (c) triclinic (d) Orthorhombic

3. What is the unit of loudness? CO2-R

   (a) decibel (b) Wm^{-2} (c) sone (d) phon

4. Choose the appropriate material for magnetostriction oscillator. CO2-R

   (a) Iron (b) Glass (c) copper (d) Quartz crystal

5. _____ confirms the transverse nature of light. CO3-R

   (a) Interference (b) Polarization (c) Compton effect (d) Diffraction

6. Which of the following properties is not true in the characteristics of a laser CO3-R

   (a) Monochromatic (b) high intensity (c) Incoherent (d) high directionality

7. Compton effect can be explained by _____ CO4-R

   (a) Quantum theory (b) Classical theory (c) Classical mechanics (d) Diffraction

8. The successful interpretation of blackbody radiation was given by CO4-R

   (a) Max Planck (b) Einstein (c) Louis De Broglie (d) Scrodinger

9. _____ law states that "within the elastic limit stress is directly proportional to strain". CO5-R

(a) Elastic law (b) Hooke's law (c) Weber-Fechner law (d) Ohm's law

10. The ratio of shearing stress to angle of shear is called CO5-R

(a) Young's modulus (b) Bulk modulus

(c) Poisson's ratio (d) Rigidity modulus

PART – B (5 x 2= 10Marks)

11. Define unit cell. CO1-R

12. State Weber – Fechner law. CO2-R

13. What is population inversion? How is it achieved? CO3-R

14. X rays having wavelength 10 A° is scattered by carbon atoms with scattering angle 45°. Calculate the change in wave length of scattered X ray photons. CO4-R

15. State Hooke's law. CO5-R

PART – C (5 x 16= 80Marks)

16. (a) Calculate the atomic packing factor for FCC and HCP and show that the two structures have same packing factor value, CO1-U (16)

Or

(b) Explain the Bridgeman method to grow single crystals. CO1-U (16)

17. (a) Describe Piezoelectric method of producing ultrasonic sound waves with the neat diagram. CO2-U (16)

Or

(b) Explain the determination of velocity of ultrasonic using an acoustical grating element. CO2-U (16)

18. (a) Show that plane polarized light and circularly polarized lights are special cases of elliptically polarized light. CO3-U (16)

Or

(b) Identify a laser which undergoes three modes of vibration and describe its construction and working using carbondioxide gas as active medium. CO3-U (16)

19.	(a)	Derive the Schrodinger's time-dependent wave equation.	CO4-U	(16)
		Or		
	(b)	What is Compton effect? Explain the Compton effect based on quantum theory and also derive the expression for Compton effect.	CO4-U	(16)
20.	(a)	What is meant by Cantilever? Derive an expression for the depression produced due to load hanging at the end of the Cantilever beam. .	CO5-U	(16)
		Or		
	(b)	State Newton's law of cooling. Explain the Lee's disc method of determining thermal conductivity of a bad conductor.	CO5-U	(16)

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