

A

Reg. No. :

--	--	--	--	--	--	--	--	--	--

Question Paper Code: 51003

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

First Semester

Civil Engineering

15UPH103- ENGINEERING PHYSICS

(Common to ALL branches)

(Regulation 2015)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

- In _____ atoms and molecules are arranged in a regular fashion. CO1- R
(a) Amorphous solids (b) Crystals (c) Glasses (d) Plastics
- _____ crystal system has maximum number of Bravais lattices. CO1- R
(a) Cubic (b) monoclinic (c) triclinic (d) Orthorhombic
- Intensity of a sound wave is 0.4 W m^{-2} , its sound intensity level is _____ decibel. CO2-R
(a) 0 (b) 110 (c) 116 (d) 118
- Choose the appropriate material for magnetostriction oscillator. CO2 -R
(a) Iron (b) Glass (c) copper (d) Quartz crystal
- _____ confirms the transverse nature of light. CO3- R
(a) Interference (b) Polarization (c) Compton effect (d) Diffraction
- _____ is pumping technique used in solid lasers. CO3- R
(a) Electric discharge (b) Direct conversion (c) Optical pumping (d) Heating
- Compton effect can be explained by _____. CO4- R
(a) Quantum theory (b) Classical theory (c) Classical mechanics (d) Diffraction
- Wave length associated with an electron at rest is _____. CO4 -R
(a) 0 \AA (b) 10 \AA (c) 100 \AA (d) Infinity

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. Lee’s disc method is used to calculate thermal conductivity of _____ material. CO5 -R
- (a) Insulating (b) Conducting (c) Semiconducting (d) Nano

PART – B (5 x 2= 10Marks)

11. Distinguish between crystals and amorphous solids. CO1- R
12. Intensity of the sound waves produced during thunder is 0.1 W m^{-2} . Calculate sound intensity level. CO2- R
13. List any four industrial applications of laser. CO3 -R
14. X rays having wavelength 10 \AA 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) Prove that the packing factor for face centered cubic structure and hexagonally close packed structure are same. CO1 -App (16)
- Or
- (b) Explain the Bridgeman method to grow single crystals. CO1- U (16)
17. (a) Construct an oscillator circuit using quartz crystal to generate sound waves having frequency more than 20000 Hz. CO2 -App (16)
- Or
- (b) Describe an experimental setup to determine the velocity of ultrasonic waves in given liquid also derive the expression for velocity of ultrasonic waves in liquid. CO2- U (16)
18. (a) Discuss the theory of plane, circular and elliptically polarized light. CO3 -Ana (16)
- Or
- (b) Discuss the probability of atomic transitions in the following process. CO3- Ana (16)
1. Stimulated absorption (or) Induced absorption.
 2. Spontaneous emission.
 3. Stimulated emission (or) Induced emission.
- Also deduce Einstein’s coefficients.

19. (a) Derive Schrödinger's time independent and dependent wave equations. 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) Derive an expression for depression produced at the loaded end of the cantilever. Based on that how will you determine the Young's modulus of the given brass beam. CO5 -U (16)
- Or
- (b) Define thermal conductivity. How will you determine the thermal conductivity of a given card board by Lee's disc method. CO5 -U (16)

