A   Reg. No. :

Question Paper Code: 51003

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

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)

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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 CO4-U (16)
quantum theory and also derive the expression for Compton
effect.

20. (a) What is meant by Cantilever? Derive an expression for the CO5-U (16)
depression produced due to load hanging at the end of the
Cantilever beam. .

Or

(b) State Newton's law of cooling. Explain the Lee's disc method of CO5-U (16)
determining thermal conductivity of a bad conductor.

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