

BACHELOR OF TECHNOLOGY (CBCS) (2021-COURSE)
Computer Science & Business Systems
B. Tech. Sem - I :SUMMER : 2023
SUBJECT : PHYSICS FOR COMPUTING SCIENCE

Day : Tuesday
Date : 16-05-2023

S-24134-2023

Time : 10:00 AM-01:00 PM
Max. Marks : 60

N.B.:

- 1) All questions are **COMPULSORY**.
- 2) Figures to the right indicate **FULL** marks.
- 3) Draw neat and labeled diagram **WHEREVER** necessary.
- 4) Use of non-programmable **CALCULATOR** is allowed.
- 5) Assume suitable data if necessary.

Constants:

$$e = 1.6 \times 10^{-19} \text{C}$$

$$m_e = 9.1 \times 10^{-31} \text{kg}$$

$$h = 6.63 \times 10^{-34} \text{J-s}$$

$$m_p = 1.67 \times 10^{-27} \text{kg}$$

$$N_a = 6.025 \times 10^{23} \text{ atoms/gm - mole}$$

- Q.1 What is free oscillation? Set up the differential equation for free oscillation and solve it. [10]
- OR**
- Q.1 Define resonance. What are the factors affecting sharpness of resonance? Define quality factor. [10]
- Q.2 With experimental setup, explain the formation of fringes in Newton's rings. Prove that the diameter of a dark ring is proportional to square root of n. [10]
- OR**
- Q.2 Prove that when two harmonic waves are acting perpendicular to each other they may give plane polarised waves. [10]
- Q.3 Derive the Schrodinger's time dependent wave equation. [10]
- OR**
- Q.3 State and explain Heisenberg's uncertainty principle. Prove that an electron cannot exist inside the nucleus. [10]
- Q.4 What is atomic packing factor? Calculate the packing factor for:
i) Simple Cubic ii) BCC iii) FCC [10]
- OR**
- Q.4 What is energy band? Explain the formation of energy band in crystals. [10]
- Q.5 Define Einstein's A and B coefficients. Also derive a relation between them. [10]
- OR**
- Q.5 With energy level diagram, explain the construction and working of Nd - YAG laser. [10]
- Q.6 State and explain the Maxwell's equations. Give their physical significance. [10]
- OR**
- Q.6 State and explain the third law of thermodynamics. Prove that entropy in reversible process is zero. [10]

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