

**BACHELOR OF TECHNOLOGY (CBCS - 2023)**  
**B. Tech. Sem-I Computer Science & Business Systems : WINTER : 2024**  
**SUBJECT: PHYSICS FOR COMPUTING SCIENCE**

Day : Thursday  
Date : 12/12/2024

W-27625-2024

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) Use of non-programmable calculator is **ALLOWED**.
- 4) Assume suitable data, if necessary.

Constants:

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

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

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

$$m_p = 1.66 \times 10^{-27} kg$$

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

- Q. 1** What is forced oscillation? Derive the formula for resonance. (10)

**OR**

Explain the vibration in spring mass system when two springs are connected

- a) Parallel                      b) Series

- Q. 2** Explain the diffraction at a single slit. Derive formula for intensity distribution for diffracted light. (10)

**OR**

What is double refraction? Explain it on the basis of Huygens's theory

- Q. 3** Derive Schrodinger's time dependent wave equation. (10)

**OR**

Derive the formula for wave function of a particle trapped in an infinite potential well.

- Q. 4** Derive the formula for inter planar distance in a simple cubic structure. (10)

**OR**

What is Miller indices? Draw the planes for following Miller indices.

- a) (111)                      b) (100)                      c) (001)

- Q. 5** Give the principle, construction and working of CO<sub>2</sub> laser. (10)

**OR**

Explain the mechanism of data transfer in a fibre optic. What are different types of fibre optics?

- Q. 6** State 3<sup>rd</sup> law of thermodynamics. What is entropy in reversible and irreversible process? (10)

**OR**

State and explain Maxwell's equation.

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