

**BACHELOR OF TECHNOLOGY (CBCS - 2023)**  
**B. Tech. Sem-II Computer Science & Engineering : WINTER : 2024**  
**SUBJECT: ENGINEERING PHYSICS**

Day : Saturday  
Date : 07/12/2024

**W-27694-2024**

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) Assume suitable data **WHEREVER** necessary.
- 4) Draw neat diagrams **WHEREVER** necessary.

**Given**

Mass of electron ( $m_e$ ) =  $9.1 \times 10^{-31}$  kg  
Charge on electron ( $e$ ) =  $1.6 \times 10^{-19}$  C  
Planck's constant ( $h$ ) =  $6.625 \times 10^{-34}$  J-s  
Mass of proton ( $m_p$ ) =  $1.67 \times 10^{-23}$  kg.

- Q.1 Explain construction and working of Cathode Ray Tube (CRT). (10)  
OR
- Q.1 Distinguish between scanning electron microscope and transmission electron microscope. (10)  
Calculate the force due to transverse magnetic field experienced by an electron revolving in an orbit of 2 cm radius and velocity  $10^8$  cm/s.
- Q.2 What are the requirements of acoustically good hall? (Any five) (10)  
OR
- Q.2 Explain use of ultrasonic for measurement of thickness. (10)  
Find the sound intensity emitted by a sound source of 65dB ( $I_0 = 10^{-16}$  watt/cm<sup>2</sup>).
- Q.3 What are the physical significance of wave function  $\Psi$ ? (10)  
Calculate the difference between two lowest energy levels of an electron confined to an infinite potential well of width  $3.1 \text{ \AA}$ .  
OR
- Q.3 Derive the derivation for Schrodinger's time independent wave equation. (10)
- Q.4 Write a note on interference due to thin film? (10)  
A monochromatic light incident normally on a plane diffraction grating having 14000 lines/inch. Calculate wavelength of incident light if second order spectrum is observed at  $20^\circ$ .  
OR
- Q.4 What is diffraction? Explain diffraction in plane diffraction grating. (10)
- Q.5 State and explain: i) Huygen's theory of double refraction. (10)  
ii) Discuss positive crystal.  
OR
- Q.5 Explain construction of optical fiber and its application in the field of communication. (10)
- Q.6 Define Fermi energy level. Derive the derivation of Fermi energy level in intrinsic semiconductor at room temperature. (10)  
OR
- Q.6 i) State and explain Hall effect. (10)  
ii) Explain any two properties of nanoparticles.

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