BACHELOR OF TECHNOLOGY (CBCS - 2023)
B. Tech. Sem-II Computer Science & Engineering : WINTER: 2025
SUBJECT: ENGINEERING PHYSICS

Day . Monday
Date : 24/11/2025

W-27694-2025

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:
Planck's constant (h) = 6.63×10^{-34} J-S
Mass of electron (m_e) = 9.1×10^{-31} kg
Charge on electron (e) = 1.6×10^{-19} C
Avogadro's number = 6.022×10^{23}/mole

Q.1 Explain principle, construction of Bain bridge mass spectrograph and explain its application for isotope detection. **(10)**

OR

Q.1 Derive the derivation for velocity and displacement of an electron moving in a parallel electric field. **(10)**
An electron of energy 1.13×10^{-17} joule revolves in a perpendicular magnetic field of 0.05 T. Calculate the radius of its path in given field.

Q.2 State piezoelectric effect. Explain piezoelectric oscillator for production of ultrasonic waves. **(10)**

OR

Q.2 Define musical sound and noise? What are the different types of noise? Give their remedies. **(10)**

Q.3 State and explain **(10)**
i) Matter waves ii) Wave function (ψ) and probability density ($|\psi^2|$)
Calculate the kinetic energy of an electron if wavelength of 5890 A° is associated with it.

OR

Q.3 Explain motion of an electron in a rigid box. Derive the derivation for energy of an electron inside the rigid box. **(10)**

Q.4 With a neat labelled diagram explain interference due to wedge shape thin film. Derive the conditions for constructive and destructive interference. **(10)**

OR

Q.4 What is diffraction? Distinguish between Fraunhofer and Fresnel diffraction. **(10)**
A monochromatic wavelength of 6328A° incident on a plane diffraction grating. A spectral line is diffracted at an angle of 20° from the normal. Calculate the grating element if n=1.

Q.5 Explain Nicol Prism i) As a polarizer and ii) As an analyzer **(10)**

OR

Q.5 With neat labelled diagram explain construction and working of He-Ne LASER. **(10)**

Q.6 Explain in detail synthesis of nanoparticles by physical method. **(10)**

OR

Q.6 With the help of energy level diagram explain fermi energy level in p-type semiconductor at i) T= 0 K and ii) T ≠ 0 K **(10)**

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