BACHELOR OF TECHNOLOGY (CBCS - 2023)
B. Tech. Sem-I CS&BS : WINTER : 2023
SUBJECT : PHYSICS FOR COMPUTING SCIENCE

Day : Tuesday
Date : 12/12/2023

W-27625-2023

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) Use of Nonprogrammable calculator is **allowed.**
4) Assume suitable data **WHEREVER** necessary.
5) Draw a neat labelled diagrams **WHEREVER** necessary.

Contents :

$e = 1.6 \times 10^{-19}$ 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
$N_a = 6.025 \times 10^{23}$ atoms/gm-mole

Q.1 Explain the construction and working of SEM. Draw a neat labelled diagram of CRT. **(10)**

OR

Q.1 Explain the Bainbridge mass spectroscope. the electron is accelerated by voltage of 220kV. Calculate its velocity and energy in eV. **(10)**

Q.2 Write Sabines Formula. Explain Basic requirement for acoustically good Hall. Write The different types of noise **(10)**

OR

Q.2 Explain production of Ultrasonics by magnetostriction method. Explain Reverberation & Reverberation time. **(10)**

Q.3 Deduce the Schrodinger's time dependent wave equation. **(10)**

OR

Q.3 State and explain the Heisenberg's uncertainty principle. Find the wavelength of proton beam having energy 0.040 eV and mass $m_p = 1.66 \times 10^{-27}$kg. **(10)**

Q.4 With the experimental set up explain the formation of Newton's rings. also prove that the diameter of dark ring is proportional to square root of an integer. In Newton's ring Experiment Diameter of 5th and 15th dark ring was 0.336cm and 0.590cm, Find the Radius of Plano Convex Lens [wavelength (4500 A^0)] **(10)**

OR

Q.4 Distinguish between Interference and diffraction. Derive an expression for resultant intensity in Fraunhofer diffraction due to single slit. **(10)**

Q.5 Explain the construction and working of $H_e - N_e$ Laser. Write medical application of Laser. **(10)**

OR

Q.5 Explain Nicol Prism. Step index fibre has a core diameter 21×10^{-6}m refractive index of core and cladding is 1.54 and 1.5180 if the light of wavelength is 1.6 micrometre is transmitted through the fibre. Determine normalized frequency of the fibre. **(10)**

Q.6 What is a hall Effect? State its significance. How can conductivity be determined by using Hall effect? **(10)**

OR

Q.6 Write Fermi Dirac Probability Function. Explain Position of Fermi Level in intrinsic semiconductor. Write Properties of nano particles. **(10)**

* * * * *