ONLY FOR COE MUMBAI CENTRE
BACHELOR OF TECHNOLOGY (CBCS - 2023)
B. Tech. Sem-I COMPUTER SCIENCE & BUSINESS SYSTEMS : SUMMER : 2024
SUBJECT: PHYSICS FOR COMPUTING SCIENCE

Day : Thursday | Time : 10:00 AM-01:00 PM
Date : 16/05/2024 | S-27625-2024 | 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 300kV. Calculate its velocity and energy in eV **(10)**

Q.2 Write The Properties of Ultrasonic waves. 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 Explain the de-Broglie hypothesis. Write properties of matter waves and hence find de-Broglie wavelength for electron accelerated by potential 220 V. **(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. Why Newton's rings circular in nature? A Newton's rings setup 4500 A^0 and 4000 A^0 light wavelength it is found that n^{th} dark ring due to one wavelength (4500 A^0) coincides with $(n+9)^{th}$ dark ring of another wavelength (4000 A^0) radius of curvature 57 cm. Find order and radius of n^{th} dark ring **(10)**

OR

Q.4 Derive an expression for resultant intensity in Fraunhofer diffraction due to single slit. A soap of refractive index 1.33 light incident at an angle 45^0 calculate thickness of film which will appear dark by reflection (incident wavelength=5890 A^0 **(10)**

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

OR

Q.5 What is a stimulated emission? What is a pumping in Laser? Give the difference types of pumping. Refractive Index of core and cladding is 1.58 and 1.49 find numerical aperature and acceptance angle **(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)

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