BACHELOR OF TECHNOLOGY (CBCS) (2021-COURSE)
B. Tech. Sem - II COMPUTER SCIENCE & ENGINEERING : SUMMER : 2024
SUBJECT: PHYSICS FOR COMPUTING SYSTEMS

Day : Friday
Date : 24/05/2024

S-24026-2024

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) Draw neat and labelled diagrams **WHEREVER** necessary.
4) Use of non-programmable calculator is **ALLOWED.**
5) Assume suitable data, if necessary.

Constants :

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

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

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

$m_p = 1.67 \times 10^{-27} kg$

$Na = 6.025 \times 10^{23}$ $atoms / gm - mole$

Q. 1 Explain electrostatic and magnetostatic focusing of charged particle. **(10)**

OR

Discuss the separation of isotopes by Bainbridge mass spectrometer and calculate radius of circular orbit and period of revolution of an electron circulating with velocity 4×10^5 m / sec. in a plane at right angles to a uniform magnetic field of strength $10^{-5} wb / m^2$ **(10)**

Q. 2 With labelled diagram explain formation of Newton rings and calculate radius of curvature of a convex lens surface in contact with glass plate in Newton's ring experiment, if diameter of n^{th} ring is 0.55 cm and 10^{th} ring beyond it is 0.88 cm. **(10)**

Given: $\lambda = 5999\ A^0$

OR

Explain the production of polarised light using Nicol prism and distinguish between positive crystals and negative crystals. **(10)**

Q. 3 Explain the construction and working of ruby laser and discuss any four engineering applications of laser. **(10)**

OR

Explain the construction and working of He-Ne laser and write a short note on laser speckles. **(10)**

P. T. O.

Q. 4 Explain different types of optical fibres. (10)

OR

Discuss advantages and disadvantages of optical fibres. (10)

Q.5 With suitable illustration discuss Heisenberg's uncertainty principle and write a short note on de Broglie's hypothesis. (10)

OR

Derive an expression for energy and wave function of a particle in rigid box. (10)

Q.6 Discuss Hall effect and derive an expression for Hall voltage. Calculate Hall voltage when a conductor of thickness 1cm carrying current of 150 A is placed in a magnetic field of 2T. Given, density of charges inside conductor is $4.8 \times 10^{25} / m^3$. (10)

OR

Discuss photovoltaic effect & explain working of solar cell and its characteristics. (10)

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