B.Tech sem-II All Branch

B.Tech. SEM -II Computer/ Info. Tech./ Electronics / Bio Medical / E & TC) 2014 Course (CBCS) : SUMMER - 2019

SUBJECT : ENGINEERING PHYSICS

Day : Wednesday | **S-2019-2538** | Time : 10.00 AM TO 01.00 PM

Date : 29/05/2019 | Max. Marks : 60

N.B.:

1) All questions are **COMPULSORY**.
2) Figures to the right indicate **FULL** marks.
3) Use of non programmable **CALCULATOR** is allowed.
4) Draw neat and labeled diagrams **WHEREVER** necessary.
5) Assume suitable data wherever necessary.

Constants:

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

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

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

$m_p = 1.66 \times 10^{-27}\ kg$

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

Q.1 Explain with a neat diagram the principle and working of a Bainbridge mass spectrograph. If the magnetic field in the velocity selector is $1 Wb/m^2$ and ions having a velocity of 0.4×10^7 m/s pass undeflected find the electric field in the velocity selector. **[10]**

OR

Describe principle, construction and working of cyclotron and derive resonance frequency.

Q.2 Derive an expression for conductivity in a metal. Calculate the conductivity of extrinsic silicon at room temperature if the donor impurity added is 1 in 10^8 silicon atoms. **[10]**

Given : $n_i = 1.5 \times 10^{10}$ per cm^3

$\mu_e = 1300 cm^2/volt.\ Sec.$

No. of atoms per unit volume = 5×10^{22}.

OR

What is superconductivity? Explain BCS theory of superconductors.

Q.3 What is entropy? Explain reversible and irreversible process. **[10]**

OR

Explain briefly how colloids are synthesized by a chemical route.

Q.4 Explain the theory and the experimental arrangement of Newton's rings experiment. [10]

OR

Derive an expression for the intensity at a point in the Fraunhofer's type of diffraction produced by single slit.

Q.5 Explain the phenomenon of double refraction on the basis of Huygen's wave theory. Calculate the thickness of quarter wave plate and a half wave plate. **[10]**

Given : $\mu_e = 1.553$, $\mu_0 = 1.544$ and $\lambda = 5000 A^0$.

OR

State and explain the properties of LASER. Write any two applications of LASER in detail.

Q.6 What are the factors which affect the architectural acoustics? Discuss the remedies for the same. **[10]**

OR

Derive Schroedinger's time independent wave equation. Lowest energy level of an electron trapped in a potential well is 38 eV. Find the width of the well.

* * * *