

**BACHELOR OF TECHNOLOGY (CBCS - 2023)**  
**B. Tech. Sem-I COMPUTER SCIENCE & ENGINEERING-A&M : SUMMER : 2024**  
**SUBJECT: PHYSICS FOR COMPUTING SYSTEMS**

Day : Thursday  
Date : 09/05/2024

**S-27615-2024**

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) Use of **non-programmable CALCULATOR** is allowed.
- 4) Draw neat labelled diagrams **WHEREVER** necessary.

**Q.1** Explain construction, working principle of T.E.M. (Transmission electron microscope) two parallel plates 0.05 m apart and connected to 120V DC supply and electron form rest passes to the plate. Calculate velocity. (10)

**OR**

**Q.1** Calculate the velocity of proton and electron accelerated through potential difference of 3.4 kV. Distinguish between S.E.M and T.E.M. (10)

**Q.2** With suitable diagram formation and Newton's ring in reflected light. Prove that diameter of  $n^{\text{th}}$  dark ring is proportional to the square root of natural number (10)

**OR**

**Q.2** A plane transmission grating having 7000 lines per centimeter gives an angle of diffraction of a  $30^\circ$  in 2<sup>nd</sup> order. Find wavelength. Distinguish between Interference and diffraction. Explain Double refraction. (10)

**Q.3** With the neat energy level diagram. Explain construction and working of Ruby Laser. List the application of LASER in Engineering and Industrial field. (10)

**OR**

**Q.3** With neat energy level diagram explain construction and working of CO<sub>2</sub> Laser. Write properties of Laser Light (10)

**Q.4** What do you mean by numerical aperture? Give name of various types of fibre? Calculate numerical aperture acceptance angle if Refractive Index of core and cladding is 1.55 and 1.48. (10)

**OR**

**Q.4** What are advantages of using optical fibre cable? Explain Total internal reflection (TIR). Distinguish between single mode and multi-mode step index fibre. (10)

**Q.5** Derive Schrodinger time independent wave equation in one dimension. Write property of matter wave. (10)

**OR**

**Q.5** Explain wave Nature of electron. Explain De-Broglie hypothesis and hence find De Broglie wavelength for electron accelerated by potential 200V. (10)

**Q.6** Explain Fermi level in Intrinsic semiconductor Draw the energy band diagram in reverse biased. (10)

**OR**

**Q.6** Explain Hall effect. How will you calculate conductivity in conductor? Explain energy band in solids. (10)

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