

Roll No.

3005

**B. Tech. 2nd Semester (Bio-Tech)
(G Scheme) (Re-Appear)**

Examination – October, 2020

**OPTICS, OPTICAL FIBER, MAGNETISM AND
QUANTUM MECHANICS**

Paper : BSC-PHY-105-G

Time : 1.45 hours] [Maximum Marks : 75

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Attempt any *three* questions. All questions carry equal marks.

1. (a) What is photoelectric effect ?
- (b) What do you mean by total internal reflection ?
- (c) Discuss silent characteristics of Laser.
- (d) Define the term Diffraction and its type.
- (e) What do you mean by Compton scattering ?
- (f) What are polar and non polar molecules ?

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2. Difference between Fraunhofer and Fresnel diffraction. Explain the phenomenon of diffraction through a single slit.
3. What do you understand by double reflection ? Explain how would you use the phenomenon to produce plane polarized and circularly polarized light.
4. (a) What is meant by population inversion and how it is achieved in practice ?
(b) Write a short note on semiconductor laser.
5. What is an optical fiber ? Explain the terms acceptance angle and numerical aperture. What do you understand by single mode and multimode fiber ?
6. What is equation of continuity ? Drive Maxwell's equations and give their physical interpretation.
7. Distinguish between diamagnetic, paramagnetic and ferromagnetic Substances and give the theory of magnetic domain in ferromagnetic substances.
8. Derive time independent one dimensional Schrodinger wave equation for a non-relativistic free particle. Explain the significance of the wave function.
9. Discuss the theory of Compton scattering and calculate Compton wave length.
