Code No: R161104 **R16** SET - 1

I B. Tech I Semester Supplementary Examinations, April - 2022

APPLIED PHYSICS

(Com. to ECE, CSE, IT, EIE, E Com E)

Time: 3 hours Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**
2. Answering the question in **Part-A** is Compulsory
3. Answer any **FOUR** Questions from **Part-B**

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PART –A

1. a) What are the necessary conditions for obtaining sustained interference fringes? (2M)
   b) Distinguish between Fresnel and Fraunhoffer diffractions. (2M)
   c) What is meant by Active medium in a Laser? (2M)
   d) Explain the principle of Polarimeter. (2M)
   e) Write any two properties of Electromagnetic waves. (2M)
   f) What are matter waves? What is the wavelength of the matter wave associated with a particle at rest? (2M)
   g) What are the majority and minority charge carriers in p-type semiconductors? (2M)

PART -B

2. a) Explain in detail the Principle of Superposition of waves. (4M)
   b) With ray diagram discuss the theory of thin films and derive the condition for constructive and destructive interference in the case of reflected system. (10M)
3. a) Explain what is meant by diffraction of light. How diffraction is different from interference? (4M)
   b) Discuss Fraunhofer single slit diffraction. Draw intensity distribution curves and give conditions for bright and dark fringes in single slit diffraction pattern. (10M)
4. a) How the polarized light is different from ordinary light? Write notes on Nicol prism. (10M)
   b) Find the minimum thickness of half and quarter wave plates for a light beam, λ=589.3nm if μ_e= 1.48640 and μ_o= 1.65833. (4M)
5. a) Describe the construction and working of Ruby laser with neat diagrams. (10M)
   b) Mention any two applications each of laser in Industry and Scientific fields. (4M)
6. a) Deduce an expression for energy of an electron confined to a potential box of width á'. (10M)
   b) Explain the physical significance of wave function. (4M)
7. a) Distinguish between intrinsic and extrinsic semiconductors with suitable examples. (4M)
   b) Derive an expression for the density of holes in the valence band of an intrinsic semiconductor. (10M)

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