

Code No: **R201117**

**R20**

**SET - 1**

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY GURAJADA VIZIANAGARAM**  
**I B. Tech I Semester Supplementary Examinations June 2025**

**APPLIED PHYSICS**

(Common to CSE, IT & CSE(CS))

Time: 3 hours

Max. Marks: 70

Answer any **FIVE** Questions. **ONE** Question from **Each unit**

All Questions Carry Equal Marks

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**UNIT-I**

1. a) Describe the Fraunhofer diffraction due to double slit and obtain the conditions for minimum and maximum. [7M]  
b) Interpret the formation of Newton's rings and obtain the expression for determination of wavelength of light used in it. [7M]  
(OR)
2. a) Discuss the production of plane polarized light by reflection. [7M]  
b) Explain briefly about half and quarter wave plates and develop an expression for its thickness. [7M]

**UNIT-II**

3. a) Interpret the construction and working of He-Ne LASER with the help of suitable diagrams. [10M]  
b) Report any eight applications of LASER beam. [4M]  
(OR)
4. a) Explain the working principle behind the functioning of an optical fiber. [5M]  
b) Classify the optical fibers based on refractive index profile and modes. [9M]

**UNIT-III**

5. a) Evaluate Schrodinger's time independent wave equation for a free particle. [6M]  
b) Develop the expression for the density of states in a material. [8M]  
(OR)
6. a) Illustrate the formation of allowed and forbidden energy bands on the basis of the Kronig-Penney model. [10M]  
b) Explain the classification of crystalline solids based on band theory. [4M]

**UNIT-IV**

7. a) Explain the terms i) Dielectric polarization ii) Dielectric susceptibility iii) Piezoelectricity [6M]  
b) Interpret the various types of polarization mechanism in dielectric materials. [8M]  
(OR)
8. a) Interpret the atomic origin of magnetic moment in materials. [8M]  
b) Classify in detail the classification of magnetic materials based on their properties. [6M]

**UNIT-V**

9. a) Develop an expression for the carrier concentration in n-type semiconductor. [7M]  
b) Describe the concept of drift and diffusion currents and develop the drift and diffusion current equations. [7M]  
(OR)
10. a) Describe the BCS theory of superconductivity. [7M]  
b) Explain the AC and DC Josephson effects for superconductors. [7M]

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