

Code No: **R201103**

**R20**

**SET - 1**

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

**ENGINEERING PHYSICS**

(Common to MECH & CE)

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) Discuss the theory of thin films and derive the conditions for bright and dark fringes. [7M]  
b) Explain the principle of superposition of waves. [7M]  
(OR)
2. a) Interpret diffraction due to single slit and obtain the conditions for principal maxima, secondary maxima and minima. [7M]  
b) Explain the construction and working mechanism of Nicol prism. [7M]

**UNIT-II**

3. a) Illustrate the construction and working mechanism of Ruby laser with suitable energy level diagram. [7M]  
b) Differentiate Spontaneous and Stimulated emissions of radiations. [7M]  
(OR)
4. a) Develop an expression for acceptance angle and numerical aperture of an optical fiber. [7M]  
b) Find the critical angle and numerical aperture of an optical fiber with refractive indices of core and cladding as 1.53 and 1.42 respectively. [7M]

**UNIT-III**

5. a) Interpret Lorentz internal field in dielectrics. [7M]  
b) Develop an expression for Clausius-Mossotti equation. [7M]  
(OR)
6. a) Classify the magnetic materials into dia, para and ferro based on their properties. [7M]  
b) Distinguish between Soft and Hard magnetic materials. [7M]

**UNIT-IV**

7. a) Explain the terms reverberation and reverberation time. [7M]  
b) Discuss the factors affecting acoustics of buildings and their remedies. [7M]  
(OR)
8. a) Apply the magnetostriction method to generate the ultrasonic sound waves. [7M]  
b) Describe the pulse echo technique for finding a flaw in a material. [7M]

**UNIT-V**

9. a) Describe the seven crystal systems with neat diagrams. [7M]  
b) Estimate the coordination number, effective number of atoms per unit cell and atomic packing fraction of Face centered cubic crystal. [7M]  
(OR)
10. a) Explain Bragg's law in crystallography. [7M]  
b) Describe the Powder method in crystallography with neat sketch. [7M]

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