

Subject Code: 24BP11RC01

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GAYATRI VIDYA PARISHAD COLLEGE OF ENGINEERING FOR WOMEN
(AUTONOMOUS)

(Affiliated to Andhra University, Visakhapatnam)

B.Tech. - I Semester Regular Examinations, December / January – 2025

ENGINEERING PHYSICS

(Common to CSE [AI&ML], ECE)

1. All questions carry equal marks
2. Must answer all parts of the question at one place

Time: 3Hrs.

Max Marks: 70

UNIT-I

1. a. Derive conditions for path difference for interference in thin parallel film due to reflected light and obtain the conditions for maxima and minima. [8M]
b. Assuming the expression for intensity due to Fraunhofer single slit, obtain the conditions for maxima and minima on the screen. [6M]
OR
2. a. Explain various methods of production of plane polarized light from unpolarized light. [7M]
b. Discuss the construction and working of Nicol's prism. [7M]

UNIT-II

3. a. Explain first law of thermodynamics. Obtain an expression for work done in adiabatic process. [7M]
b. State and prove Carnot's theorem. [7M]
OR
4. a. Derive an expression for efficiency of Carnot's heat engine. [10M]
b. Explain Entropy in terms of second law of thermodynamics. [4M]

UNIT-III

5. a. State and prove Gauss theorem in Electrostatics. Determine the electric field due to a line charge distribution [10M]
b. Explain Faraday's law of Electromagnetic induction. [4M]
OR
6. a. Derive wave equation for Electromagnetic wave using Maxwell's Equations. [7M]
b. Obtain an expression for magnetic field due to a long straight wire using Biot-Savart's law. [7M]

UNIT-IV

7. a. Distinguish between spontaneous and stimulated processes. [4M]
b. Discuss construction and working of He-Ne Laser system. [10M]
OR
8. a. Explain the principle of propagation of light through optical fiber. [6M]
b. Derive an expression for acceptance angle and numerical aperture in optical fiber. [8M]

UNIT-V

9. a. What are matter waves? Derive an expression for de-Broglie matter wavelength. [6M]
b. Derive Schrödinger time-independent wave equation for a free particle. [8M]
OR
10. a. What is meant by Quantum Entanglement? Differentiate between Q-bits and Classical bits. [7M]
b. What are Pauli spin matrices, and how are they used in quantum computing? [7M]