GAYATRI VIDYA PARISHAD COLLEGE OF ENGINEERING FOR WOMEN
(Autonomous)
(Affiliated to Andhra University, Visakhapatnam)
I B.Tech. - I Semester Regular/ SupplementaryExaminations, Jan – 2026
Engineering Physics
(Common to CSE-AIML, ECE and EEE)
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. State and explain the principle of superposition of waves. [7M]
   b. Obtain an expression for the resultant intensity due to superposition of two coherent waves. [7M]

OR

2. a. Distinguish between Fresnel diffraction and Fraunhofer diffraction. Derive an expression for intensity due to a single slit illuminated by a monochromatic light of wavelength λ. [7M]
   b. Explain the phenomenon of double refraction in uniaxial crystals. Distinguish between ordinary ray and extraordinary ray. [7M]

UNIT-II

3. a. Define heat and work in thermodynamics. Explain different modes of heat transfer. Distinguish between heat and work. [7M]
   b. State the Kelvin–Planck statement and Clausius statement of the second law of thermodynamics. [7M]

OR

4. a. Define reversible and irreversible processes. Compare them with suitable examples. [7M]
   b. State and explain Carnot's theorem. Mention its importance in heat engine theory. [7M]

UNIT-III

5. a. State Biot–Savart law. Using it, derive the expression for the magnetic field at a point due to a long straight current-carrying conductor. [7M]
   b. Explain the need for Maxwell's displacement current and show how it modifies Ampere's law. [7M]

OR

6. a. State and explain Faraday's laws of electromagnetic induction. Derive an expression for electromagnetic wave using Maxwell's relations. [7M]
   b. Obtain the expression for the electric field due to a solid charged sphere using Gauss's law. [7M]

UNIT-IV

7. a. Derive expression for acceptance angle and numerical aperture of an optical fiber. [7M]
   b. What are the step index fiber and graded index fiber? How light propagates through step index fiber and graded index fiber. [7M]

OR

8. a. With the help of suitable diagrams, explain the principle, construction and working of
He-Ne laser. [7M]

b. Distinguish between spontaneous emission and stimulated emission. [7M]

UNIT-V

9. a. Obtain the expression for the wavelength of matter waves (de-Broglie's relation) and explain physical significance of wave function. [7M]

b. Derive Schrödinger time-independent wave equation for a free particle. [7M]

OR

10. a. What are Pauli spin matrices, and how are they used in quantum computing? [7M]

b. Distinguish between qubits and classical bits. [7M]