Subject Code:24BP11RC01 **R-24** **Reg No:** | | | | | | | | | | | | |

GAYATRI VIDYA PARISHAD COLLEGE OF ENGINEERING FOR WOMEN

(Autonomous)

(Affiliated to Andhra University, Visakhapatnam)

I B.Tech. - II Semester Regular / Supplementary Examinations, July – 2026

ENGINEERING PHYSICS

[Common to CSE, CSE-CS and IT]

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. Explain the working principle of Michelson's interferometer and describe how it is used to determine the thickness of a thin transparent sheet. **[8M]**
   b. Differentiate between Fresnel and Fraunhofer diffraction. Derive the condition for minima in Fraunhofer diffraction due to a single slit. **[6M]**

OR

2. a. Explain the phenomenon of polarization by reflection. Derive Brewster's law. **[7M]**
   b. Describe the construction and working of a Nicol prism. Mention its applications. **[7M]**

UNIT-II

3. a. State the first law of thermodynamics and derive an expression for work done during an isothermal process. **[7M]**
   b. Explain entropy and discuss the second law of thermodynamics in terms of entropy. **[7M]**

OR

4. a. Derive the expression for the efficiency of a Carnot heat engine and prove Carnot's theorem. **[10M]**
   b. Differentiate between reversible and irreversible processes. **[4M]**

UNIT-III

5. a. Using Gauss's law, derive the electric field due to an infinitely long uniformly charged wire. **[10M]**
   b. State and explain Faraday's law of electromagnetic induction. **[4M]**

OR

6. a. Derive the electromagnetic wave equation in free space using Maxwell's equations. **[10M]**
   b. Obtain an expression for the magnetic field at the centre of a circular current loop using Biot–Savart's law. **[4M]**

UNIT-IV

7. a. Explain the construction and working of a He–Ne laser with a neat diagram. **[10M]**
   b. List any four applications of semiconductor lasers. **[4M]**

OR

8. a. Derive expressions for the acceptance angle and numerical aperture of an optical fibre. **[8M]**
   b. Discuss the different types of optical fibre losses. **[6M]**

UNIT-V

9. a. State and explain Heisenberg's uncertainty principle. Derive Schrödinger's time-independent wave equation. **[8M]**
   b. Explain the physical significance of the wave function. **[6M]**

OR

10. a. Explain Bloch sphere representation and single-qubit gates in quantum computing. **[7M]**
    b. Differentiate between quantum bits and classical bits. Explain quantum teleportation (basic idea). **[7M]**