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Total No. of Pages : 02

Total No. of Questions : 09

**B.Tech. (AI&ML/AI&DS/Block Chain/CSD/DS/
CE/CSE/CS/ECE/EEE/EE/E&TE/IT/ME/Robotics & Artificial
Intelligence/Internet of Things and Cyber Security including Block Chain
Technology) (Sem-1,2)**

ENGINEERING PHYSICS

Subject Code : BTPH101-23

M.Code : 93794

Date of Examination : 04-01-2025

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. **SECTION-A is COMPULSORY** consisting of TEN questions carrying TWO marks each.
2. **SECTION - B & C** have FOUR questions each.
3. Attempt any FIVE questions from SECTION B & C carrying EIGHT marks each.
4. Select atleast TWO questions from SECTION - B & C.

SECTION-A

I. Write short notes on :

- a. What is Bragg's law?
- b. Draw I-V characteristics of p-n junction.
- c. Define magnetic anisotropy.
- d. Define Poynting vector.
- e. What information can be obtained from Wave function?
- f. Write a note on Optical pumping.
- g. What is total internal reflection?
- h. Discuss two mechanisms for loss associated with optic fibres.
- i. Discuss important applications of nano-materials.
- j. Why Ruby laser is a pulsed laser?

SECTION-B

2. Distinguish between X-rays and gamma-rays. Explain the origin of Continuous and Characteristic X-rays.
3. What is Zener diode? Explain the application of Zener diode as a voltage regulator.
4. a) What is superconductivity? Distinguish between Type-I and Type-II superconductors.
b) Distinguish between Diamagnetic and Paramagnetic materials.
5. Solve the electromagnetic wave propagation equation in free space and obtain the expression for velocity of electromagnetic wave in free space.

SECTION-C

6. Explain the construction and working of He-Ne laser with the help of energy level diagram. Why a narrow discharge tube is used in He-Ne laser?
7. Solve Schrodinger wave equation for particle in a box and show that energy of particle in a box is quantized.
8. What are different modes of propagation of signal in optical fibre? Obtain expression for normalized frequency.
9. What are Carbon nanotubes? What are the different types of Carbon nanotubes? Discuss top-down method of synthesis of nano particles.

NOTE : Disclosure of Identity by writing Mobile No. or Marking of passing request on any paper of Answer Sheet will lead to UMC against the Student.