

**Roll No.**

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**Total No. of Pages: 02**

**Total No. of Questions: 09**

**B.Tech (CE / CSE / EE / ECE / ME) (Sem – 1,2)**

# ENGINEERING PHYSICS

**Subject Code: BTPH-101**

**M Code: 54105**

**Date of Examination : 06-06-2023**

**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, carrying **EIGHT** marks each.
3. Attempt any **FIVE** questions from **SECTION B & C**, selecting atleast **TWO** questions from each of these **SECTIONS B & C**.

## SECTION-A

1. Write briefly :
- a) Explain Ferro and Ferri magnetism.
  - b) Write the physical significance of gradient.
  - c) What is BCS theory?
  - d) What are the conditions for laser action?
  - e) Define couplers and connectors.
  - f) What for the Michelson-Morley experiment was performed?
  - g) Define group and phase velocities.
  - h) Define space lattice.
  - i) Explain carbon nanotubes.
  - j) Define uncertainty principle.

### SECTION-B

2. Explain the meaning of each Maxwell's equation. What was the problem with the Ampere's law?
3. Mention different types of superconductors. How type-II superconductor differs from type-I superconductor?
4. a) Describe Bragg's spectrometer.  
  
b) The X-ray of wavelength 0.154nm were obtained using Molybdenum BCC metal as target. The diffraction was obtained from the {200} planes at  $2\theta = 58.535^\circ$ . Find lattice constant for Mo.
5. What is laser? Describe the principle, construction and working of He-Ne laser.

### SECTION-C

6. What is an optical fiber? What is pulse dispersion? How it can be minimised?
7. How does mass vary with relativistic velocity? Develop its relation.
8. Develop time-dependent and time-independent Schrodinger wave equations.
9. What is meant by 'surface-to-volume ratio'? Discuss sol-gel method for the synthesis of nanomaterials.

**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.**