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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.**