

Roll No.

Total No. of Pages : 02

Total No. of Questions : 09

B.Tech. (Bio Tech) (2018 & Onwards) (Sem.-2)

INTRODUCTION TO PHYSICS : BIOTECHNOLOGY

Subject Code : BTPH-107-18

M.Code : 75369

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

- 1. Answer briefly :**
- a) What is population inversion in lasers?
 - b) What is difference between holography and photography?
 - c) What do you understand by metastable states?
 - d) What is magnetostriction?
 - e) Why superconductivity is low temperature phenomena?
 - f) What is pulse-echo technique?
 - g) What is the importance of Bragg's law?
 - h) What are soft magnets?
 - i) Define De-Broglie wavelength associated with matter.
 - j) What is electron confinement?

SECTION-B

2. What is three level laser? Explain the theory and working of any three-level laser.
3. a) What is optical fibre? Give the basic principle behind propagation of light through optical fibre.
b) Differentiate between single mode and multimodal fibre.
4. a) What is superconductivity? Discuss about Meissner effect.
b) Differentiate between type-I and type-II superconductors.
5. What is domain theory? Explain magnetism in ferromagnetic materials on the basis of domain theory.

SECTION-C

6. a) Discuss in brief about production of X-rays. (4)
b) What are continuous and characteristic X-rays? Give example of sources producing continuous and characteristic X-rays. (4)
7. List properties of ultrasound waves and their propagation in biological tissues. (8)
8. a) Discuss in detail about concept of photoelectric effect in materials. (5)
b) What is the wavelength of an electron moving at a speed of 5.31×10^6 m/sec? (3)
9. What are nanomaterials? Discuss top-down and bottom-up methods for nanomaterials synthesis. (8)

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