Roll No. | | | | | | | | | | | | Total No. of Pages : 02

Total No. of Questions : 18

B.Tech. (Bio Tech) (2018 & Onwards) (Sem.–1,2)

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

Answer briefly :

Q1. State the principle and working of a laser.

Q2. Explain the conditions for total internal reflection phenomena.

Q3. Mention various fiber parameters.

Q4. Differentiate between soft and hard magnetic materials.

Q5. Differentiate between type-I and type-II superconductors.

Q6. Justify that "*Meissner effect is the true verification of superconducting state*".

Q7. Give the difference between continuous and characteristic X-rays.

Q8. Mention properties of ultrasound waves.

Q9. Explain the concept of wave-particle duality.

Q10. What is the difference between a quantum wire and quantum dot?

SECTION-B

Q11. a) Explain the construction, working and energy diagram of Ruby laser. 5

b) Discuss some medical applications of lasers. 3

Q12. a) Discuss the construction and working of step and graded index fibers. 5

b) Discuss different losses associated with optical fibers and their control. 3

Q13. a) Make a comparison between the characteristics of dia, para, ferro, ferri and ferrite magnetic materials. 5

b) Explain the phenomena of magnetostriction and mention its few applications. 3

Q14. a) Discuss the superconducting state and its various properties. 4

b) Give a brief account of BCS theory of superconducting state. 4

SECTION-C

Q15. Give an account of the properties of X-rays and discuss the method of their production. 8

Q16. a) Explain the principle and working of ultrasound generator. 5

b) Mention the adverse effect of ultrasound waves. 3

Q17. a) Write a short note on de-Broglie waves and their properties. 3

b) Give definitions of Photoelectric effect and Compton Effect. 3

c) Calculate the frequency and wavelength of a photon whose energy is 75eV. 2

Q18. a) Discuss the top-down and bottom-up methods of nanoparticles synthesis. 4

b) What are carbon nanotubes? Discuss how various types of carbon nanotubes can be formed from graphene? 4

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.