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?

(S1)-591

#### **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 magnetic materials.	ferrite 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.	Giv	ve 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 formed from graphene?	be 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.

(S1)-591