(Pages : 3) **P – 3171**

Reg. No. : .....

Name : .....

Ph.D. ENTRANCE EXAMINATION, NOVEMBER 2022

FACULTY OF APPLIED SCIENCE AND TECHNOLOGY

BIOTECHNOLOGY

Time : 3 Hours Max. Marks : 100

Instructions **:**

1) *Answer **any ten** questions each from* Section ***A*** *and* ***B.***
2) *Each question carries **5** marks.*
3) *No additional Answer sheets will be provided.*
4) *Candidates should clearly indicate the section, Question number in the answer booklet.*

Section – A

Research Methodology

I. Answer any **ten** questions. All Questions carry equal marks.

1. When you may need to use Differential Scanning Calorimetry? How would you do it?

2. How do you preserve the microbes for future use?

3. Briefly describe the principle and applications of pH Meter

4. Discuss principles of FISH and comparative genomic hybridization (CGH) technique.

5. How you may silence genes?

6. Describe methods of immobilizing enzymes.

7. Describe a method of testing experiments' significance.

8. Define Enzyme engineering- and briefly explain the steps in enzyme engineering.

9. Discuss the applications of the Lineweaver-Burk plot and the Eadie-Hofstee plot. How they are constructed?

10. Briefly discuss the uses of cryo-EM techniques.

11. How would you test the antibiotic property of a natural product?

12. Describe the protocol for producing antibody against an antigen.

13. Describe the principle of next-generation sequencing and its applications.

14. When you would use *a* gene-knocked-out animal in research?

15. Describe the methods of microbial strain improvement by sexual and parasexual processes.

(10 × 5 = 50 Marks)

Section – B

Biotechnology

II. Answer any **ten** questions. All Questions carry equal marks.

1. What are mRNA vaccines? Debate its merits

2. Describe water as a solvent

3. What is TCA cycle?

4. Describe the biotechnological significance of RNA Polymerase of bacteria briefly.

5. Briefly discuss the biotechnological significance of *Cre/Lox* and RecA recombinases.

6. Describe the applications of immobilized enzymes.

7. Briefly discuss the events in the cell cycle

8. What are therapeutic antibodies?

9. Discuss the vectors used in gene therapy.

10. Classify immunoglobulins.

11. What are DNA ligases?

12. Describe the types of fermentation processes.

13. Describe the applications of stem cell technology.

14. Describe briefly the important enzymes and pathways of drug metabolism.

15. What are the important targeted tumor-drug delivery systems?

———————— **(10 × 5 = 50 Marks)**