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Reg. No. : .....

Name : .....

Ph.D. ENTRANCE EXAMINATION 2023

Faculty of Applied Sciences and Technology

MICROBIOLOGY

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. Each carries 5 marks.

1. Provide a concise Overview of various research methodologies.

2. Explain the importance of Regression and correlation analysis.

3. Describe why probability analysis is essential for conducting statistical testing.

4. Define scientific evidence and discuss its significance.

5. Explain the concept of bibliography and outline the different formats it can take.

6. How to address a null hypothesis inquiry?

7. What is descriptive and inferential statistics with example?

8. How do you write a literature review for a research methodology?

9. Why is multivariate analysis important in research methodology?

10. Describe the importance of primary sources of data.

11. Write a lucid note on Research Design.

12. Differentiate between questionnaire and schedule.

13. Describe the process of report preparation. Discuss the importance of objectivity in writing a Microbiology research report.

14. Compare and contrast between measure of Central tendency vs measure of Variation.

15. What are the strategies to avoid plagiarism?

(10 × 5 = 50 Marks)

Section – B

Microbiology

II. Answer any **ten** questions. Each carries 5 marks.

1. Describe the higher order DNA structures that ultimately form a Chromosome.

2. Explain the importance of the double reciprocal plot.

3. What are the steps of ATP synthesis?

4. What are the differences between gel electrophoresis and SDS gel electrophoresis?

5. Detail the apoptotic pathway involving mitochondria.

6. What are emerging and re-emerging infectious diseases?

7. Explain the process of integrons acquiring antibiotic resistance cassettes.

8. What are some advantages of identifying an organism by using the ribosomal database project?

9. What is the role of PAMPs and PRRs?

10. What is clonal anergy of T cells?

11. Highlight the present-day developments in protein engineering.

12. Why is fusion tag a challenge in E coli expression system?

13. Explain the significance and role of microfouling and biofilm-benthos interactions.

14. How do homofermentative lactic acid bacteria metabolize glucose?

15. What is pyogenic infection?

(10 × 5 = 50 Marks)

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