D5BZL2204 **Reg. No.....**

Name: .....

FIFTH SEMESTER B.Sc. DEGREE EXAMINATION, NOVEMBER 2024
(Regular/Improvement/Supplementary)
ZOOLOGY
GZOL5B09T: METHODOLOGY IN SCIENCE, BIOSTATISTICS AND BIOINFORMATICS

Time: 2 ½ Hours **Maximum Marks: 80**

SECTION A: Answer the following questions. Each carries *two* marks.
(Ceiling 25 marks)

1. Define Empiricism.
2. Differentiate between inductive and deductive reasoning.
3. List the types of experiments.
4. Define Plagiarism.
5. Mention the importance of replications in experiments.
6. Write down the calculation of standard deviation.
7. What is the principle behind micro array?
8. Differentiate between metabolomics and metagenomics.
9. What do you mean by Pyrosequencing?
10. Comment On Clustal W.
11. How do census and sampling differ from each other?
12. What are the key differences between cladistics and ontogeny?
13. Mention any four roles of statistics in life science.
14. Name any two web-based and two Stand-alone tools for Protein sequence analysis.
15. What are the major challenges in Proteomics?

SECTION B: Answer the following questions. Each carries *five* marks.
(Ceiling 35 marks)

16. Which are major science disciplines? Add a note on various interdisciplinary approaches available and the importance of each discipline.
17. Explain the principles and procedures of designing an experiment.
18. Enumerate the importance of simulations, virtual testing and models in scientific learning.
19. Briefly explain molecular docking and drug design.
20. Write a paragraph on nucleotide sequence databases.
21. Distinguish between gene phylogeny and species phylogeny.
22. Briefly describe the major genome sequencing technologies.
23. What are the major methods of sequence alignment?

SECTION C: Answer any *two* questions. Each carries *ten* marks.

24. Write an essay on major databases in bioinformatics.
25. Explain various methods of data presentation with examples.
26. Define Hypothesis. Write an essay on hypothesis testing and interpretation of results using `t test` and `F test.'
27. Write an essay on ethics in science. Add notes on criteria for using animals in research.

(2 × 10 = 20 Marks)