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Name.....

Reg. No.....

**FIFTH SEMESTER (CBCSS—UG) DEGREE EXAMINATION
NOVEMBER 2025**

Zoology

ZOL 5B 09T—METHODOLOGY IN SCIENCE, BIostatISTICS AND BIOINFORMATICS

(2019 Syllabus)

Time : Two Hours and a Half

Maximum : 80 Marks

Section A (Short Answer Type)*All questions can be answered.**Each question carries 2 marks.**(Ceiling 25 marks)*

1. Define the hypothetico-deductive model.
2. How do theories differ from laws in science ?
3. What is replication, and why is it crucial in experiments ?
4. Why is it essential to plan an experiment carefully ?
5. Define primary and secondary sources of scientific information.
6. What ethical considerations are addressed by the CPCSEA guidelines ?
7. Mention two advantages of graphical data representation.
8. What is the difference between tabular and graphical data representation ?
9. Define mode and standard error.
10. What is the significance of the ANOVA test ?
11. What are secondary databases, and how do they differ from primary databases ?
12. Mention two metabolite databases and their applications.
13. What are the types of sequence alignment ?
14. What is structural proteomics ?
15. What is cladistics, and how is it used in molecular phylogenetics ?

Turn over

Section B (Paragraph/Problem Type)

All questions can be answered.

Each question carries 5 marks.

(Ceiling 35 marks)

16. What are the major steps in the scientific method ? Explain briefly.
17. Describe the principles and procedures involved in designing an experiment.
18. What are the key provisions of Article 51A (g) of the Indian Constitution related to science and animal ethics ?
19. Explain the role of sampling methods in statistical analysis. Provide examples.
20. What are the measures of central tendency ? How are they used in data analysis ?
21. Write a note on primary nucleotide sequence databases with examples.
22. Briefly explain the importance of Genbank in bioinformatics.
23. Differentiate between gene phylogeny and species phylogeny with examples.

Section C (Essay Type)

Answer any two of the following questions.

Each question carries 10 marks.

24. Explain the empirical approach in scientific studies and how it is fundamental to the scientific method. How does this approach differ from other types of inquiry ?
25. Explain the difference between discrete and continuous data. How would you calculate mean, median, and mode for each type of data ? Provide an example.
26. Describe the process of whole genome sequencing.
27. Explain structural database.

(2 × 10 = 20 marks)