

**M.Sc. (Zoology) Semester - 1 (CBCS) Examination**  
**OCT/NOV-2024 (AS PER SYLLABUS YEAR JUNE-2018)**  
**BIostatistics and Bioinformatics(Multi/Inter Disciplinary)**

Time: 2:30 Hours

Marks: 70

**Instructions:**

1. All questions are compulsory.
2. Figures to the right indicate marks.

- Que.1 Answer the following (Any seven out of Ten, each of 02 marks) (14)**
- (1) Calculate Mean, Mode, Median and Range from 31,42,5,73,9,27,9 data
  - (2) What is difference between paired and unpaired student's t test?
  - (3) Write any two merits and demerits of the mean
  - (4) Write note on Column graph with suitable example
  - (5) What is difference between null hypothesis and alternative hypothesis?
  - (6) Explain the uses of Bioinformatics in agriculture science.
  - (7) Write the full form of DDBJ and OMIM
  - (8) Give the example of pairwise alignment.
  - (9) Give the examples of tools use for Gene prediction.
  - (10) List out the methods use in protein sequencing.
- Que.2 Answer the following (Any two out of three, each of 07 marks) (14)**
- (1) Describe types of graphs with suitable examples.
  - (2) Find the variance and standard deviation for the following snow fall in Kedarnath region and discuss your results.  
15, 18, 36, 41, 12, 43, 09, 11, 23, 27, 31.
  - (3) Calculate the Coefficient of Variation (CV) for the following two spices sample data sets and give your interpretation from results.  
Class A - 93, 91, 97, 93, 95, 84, 98, 82, 97, 80, 93.  
Class B. - 77, 96, 97, 77, 95, 98, 93, 74, 72, 98, 99.
- Que.3 Answer the following (14)**
- |     |                                                  |    |
|-----|--------------------------------------------------|----|
| (1) | Write a detail note on Regression                | 05 |
| (2) | What is the Chi-square test? Discuss in detail.  | 05 |
| (3) | Write a detail note on the analysis of variance. | 04 |
- OR**
- Que.3 Answer the following (a & b – Both are compulsory, each of 07 marks) (14)**
- (1) Calculate un-paired student's T-test with below two different Soil sample from Uttarakhand region sites pH data (use 1.746 t critical/table value), set hypothesis and evaluate after result.  
Water sample:  
Sample area 1 : 4.1, 5.1, 3.9, 5.2, 5.9, 6.4, 8.2, 7.7 and 9.1  
Sample area 2 : 5.7, 6.0, 8.2, 5.3, 7.7, 8.9, 7.1, 7.2 and 6.9
  - (2) Write a note on Student's T-test? Discuss paired student's T-test with below data (use 1.833 t critical/table value)  
Internal mark: 58, 61, 46, 52, 69, 74, 57, 91, 33, 18  
Test marks after remedial classes: 62, 65, 71, 54, 76, 74, 80, 93, 49, 20
- Que.4(A) Answer the following (Any two out of three – Each of 05 marks) (14)**
- (1) Explain nucleotide data base
  - (2) What is secondary data base? Explain any two data base in details
  - (3) Application of Bioinformatics in biological sciences with appropriate examples.
- Que.4(B) Answer the following (Any one out of two –04 marks)**
- (1) Explain Gene Bank in details
  - (2) Write short note on PubMed.
- Que.5 Answer the following (Any two out of four, each of 07 marks) (14)**
- (1) Write note on multiple alignment
  - (2) Describe Smith – Waterman algorithm
  - (3) Explain the phylogenetic tree and mentioned its applications.
  - (4) What is drug discovery? explain in details

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