

M.Sc. (Micro) Semester - 1 (CBCS) Examination**Nov/Dec-2023 (SYLLABUS YEAR JUNE-2023)****Biostatistics, Bioinformatics & Biosafety (Interdisciplinary)****Time: 2:30 Hours****Marks: 70****Instructions:**

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

Q.1 Answer the followings: (Any Seven)**14**

- (1) What is null hypothesis?
- (2) What are the types of frequency distribution?
- (3) Define Coefficient of Variation.
- (4) Explain regression.
- (5) What is the significance level of Chi-square test?
- (6) Define the term bioinformatics.
- (7) Enlist the tools for prediction of gene.
- (8) What is multiple sequence alignment?
- (9) Write a full form of RCGM.
- (10) What are the biosafety cabinets?

Q.2 Answer the following (any two)**14**

- (1) Describe types of graphs with suitable examples.
- (2) Find the variance and standard deviation for the following test score and discuss your results.
75, 91, 72, 86, 77, 99, 75, 65, 80, 96, 11.
- (3) Calculate the Coefficient of Variation (CV) for the following two samples data sets and give your interpretation from results.
Group X - 33, 31, 37, 33, 45, 34, 38, 22, 37, 30, 33.
Group Y. - 67, 56, 87, 47, 95, 88, 93, 84, 82, 98, 69.

Q.3 Answer the following (any two)**14**

- (1) Calculate un-paired student's T-test with below two different water sample sites pH data (use 1.746 t critical/table value), set hypothesis and evaluate after result.
Water sample:
Forest area 1 : 5.1, 6.1, 2.9, 4.2, 3.9, 4.4, 8.2, 9.7 and 11.1
Forest area 2: 3.7, 4.0, 7.2, 9.3, 9.7, 9.9, 7.4, 12.2 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)
Student: 1 2 3 4 5 6 7 8 9 10
Test mark: 48, 41, 16, 42, 59, 64, 77, 81, 23, 58
Test marks after remedial classes: 52, 45, 11, 44, 56, 64, 70, 83, 39, 60
- (3) What is the Chi-square test? Discuss in detail.

Q.4 Answer the followings (Any two)**14**

- (1) Explain the application of bioinformatics in medicine.
- (2) Describe the nucleotide databases.
- (3) Write a note on nucleotide and protein sequence.

Q.5 Answer the followings: (Any two)**14**

- (1) Write a detail note on biosafety levels.
- (2) Describe the role of institutional biosafety committee.
- (3) What are the application of GMO.
