

Enrollment No./Seat No.:

GUJARAT TECHNOLOGICAL UNIVERSITY
Bachelor of Engineering - SEMESTER - III EXAMINATION - WINTER 2025

Subject Code: BE03004051

Date: 22-12-2025

Subject Name: Biostatistics

Time: 10:30 AM TO 01:00 PM

Total Marks: 70

Instructions

- 1. Attempt all questions.**
- 2. Make suitable assumptions wherever necessary.**
- 3. Figures to the right indicate full marks.**
- 4. Simple and non-programmable scientific calculators are allowed.**

	Marks
Q.1 (a) Define mean, median, and mode with examples.	03
(b) Explain types of biological data with examples.	04
(c) Explain measures of dispersion: Range, Variance, SD with formulas and examples.	07
Q.2 (a) State Bayes' theorem with biological application.	03
(b) Differentiate Type I and Type II errors with examples.	04
(c) Explain t-tests (single, paired, two-sample) with biological examples.	07
OR	
(c) Explain z-test and chi-square test with formulas and examples.	07
Q.3 (a) State principles of experimental design.	03
(b) Differentiate CRD and RBD.	04
(c) Explain 3-factor factorial design (A, B, C) along with the concepts of main effects and interaction effects. Provide a suitable biological example.	07
OR	
(a) Define crossover design with biological example.	03
(b) Explain Latin Square Design.	04
(c) Describe Response Surface Methodology (RSM). Explain central composite design (CCD) and its components with an example from biotechnology.	07
Q.4 (a) Define correlation and regression.	03
(b) Explain simple linear regression with example.	04
(c) Explain one-way ANOVA with assumptions.	07
OR	
(a) State assumptions of two-way ANOVA.	03
(b) Explain PCA with omics application.	04

- (c) Explain cluster analysis with steps. 07
- Q.5** (a) Define Big Data and its 5Vs. 03
- (b) Explain supervised vs unsupervised learning with examples. 04
- (c) Explain data analytics lifecycle with diagram. 07

OR

- (a) Define ROC curve and confusion matrix. 03
- (b) Explain logistic regression with biological example. 04
- (c) Discuss CONSORT and STROBE guidelines. 07
