

**GUJARAT TECHNOLOGICAL UNIVERSITY****B.PHARM - SEMESTER- 8 EXAMINATION – SUMMER-2024****Subject Code:BP801TT****Date: 29/04/2024****Subject Name: Biostatistics and Research Methodology****Time: 10.30 a.m. to 1.30 p.m.****Total Marks: 80****Instructions:**

- 1. Attempt any five questions.**
- 2. Make suitable assumptions wherever necessary.**
- 3. Figures to the right indicate full marks.**

- Q.1** (a) Explain correlation. Discuss different types of correlation in detail. **06**  
(b) For the following tablet weights: 100, 98, 101, 94, 104, 102, 108, 108, calculate (a) the mean, (b) the median, (c) the mode **05**  
(c) Define the terms: Range, Median, Frequency distribution, Variance **05**
- Q.2** (a) Define Probability. Explain normal distribution giving example. **06**  
(b) Compare and contrast: (i) Type-I Error & Type-II Error (ii) Null & Alternative hypothesis **05**  
(c) Write a note on sampling. **05**
- Q.3** (a) What are non-parametric tests? Explain Wilcoxon Rank Sum Test in detail. **06**  
(b) Discuss giving reasons the need for designing an experiment. **05**  
(c) Define plagiarism. Discuss different types of plagiarism giving examples. **05**
- Q.4** (a) Discuss step-wise Hypothesis testing procedure in Multiple regression models. What do you understand by multiple regression? **06**  
(b) Write the significance of Blocking and confounding for variables in Two-level factorials? **05**  
(c) Enlist different software used in biostatistics. Write a note on any one software with its features and applications. **05**
- Q.5** (a) Write advantages of factorial experimental designs over traditional one factor at a time experimental designs. State the differences between 2-level and 3-level experimental design. **06**  
(b) Describe central composite design considering a formulation development of oral solid dosage form. **05**  
(c) Discuss statistical optimization techniques for development of a pharmaceutical product. **05**
- Q.6** (a) Describe least square method for simple regression analysis. **06**  
(b) What is t-test with reference to hypothesis testing? Under which conditions we apply Unpaired and Paired t-test? **05**  
(c) Explain ANOVA as hypothesis testing method. Write the difference between one-way and two-way ANOVA. **05**
- Q.7** (a) Discuss “Shape” as distribution of data values with schematic illustrations (diagram) of different shapes. **06**  
(b) How can we visualize data using different graphs/charts? Discuss different types of graphs/charts for different types of data. **05**  
(c) Enlist different sections of a research report. Describe any three sections of a research report giving suitable example of your practice school report. **05**