

GUJARAT TECHNOLOGICAL UNIVERSITY
B.PHARM - SEMESTER-8 EXAMINATION – WINTER -2024

Subject Code:BP801TT**Date: 20-11-2024****Subject Name: Biostatistics and Research Methodology****Time: 02.30 PM TO 05.30 PM****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) What is Biostatistics? Discuss types of statistics and explain frequency distribution. **06**
- (b) Assay results for 10 randomly selected tablets from a batch are given below, **05**
 101.8, 104.5, 102.6, 100.7, 99.8, 106.3, 104.9, 100.6, 103.8, 105.0
 Calculate the sample standard deviation of the above data.
- (c) Explain the following terms: **05**
- a) Mode
 - b) Range
 - c) Variance
 - d) Dispersion
 - e) Geometric mean
- Q.2** (a) Powder compacts for 8 observations were prepared at different compaction pressure and hardness of tablet and following data were obtained. Find correlation coefficient between compaction pressure and hardness of tablet **06**
- | | | | | | | | | |
|-----------------|------|------|-----|-----|-----|-----|-----|-----|
| Pressure (tons) | 0.25 | 0.75 | 1 | 1.5 | 2 | 2.5 | 3 | 4 |
| Hardness (Kg) | 1 | 1.3 | 1.9 | 2.6 | 2.8 | 3.3 | 4.2 | 5.3 |
- (b) What is the need for design of experiments? Discuss experimental design techniques? **05**
- (c) Give a note on Poisson's distribution. **05**
- Q.3** (a) What is t-test? Explain different types of t-tests. **06**
- (b) Write a note on Wilcoxon Rank Sum test. **05**
- (c) Give the difference between one way ANOVA and two way ANOVA. **05**
- Q.4** (a) Give difference between: **06**
- a) Type I error and Type II error
 - b) Standard deviation and Standard error of mean
- (b) Give a note on various types of sampling methods. **05**
- (c) Explain hypothesis testing in the simple regression model. **05**
- Q.5** (a) What are probabilities? Explain normal distribution in detail. **06**
- (b) What is Non-parametric test? discuss on Kruskal-Wallis test. **05**
- (c) What is SPSS? Write down its applications in biostatistics. **05**

- Q. 6** (a) Explain the following terms: **06**
- a) Sample
 - b) Population
 - c) Large sample
 - d) Small sample
 - e) Null hypothesis
 - f) Alternative hypothesis
- (b) Write a note on cohorts and experimental studies in detail. **05**
- (c) Explain different types of charts used for the data representation. **05**
- Q.7** (a) Explain the concept of factorial design in detail. **06**
- (b) Explain fitting the lines of regression of $y = a + bx$ and $x = a + by$ in regression analysis. **05**
- (c) Write a note on the central composite design. **05**
