

GUJARAT TECHNOLOGICAL UNIVERSITY
B.PHARM – SEMESTER – 8 EXAMINATION – SUMMER-2025

Subject Code: BP801TT**Date: 08-05-2025****Subject Name: Biostatistics and Research Methodology****Time: 10.30 AM TO 01.30 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) Discuss correlation coefficient with example. **06**
 (b) Explain terms: Dispersion, Range **05**
 (c) Tablets of atenolol were subjected to Assay. The results obtained are as follows, **05**

Method/Person	HPLC	UV	Titration
ABC	100	101	97
DEF	98	100	99
GHI	102	99	102
JKL	103	98	100
MNO	94	95	93

Find out whether all the methods and/or person are similar or not?

$$F_{\text{tab}(4, 8)}=3.83, F_{\text{tab}(2, 8)}=4.45$$

$$F_{\text{tab}(4, 10)}=3.47, F_{\text{tab}(2, 12)}=3.88$$

- Q.2** (a) Write a note on least square method of curve fitting. **06**
 (b) Differentiate: Normal distribution and binomial distribution. **05**
 (c) Results of a 2^3 full factorial study are given below, **05**

X_1	-1	1	-1	1	-1	1	-1	1
X_2	-1	-1	1	1	-1	-1	1	1
X_3	-1	-1	-1	-1	1	1	1	1
Y	25	34	37	31	36	40	32	42

Derive full Model representing relationship between independent and dependent variables.

- Q.3** (a) Explain terms: Null hypothesis, Standard error of mean, population **06**
 (b) Enlist non parametric tests. Discuss any one in detail. **05**
 (c) Perform t-test for given data. ($t_{(0.05, 10)} = 2.23$, $t_{(0.05, 20)} = 2.08$, $t_{(0.05, 21)} = 2.07$) **05**

Batch A	31	35	36	37	34	32	33	40	36	34	39
Batch B	33	32	34	35	40	34	33	34	35	36	37

- Q.4** (a) What is plagiarism? How it affects research outcome? **06**
 (b) Justify: Design of experiments helps in faster and economic research. **05**
 (c) Draw a histogram for the given data using graph paper given on last page of answer sheet. **05**

Range	0-10	10-20	20-30	30-40	40-50	50-60	60-70
Frequency	6	13	22	37	24	10	2

- Q.5** (a) Give importance of report writing and presentation of data. **06**
 (b) Discuss various phases of clinical trial. **05**
 (c) Explain by calculating probability: While rolling two dice at a time, probability of getting total of both dice equal to 7 is highest. **05**

- Q.6** (a) Explain blocking and confounding in relation to experimental designs. 06
(b) What is multiple regression? How it helps in research? 05
(c) Calculate standard deviation for given data: 05
15, 21, 18, 17, 19, 16, 15, 17, 18, 14, 16, 15, 16, 17, 18, 17
- Q.7** (a) Write a detailed on any one rotatable design. 06
(b) Discuss importance of MS excel as statistical analysis tool. 05
(c) Calculate mean, median and mode for the given unorganized data: 05
7, 6, 8, 7, 5, 9, 6, 7, 5, 7, 8, 7, 6, 5, 7
