Name: **Enrolment No:**	

UPES

End Semester Examination, May 2024

Course: Biostatistics and Research Methodology **Semester : VIII**

Program: B. Pharma **Duration : 03 Hours**

Course Code: BP801T **Max. Marks: 75**

Instructions: Attempt all questions. The use of Calculator is permitted

SECTION A

(20Qx1M=20 Marks)

S. No.		**Marks**	**COs**
Q 1	We must arrange the data for applying following statistical test: a. T-test b. Paired t-test c. Wilcoxon rank test d. Standard deviation	**1**	CO1
Q 2	The sum of deviations about mean is: a. Zero b. Maximum c. Minimum d. All of the above	**1**	CO1
Q 3	Which distribution has a bell-shaped curve? (a) Poisson distribution (b) Normal Distribution (c) Bernoulli distribution (d) Binomial distribution	**1**	CO1
Q 4	What will be the variance of a frequency distribution having standard deviation is 8?	**1**	CO1
Q 5	Define degree of freedom .	**1**	CO2
Q 6	Define random sampling.	**1**	CO2
Q 7	Find range from the data below: Lowest blood pressure is 120 and highest blood pressure is 148.	**1**	CO2
Q 8	Nonparametric test requires data to be normally distributed. (True/False)	**1**	CO2
Q 9	Define null and alternate hypothesis.	**1**	CO3
Q 10	Give the name of two method used for visualization of data.	**1**	CO3
Q 11	Name a software used for factorial design.	**1**	CO3
Q 12	Define Standard deviation.	**1**	CO3
Q 13	Calculate the mean of the following values. 18,22,46,32,35,39	**1**	CO4
Q 14	Give two advantages for factorial design.	**1**	CO4
Q 15	Give formula for variance.	**1**	CO4

Q 16	Define Research.	**1**	CO4
Q 17	Define Descriptive research.	**1**	CO5
Q 18	Least significance difference is applied after one way ANOVA. (True/False)	**1**	CO5
Q 19	One way ANOVA is applied to the sample having one variable and one outcome. (True/False)	**1**	CO5
Q 20	The best use of Wilcoxon signed-ranks test will be for comparison of which of the following types of data. a. Continuous, parametric unpaired data b. Continuous, non-parametric paired data c. Continuous, non-parametric, unpaired data d. Categorical unpaired data	**1**	CO5
SECTION B (20 Marks) **(2Qx10M=20 Marks)** **Attempt 2 Question out of 3**			
Q 1	Discuss in detail with suitable examples about a. Parametric test b. Non-Parametric test	**5x2=10**	CO3
Q2.	Over eight weeks, Jack visits his local supermarket on a Friday or Saturday and takes the time for shopping in minutes as given in the table below. **Friday** 38 56 60 **Saturday** 74 58 61 50 64 Find if the shopping frequency on Friday and Saturday has any difference. Critical values of the smallest rank sum for the Wilcoxon rank sum in table for n2=5 and n1=3 is 6 at α=0.05	**10**	CO4
Q3.	Discuss in detail the Design of experiment with emphasis on factorial design using 2x2 factorial design	**10**	CO5
SECTION-C (35 Marks) **(7Qx5M=35 Marks)** **Attempt 7 Question out of 9**			
Q 1	Discuss in detail about Probability.	**5**	CO1
Q 2	Discuss briefly about. a. Research b. Null Hypothesis and Alternative Hypothesis	**5**	CO1
Q 3	Describe various softwares used in pharmaceutical industry and research for statistics.	**5**	CO1
Q 4	Describe in detail about sample size determination and power of study.	**5**	CO2
Q 5	The following data was observed by the student while determining the disintegration time of the tablet in minutes	**5**	CO2

<table>
<tr><td></td><td>4, 2, 5, 4, 12, 7, 8, 11, 9, 3, 7, 4, 12, 5, 4, 10,
Calculate Mean, median, and standard deviation.</td><td></td><td></td></tr>
<tr><td>Q 6</td><td>Calculate the linear regression equation of the following data by using method of least square.<table><tr><td>X</td><td>Y</td></tr><tr><td>2</td><td>5.4</td></tr><tr><td>4</td><td>10.6</td></tr><tr><td>6</td><td>16</td></tr><tr><td>8</td><td>21</td></tr></table></td><td>5</td><td>CO3</td></tr>
<tr><td>Q 7</td><td>Discuss the features of Normal Distribution.</td><td>5</td><td>CO3</td></tr>
<tr><td>Q 8</td><td>Discuss the need of research in pharmaceutical industry.</td><td>5</td><td>CO4</td></tr>
<tr><td>Q 9</td><td>Define
a. Correlation
b. Observational Studies</td><td>2.5x2=5</td><td>CO5</td></tr>
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