THE TAMIL NADU Dr. M.G.R. MEDICAL UNIVERSITY

[BPHARM0422] APRIL 2022 Sub. Code: 2077
(SEPTEMBER 2021 SESSION)

B.PHARMACY DEGREE COURSE (SEMESTER EXAMINATIONS)
PCI Regulation 2017 SEMESTER VIII
PAPER I – BIOSTATISTICS AND RESEARCH METHODOLOGY
Q.P. Code: 562077

Time: Three hours **Maximum: 75 Marks**

I. Elaborate on: Answer any TWO questions. (2 x 10 = 20)

1. Discuss the protocol for an experimental study design.
2. Describe the different measures of central tendency.
3. How is QbD based product development better? Explain the steps involved in it.

II. Write notes on: Answer any SEVEN questions. (7 x 5 = 35)

1. Explain correlation, types of correlation and its applications.
2. Discuss different methods of sampling.
3. Explain null hypothesis, type I and type II errors.
4. Explain types of observational study designs.
5. Explain with examples- Histogram, Pie chart.
6. Discuss the applications of SPSS and MINITAB in data analysis.
7. Explain the concept of Central Composite Design.
8. Classify and explain different types of t- tests.
9. Explain ANOVA and its applications.

III. Short answers on: Answer ALL questions. (10 x 2 = 20)

1. Report writing in research study.
2. Confidence interval.
3. Chi square test.
4. Probability.
5. Standard error of mean.
6. 2^2 and 2^3 designs.
7. Applications of nonparametric tests.
8. Degrees of freedom.
9. Differentiate SD and SEM.
10. Define scatter plots.

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THE TAMIL NADU Dr. M.G.R. MEDICAL UNIVERSITY

[BPHARM 1022] OCTOBER 2022 Sub. Code: 2077
(MARCH 2022 SESSION)

B.PHARMACY DEGREE COURSE (SEMESTER EXAMINATIONS)
PCI Regulation 2017 - SEMESTER VIII
PAPER I – BIOSTATISTICS AND RESEARCH METHODOLOGY
Q.P. Code: 562077

Time: Three hours **Maximum: 75 Marks**

I. Elaborate on: Answer any TWO questions. (2 x 10 = 20)

1. Classify different types of data, explain any three measures of dispersion with example.
2. Explain the hypothesis testing of non-parametric data.
3. Discuss different types of observational studies in detail.

II. Write notes on: Answer any SEVEN questions. (7 x 5 = 35)

1. Explain Karl Pearson's coefficient of correlation with examples.
2. Explain ANOVA and its applications.
3. Discuss different methods of sampling.
4. Explain the types and advantages of factorial design in formulation development.
5. Explain student 't' test and its applications.
6. Explain type I and type II errors.
7. Explain phases of clinical trial.
8. Define and explain probability and its significance in statistics.
9. Explain the concept of Design of Experiments.

III. Short answers on: Answer ALL questions. (10 x 2 = 20)

1. Multiple regression.
2. Pharmaceutical examples for data analysis using SPSS.
3. Factorial design.
4. Power of a study.
5. Two methods of sample size calculation in research study.
6. Degrees of freedom.
7. Standard error of mean and its significance.
8. One tailed and Two tailed tests.
9. Pharmaceutical examples for optimization techniques.
10. Wilcoxon Rank Sum test.

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THE TAMIL NADU Dr. M.G.R. MEDICAL UNIVERSITY

[B.PHARM 0323] MARCH 2023 Sub. Code: 2077
(SEPTEMBER 2022 EXAM SESSION)

B.PHARMACY DEGREE COURSE (SEMESTER EXAMINATIONS)
PCI Regulation 2017 - SEMESTER VIII
PAPER I – BIOSTATISTICS AND RESEARCH METHODOLOGY

Q.P. Code: 562077

Time: Three hours **Maximum: 75 Marks**

I. Elaborate on: Answer any TWO questions. (2 x 10 = 20)

1. a) Explain about the Measures of central tendency.
   b) From the following table, find the mean and mode,

Classes	10 - 25	25 - 40	40 - 55	55 - 70	70 - 85	85 - 100
No. of students	6	50	44	26	3	1

2. Statistical analysis using SPSS.
3. a) Define Wilcoxon Rank Sum test.

   b) Consider a Phase II clinical trial designed to investigate the effectiveness of a new drug to reduce symptoms of asthma in children. A total of n=24 participants are randomized to receive either the new drug or a placebo. Participants are asked to record the number of episodes of shortness of breath over a 1 week period following receipt of the assigned treatment. The data are shown below:

New drug	8	9	13	14	11	10	12	14	13	9	10	8
Placebo	7	11	9	4	8	6	12	11	9	10	11	11

Is there a difference in the number of episodes of shortness of breath over a 1 week period in participants receiving the new drug as compared to those receiving the placebo? By inspection, it appears that participants receiving the placebo have more episodes of shortness of breath, but is this statistically significant at the 0.05% level of significance by using Wilcoxon Rank Sum test?

II. Write notes on: Answer any SEVEN questions. (7 x 5 = 35)

1. Karl Pearson's Coefficient of Correlation.
2. Calculate the Median from the following data.

X	0 - 30	30 – 60	60 - 90	90 - 120	120 - 150	150 - 180
F	8	13	22	27	18	7

3. Sampling and Types of Sampling.
4. Blocking and confounding system for two level factorial.
5. Graphical Presentation of data.
6. Basic concepts of design methodology.
7. ANOVA.
8. Factorial design and it's advantage.
9. Central composite design.

III. Short answers on: Answer ALL questions. (10 x 2 = 20)

1. Biostatistics.
2. Following are the weight in gram, Calculate the median weight – 68, 66, 35, 42, 26, 85, 44, 80, 33, 72.
3. SEM.
4. Need for Research.
5. Cohort study.
6. Types of hypothesis in regression modelling.
7. R online statistical software.
8. Calculate the mode value for the following data.

X	0	1	2	3	4	5
F	42	55	32	22	15	6

9. List out the optimization techniques in response surface methodology.
10. Applications of Factorial design.

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THE TAMIL NADU Dr. M.G.R. MEDICAL UNIVERSITY

[B.PHARM 0823] AUGUST 2023 Sub. Code: 2077
(MARCH 2023 EXAM SESSION)

B.PHARMACY DEGREE COURSE (SEMESTER EXAMINATIONS)
PCI Regulation 2017 - SEMESTER VIII
PAPER I – BIOSTATISTICS AND RESEARCH METHODOLOGY

Q.P. Code: 562077

Time: Three hours **Maximum: 75 Marks**

I. Elaborate on: Answer any TWO questions. (2 x 10 = 20)

1. a) Response Surface Methodology.
2. a) Define t test in parametric test.
   b) An IQ test was administered for five students, the result are as follows,

Candidate	A	B	C	D	E
IQ before training	110	120	123	132	125
IQ after training	120	118	125	136	121

   Using t test, whether there is any change in the IQ after training programme?
3. R – Online statistical software.

II. Write notes on: Answer any SEVEN questions. (7 x 5 = 35)

1. Method of determination of the sample size.
2. Friedman test.
3. Differentiate between Stratified random sampling and Cluster random sampling.
4. Calculate the mean and median from the following table.

x	2.5	3.5	4.5	5.5	6.5	7.5	8.5	9.5	10.5
f	2	3	5	6	6	4	6	4	14

5. Concept of Cohort.
6. Minitab.
7. Find the rank correlation for the following table. The ranking of 10 students in Maths and Statistics are as follows:

Maths	6	4	9	8	1	2	3	10	5	7
Statistics	3	5	8	4	7	10	2	1	6	9

2...

8. Box Behnken Design.
9. In a health survey of a town, it is found that the mean haemoglobin level of 86 people is 12.7 g per 100 ml with a standard deviation of 4.0
   Can we consider this group has been taken from a population with a mean of 13.2 g per 100 ml. Compare the sample mean with population mean?

III. Short answers on: Answer ALL questions. (10 x 2 = 20)

1. Probability.
2. Null hypothesis and Alternative hypothesis.
3. Find the mean value from the following table.

Size below	5	10	15	20	25	30	35
Frequency	1	3	13	17	27	36	38

4. Wilcoxon Rank Sum test.
5. Response surface plot.
6. F – Statistics.
7. Excel.
8. Range and calculate the range from the data given below:
   188, 178, 173, 164, 172, 183, 184, 185, 211, 217, 232, 240
9. Central composite design.
10. Advantage of Factorial design.

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THE TAMIL NADU Dr. M.G.R. MEDICAL UNIVERSITY

[B.PHARM 1223] DECEMBER 2023 Sub. Code: 2077
(SEPTEMBER 2023 EXAM SESSION)

B.PHARMACY DEGREE COURSE (SEMESTER EXAMINATIONS)
PCI Regulation 2017 - SEMESTER VIII
PAPER I – BIOSTATISTICS AND RESEARCH METHODOLOGY

Q.P. Code: 562077

Time: Three hours **Maximum: 75 Marks**

I. Elaborate on: Answer any TWO questions. (2 x 10 = 20)

1. Discuss about the hypothesis testing of parametric data.
2. Classify different types of data, explain the measures of central tendency with examples.
3. Elaborate on the different phases of clinical trials.

II. Write notes on: Answer any SEVEN questions. (7 x 5 = 35)

1. What is QbD? List the experimental designs used in QbD.
2. Explain in detail about cross-over and parallel clinical study design.
3. Compare and contrast Nonparametric and Parametric data.
4. Explain report writing in research methodology.
5. Explain the measures of dispersion.
6. Discuss the methods of sampling in research study.
7. Discuss – Pie chart, Cubic graph.
8. Explain one way ANOVA and the assumptions in one way ANOVA.
9. Explain student ‘t’ test and its applications.

III. Short answers on: Answer ALL questions. (10 x 2 = 20)

1. Standard Error of Mean.
2. Central composite design.
3. Define semi logarithmic plots.
4. Histogram.
5. Types of correlation.
6. Classify observational and experimental studies.
7. Define coefficient of variation.
8. Type I and Type II errors in hypothesis testing.
9. Degrees of freedom.
10. Relationship between sample size and power of the study.

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