

[LN 1018]

OCTOBER 2018

Sub. Code: 1902

**M.Sc. IN PUBLIC HEALTH EXAMS
FIRST YEAR
PAPER II – PRINCIPLES OF BIO-STATISTICS**

Q.P. Code : 281902

Time: Three hours

Maximum : 100 Marks

I. Elaborate on:

(2 x 20 = 40)

1. What is Diagnostic Test? Explain about: Sensitivity, Specificity, Positive and Negative Predictive Values with suitable example.

2. Determine the following:

a) Regression equation of Y on X for the given data.

x	1	3	6	3	2	1
y	2	4	4	2	6	3

b) Calculate the Pearson r for the following data:

20, 5, 18, 6, 19, 3, 4, 3, 17, 18

II. Write notes on:

(10 x 6 = 60)

1. Explain the following terms:

Mean, Median, Mode with suitable example.

2. Explain graphical representation of data and How do you graphically portray for quantitative and qualitative data.

3. Define the following with symbol

Two - tailed, Left - tailed, Right - tailed test.

4. Define probability distribution and write short note about the following distributions:

Binomial Distribution, Normal Distribution, Poisson distribution.

5. Define Reliability, Validity and Accuracy.

6. Explain the necessity for questionnaire constructions and list out steps to Design a Questionnaire.

7. Explain the following:

a) Inferential statistics b) Estimation c) Hypothesis

8. Explain the logic behind a Kruskal-Wallis test and how it differs from ANOVA?

9. Explain linear regression and brief about the assumptions of regression.

10. Define Censoring and discuss different types of censoring.

[LP 1019]

OCTOBER 2019

Sub. Code: 1902

M.Sc. IN PUBLIC HEALTH EXAMS
FIRST YEAR
PAPER II – PRINCIPLES OF BIO-STATISTICS

Q.P. Code : 281902

Time: Three hours

Maximum : 100 Marks

I. Elaborate on:

(2 x 20 = 40)

1. Sampling and sampling techniques with examples.
2. a) Concept of accuracy and precision with example.
b) Calculate the diagnostic accuracies i.e., sensitivity, specificity, positive predictive value, negative predictive value and positive likelihood ratio for the following data.

		Gold standard		Total
		Positive	Negative	
Reference test	Positive	18	20	38
	Negative	2	80	82
Total		20	100	120

II. Write notes on:

(10 x 6 = 60)

1. Types of data and measurement scales with example.
2. Calculate the standard deviation and coefficient of variation for the following data: 20, 30, 45, 12, 30, 40, 12.
3. Binomial distribution and Poisson distribution with examples.
4. Power and error.
5. Parametric test used for comparing means (two groups-paired and unpaired, and more than two groups).
6. Calculate Spearman correlation coefficient between two scores.

X	2	5	10	8	10	4	1	7	4	9
Y	1	7	10	7	9	3	2	6	5	10

7. Concept of standard error and confidence intervals.
8. Scatter diagram and Pearson's correlation coefficient.
9. Procedure of Chi-square test and uses.
10. How to compare two survival curves?

[LQ 1019]

NOVEMBER 2020
(MAY 2020 EXAM SESSION)
M.Sc. IN PUBLIC HEALTH

Sub. Code: 1902

FIRST YEAR

PAPER II – PRINCIPLES OF BIO-STATISTICS

Q.P. Code : 281902

Time: Three hours

Maximum : 100 Marks

I. Elaborate on:

(2 x 20 = 40)

1. a) What are the Parametric tests and Non Parametric tests used for Analysis.
b) What are the situations used for Non-parametric Tests.
2. Calculate Product Moment Correlation of Calcium level(mg/dl) for the following data:

X	6	4	7	3	8	5
Y	8	6	7	5	9	6

II. Write notes on:

(10 x 6 = 60)

1. Explain types of Variables and Scales of measurement.
2. Measures of Dispersion with examples
3. Find Mean,Median, Mode and Mean Deviation of the Urine albumin(mg) for the following data; 23,29,21,25,22,28,27,25
4. Explain all types of Probability distribution.
5. Explain Accuracy,Precision,Validity and Reliability.
6. Define Standardisation and Non Standardisation with suitable example.
7. Explain methods of Sample Size calculation.
8. Explain Linear Regression and Regression Co-efficient.
9. Explain Non-Probability Sampling techniques
- 10.Explain Kaplan Meier and Cox PH regression.

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

[AHS 0321]

MARCH 2021

Sub. Code: 1902

(OCTOBER 2020 EXAM SESSION)

M.Sc. PUBLIC HEALTH

FIRST YEAR (From 2017-2018 onwards)

PAPER II – PRINCIPLES OF BIO-STATISTICS

Q.P. Code : 281902

Time: Three hours

Answer ALL Questions

Maximum: 100 Marks

I. Elaborate notes on:

(2 x 20 = 40)

1. a) Define Diagnostic test? What are the Diagnostic tests and explain briefly.
b) Explain applications of Normal distribution curve
2. a) What are the applications of Life table.
b) Determine the Regression equation Y on X

X	6	4	7	3	8	5
Y	8	6	7	9	6	5

II. Write Short Notes on:

(10x6 = 60)

1. Diagrammatic representation of data.
2. Measures of Central Tendency.
3. Calculate Standard deviation and Variance of Uric acid(mg/dl) for the following data:
3,7,5,4,9,8,6 and 7
4. Explain Binomial distribution, Poisson distribution and Normal distribution.
5. What are the steps used for construction of Questionnaire.
6. Define ANOVA and Variations of ANOVA.
7. Measures of Correlation.
8. Uses of Life table.
9. Uses of Chi-Square test.
10. Mann-Whitney Test.

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[AHS 0921]

**SEPTEMBER 2021
(MAY 2021 EXAM SESSION)**

Sub. Code: 1902

**M.Sc. PUBLIC HEALTH
FIRST YEAR (From 2017-2018 onwards)
PAPER II – PRINCIPLES OF BIO-STATISTICS
*Q.P. Code : 281902***

Time: Three hours

Answer ALL Questions

Maximum: 100 Marks

I. Elaborate on:

(2 x 20 = 40)

1. a) Explain Sampling techniques used for primary data collection.
b) Explain the merits and demerits of Non Parametric tests
2. a) Explain Chi-square test, Median test, students 't' test ,MANOVA and F-test
b) Calculate χ^2 value for the following data:

	Lung cancer	No-lung cancer	Total
Smokers	22	78	100
Non-smokers	8	42	50
Total	30	120	150

II. Write notes on:

(10 x 6 = 60)

1. Graphical representation of data.
2. Explain Standard deviation and Co-efficient of variation
3. What are the sources of data and how to evaluate.
4. Relationship between Correlation and Regression
5. Explain Confidence interval and Significance level.
6. Health indicators.
7. Scatter diagram and Correlation Coefficient
8. Spearman rank order Correlation
9. Tests of significance
10. Normal distribution Curve and its applications.

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[AHS 0222]

**FEBRUARY 2022
(OCTOBER 2021 EXAM SESSION)**

Sub. Code: 1902

**M.Sc. PUBLIC HEALTH
FIRST YEAR (Candidates admitted from 2017-2018 onwards)
PAPER II – PRINCIPLES OF BIO-STATISTICS
*Q.P. Code : 281902***

Time: Three hours

Answer ALL Questions

Maximum: 100 Marks

I. Elaborate on:

(2 x 20 = 40)

1. Explain the steps involved in Testing an Hypothesis with suitable example.
2. Find out the measures of central tendency for the given data of the systolic blood pressure(in mmHg) recordings from 11 persons: 148, 126, 160, 130,128,154, 122, 160, 150, 144, 160.

II. Write notes on:

(10 x 6 = 60)

1. Presentation of Data.
2. Measures of Dispersion.
3. Methods of Collection of Data.
4. Prerequisite for Good Questionnaire.
5. Probability Distribution.
6. Measures of Diagnostics Tests.
7. Methods for finding Correlation.
8. Non Probability Sampling.
9. Need for Sampling and Sample Size Calculation.
10. Kaplan Meier Curve.

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[AHS 1022]

OCTOBER 2022

Sub. Code: 1902

**M.Sc. PUBLIC HEALTH
FIRST YEAR (Candidates admitted from 2017-2018 onwards)
PAPER II – PRINCIPLES OF BIO-STATISTICS**

Q.P. Code : 281902

Time: Three hours

Answer ALL Questions

Maximum: 100 Marks

I. Elaborate on:

(2 x 20 = 40)

1. a) Concept of accuracy and precision with example.
b) Calculate the diagnostic accuracies ie., sensitivity, specificity, positive predictive value, negative predictive value and positive likelihood ratio for the following data.

Reference Test	Gold Standard Test	
	Positive	Negative
Positive	18	20
Negative	2	80

2. a) What are the Parametric tests and Non Parametric tests used for Analysis?
b) What are the situations used for Non-parametric Tests?

II. Write notes on:

(10 x 6 = 60)

1. Brief on Scales of measurement with examples.
2. Discuss the graphical methods of finding outlier and use of connecting lines in diagrams.
3. Explain Measures of Central Tendency by comparing its merits and demerits.
4. What are the steps used for construction of Questionnaire?
5. Importance of sampling and sample size calculation in research.
6. List out the Characteristics of Normal Distribution.
7. Calculate 95% confidence interval for a sample of 49 Women with bleeding disorder who had given birth by the end of 1997 with mean 27.01 and standard deviation 5.13. (Table value $t=2.1011$ for 48 degrees of freedom).
8. Chi-square Test.
9. Key survey data of National Importance.
10. Survival Probability and Survival curve.

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[AHS 0523]

MAY 2023

Sub. Code: 1902

**M.Sc. PUBLIC HEALTH
FIRST YEAR (Candidates admitted from 2017-2018 onwards)
PAPER II – PRINCIPLES OF BIO-STATISTICS**

Q.P. Code: 281902

Time: Three hours

Answer ALL Questions

Maximum: 100 Marks

I. Elaborate on:

(2 x 20 = 40)

1. Discuss the methods of testing difference of two means and several means with examples.
2. a) What are the applications of Life table?
b) Determine the Regression equation Y on X.

X	6	4	7	3	8	5
Y	8	6	7	9	6	5

II. Write notes on:

(10 x 6 = 60)

1. Types of Data.
2. Measures of Variation.
3. Binomial and Poisson Distribution.
4. Measures of Diagnostic Accuracy.
5. Discuss Errors in Hypothesis Testing.
6. How will you choose an appropriate statistical model?
7. Explain a) Coefficient of Determination b) Coefficient of Variation.
8. Rank Correlation.
9. Give Research examples for ANOVA, MANOVA and ANCOVA.
10. Appropriate method for displaying survival data.

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[AHS 1023]

OCTOBER 2023

Sub. Code: 1902

**M.Sc. PUBLIC HEALTH
FIRST YEAR (From 2017-2018 onwards)
PAPER II – PRINCIPLES OF BIO-STATISTICS**

Q.P. Code: 281902

Time: Three hours

Answer ALL Questions

Maximum: 100 Marks

I. Elaborate on:

(2 x 20 = 40)

1. Explain in detail about Kaplan Meier Analysis and how to interpret it?
2. Define Validity. What are the different types of validity? How will you validate a questionnaire or instrument in medical research?

II. Write notes on:

(10 x 6 = 60)

1. Difference between standard deviation and standard error.
2. Explain in detail about Binomial distribution.
3. Correlation coefficient.
4. Explain in detail about systematic random sampling.
5. Tools for measuring validity of screening test.
6. Mann Whitney U test application and interpretation.
7. What is a variable? What are the different types of variables?
8. Statistical applications and its usage in medical research.
9. What is hypothesis statement? Explain about different types of hypothesis.
10. Calculate the measures of central tendency and dispersion for the following data of 5 student's weight 15,20,30,25,15.

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[AHS 1024]

OCTOBER 2024

Sub. Code: 1902

**M.Sc. PUBLIC HEALTH
FIRST YEAR (From 2017-2018 onwards)
PAPER II – PRINCIPLES OF BIO - STATISTICS**

Q.P. Code: 281902

Time: Three hours

Answer ALL Questions

Maximum: 100 Marks

I. Elaborate on:

(2 x 20 = 40)

1. Define Validity. What are the different types of validity? How will you validate a questionnaire or instrument in medical research?
2. Brief about linear regression analysis in the following headings:
 - a) Assumptions to be followed.
 - b) Steps in conducting linear regression.
 - c) Interpretation of linear regression analysis.

II. Write notes on:

(10 x 6 = 60)

1. Measures of central tendency with example.
2. What are the different types of distribution and brief about normal distribution?
3. What are the different types of Chi square test and brief about Chi square test of independence?
4. What are the measures of reliability? Explain with an example.
5. Explain in detail about non-probability sampling techniques.
6. Write in detail about Hazard ratio and how to interpret it?
7. What is a variable? What are the different types of variables?
8. Graphical representation of continuous data.
9. What is mean by standardization and what are the types of standardization?
10. How will you calculate sample size for a cross sectional study with the population prevalence of 25% with an error margin of 5% and a 95% confidence interval?

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[AHS 1025]

OCTOBER 2025

Sub. Code: 1902

**M.Sc. PUBLIC HEALTH
FIRST YEAR (From 2017-2018 onwards)
PAPER II – PRINCIPLES OF BIO - STATISTICS**

Q.P. Code: 281902

Time: Three hours

Answer ALL Questions

Maximum: 100 Marks

I. Elaborate on:

(2 x 20 = 40)

1. Sampling distribution, standard error and confidence interval.
2. a) Steps involved in testing the hypothesis.
b) Difference between Large and small tests of significance.

II. Write notes on:

(10 x 6 = 60)

1. Visualization and tests to determine normality.
2. Difference between parametric and non-parametric tests.
3. Poisson distribution with example.
4. A sample of 150 hospital emergency admissions with a certain diagnosis, 128 listed vomiting as a presenting symptom. Does the data provide sufficient evidence to indicate, at 1% level of significance, that the proportion of vomiting is different from 92%?
5. Importance of Crude birth rate, infant mortality rate and neonatal mortality rate in public health policies.
6. Concept of correlation and how will you measure the degree of correlation between two variables.
7. Cox-PH test and its assumptions.
8. Application of receiver operating characteristic curve in health care data.
9. Concept of power and error used in sample size calculation.
10. Sampling and non-sampling bias.
