

# Contents

Preface	V
<b>Ch. 1. INTRODUCTION</b>	<b>1-4</b>
1.1 Introduction	1
1.2 Historical Perspective	1
1.3 Applications of Statistics	1
1.4 Characteristics of Statistics	2
1.5 Limitation of Statistics	2
1.6 Introduction to Bio-statistics	2
1.7 Bio-Statistics	2
1.8 Applications and Uses of Bio-Statistics	3
1.9 Scope of Bio-Statistics	3
<b>Ch. 2. SAMPLING AND INFERENCES</b>	<b>5-10</b>
2.1 Introduction	5
2.2 Sampling	5
2.3 Types of Sampling	5
2.4 Characteristics of a Good Sample Design	7
2.5 Techniques for Random Sampling	7
2.6 Stratified Random Sampling	8
2.7 Systematic Random Sampling	9
2.8 Limitations of Sampling	9
<b>Ch. 3. STATISTICAL DATA</b>	<b>11-32</b>
3.1 Introduction	11
3.2 Sources of Data	12
3.3 Methods of Collecting Primary Data	12
3.4 Schedule and Questionnaire	13
3.5 Methods of Collecting Secondary Data	14
3.6 Classification of Data	14
3.7 Statistical Series	16
3.8 Tabulation of Data	18
3.9 Frequency Distribution	20
3.10 Grouped Frequency Distribution	21
3.11 Cumulative Frequency	24
<b>Ch. 4. GRAPHICAL REPRESENTATION OF DATA</b>	<b>33-54</b>
4.1 Introduction	33
4.2 Types of Diagrams	33
4.3 One-Dimensional Diagram	33
4.4 Two-Dimensional Diagrams	36
4.5 Three Dimensional Diagrams	38
4.6 Pie Diagrams	39

4.7	Cartograms	40
4.8	Pictogram	40
4.9	Historigrams	40
4.10	Graphical Representatoin of Data	41
4.11	Graphs of Frequency Distributions	42
4.12	Types of Frequency Curve	45
<b>Ch. 5.</b>	<b>MEASURE OF CENTRAL TENDENCY</b>	<b>55-94</b>
5.1	Introduction	55
5.2	Kinds of Statistical Averages	55
5.3	Arithmetic Mean	55
5.4	Combined Mean	66
5.5	Geometric Mean	67
5.6	Harmonic Mean	71
5.7	Median	73
5.8	Quartiles	78
5.9	Quantiles	79
5.10	Decile and Percentile	79
5.11	Mode	84
5.12	Empirical Formula	86
<b>Ch. 6.</b>	<b>MEASURE OF DISPERSION AND SKEWNESS</b>	<b>95-136</b>
6.1	Introduction	95
6.2	Measure of Dispersion	95
6.3	Range	96
6.4	Interquartile Range and Semi-Quartile Deviation	98
6.5	Average Deviation or Mean Deviation	101
6.6	Absolute and Relative Measure of Dispersion	106
6.7	Standard Deviation and Root Mean Square Deviation	107
6.8	Short Cut Method to Calculate the Standard Deviation of Discrete Series	111
6.9	Summary of the Mathematical Properties of Standard Deviation	116
6.10	Relation between Different Measures of Central Tendency and Measure of Skewness	118
6.11	Relation between Different Measures of Dispersion	118
6.12	Standard Deviation of Two Combined Sets	123
6.13	Skewness	128
6.14	Measure of Skewness	128
<b>Ch. 7.</b>	<b>CORRELATION AND REGRESSION</b>	<b>137-162</b>
7.1	Introduction	137
7.2	Multivariate and Bivariate Data	137
7.3	Correlation	137
7.4	Types of Correlation	138
7.5	Perfect Correlation	138
7.6	Methods for Finding the Correlation	138
7.7	Coefficient of Correlation for Grouped Distribution	144

7.8 Rank Correlation	146
7.9 Regression	150
7.10 Properties of Regression Coefficients	151
7.11 Angle between Two Lines of Regression	151
7.12 Multiple Linear Regression	156
<b>Ch. 8. PROBABILITY AND DISTRIBUTIONS</b>	<b>163-206</b>
8.1 Introduction	163
8.2 Classical (or Prior) Probability	164
8.3 Rules on Probability	168
8.4 Conditional Probability	169
8.5 Dependent and Independent Events	169
8.6 Probability of Happening of at least One of Independent Events	171
8.7 Law of Total Probability and Bayes' Theorem	172
8.8 Random Variables and Probability Distribution	177
8.9 Probability Distributions	177
8.10 Binomial Distribution	180
8.11 Applicability of Binomial Distribution	181
8.12 Moments of the Binomial Distribution	181
8.13 Poisson Distribution	187
8.14 Limiting Form of Binomial Distribution	188
8.15 Moments of Poisson Distribution	188
8.16 Moment Generating Function (M.G.F.) of Poisson Distribution	190
8.17 Cumulant Generating Function of Poisson Distribution	190
8.18 Normal Distribution	194
8.19 Standard Form of the Normal Curve	195
8.20 Properties of the Normal Distribution	195
8.21 Fitting of Normal Distribution	196
8.22 Moment Generating Function of Normal Distribution	197
8.23 Cumulant Generating Function of Normal Distribution	197
<b>Ch. 9. TESTS OF SIGNIFICANCE</b>	<b>207-252</b>
9.1 Introduction	207
9.2 Types of Population	207
9.3 Statistical Hypothesis	207
9.4 Null and Alternative Hypothesis	208
9.5 Tests of Significance	208
9.6 Level of Significance	208
9.7 Critical Region and Acceptance Region	208
9.8 Type-I And Type-II Errors	209
9.9 Best Critical Region	210
9.10 One Tail and Two Tail Tests	210
9.11 Test of Significance of Large Samples	212
9.12 Standard Error	212

<i>Biostatistics</i>	<i>x</i>
9.13 Probable Error	213
9.14 Test of Significance in Case of Attributes (Large Samples)	213
9.15 Confidence Limits of Unknown P	214
9.16 Test of Significance of Mean (Large Sample of Variables)	215
9.17 Testing the Significance of the Difference between the Means of Two Large Samples	216
9.18 Test of Significance of Difference between the Sample Proportion	219
9.19 Test of Significance of Difference between the Standard Deviation (Large Samples)	220
9.20 Students 't' Test	221
9.21 Paired t-Test for difference of Means	230
9.22 F-Test of Equality of Population Variance	232
9.23 Analysis of Variance (ANOVA)	236
<b>Ch. 10. CHI-SQUARE TEST</b>	<b>253-270</b>
10.1 Introduction	253
10.2 Chi-Square ( $\chi^2$ ) Test	253
10.3 Applications of $\chi^2$ Distribution	253
10.4 Chi-Square ( $\chi^2$ ) Test for Goodness of Fit	254
10.5 $\chi^2$ -Test for Independence of Attributes	260
<b>Ch. 11. VITAL STATISTICS (DEMOGRAPHY AND MEASURE OF POPULATIONS)</b>	<b>271-284</b>
11.1 Introduction	271
11.2 Demography	271
11.3 Population Census	271
11.4 Vital Biostatistics	271
11.5 Methods of Obtaining Vital Statistics	272
11.6 Measures of Population	272
11.7 Measure of Vital Statistics	274
11.8 Measurement of Mortality	275
11.9 Infant Mortality Rates	276
11.10 Fertility Rates	277
11.11 Life Table	278
11.12 Construction of a Life Table	278
<b>Ch. 12. DESIGNING AND METHODOLOGY OF RESEARCH</b>	<b>285-292</b>
12.1 Introduction	285
12.2 Methodology and Designing	285
12.3 Research Protocols	287
12.4 Some Common Study Designs	288
12.5 Clinical Trial	288
12.6 Research Publications : General Terms	289
● <b>APPENDIX: SELECTED TABLES</b>	<b>293-308</b>
● <b>BIBLIOGRAPHY</b>	<b>309-310</b>
● <b>INDEX</b>	<b>311-312</b>