Table of Contents

Preface iii
Acknowledgment v

CHAPTER

1 **Basic Concepts of Statistics** 1
Introduction 3
Classification of Data 4
Classification of Variable 5
Level of Measurements 6
Exercise 1.1 9
Exercise 1.2 11
Exercise 1.3 13

2 **Collection of Data** 15
Sources of Data 17
Methods of Collection of Data 17
Sample Size Formula 18
Sampling Technique 18
Exercise 2.1 21
Exercise 2.2 23

3 **Presentation of Data** 25
Methods of Presentation of Data 27
Exercise 3.1 31
Exercise 3.2 33

4 **Frequency Distribution Table** 35
How to Construct Frequency Distribution Table 37
Types of Frequency Distribution 43
Exercise 4.1 45

5 **Measure of Central Tendency** 47
Mean 49
Median 54
How to Get the Median Class? 55
Mode 58
How to Get the Modal Class? 59
Quantiles 61
Exercise 5.1 65
Exercise 5.2 67

6 Measure of Variation **69**
Range (*R*) 71
Quartile Deviation (*QD*) 71
Mean Absolute Deviation (*MAD*) 71
Standard Deviation 72
Variance 72
Exercise 6.1 ..... **77**

7 Relative Dispersion, Skewness and Kurtosis **79**
Coefficient of Variation 81
Coefficient of Quartile Deviation (*CQD*) 81
Skewness (*SK*) 81
Kurtosis (*Ku*) 82
Exercise 7.1 ..... **93**

8 Normal Distribution Curve **95**
Properties of Normal Curve 97
Areas under the Curve 98
Exercise 8.1 ..... **105**

9 Hypothesis Testing **109**
Type I and Type II Error 111
Terminologies in Hypothesis Testing 111
Z - Test 112
Steps in Hypothesis Testing 112
T-Test 117
Exercise 9.1 ..... **123**

10 Non-Parametric Testing **127**
Chi- Square 128
Goodness- of-Fit Test (The One Variable Chi-Square) 129
One Variable Chi-Square with One Variable of Unequal Expected Frequencies 130
Chi-Square Test of Independence 132
Analysis of Variance (ANOVA) 134
The F-Test 134
Steps in F-Test (Raw Score Method) 134
Steps in ***F-Test*** (deviation method): 136
Exercise 10.1 ..... **143**

11 Simple Regression, and Correlation **147**
Correlation Analysis 149
Pearson's Product – Moment Correlation Coefficient: 150
Spearman Rank Order Correlation Coefficient 155
Regression Analysis 158
Linear Regression 158

Coefficient of Determination (r^2) 158
Exercise 11.1 ..... **163**
Exercise 11.2 ..... **167**

12 Probability **171**
Sample Space 173
The Algebra of Sets 173
Terminologies and Notations 173
Types of Sets 174
Basic Operations in Sets 175
Sample Problems 177
Exercise 12.1 ..... **187**
Exercise 12.2 ..... **189**
Exercise 12.3 ..... **191**
Exercise 12.4 ..... **193**
Probability Function 197
Some Basic Properties of Probability 197
Odds versus Probability 197
Conditional Probability 201
Exercise 12.5 ..... **205**
Exercise 12.6 ..... **207**
Combinatorics 209
Combination versus Permutation 213
Exercise 12.7 ..... **215**

Appendices

Table 1: Normal Distribution Curves Areas 217
Table 2: Tabular Value for ***Z*** in ***Z***-Test 218
Table 3: Tabular Value for ***T*** in ***T***-Test 218
Table 4: Critical Values of Chi-quared (x^2) 219
Table 5: ANOVA ***(F- Tabular Values)*** 220
Level of Significance = 5% 221
Level of Significance = 2.5% 222
Level of Significance = 1.0% 223

Bibliography **225**