Punyashlok Ahilyadevi Holkar Solapur University, Solapur

NAAC Accredited-2015
'B' Grade (CGPA 2.62)

Name of the Faculty: Science & Technology

CHOICE BASED CREDIT SYSTEM

Syllabus: STATISTICS

Name of the Course: B.Sc. I (Sem–I & II)

(To be effective from the academic year June-2019).

PUNYASHLOK AHILYADEVI HOLKAR SOLAPUR UNIVERSITY, SOLAPUR.

B.Sc. Part-I (STATISTICS) Choice Based Credit and Grading System Semester Pattern Syllabus

(To be implemented from June, 2019)

Choice Based Credit System: With the view to ensure worldwide recognition, acceptability, horizontal as well as vertical mobility for students completing undergraduate degree, Punyashlok Ahilyadevi Holkar Solapur University has implemented Choice Based Credit System (CBCS) at Undergraduate level.

The CBCS provides an opportunity for the students to choose courses from the prescribed courses comprising core, elective/ minor or skill based courses. The courses can be evaluated following the grading system, which is considered to be better than the conventional marks system. Therefore, it is necessary to introduce uniform grading system in the entire higher education in India. This will benefit the students to move across institutions within India to begin with and across countries. The uniform grading system will also enable potential employers in assessing the performance of the candidates. In order to bring uniformity in evaluation system and computation of the Cumulative Grade Point Average (CGPA) based on Student's performance in examinations.

Outline of Choice Based Credit System:

1. ***Core Course:*** A course, which should compulsorily be studied by a candidate as a core requirement is termed as a Core course.

2. ***Elective Course:*** Generally a course which can be chosen from a pool of courses and which may be very specific or specialized or advanced or supportive to the discipline/ subject of study or which provides an extended scope or which enables an exposure to some other discipline/subject/domain or nurtures the candidate's proficiency/skill is called an Elective Course.

Discipline Specific Elective (DSE) Course: Elective courses may be offered by the main discipline/subject of study is referred to as Discipline Specific Elective.

3. ***Ability Enhancement Courses (AEC):*** The Ability Enhancement (AE) Courses may be of two kinds: **Ability Enhancement Compulsory Courses (AECC)** and **Skill Enhancement Courses (SEC).** "AECC" courses are the courses based upon the content that leads to Knowledge enhancement; (i) Environmental Science and (ii) English/MIL Communication. These are mandatory for all disciplines. SEC courses are value-based and/or skill-based and are aimed at providing hands-on-training, competencies, skills, etc.

· **Credit:** Credit is a numerical value that indicates students work load (Lectures, Lab work, Seminar, Tutorials, Field work etc.) to complete a course unit. In most of the universities 15 contact hours constitute one credit. The contact hours are transformed into credits. Moreover, the grading system of evaluation is introduced for B.Sc. course wherein process of Continuous Internal Evaluation is ensured. The candidate has to appear for Internal Evaluation of 20 marks and University Evaluation for 80 marks.

Punyashlok Ahilyadevi Holkar Solapur University, Solapur

Faculty of Science

Choice Based Credit System (CBCS),(w.e.f.2019-20) Structure for B. Sc-I Statistics

Subject/ Core Course	Name and Type of the Paper		No. of papers/ Practical	Hrs/week			Total Marks Per Paper	UA	CA	Credits
	Type	Name		L	T	P				
Class	**B.Sc. I Semester-I**									
Ability Enhancement Course(AECC)	English (communication skill)		Paper- I	4.0			100	80	20	4.0
Core (*Students can opt any Four Subjects from the Twelve Subjects Listed below. Out of these Four Subjects One Subject will be CORE and other Three will be ELECTIVE Subjects.)	DSC 1A		Paper-I	2.5	--	--	50	40	10	4.0
			Paper-II	2.5	--	--	50	40	10	
	DSC 2A		Paper-I	2.5	--	--	50	40	10	4.0
			Paper-II	2.5	--	--	50	40	10	
	DSC 3A		Paper-I	2.5	--	--	50	40	10	4.0
			Paper-II	2.5	--	--	50	40	10	
	DSC 4A **Statistics**		Paper-I **Descriptive Statistics-I**	2.5	--	--	50	40	10	4.0
			Paper-II **Probability and Probability Distribution-I**	2.5	--	--	50	40	10	
Total				**24**	--	--	**500**	**400**	**100**	**20**
Class	**B.Sc. I Semester-II**									
Ability Enhancement Course(AECC)	English (Communication skill)		Paper- II	4.0			100	80	20	4.0
Core (*Students can opt any Four Subjects from the Twelve Subjects Listed below. Out of these Four Subjects One Subject will be CORE and other Three will be ELECTIVE Subjects.)	DSC 1B		Paper-III	2.5	--	--	50	40	10	4.0
			Paper-IV	2.5	--	--	50	40	10	
	DSC 2B		Paper-III	2.5	--	--	50	40	10	4.0
			Paper-IV	2.5	--	--	50	40	10	
	DSC 3B		Paper-III	2.5	--	--	50	40	10	4.0
			Paper-IV	2.5	--	--	50	40	10	
	DSC 4A **Statistics**		Paper-III **Descriptive Statistics-II**	2.5	--	--	50	40	10	4.0
			Paper-I**V** **Probability and Probability Distribution-II**	2.5	--	--	50	40	10	
	Democracy, Elections and Good Governance			3.0			50	40	10	NC
Total (Theory)				**27**	--	--	**550**	**440**	**110**	**20**
Core	DSC 1 A & 1B		Practical I and II	--	--	4	100	80	20	4.0
	DSC 2 A & 2B		Practical I and II	--	--	4	100	80	20	4.0
	DSC 3A & 3B		Practical I and II	--	--	4	100	80	20	4.0
	DSC 4A & 4B **Statistics**		Practical I and II	--	--	4	100	80	20	4.0
Total (Practical)						**16**	**400**	**320**	**80**	**16**
Grand Total				**51**		**16**	**1450**	**1160**	**290**	**56**

***Core Subjects**

Chemistry/Physics/Electronics/Computer Science/Mathematics/Statistics/Botany/Zoology/ Microbiology/Geology/ Geography/Psychology

PUNYASHLOK AHILYADEVI HOLKAR SOLAPUR UNIVERSITY, SOLAPUR.

B.Sc. Part-I (STATISTICS) Choice Based Credit and Grading System Semester Pattern

Syllabus

(To be implemented from June, 2019)

Title of the course: B.Sc. Part-I Statistics (Semesters I and II)

Introduction: Statistics is the study of the collection, organization, analysis, interpretation, and presentation of data. Statistics plays a vital role in every fields of human activity. Statistics has important role in determining the existing position of per capita income, unemployment, population growth rate, housing, schooling medical facilities etc…in a country. Now statistics holds a central position in almost every field like Industry, Commerce, Trade, Physics, Chemistry, Economics, Mathematics, Biology, Botany, Psychology, Astronomy etc., so application of statistics is very wide. Today, statistics is increasingly becoming important in a number of professions, and people from all walks of life actively use statistics, from politicians and business leaders to engineers and biologists.

There are at least three reasons for studying statistics: (1) data are everywhere, (2) statistical techniques are used to make many decisions that affect our lives, and (3) no matter what your career, you will make professional decisions that involve data. An understanding of statistical methods will help you make these decisions more effectively.

Eligibility of the course: Standard XII Science or equivalent examination passed.

Duration: One year divided into two semesters.

Medium of instruction: English

· **Scheme of Evaluation**

As per the norms of the grading system of evaluation, out of 100 marks, the candidate

has to appear for college internal assessment of 20 marks and external evaluation

(University assessment) of 20 marks.

Semester – I:

Theory: (100 marks)

University Examination (80 marks): No. of theory papers: 2 (paper I and paper II of 40 marks each)

Internal Continuous Assessment: (20 marks and 10 marks each for two papers)

(a) Internal test- Home assignment / tutorials / seminars / viva/ group discussion/ outreach programs.

Semester – II

Theory: (100 marks)

University Examination (80 marks): No. of theory papers: 2 (paper III and paper IV of 40 marks each)

Internal Continuous Assessment: (20 marks and 10 marks each for two papers)

(a) Internal test- Home assignment / tutorials / seminars / viva/ group discussion/ outreach programs.

Practical Examination: (100 marks)

University Examination (80 marks): No. of practical course: 1

Internal Continuous Assessment: (20 marks)

(a) Internal practical test - Scheme of marking: **10 marks**

(b) Viva/group discussion/model or chart/attitude/attendance/overall behavior: **10 marks**

Passing Standard

The student has to secure a minimum of 4.0 grade points (Grade C) in each paper. A student who secure less than 4.0 grade point (39% or less marks, Grade FC/FR) will be declared fail in that paper and shall be required to reappear for respective paper. A student who failed in University Examination (theory) and passed in internal assessment of a same paper shall be given FC Grade. Such student will have to reappear for University Examination only. A student who fails in internal assessment and passed in University examination (theory) shall be given FR Grade. Such student will have to reappear for both University examination as well as internal assessment. In case of Annual pattern/old semester pattern students/candidates from the mark scheme the

candidates shall appear for the same 70 marks of external examination and his performance shall be scaled to 100 marks.

ATKT

Candidate passed in all papers, except **5 (five)** papers combined together of semester I and II of B.Sc. Part-I Statistics examination shall be permitted to enter upon the course of Semester III of B.Sc. Part-II Statistics

STRUCTURE OF COURSE

Semester No.	Paper No.	Title of the Paper	Marks
I	STATISTICS PAPER-I	Descriptive Statistics-I	50 (40-UA and 10-CA)
	STATISTICS PAPER-II	Probability and Probability Distributions-I	50 (40-UA and 10-CA)
II	STATISTICS PAPER-III	Descriptive Statistics-II	50 (40-UA and 10-CA)
	STATISTICS PAPER-IV	Probability and Probability Distributions-II	50 (40-UA and 10-CA)
ANNUAL EXAM.	STATISTICS PRACTICAL	Statistics Practical Paper-I	100 (80-UA and 20-CA)

Teaching Periods:

1. Total teaching periods for Two Theory Papers are five periods per week in each semester.
2. Total teaching periods for Practical-I are four periods per week per batch.

Duration of examination:

1. For each theory paper of 50 marks two hours.
2. For Practical Paper-I (Four hours for a Batch 20 Students) annually.

SEMESTER-I

STATISTICS PAPER – I: Descriptive Statistics-I

STATISTICS PAPER –II: Probability and Probability Distributions-I

Objectives:

The main objective of this course is to acquaint students with some basic concerns statistics. They will be introduced to some elementary statistical methods of analysis and Probability at the end of this course students are expected to be able.

1. To prepare frequency distribution and represent it by graphically with the help of tables.
2. To compute various measures of central tendency, dispersion, moments, Skewness, Kurtosis and to interpret them.
3. To distinguish between random and non-random experiments.
4. To find the probabilities of the events.

CORE COURSE-I (Total Credits: 4)

PAPER-I: Descriptive Statistics-I

(Total Credits: 2.0, Contact Hrs: 30.0)

Unit – 1 Nature of Data: (07)

1.5 Meaning of primary and secondary data.

1.6 Qualitative data (Attributes): Nominal Scale and Ordinal scale, Quantitative data (Variables): Interval Scale and ratio scale, discrete and continuous variables, raw data.

1.7 Classification of data: Discrete and continuous frequency distribution, inclusive and exclusive methods of classification, cumulative frequency distribution, relative frequency.

1.8 Graphical representation of data: Histogram, frequency polygon, frequency curve and Ogive curves.

1.9 Illustrative Examples.

Unit – 2 Measures of Central Tendency: (09)

2.1 Concept of central tendency of statistical data, statistical average, requirements of

good statistical average.

2.2 Arithmetic Mean (A. M.): Definition, effect of change of origin and scale, deviation of observations from A. M., Mean of pooled data, weighted A. M.

2.3 Geometric Mean (G. M.): Definition

2.4 Harmonic Mean (H. M.): Definition

2.5 Relation: A. M. $\geq$ G. M. $\geq$ H. M. (Proof for n = 2, positive observations)

2.6 Median: Definition, Derivation of formula for grouped frequency distribution.

2.7 Mode: Definition for ungrouped and grouped data derivation of formula

2.8 Empirical relation between Mean, Median and Mode

2.9 Partition Values: Quartiles, Deciles and Percentiles

2.10 Graphical method of determination of Median, Mode and Partition values.

2.11 Comparison between averages in accordance with requirements of good average.

2.12 Situations where one kind of average is preferable to others.

2.13 Examples to illustrate the concept.

Unit – 3 Measures of Dispersion: (07)

3.1 Concept of dispersion, Absolute and Relative measures of dispersion, Requirements of a good measure of dispersion.

3.2 Range: Definition, Coefficient of range.

3.3 Quartile Deviation (Semi-inter quartile range): Definition, coefficient of Q.D.

3.4 Mean Deviation: Definition, coefficient of M. D., Minimal property of M. D.

3.5 Mean Square Deviation, Definition, minimal property of M. S. D.

3.6 Variance and Standard Deviation: Definition, Effect of change of origin and scale, S. D. of pooled data (without proof).

3.7 Coefficient of Variation: Definition and use.

3.8 Comparison of absolute and relative measures of dispersion.

3.9 Examples of illustrate the concept.

Unit – 4 Moments, Skewness and Kurtosis: (07)

4.1 Moments: Raw moments (μ'_r) and central moments (μ_r) for ungrouped and grouped data.

4.2 Effect of change of origin and scale on moments, relation between central moments and raw moments (up to 4th order)

4.3 Sheppard's correction, need of Sheppard's correction and its importance.

4.4 Skewness: Concept of Skewness of a frequency distribution, Types of Skewness and its interpretation.

4.5 Bowley's coefficient of skewness, Karl Pearson's coefficient of skewness, Measure of

skewness based on moments.

4.6 Kurtosis: Concept of kurtosis of a frequency distribution, Types of kurtosis and its interpretations.

4.7 Measure of kurtosis based on moments.

4.8 Illustrative Examples.

PAPER –II: Probability and Probability Distributions-I

(Total Credits: 2.0, Contact Hrs: 30.0)

Unit –1 Sample Space and Events: (05)

1.1 Concepts of experiments and random experiments.

1.2 Definitions: Sample space, discrete sample space (finite and countably infinite), event, elementary event, compound event.

1.3 Algebra of events (Union, Intersection, complementation)

1.4 Definitions of Mutuality exclusive events, Exhaustive events, impossible events, certain events.

1.5 Power ser IP (Ω) (sample space consisting at most 4 sample points).

1.6 Symbolic representation of given events and description of events in symbolic form.

1.7 Illustrative examples.

Unit – 2 Probability: (10)

2.1 Equally likely outcomes (events), apriori (classical), definition of probability of an event. Equiprobable sample space, simple examples of computation of probability of the events based on Permutations and Combinations.

2.2 Axiomatic definition of probability with reference to a finite and countably infinite sample space.

2.3 Proof of the results : i) $P(\Phi) = 0$ ii) $P(A^c) = 1 - P(A)$

iii) $P(A \cup B) = P(A) + P(B) - P(A \cap B)$ (with proof), extension of this to $P(A \cup B \cup C)$. iv) If $A \subset B$, $P(A) \leq P(B)$.

v) $0 \leq P(A \cap B) \leq P(A) \leq P(A \cup B) \leq P(A) + P(B)$

vi) $P(A \cap B^c) = P(A) - P(A \cap B)$

2.4 Illustrative examples based on the results in 2.3 above.

Unit – 3 Conditional Probability and Independence of Events: (08)

3.1 Definition of conditional probability of an event.

3.2 Multiplication theorem for two events $P(A \cap B) = P(A)\, P(B/A)$

3.3 Partition of Sample space

3.4 Idea of Posteriori probability, statement and proof of Bayes theorem, examples on Bayes theorem.

3.5 Concept of Independence of two events.

3.6 Proof of the result that if A and B are independent then,

i) A and B^c, ii) A^c and B, iii) A^c and B^c are independent.

3.7 Pairwise and Mutual Independence for three events.

3.8 Elementary examples.

Unit – 4 Univariate Probability Distribution: (Defined on finite and countable infinite sample space) (07)

4.1 Definition of discrete random variables.

4.2 Probability mass function (p.m.f.) and cumulative distribution function (c.d.f.),a discrete random variable, properties of c.d.f. (statements only)

4.3 Probability distribution of function of a random variable.

4.4 Median and Mode of a univariate discrete probability distribution.

4.5 Examples

SEMESTER-II

STATISTICS PAPER –III: Descriptive Statistics-II

STATISTICS PAPER –IV: Probability and Probability Distributions-II

Objectives:

The main objective of this course is to acquaint students with some basic concept of random variable, probability distribution (univariate and bivariate). By the end of this course students are expected to be able.

1. To compute correlation coefficient and interpret its value.
2. To analysis data pertaining to attributes and to interpret the results.
3. Use the index numbers to various fields.
4. To apply discrete probability distributions studied in this course in different situations.

CORE COURSE-I (Total Credits: 4)

PAPER-III: Descriptive Statistics-II

(Total Credits: 2.0, Contact Hrs: 30.0)

Unit – 1 Correlation: (08)

1.1 Bivariate data

1.2 Concept of correlation between two variables, types of correlation.

1.3 Scatter diagram, its utility

1.4 Covariance : Definition, effect of change of origin and scale.

1.5 Karl Pearson's coefficient of correlation (r) : Definition, Computation for ungrouped and grouped data. Properties (with proof) : i) $-1 \leq r \leq 1$ ii) Effect of change of origin & scale.

1.6 Interpretation when r = -1, 0, 1.

1.7 Spearman's rank correlation coefficient : Definition, Computation (for with and without ties). Derivation of the formula for without ties.

1.8 Illustrative Examples.

Unit – 2 Regression: (08)

2.1 Concept of regression, Lines of regression, fitting of lines of regression by the least square method.

2.2 Regression coefficients (bxy , byx) and their geometric interpretations,

Properties : i) $b_{xy} \times b_{yx} = r^2$ ii) $b_{xy} \times b_{yx} \leq 1$

iii) $(b_{xy} + b_{yx}) / 2 \geq r$ iv) Effect of change of origin and scale on regression coefficients.

2.3 The point of intersection of two regression lines.

2.4 Derivation of acute angle between the two lines of regression.

2.5 Illustrative Examples.

Unit – 3 Theory of Attributes: (08)

3.1 Attributes: Notation, dichotomy, class frequency, order of class, positive and negative class frequency, ultimate class frequency, fundamental set of class frequency, relationships among different class frequencies (up to three attributes)

3.2 Concept of Consistency, conditions of consistency (upto three attributes)

3.3 Concept of Independence and Association of two attributes.

3.4 Yule's coefficient of association (Q) : Definition, interpretation.

3.5 Coefficient of colligation (Y) : Definition, Interpretation.

3.6 Relation between Q and Y: $Q = 2Y / (1 + Y^2)$, $|Q| \geq |Y|$, $0 \leq |Y| \leq |Q| \leq 1$.

3.7 Illustrative Examples.

Unit - 4: Index Numbers: (06)

4.1 Meaning and utility of price index numbers, problems in construction of index numbers.

4.2 Unweighted price index numbers using: i) Aggregate method

ii) Average of price or quantity relatives method (A. M. or G. M. to be used as average).

4.3 Weighted price index numbers using aggregate method: Laspeyre's, Paasche's, Fisher's Formulae, cost of living index numbers.

4.4 Tests of Index numbers (time reversal and factor reversal test).

4.5 Illustrative Examples.

PAPER –IV: Probability and Probability Distributions-II

(Total Credits: 2.0, Contact Hrs: 30.0)

Unit – 1 Mathematical Expectation (Univariate Random Variable) : (06)

1.1 Definition of expectation of a random variable, expectation of a function of a random variable.

1.2 Results on expectation : i) $E(c) = c$, where c is a constant.

ii) $E(aX+b) = a\,E(X) + b$,

where a and b are constants

1.3 Definitions of mean, variance of univariate distributions. Effect of change of origin and scale on mean and variance.

1.4 Definition of raw and central moments and factorial moments upto order 2.

1.5 Definition of probability generating function (p.g.f.) of a random variable. Effect of change of origin and scale. Definition of mean and variance by using p.g.f.

1.6 Simple Examples.

Unit – 2 Bivariate Probability Distribution (Defined on finite sample space) : (07)

2.1 Definition of two dimensional discrete random variable, its p.m.f. and distribution function.

2.2 Computation of probabilities of events in bivariate probability distributions.

2.3 Concepts of marginal and conditional probability distributions.

2.4 Independence of two discrete random variables.

2.5 Examples.

Unit – 3 Mathematical Expectation (Bivariate discrete random variable) : (08)

3.1 Definition of expectation in bivariate distributions.

3.2 Theorems on expectation : E(X + Y), E(XY) (Statement only).

3.3 Expectation and variance of linear combination of two discrete random variables. (Statement only).

3.4 Probability generating function of sum of two independent random variables.

3.5 Conditional expectation in bivariate probability distributions.

3.6 Definition of conditional mean, variance in bivariate probability distributions

3.7 Definition of covariance and correlation coefficient in bivariate probability distributions, distinction between uncorrelated variables and independent variables.

3.8 Examples.

Unit – 4 Some Standard Discrete Probability Distributions : (09)

4.1 Idea of one point, two point distributions and their mean and variance.

4.2 Bernoulli Distribution p.m.f., mean, variance, distribution of sum of, independent and identically distributing Bernoulli variables.

4.3 Discrete Uniform Distribution: p.m.f. mean and variance.

4.4 Binomial Distribution: p.m.f. $P(x) = {}^{n}C_{x}\, P^{x}\, q^{n-x}$, x= 0,1,2,3,----,n.

$0 \leq p \leq 1$, $q = 1 - p$.

= 0., otherwise

Notation : $X \sim B(n, p)$, recurrence relation for successive probabilities, computation of probabilities of different events. p.g.f. and hence or otherwise mean and variance, Examples.

4.5 Hypergeometric Distribution : p.m.f.

$${}^{M}C_{x}\, {}^{N-M}C_{n-x}$$

$$P(x) = \frac{{}^{M}C_{x} \; {}^{N-M}C_{n-x}}{{}^{N}C_{n}}, \quad x = \max(0, n-(N-M)), \ldots \min(n, M)$$

$$= 0 \qquad \text{o. w.}$$

Notation : $X \sim H(N, M, n)$, mean and variance of distribution assuming $n \leq N - M \leq M$, Examples.

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Books Recommended:

1. Bhat B. R., Srivenkatramana, T and Madhava K. S. (1996) : Statistics : A Beginner's Text Vol. 1, New Age International (P), Ltd.

2. Croxton F. E., Cowden D. J. and Kelin S. (1973) : Applied General Statistics, Prentice Hall of India.

3. Goon, Gupta and Dasgupta: Fundamentals of Statistics Vol. I & II, World Press, Calcutta.

4. Gupta S. P : Statistical Methods.

5. Snedecor G. W.and Cochran W. G. (1967) : Statistical Methods Lowa State University Press.

6. Walker and Lev : Elementary Statistical Methods.

7. Applied Statistics : Gupta and Kapoor.

8. Dr. P.G. DIXIT, Dr. Mrs. S.V. Rajmanya, R.V. Rajmane, Dr. P.M. Dargopatil : Descriptive Statistics-I Statistics Paper-I B.Sc. Part-I Semester-I
Publisher: Nirali Prakashan, Pune.

9. Dr. P.G. DIXIT, Dr. Mrs. S.V. Rajmanya, R.V. Rajmane, Dr. P.M. Dargopatil : Probability and Probability Distributions-I Statistics Paper-II B.Sc. Part-I Semester-I
Publisher: Nirali Prakashan, Pune.

10. Fundamentals of Mathematical statistics: Gupta & Kapoor.

11. Mood A. M., Graybill F. A. and Boes D. C. (1974) : Introduction to the Theory of Statistics, McGraw Hill.

12. Hoel P. G. (1971) : Introduction to Mathematical Statistics, Asia Publishing House.

13. Meyer P. L. (1970) : Introductory Probability and Statistical Applications, Addison Wesley.

14. Rohatgi V. K. and Saleh A. K. Md E(2002) : An introduction to probability and statistics , John Wiley and Sons (Asia).

15. Hogg R. V. and Crag R. G. : Introduction to Mathematical Statistics Ed. 4

15. Kumbhojkar G. V. Mathematical Statistics Paper I & II

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STATISTICS PRACTICAL PAPER – I

Pre requisites : Knowledge of the topics in the theory papers.

Objectives : At the end of this course students are expected to be able

1) To represent statistical data by graphically.
2) To compute various measures of central tendency, dispersion , moments, skewness, and kurtosis.
3) To compute correlation coefficient, regression coefficients.
4) To analyze data pertaining to discrete and continuous variables and to interpret the results.
5) To understand consistency, association and independence of attributes.
6) To compute price index number, quantity index number.
7) To compute probabilities of bivariate distributions.
8) To know applications of some standard discrete probability distributions.

LIST OF PRACTICALS

1.1) Graphical representation of the frequency distribution (Histogram, frequency polygon, frequency curve, Location of Mode, Ogive curves, Location of Partition values)

1.2) Measures of Central tendency- I (Ungrouped data)

1.3) Measures of Central tendency-II (Grouped data)

1.4) Measures of the Dispersion -I (Ungrouped data)

1.5) Measures of the Dispersion -II (Grouped data)

1.6) Moments, Skewness and Kurtois – I (Ungrouped data)

1.7) Moments, Skewness and Kurtois – II (Grouped data)

1.8) Correlation Coefficient and Spearman's Rank Correlation Coefficient (Ungrouped data)

1.9) Correlation Coefficient: (Grouped data)

1.10) Regression – I (Ungrouped data)

1.11) Regression – II (Grouped data)

1.12) Attributes-I: (Missing frequencies and Consistency)

1.13) Attributes- II: (Association and Independent of Attributes)

1.14) Fitting of Discrete Uniform distribution and test for goodness of fit.

1.15) Fitting of Binomial distribution and test for goodness of fit.

1.16) Fitting of Hypergeometric distribution and test for goodness of fit.

1.17) Model Sampling from Discrete Uniform distribution.

1.18) Model Sampling from Binomial distribution.

1.19) Model Sampling from Hypergeometric distribution.

1.20) Index Numbers.

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Note :

1) Students are allowed to use any type of calculator or computer using any software like MS-Excel for computations in practicals.

2) Student must complete all the practicals to the satisfaction of the teacher concerned.

3) Students must produce laboratory journal along with completion certificate signed by Head of the Department at the time of practical examination.

Laboratory Requirements :

Laboratory should be well equipped with sufficient number of electronic calculators and computers along with necessary software, UPS and printers.

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Nature of Practical Question Paper

B. Sc. Part – I (Statistics)

In the practical question paper there shall be four questions each of 35 marks, a student has to attempt any two questions.

a) Use of any type of calculator or computer using any software like MS-Excel etc is allowed for computations in all questions.

b) 5 marks are reserved for the journal and 5 marks for the oral examination.

d) Practical Examination duration is four hours which includes viva Examination and on line demonstration.

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