



VIKRAMA SIMHAPURI UNIVERSITY
Common Framework of CBCS for Colleges in Andhra Pradesh
(A.P. State of Council of Higher Education)

B.A./B.Sc. Statistics(Non-Mathematics) Core Syllabus under CBCS

w.e.f. 2020-21

Structure of Statistics (Non-Mathematics) Core Syllabus under CBCS

Sem	Paper	Title of the Course	Credits	Hrs	Marks		
					Int	Univ	Total
I	I	Elementary Mathematics	4	4	25	75	100
		Practical-1	1	2		50	50
II	II	Descriptive Statistics	4	4	25	75	100
		Practical-II	1	2		50	50
III	III	Statistical Methods and Probability	4	4	25	75	100
		Practical- III	1	2		50	50
IV	IV	Probability Distributions, Correlation and Regression	4	4	25	75	100
		Practical-1V	1	2		50	50
IV	V	Statistical Applications	4	4	25	75	100
		Practical-V	1	2		50	50

OBJECTIVE OF THE COURSE

Statistics is a key to success in the field of science and technology. Today, the students need a thorough knowledge of fundamental basic principles, methods, results and a clear perception of the power of statistical ideas and tools to use them effectively in modeling, interpreting and solving the real life problems. Statistics plays an important role in the context of globalization of Indian economy, modern technology, computer science and information technology.

The main objectives of the course are

- To build the basis for promoting theoretical and application aspects of statistics.
- To underline the statistics as a science of decision making in the real life problems with the description of uncertainty.
- To emphasize the relevance of statistical tools and techniques of analysis in the study of inter-disciplinary sciences.
- To acquaint students with various statistical methods and their applications in different fields.
- To cultivate statistical thinking among students.
- To develop skills in handling complex problems in data analysis and research design.
- To prepare students for future courses having quantitative components.

VIKRAMA SIMHAPURI UNIVERSITY: NELLORE
B.A./B.SC I YEAR : STATISTICS
(For Non - Mathematics Combination) Semester - I
CBCS
Paper-I :ELEMENTARY MATHEMATICS

Course Outcomes:

After successful completion of this course, the student will be able to;

1. Have an idea about basic mathematical techniques which are necessary to analyze the Statistical techniques
2. Able to know the concepts of set theory and operations in sets .
3. Able to know the concept of matrices and its operations.
4. Able to complete the adjoint and determinate of a square matrix , hence its inverse.
5. Capable of solving the simultaneous equations using matrix method.
6. Understands the concept of finite differences.

COURSE SYLLABUS:

UNIT-I:

Types of matrices -Matrix addition and subtraction - Matrix multiplication-Transpose of a matrix, row matrix, column matrix, Symmetric and skew symmetric matrices.

UNIT-II:

Singular and Non-Singular Matrices, Determinant of a square matrix, Ad joint of a square matrix, Inverse of square matrix Up to 3 order only.

UNIT-III:

Definition of a Rank, Rank of a Matrix through determinant method up to 3 order only

Solution of Linear Equations.

- (i) Algebraic Method
- (ii) Cramer's Rule
- (iii) Matrix Inversion Method

UNIT – IV :

Set, Subset, Types of Sets, Operations onsets, Demorgan Laws – statements only.

UNIT-V:

Finite Differences - Forward Differences - Backward differences.

Newton's forward interpolation formula - Newton's backward interpolation formula

Note :1. Concentration on numerical problems Only.

2. Proofs of theorems and Derivations of expressions are omitted.

Text Books:

1. Differential Calculus - Santhi Narayana.
2. Outlines of Matrices – Schaum.

Reference Books:

1. Statistical methods - S.P.Gupta.
2. Fundamentals of Mathematical statistics - SC Gupta and V.K.Kapoor.
3. Quantitative Techniques1 –Sulthan Chand Publication.

Paper-1 Practicals:

1. Addition, Subtraction of Matrices.
2. Multiplication of Matrices.
3. Adjoint of a Matrix
4. Inverse of a Matrix
5. Rank of a Matrix
6. Linear equations
7. Union and Intersection on sets
8. Operation on sets
9. Newton's forward interpolation formula
10. Newton's backward interpolation formula

BLUE PRINT OF QUESTION PAPER
(INSTRUCTIONS TO PAPER SETTER)

B.A./B.Sc. STATISTICS SYLLABUS(NON-MATHEMATICS)

Semester - I CBCS:Paper-I :ELEMENTARY MATHEMATICS

NOTE: - Paper Setter Must select TWO Short Questions and TWO Easy Questions from Each Unit as Follows

UNIT	TOPICS	5 MARKS	10 MARKS
UNIT-I	Matrix addition, subtraction and Multiplication Transpose of a matrix	2 (PROBLEMS)	2 (PROBLEMS)
UNIT-II	Singular and Non Singular matrices and Determinant	2 (PROBLEMS)	----
	Adjoint and Inverse Matrix	-----	2 (PROBLEMS)
UNIT-III	Rank of Matrix	1 (PROBLEM)	1 (PROBLEM)
	Linear Equations	1 (PROBLEM)	1 (PROBLEM)
UNIT-IV	Sets	2 (PROBLEMS)	2 (PROBLEMS)
UNIT-V	Forward Differences Backward differences	2 (PROBLEMS)	-----
	Newton's Forward interpolation Newton's backward interpolation	-----	2 (PROBLEMS)

B.A/B.Sc I YEAR : STATISTICS MODEL PAPER

(NON-MATHEMATICS COMBINATION)

SEMESTER-I: PAPER-I

ELEMENTARY MATHEMATICS

(Statistical tables and Electronic Calculators are allowed)

TIME: 3 HOURS

MAX.MARKS:75

SECTION-A

ANSWER ANY FIVE QUESTIONS. EACH QUESTION CARRIES 5 MARKS 5X5=25M

1. If $A = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$ then Prove that $(A^T)^T = A$

2. If $A = \begin{bmatrix} 1 & 2 \\ 1 & 1 \end{bmatrix}$ then find $A^2 + A + I$

3. Define Singular Matrix. Write one example for Singular Matrix.

4. Classifying square matrices as singular or non-singular

$$A = \begin{bmatrix} 0 & 2 & -1 \\ 3 & -2 & 1 \\ 3 & 2 & -1 \end{bmatrix} \quad B = \begin{bmatrix} 0 & 2 & -1 \\ 3 & -2 & 1 \\ 3 & 2 & 1 \end{bmatrix}$$

5. Define Rank of a Matrix. Find the Rank of $\begin{bmatrix} 6 & 4 \\ 3 & 2 \end{bmatrix}$

6. Solve the following system of Linear equations.

$$2x + 3y = 8, 5x - y = -2$$

7. If $A = \{5, 6, 7, 8, 9\}$, $B = \{2, 4, 6, 8, 10\}$, find (i) $A \cup B$ (ii) $A \cap B$ and examine they are equal or not

8. If $A = \{3, 4, 5, 6, 7\}$, $B = \{5, 6, 7, 8, 9\}$, find (i) $A - B$ (ii) $B - A$ and examine they are equal or not.

9. Find the forward difference table for the following data

x	35	45	55	65	75
y	200	220	243	270	289

10. Construct backward difference table to the following data and find $\nabla^2 y_2, \nabla^4 y_2$

x	0	1	2	3	4	5	6
y	0	1	16	81	256	625	1296

SECTION-B

ANSWER ANY FIVE QUESTIONS.EACH QUESTION CARRIES 10 MARKS 5X10=50

11. $A = \begin{bmatrix} 1 & 2 \\ 0 & 5 \end{bmatrix}$ and $B = \begin{bmatrix} 2 & 5 \\ 1 & 0 \end{bmatrix}$ then find (i) AB (ii) BA (iii) $A+B$ (iv) $(A+B)^T$ (v) $A-B$

12. Evaluate $A^2 - 3A + 9I$ where $A = \begin{bmatrix} 1 & -2 & 3 \\ 2 & 3 & -1 \\ -3 & 1 & 2 \end{bmatrix}$ and I is the unit Matrix.

13. If $A = \begin{bmatrix} 2 & 0 & 1 \\ 4 & -2 & 3 \\ 0 & 4 & -1 \end{bmatrix}$ then find $|A|$ and $\text{adj}A$

14. Find the Inverse of $\begin{bmatrix} 2 & 1 & 1 \\ 3 & 2 & 1 \\ 2 & 1 & 2 \end{bmatrix}$

15. If $A = \begin{bmatrix} 3 & -2 & 1 \\ 0 & 1 & 5 \\ 4 & 2 & 6 \end{bmatrix}$ then find Rank of A

16. Solve the equations by using Cramer's Rule $x - y + z = 3, 2x + y + z = 4, 3x + y - 2z = 2$

17. If $\mu = \{1, 3, 5, 7, 9, 11\}, A = \{3, 5, 7, 11\}, B = \{1, 5, 7, 11\}$ then find

(i) $A \cup \mu$ (ii) $B \cup \mu$ (iii) $A \cap \mu$ (iv) $B \cap \mu$ (v) A^c (vi) B^c

18. If $\mu = \{1, 2, 3, 4\}, A = \{2, 4\}$ then show that (i) $A \cup A^c = \mu$ (ii) $A \cap A^c = \phi$

19. Find $f(1.6)$ using Newton's forward Interpolation formula from the following table

x	1	1.4	1.8	2.2
y	3.49	4.82	5.96	6.5

20. Find $f(3.5)$ by Newton's Backward Interpolation formula from the following data

x	0	1	2	3	4
y	3	4	7	8	10

B.A./B.SC I YEAR : STATISTICS SYLLABUS

(For Non - Mathematics Combination)

Semester - II CBCS

PAPER - II : DESCRIPTIVE STATISTICS

Course Outcomes:

After successful completion of this course, the student will be able to;

- 1) knowledge of Statistics and its scope and importance in various areas such as Medical, Engineering, Agricultural and Social Sciences etc.
- 2) knowledge of various types of data in diagrammatic representation.
- 3) Brief analyzing in different types of data and tabulated.
- 4) knowledge of various types of data, their organization and evaluation of summary measures such as measures of central tendency and dispersion etc.
- 5) insights into preliminary exploration of different types of data.

COURSE SYLLABUS:

UNIT - I

Introduction to Statistics: Statistics Definition, primary and secondary data, methods of collecting primary and secondary data. Statistical enquiry, questionnaire and schedule.

UNIT – II

Classification and tabulation: classification of data, frequency distribution, rules of tabulation, simple and complex tables, single, double and manifold tables.

UNIT – III

Diagrammatic Representation : Bar diagrams, pie charts. Histogram, frequency polygon, ogives.

UNIT-IV

Measures of Central Tendency: Mean, Median, Mode, merits and demerits, finding median by graphic method, quartiles.

UNIT-V

Measures of Dispersion: Range, Q.D, S.D, M.D, Coefficient of variation.

Note :1. Concentration on numerical problems Only.

2. Proofs of theorems and Derivations of expressions are omitted.

Text Books:

1. Statistical methods - S.P.Gupta.
2. Fundamentals of Mathematical statistics - SC Gupta and V.K.Kapoor

Reference Books :

Quantitative Techniques1 –Sulthan Ch and Publication

Paper-2: Practicals:

1. Arithmetic Mean, Median, Mode
2. Calculation of CV and its comparisons.
3. Bar diagrams.
4. Pie diagram.
5. Histogram.
6. Frequency polygon.
7. O give curves.
8. Quartile Deviation
9. Mean Deviation
10. Standard Deviation.

B.A/B.Sc I YEAR : STATISTICS MODEL PAPER

(NON-MATHEMATICS COMBINATION)

SEMESTER-II: PAPER-II

DESCRIPTIVE STATISTICS

(Statistical tables and Electronic Calculators are allowed)

TIME: 3 HOURS

MAX.MARKS:75

SECTION-A

ANSWER ANY FIVE QUESTIONS. EACH QUESTION CARRIES 5 MARKS 5X5=25M

1. Explain Various definitions of Statistics.
2. Define Primary data and secondary data.
3. Write rules of tabulation.
4. Explain frequency distribution with one example.
5. Construct frequency polygon for the following data

Class interval	Mid values	No.of employees
0-10	5	2
10-20	15	4
20-30	25	8
30-40	35	3
40-50	45	5

6. Define o give curves.

7. Compute mean from the following frequency distribution.

x	1	2	3	4	5	6	7
y	5	9	12	17	14	10	6

8. Find the Median and Mode from the following data

4,5,6,4,5,4,10

9. Compute Quartile deviation from the following data

Marks	10	20	30	40	50	60
No.of Students	4	7	15	8	7	2

10. If mean of a distribution is 160, Mode 157 and Standard distribution is 50 then find Coefficient of variation.

SECTION-B

Answer Any Five Questions. Each Question Carries 10

Marks 5x10=50m

11. Explain various methods of collecting primary data.

12. Explain Questionnaire and schedule.

13. Classification of 100 students based on the marks obtained by them in physics and chemistry in an examination. It is shown in the below table:

Marks out of 50/Subject	40 and above	30 and above	20 and above	10 and above	0 and above
Physics	9	32	80	92	100
Chemistry	4	21	66	81	100
Average	7	27	73	87	100

(i) what is the number of students scoring less than 40% marks in aggregate.

(ii) If at least 60% marks in physics are required for pursuing higher studies in physics, how many students will be eligible to pursue higher studies in physics.

14. Define tabulation. Explain various types of tables.

15. Draw histogram for the following data

Age	2-5	5-11	11-12	12-14	14-15	15-16
No.of Boys	6	6	2	5	1	3

16. Prepare pie chart for expenditure in book publishing for the following data

Items of expenditure	Family A	Family B
Food	12000	15000
Clothing	5000	8000
House rent	15000	12000
Education	18000	5000
Miscellaneous	10000	10000

17. Calculate Arithmetic mean of the marks from the following data

Marks	0-10	10-20	20-30	30-40	40-50	50- 60
No.of students	12	18	27	20	17	6

18. Find the mode of the following data

Marks	0-10	10-20	20-30	30-40	40-50
No.of students	3	15	7	10	12

19. Calculate mean deviation from the following data

x	5	10	15	20	25	30
f	3	4	8	12	7	2

20. Compute Coefficient of Quartile deviation to the following data

Marks	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100
Students	10	15	28	32	40	35	26	14	10	5

B.A./B.SC IIYEAR : STATISTICS SYLLABUS

(For Non - Mathematics Combination)

Semester - III CBCS.

PAPER - III : STATISTICAL METHODS AND PROBABILITY

Course Outcomes:

After successful completion of this course, the student will be able to;

- 1) Knowledge related to concept of attributes.
- 2) knowledge of other types of data reflecting quality characteristics including concepts of independence and association between two attributes.
- 3) knowledge to conceptualize the probabilities of events including frequent and axiomatic approach. Simultaneously, they will learn the notion of conditional probability.
- 4) knowledge related to concept of discrete and continuous random variables and their probability distributions including expectation and moments,
- 5) knowledge related to concept of random variable, Probability mass function and probability density function.
- 6) knowledge related to concept of Mathematical expectation.

COURSE SYLLABUS:

UNIT-I

Attributes: Classes, 2×2 , manifold classification, class frequencies, ultimate classes frequencies, contingency tables, association and independence of attributes, consistency of data, coefficient of colligation.

UNIT -II

Moments: Central and Non - Central moments, Sheppard's correction for moments for grouped data. Skewness, kurtosis, and their measures.

UNIT-III

Concept on Permutations and Combinations.

Probability: Definitions of random experiment, outcome, sample space, event, mutually exclusive event, equally likely events, favorable events, classical, statistical and axiomatic definitions of probability. Addition and multiplication theorems for two events. Conditional probability.

UNIT-IV

Random variable : Discrete - Probability mass function. Continuous Random Variable - Probability density function, distribution function of a R.V and properties.

UNIT-V

Mathematical expectation: Basic results & properties of M.G.F, C.G.F, C.F

Note :1. Concentration on numerical problems Only.

2. Proofs of theorems and Derivations of expressions are omitted.

Text Book:

1. Statistical Methods by S.P.Gupta.

2. Fundamentals of Mathematical statistics - S.C. Gupta & V.K.Kapoor.

Reference books:

1. Sambavyatha – Telugu Academy.

2. Fundamentals of statistics - Goon, Gupta and Das Gupta.

Paper-3: Practicals:

1. Non central Moments
2. Central Moments
3. Sheppard's corrections,
4. skewness
5. Kurtosis.
6. Coefficients of Association and colligation
7. Attributes
 8. Probability
 9. Random variable
 10. Mathematical Expectation

B.A/B.Sc II YEAR : STATISTICS MODEL PAPER

(NON-MATHEMATICS COMBINATION)

SEMESTER-III: PAPER-III

STATISTICAL METHODS AND PROBABILITY

(Statistical tables and Electronic Calculators are allowed)

TIME: 3 HOURS

MAX.MARKS:75

SECTION-A

ANSWER ANY FIVE QUESTIONS. EACH QUESTION CARRIES 5 MARKS 5X5=25

1. Explain independent of Attributes.
2. Define Coefficient of Colligation.
3. The first four non central moments of a distribution are -1.5,17,-30 and 108.Find Moments
4. Write Sheppard correction for moments.
5. Define random experiment and sample space.
6. In a single throw with two
7. Define Random variable.
8. A random variable X has the following probability function

$X = x$	-2	-1	0	1	2	3
$P(X = x)$	0.1	K	0.2	2k	0.3	K

9. Define Mathematical Expectation.
10. Write the additive property of M.G.F

SECTION-B

ANSWER ANY FIVE QUESTIONS.EACH QUESTION CARRIES 10 MARKS 5X10=50

11. Given the following ultimate class frequencies , find the frequencies of positive class.

$$(ABC) = 149 \quad (AB\gamma) = 738 \quad (A\beta C) = 225 \quad (A\beta\gamma) = 1196$$

$$(\alpha BC) = 204 \quad (\alpha B\gamma) = 1762 \quad (\alpha\beta C) = 171 \quad (\alpha\beta\gamma) = 21842$$

12. Find if A and B are independent , positively associated or negatively associated in each of the following data.

(i) $N = 1000, (A) = 470, (B) = 620, (AB) = 320$

(ii) $(A) = 490, (AB) = 294, (\alpha) = 570, (\alpha B) = 380$

(iii) $(AB) = 256, (\alpha B) = 768, (A\beta) = 48, (\alpha\beta) = 144$

13. Calculate the first four central moments of the following distribution about mean and hence find β_1 and β_2

x	0	1	2	3	4	5	6	7	8
f	1	8	28	56	70	56	28	8	1

14. For a distribution the mean is 10, variance is 16, γ_1 is 1 and β_2 is 4. Obtain the first four moments about the origin.

15. If $P(A) = \frac{1}{3}, P(B) = \frac{1}{4}, P(A \cup B) = \frac{23}{60}$ then find $P\left(\frac{A}{B}\right), P\left(\frac{B}{A}\right)$

16. Define conditional probability. State multiplication theorem for two events.

17. Explain properties of distribution function.

18. A random variable X has the following probability function.

$X = x$	0	1	2	3	4	5	6	7
$P(X = x)$	0	K	$2K$	$2K$	$3K$	K^2	$2K^2$	$7K^2 + K$

Find (i) K (ii) Mean (iii) Variance

19. Find expected number of heads in tossing three coins.

20. Write the properties of C.G.F

B.A./B.SC IIYEAR : STATISTICS SYLLABUS

(For Non - Mathematics Combination)

Semester -IV CBCS.

PAPER – IV : PROBABILITY DISTRIBUTIONS, CORRELATION AND REGRESSION

Course Outcomes:

After successful completion of this course, the student will be able to;

1. Ability to distinguish between discrete and continuous distributions.
2. knowledge related to concept of curve fitting.
3. Knowledge of important discrete and continuous distributions such as Binomial, Poisson, rectangular , normal, distributions.
4. Acumen to apply standard discrete and continuous probability distributions to different situations.
5. Knowledge related to concept of correlations.
6. Knowledge related to concept of regressions.
7. Knowledge of correlation, regression analysis, regression diagnostics.

COURSE SYLLABUS

UNIT – I

Discrete Distributions : Binomial and Poisson Distributions – Definitions, means, variances and applications of these distributions. Additive property if exists. Simple problems.

UNIT – II

Continuous Distributions : Normal, Rectangular Distributions - definitions and their properties. Simple problems.

UNIT – III

Curve Fitting : principle of least squares - fitting of straight line, Parabola.

UNIT – IV

Correlation :Meaning of Correlation, Types of correlation Karl-pear sons coefficient of correlation (for individual series only) Spearman's Rank correlation.

UNIT – V

Regression : Simple linear regression, properties of regression coefficients. Regression lines, Simple Problems.

Text Books :

1. Fundamentals of Mathematical statistics - S.C. Gupta & V.K. Kapoor.
2. Statistical methods - S.P Gupta.

Reference Books :

1. Sambavyatha – Telugu Academy.
2. Fundamentals of statistics - Goon, Gupta and Das Gupta

Paper-4: Practicals:

1. Fitting of Binomial by Direct method
2. Fitting of Poisson distribution.
3. Fitting of Rectangular distribution.
4. Fitting of Normal Distribution by Ordinates methods.
5. Fitting of Straight Line.
6. Fitting of Parabola.
7. Rank Correlation.
8. Correlation coefficient.
9. Regression lines X on Y.
10. Regression lines Y on X.

B.A/B.Sc II YEAR : STATISTICS MODEL PAPER

(NON-MATHEMATICS COMBINATION)

SEMESTER-IV: PAPER-IV

PROBABILITY DISTRIBUTIONS, CORRELATION AND REGRESSIONS

(Statistical tables and Electronic Calculators are allowed)

TIME: 3 HOURS

MAX.MARKS:75

SECTION-A

ANSWER ANY FIVE QUESTIONS. EACH QUESTION CARRIES 5 MARKS 5X5=25

1. Define Binomial distribution. Write down its mean and variance.
2. Explain uses of Poisson distribution.
3. Importance of Normal distribution.
4. Define exponential distribution. Write down its mean and variance.
5. Explain the procedure of fitting of straight line by the method of least squares.
6. Explain the procedure of fitting of parabola by the method of least squares.
7. Explain correlation coefficient of $\sum x^2 = 222, \sum y^2 = 364, \sum xy = 261$
8. The ranks of two subjects A and B are given below. Obtain rank correlation coefficient.
(3,2),(4,4),(1,1),(2,3),(6,6),(5,5)
9. Define Regression. Write Regression coefficients.
10. Write properties of regression coefficients.

SECTION-B

ANSWER ANY FIVE QUESTIONS.EACH QUESTION CARRIES 10 MARKS
5X10=50

11. A fair coin is tossed six times. Find the probability of getting four heads.
12. A manufacturer knows that the condensers he makes contain on average 1% defectives. He packs them in boxes of 100. What is the probability that a box picked at random will contain 3 or more faulty condensers?
13. Write properties of Normal distribution.
14. If X is uniformly distributed with mean 1 and variance $\frac{4}{3}$ find $P(X < 0)$.

15. By the method of least squares find the straight line that best fits the following data.

x	1	2	3	4	5
y	12	25	40	50	65

16. Fit a second degree parabola for the following data

x	0	1	2	3	4
y	1	1.8	1.3	2.5	6.3

17. Calculate coefficient of correlation of the following data

x	10	12	13	16	17	20	25	30	34
y	20	22	26	27	29	33	37	40	42

18. Calculate rank correlation of the following data

x	72	70	46	69	56	65	65	45	35	75
y	111	110	105	112	115	115	101	118	107	120

19. Calculate regression equation of Y on X from the following data

x	40	38	35	42	30
y	30	35	40	36	29

20. Write difference between correlation and regression.

B.A./B.SC IIYEAR : STATISTICS SYLLABUS

(For Non - Mathematics Combination)

Semester –IV CBCS.

PAPER – V :STATISTICAL APPLICATIONS

Course Outcomes:

After successful completion of this course, the student will be able to;

- 1) Concept of Criteria of a good estimator
- 2) Knowledge of large sampling.
- 3) Knowledge of small sampling.
- 4) Knowledge of Exact sampling
- 5) concept of random sample from a distribution, sampling distribution of a statistic, standard error of important estimates such as mean and proportions,
- 6) knowledge about important inferential aspects such as point estimation, test of hypotheses and associated concepts,
- 7) knowledge about inferences from Binomial, Poisson and Normal distributions as illustrations,
- 8) concept about non-parametric method and some important non-parametric tests.

COURSE SYLLABUS:

UNIT-I

Statistical Inference –Estimation: Definitions of population, Sample, Parameter, Standard Error. Estimation - Criteria of a good estimator, meaning of interval estimation.

UNIT-II

Statistical Hypothesis – large sample Test : Null and alternative hypothesis, level of significance, type **I** and type **II** errors, power of the test. Large sample tests for proportion (Single & double),mean(Single & double).

UNIT-III

Exact Sampling Distributions : Random Sample, Statistic, Sampling Distribution of a Statistics, Statement and properties of χ^2 , t , F distributions and applications.

UNIT - IV

Small sample tests : Tests of significance based on χ^2 , t and F. χ^2 -test for independence of attributes, t-test for single, double and paired tests, Variance Ratio Test(F-test).

UNIT – V

Non parametric tests : Advantages, disadvantages, sign test, median test and run test for two sample cases only.

Note :1. Concentration on numerical problems Only.

2. Proofs of theorems and Derivations of expressions are omitted.

Text Books:

1. Statistical methods - S.P. Gupta.
2. Fundamentals of statistics - Goon Gupta and Das Gupta vol I and vol II.

Reference Books:

1. Anuvarthita Sankyaka Sastram - Telugu academy book.
2. Applied Statistics - V.K.Kapoor& S.C Gupta.
3. Applied statistics – Parima IMukhopadhyay.

Paper-5: Practicals:

1. Large sample tests – Single Mean
2. Large sample tests – Double Mean
3. Large sample tests –Single Proportion
4. Large sample tests –Double Proportion
5. Small sample tests – t for Mean(s)
6. F-test
7. χ^2 test for Independence of attributes.
8. Run test
9. Sign test
10. Median test

B.A/B.Sc II YEAR : STATISTICS MODEL PAPER

(NON-MATHEMATICS COMBINATION)

SEMESTER IV : PAPER-V

STATISTICAL APPLICATIONS

(Statistical tables and Electronic Calculators are allowed)

TIME: 3 HOURS

MAX.MARKS:75

SECTION-A

Answer any five questions. Each question carries 5

Marks 5x5=25

1. Define sample and population.
2. Explain the meaning of internal estimation.
3. Define null and alternative hypothesis.
4. Explain type I and type II errors.
5. Define random sample and statistic.
6. Define t-distribution.
7. A merchant is making engine parts with axle diameters of 0.7 inch. A random sample of 10 parts shows a mean diameter of 0.742 inch with a S.D of 0.4 inch. Compute the statistic you would use to test whether the work is meeting the specification.
8. A sample of 26 bulbs gives a mean life of 990 hours with a S.D of 20 hours. The manufacturer claims that the mean life of bulbs is 1000 hours. Is the sample not up to the standard.
9. Explain sign test.
10. Explain median test.

SECTION-B

Answer Any Five Questions. Each Question Carries 10

Marks 5x10=50

11. Explain criteria of good estimator.

12. Define standard error. The variance of population is 2. The size of the sample collected from the population is 169. What is the standard error of mean.

13. Random samples of 400 men and 600 women were asked whether they would like to have a flyover near their residence. 200 men and 325 women were favor of the proposal. Test the hypothesis that proportions of men and women in favor of the proposal are same at 5% level.

14. The means of two large samples of sizes 1000 and 2000 members are 67.5 inches and 68.0 inches respectively. Can the samples be regarded as drawn from the same population of S.D 2.5 inches.

15. Define χ^2 distribution and explain its applications.

16. Define t distribution and explain its applications.

17. The means of two random sample sizes 9 and 7 are 196.42 and 198.82 respectively. The sum of the squares of deviations from the mean are 26.94 and 18.73 respectively. Can the sample be considered to have been drawn from the same normal population.

18. It is known that mean diameters of rivets produced by two firms A and B are practically the same, but the standard deviations may differ. For 22 rivets produced by firm A, the S.D is 2.9 mm, while for 16 rivets manufactured by firm B, the S.D is 3.8 mm. Compute the Statistic you would use to test whether the products firm A have the same variability as those of firm B and test its significance.

19. Explain advantages and disadvantages of non parametric tests.

20. Explain run test for randomness.

**VIKRAMA SIMHAPURI UNIVERSITY ::
NELLORE
UG (CBCS) SEMESTER WISE
EXAMINATION
STATISTICS(NON-MATHEMATICS
COMBINATION)
QUESTION PAPER STRUCTURE**

Time:3Hours

Max. Marks : 75

SECTION- A

Answer any FIVE Questions:-

5 X 5 =25M

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.
- 9.
- 10.

SECTION- B

Answer any FIVE questions:-

5 X 10 =50M

- 11.
- 12.
- 13.
- 14..
- 15.
- 16.
- 17.
- 18.
- 19.
- 20.

Instruction to Paper Setter :

**Two short answer questions (5 Marks) and
Two essay questions (10 Marks) must be given from each unit.**