SRI Y.N.COLLEGE(Autonomous), Narsapur
Affiliated to Adikavi Nannayya University
Thrice accredited by NAAC with 'A' Grade
Recognized by UGC as 'College with potential for Excellence'
I B.Sc Statistics (for 2017-2020 batch, w.e.f 2017-18)
Paper I, Syllabus for I semester

Descriptive Statistics And Probability

Unit – I (10 Marks-2,5 Marks-2)
Introduction to Statistics: Concepts of Primary and Secondary data. Methods of collection and editing of primary data, Secondary data. Designing a questionnaire and a schedule. Measures of Central Tendency - Mean, Median, Mode, Geometric Mean and Harmonic Mean.

Unit - II (10 Marks-3,5 Marks-2)
Measures of dispersion: Range, Quartile Deviation, Mean Deviation and Standard Deviation. Descriptive Statistics - Central and Non-Central moments and their interrelationship. Sheppard's correction for moments. Skewness and kurtosis.

Unit - III (10 Marks1-,5 Marks-1)
Introduction to Probability: Basic Concepts of Probability, random experiments, trial, outcome, sample space, event, mutually exclusive and exhaustive events, equally likely and favorable outcomes. Mathematical, Statistical, axiomatic definitions of probability. Conditional Probability and independence of events.

Unit - IV (10 Marks-2,5 Marks-2)
Probability theorems: Addition and multiplication theorems of probability for 2 and for n events. Boole's inequality and Baye's theorems and problems based on Baye's theorem.

Unit - V (10 Marks-2,5 Marks-1)
Random variable: Definition of random variable, discrete and continuous random variables, functions of random variable. Probability mass function. Probability density function, Distribution function and its properties. Bivariate random variable - meaning, joint, marginal and conditional Distributions, independence of random variables.

Note:

MS-Excel methods to be made mandatory for all the Semesters after proper training only to the teaching staff by the University concerned.

Prescribed Books:

1. B.Sc Statistics-Paper-I : DVLN Jogi Raju, C Srikala, LP Raj Kumar, Kalyan Publications,2014.
2. V.K.Kapoor and S.C.Gupta: Fundamentals of Mathematical Statistics, Sultan Chand & Sons, New Delhi.
3. BA/BSc I year statistics - descriptive statistics, probability distribution - Telugu Academy – Dr M.Jaganmohan Rao,Dr N.Srinivasa Rao, Dr P.Tirupathi Rao, Smt.D.Vijayalakshmi.
4. K.V.S. Sarma: Statistics Made Simple: Do it yourself on PC. PHI

Reference books:

1. Willam Feller: Introduction to Probability theory and its applications. Volume –I, Wiley
2. Goon AM, Gupta MK, Das Gupta B : Fundamentals of Statistics , Vol-I, the World Press Pvt.Ltd., Kolakota.
3. Hoel P.G: Introduction to mathematical statistics, Asia Publishing house.
4. M. JaganMohan Rao and Papa Rao: A Text book of Statistics Paper-I.
5. Sanjay Arora and Bansi Lal: New Mathematical Statistics: Satya Prakashan , New Delhi
6. Hogg Tanis Rao: Probability and Statistical Inference. 7th edition. Pearson.

Practicals

Conduct any 6 (Ms -excel is compulsory)

1. Computation of mean, median and mode.
2. Computation of quartile deviation.
3. Computation of mean deviation
4. Computation of Standard deviation.
5. Non-central moments and central moments, Sheppard corrections & Skewness based on moments and Kurtosis
6. MS-Excel methods for the above Serial numbers 1,2,3,4.

APPROVED

CHAIRMAN
BOARD OF STUDIES
Department of Mathematics & Statistics
SRI Y.N. COLLEGE (AUTONOMOUS)
(NAAC ACCREDITED 'A' GRADE COLLEGE)
NARSAPUR - 534 275

COLLEGE (AUTONOMOUS)
NAAC ACCREDITED 'A' GRADE COLLEGE
DEPARTMENT OF
MATHEMATICS &
STATISTICS
NARSAPUR-534 275, W.G.Dt.

Max. Marks:75

Time: 3Hrs.

PART-1(5 x 5 = 25 M)

Answer any FIVE Questions, each question carries FIVE marks.

Unit - I	: 2 questions
Unit - II	: 2 questions
Unit - III	: 1 question
Unit - IV	: 2 questions
Unit - V	: 1 question

PART-II(5 x 10 M= 50 M)

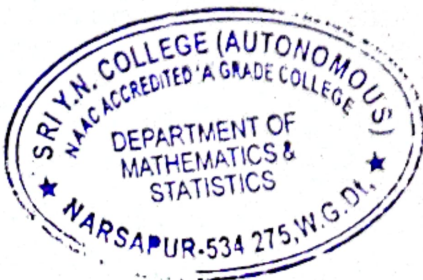**Answer any FIVE questions. Choosing atleast TWO questions from each section.**
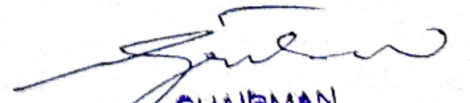
Each question carries 10 marks.

SECTION-A

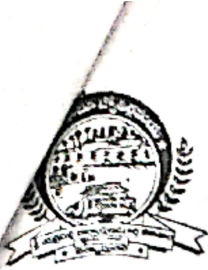|	
Unit - I	: 2 questions
Unit - II	: 3 questions

SECTION-B

Unit - III	: 1 question
Unit - IV	: 2 questions
Unit - V	: 2 questions

APPROVED

CHAIRMAN
BOARD OF STUDIES
Department of Mathematics & Statistics
SRI Y N COLLEGE (AUTONOMOUS)
NAAC ACCREDITED 'A' GRADE COLLEGE
NARSAPUR - 534 275

SRI Y.N.COLLEGE(Autonomous),Narsapur
Affiliated to Adikavi Nannaya University
Thrice accredited by NAAC with 'A' Grade
Recognized by UGC as 'College with potential for Excellence'
I B.Sc. Statistics – Paper I

Descriptive Statistics And Probability

Model Question Paper (Theory) (for 2017-20 batch w. e. f 2017-2018)

Max Marks: 75

Time: 3Hrs

PART-I

5x5M =25M

Answer any FIVE Questions, each question carries FIVE marks.

1. Distinguish between primary and secondary data.
2. Find the Geometric mean to the following data.

x	110	115	118	119	120
f	4	11	21	6	2

3. Calculate Quartile deviation to the following data

Class interval	10-20	20-30	30-40	40-50	50-60
Frequency	5	10	15	10	5

4. Prove that limits of Bowley's Coefficient of skewness is -1 to +1.
5. Explain mutually exclusive and exhaustive events.
6. Two cards are drawn from a well shuffled pack of 52 cards. Find the Probability that they are (i) two aces (ii) a king and a queen
7. A problem is given to three students A,B & C whose chances of solving it are ½, ¾ and ¼ respectively. What is the probability that the problem will be solved if all of them try independently.
8. A random variable X as the following probability function :

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

(i) Find K , (ii) Evaluate $P(X < 6)$, $P(X \geq 6)$ and $P(0 < X < 5)$

PART-II

Answer any FIVE questions. Choosing atleast TWO questions from each section.
Each question carries 10 marks.

5x10M = 50M

SECTION – A

9 . Calculate Arithmetic Mean to 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

10. Explain different methods of Primary Data Collection.
11. Calculate Standard Deviation to the following data.

Marks	0-10	10-20	20-30	30-40	40-50	50-60
No. of Students	2	3	5	6	4	1

12 . Find Karl Pearson's co efficient of Skewness to the following data

Class interval	0-2	2-4	4-6	6-8	8-10	10-12	12-14
Frequency	6	8	17	21	15	11	2

13. The first four movements of distribution about the value 4 of the variable are -1.5, 17, -30 and 108. Find the movements about mean, β_1, β_2. Also find movements about origin.

14 Define the following with examples
    (a) Sample Space
    (b) Random Experiment
    (c) Favourable Outcomes
    (d) Equality likely outcomes

15. Explain Multiplication theorem on probability for n events.

16. State and prove Bayes theorem.

17. A continuous random variable X as the Probability Density Function (p.d.f.).

$$f(x) = \begin{cases} \dfrac{1}{16}(3+x)^2, & -3 \le x \le -1 \\ \dfrac{1}{16}(6-2x^2), & -1 \le x \le 1 \\ \dfrac{1}{16}(3-x)^2, & 1 \le x \le 3 \end{cases}$$

    (i)   Verify that area under the curve is unity
    (ii)   Find the mean and variance.

18. Define Bivariate Random Variable. Joint distribution of X and Y is given by
$$f(x,y) = 4xy$$
Test whether X and Y are independent. For the above joint distribution, find the conditional density of X given Y=y.

SRI Y.N.COLLEGE(Autonomous), Narsapur
Affiliated to Adikavi Nannayya University
Thrice accredited by NAAC with 'A' Grade
Recognized by UGC as 'College with potential for Excellence'
I B.Sc Statistics (for 2017-2020 batch, w.e.f 2017-18)
Paper II, Syllabus for II semester

MATHEMATICAL EXPECTATION AND PROBABILITY DISTRIBUTIONS

Unit-I (10 Marks-2,5 Marks-2)

Mathematical expectation: Mathematical expectation(ME)of random variable and function of a random variable. Moments and covariance using mathematical expectation with examples. Addition and Multiplication theorems on expectation. Definitions of M.G.F, C.G.F, P.G.F, C.F. its properties. Chebyshev and Cauchy –Schwartz and inequalities

Unit-II (10 Marks-2,5 Marks-2)

Discrete Distributions : Binomial and Poisson distributions, their definitions , 1st to 4 central moments, M.G.F, C.F, C.G.F, P.G.F, mean, variance, additive property if exists. Possion approximation to Binomial distribution.

Unit-III (10 Marks-2,5 Marks-1)

Negative Binomial, Geomertric, Hyper Geometric Distributions –Definitions , means , variances, M.G.F , C.F, C.G.F, P.G.F, reproductive property if exists. Binomial approximation to Hyper Geometric distribution , Poisson approximation to Negative Binomial distribution

Unit-IV (10 Marks-2,5 Marks-1)

Continuous Distributions: Rectangular, Exponential, Gamma, Beta distributions of two kinds. Other properties such as mean, variance, M.G.F, C.G.F, C.F, reproductive property.

Unit-V(10 Marks-2,5 Marks-2)

Normal Distribution: Definition, Importance, properties, M.G.F, Additive property, Interrelation between Normal & Binomial, Normal & Poisson distribution . Cauchy Distribution.
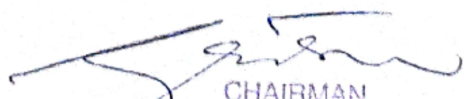
Text Books:

1. V.K.Kapoor and S.C.Gupta: Fundamentals of Mathematical Statistics, S Chand & Sons, New Delhi.

2. BA/BSc I year-Descriptive Statistics, Probability Distribution –Telugu Academy-
   Dr. M. Jaganmohan, Dr N.Srinivasa, Dr P Tirupathi Rao , Smt.D.Vijayalakshmi

3. K.V.S. Sarma: Statistics Made. Simple: Do it yourself on PC. PHI

Reference books:

1. .Willam Feller : Introduction to Probability theory and its applications, Volume–I, Wiley

2. Goon AM, Gupta MK, Das Gupta -I,B : Fundamentals Statistics, Volume – I, The World Press Pvt.Ltd., Kolakota.

APPROVED
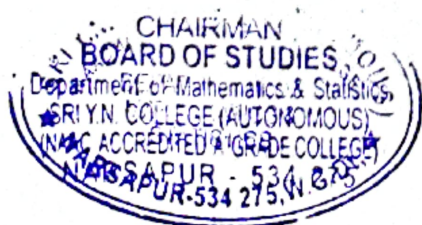
CHAIRMAN
BOARD OF STUDIES
Department of Mathematics & Statistics
SRI Y.N. COLLEGE (AUTONOMOUS)
NAAC ACCREDITED 'A' GRADE COLLEGE
NARSAPUR - 534 275, W.G.Dt.

CHAIRMAN
BOARD OF STUDIES
DEPARTMENT OF MATHEMATICS
SRI Y.N. COLLEGE (AUTONOMOUS)
(NAAC ACCREDITED 'A' GRADE COLLEGE)
NARSAPUR - 534 275

Time: 3Hrs.   Max. Marks:75

PART-I(5 x 5 = 25 M)

Answer any FIVE Questions, each question carries FIVE marks.

Unit - I	: 2 questions
Unit - II	: 2 questions
Unit - III	: 1 question
Unit - IV	: 1 question
Unit - V	: 2 questions

PART-II(5 x 10 M= 50 M)

Answer any FIVE questions. Choosing atleast TWO questions from each section.

Each question carries 10 marks.

Note : Under Section –A (Q. No: 13) and Section – B (Q. No: 14) will be given from UNIT-III

SECTION-A

Unit - I	: 2 questions
Unit - II	: 2 questions
Unit – III	: 1 question

SECTION-B

Unit - III	: 1 question
Unit - IV	: 2 questions
Unit - V	: 2 questions

APPROVED

CHAIRMAN
BOARD OF STUDIES
DEPARTMENT OF MATHEMATICS
SRI Y.N. COLLEGE (AUTONOMOUS)
(NAAC ACCREDITED 'A' GRADE COLLEGE)
N A R S A P U R - 534 275

SRI Y.N.COLLEGE(Autonomous),Narsapur
Affiliated to Adikavi Nannaya University
Thrice accredited by NAAC with 'A' Grade
Recognized by UGC as 'College with potential for Excellence'
1 B.Sc. Statistics – Paper II

MATHEMATICAL EXPECTATION AND PROBABILITY DISTRIBUTIONS

Model Question Paper (Theory) (for 2017-20 batch w. e. f 2017-2018)

Time: 3Hrs   Max Marks: 75

PART-I

Answer any FIVE Questions, each question carries FIVE marks.   5x5M =25M

1. State and prove Cauchy – Schwartz inequality.
2. Define Moment generating function. Prove that M.G.F of the sum of n independent random variables is equal to the product of their respective M.G.Fs
3. Derive the additive property of Binomial Distribution.
4. Derive the Moment Generating Function of Poisson Distribution.
5. Derive and explain the Negative Binomial Distribution.
6. Derive the M.G.F and Characteristic function of Rectangular Distribution.
7. Write the important properties of Normal Distribution.
8. Define and explain the Cauchy Distribution.

PART-II

Answer any FIVE questions. Choosing atleast TWO questions from each section.
Each question carries 10 marks.   5x10M = 50M
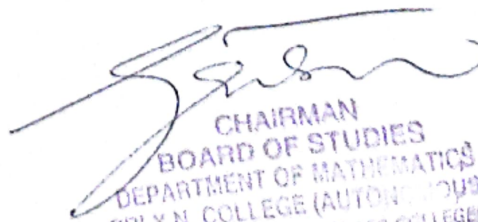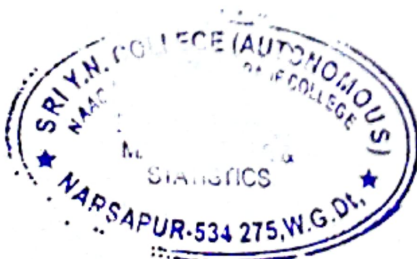
SECTION – A

9. Define Characteristic function. State and prove Chebyshev's inequality.
10. State and prove Addition theorem of Expectation.
11. Derive the M.G.F , Mean & Variance of Binomial Distribution.
12. Derive the Poisson Distribution as a limiting case of Binomial Distribution.
13. Define Geometric Distribution. Derive its Mean , Variance & M.G.F.

SECTION-B

14. Define Hyper Geometric Distribution. Obtain Binomial Distribution as a limiting case of Hyper Geometric Distribution.
15. Define Gamma Distribution. Derive its M.G.F, Mean & Variance.
16. Define Exponential Distribution. Find its M.G.F, Mean & Variance.
17. Prove that a linear combination of independent normal variates is also a normal variate.
18. Define Normal Distribution and also find out M.G.F., , Mean & Variance of Normal Distribution.

APPROVED

CHAIRMAN
BOARD OF STUDIES
DEPARTMENT OF MATHEMATICS
SRI Y.N. COLLEGE (AUTONOMOUS)
(NAAC ACCREDITED 'A' GRADE COLLEGE)
N A R S A P U R - 534 275