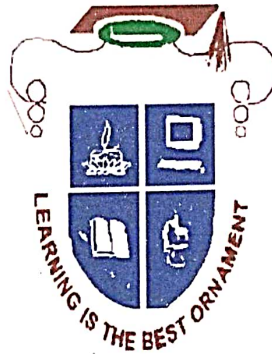


**GOVERNMENT DEGREE COLLEGE FOR WOMEN
BEGUMPET, HYD-16
(An Autonomous College of Osmania University)
DEPARTMENT OF STATISTICS
BOS (2021-2022)**

**CHOICE BASED CREDIT SYSTEM
(CBCS)**



SYLLABUS

For

B. Sc (MSCs, MPS, MES, ESCs & MSDS)

Under Graduate Programme

DEPARTMENT OF STATISTICS

**(With effect from batch of students Admitted from the Academic year
2021-22 onwards under semester system of CBCS)**

GOVERNMENT DEGREE COLLEGE FOR WOMEN(A) BEGUMPET

DEPARTMENT OF STATISTICS

Composition of the Board of Studies

1.	Head of the Department Concerned (Chairman)	Dr.G.Sunitha	<i>G. Sunitha</i>
2.	The entire faculty of the Department	Ms. M.Anusha, Lecturer in Statistics	<i>Anusha</i>
3.	Two subject experts	1. Dr. N.Ch. Bhattacharyulu Head, Department of Statistics University College of Science, Osmania University, Hyderabad 2.Prof.B.G.Manjunath Asst. Prof in Statistics University of Hyderabad Hyderabad.	<i>B.G. Manjunath</i> Dr. B.G. MANJUNATH Assistant Professor School of Mathematics & Statistics University of Hyderabad HYDERABAD-500 046. T.S.
4.	One expert to be nominated by the Vice-Chancellor	Dr. Jayasree Gadicherla Professor University Nominee, Dept. of Statistics University College of Science, Osmania University, Hyderabad	<i>J. S. Gadicherla</i> PROFESSOR, DEPT. OF STATISTICS, UNIVERSITY COLLEGE OF SCIENCE, Osmania University, HYDERABAD-500 046. T.S.
5.	One representative from industry/corporate sector /allied area relating to placement.	Dr. Venugopal General Manager JUXT Smart Mandate Analytical Solutions Pvt. Ltd.	<i>V. Venugopal</i>

Term: The term of the Nominated Members shall be three years.

Meetings: The Board of studies shall meet at least twice a year.

Functions:

The Board of Studies of a Department in the college shall.

- Prepare syllabi for various courses keeping in view the objectives of the college, interest of the stakeholders and national requirement for consideration and approval of the Academic Council.
- Suggest methodologies for innovative teaching and evaluation techniques.
- Suggest panel of names to the Academic Council for appointment of examiners.
- Coordinate research, teaching, extension and other academic activities in the department /college.

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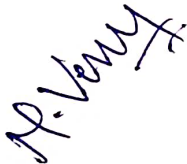
AGENDA FOR THE BOARD OF STUDIES MEETING


1. Approval of the syllabus for V&VI semesters of B.Sc. III year according to CBCS (Choice based credit system) for the Academic Year 2021-22.
2. Approval of the syllabus for I, II, III, IV, V & VI Semesters of B.Sc.I, II & III Year according to CBCS (Choice based credit system) with effect from 2021-22.
3. Re-approval of Scheme of evaluation-Examination pattern to be followed for I, II, III and IV semesters.
4. Approval of Scheme of evaluation for V and VI Semesters (60 External; 40 Internal)
5. Approval of list of panel of examiners.
6. Approval of syllabus and scheme of evaluation of Certificate Course in R Programming
7. Any other matter with the permission of chair.


Sign of B.O.S.


HEAD
Statistics Dept.
O.J.L. HYDERABAD-7






Professor, Dept. of Statistics,
UNIVERSITY COLLEGE OF SCIENCE,
Osmania University,
HYDERABAD-500 046


Dr. B.G. MANJUNATH
Assistant Professor
School of Mathematics & Statistics
University of Hyderabad
HYDERABAD-500 046, T.S.

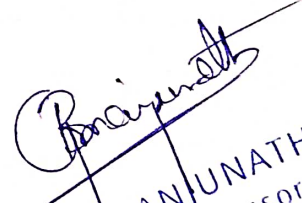
**ALLOCATION OF CREDITS FOR UNDER GRADUATES COURSES OF
B.A./B.COM./B.SC./BBA**

FOR THE ACADEMIC YEAR 2019 ONWARDS

Allocation of credits for B.A/B.Com/B.Sc from 2019 onwards								
S.No.	Subject	Sem-1	Sem-2	Sem-3	Sem-4	Sem-5	Sem-6	Total
1	English	4	4	3	3	3	3	20
2	II Language	4	4	3	3	3	3	20
3	AECC	2	2					4
4	SEC			2	2			4
5	SEC			2	2			4
6	Generic Elective / Project	-	-	-	-	4	4	8
7	DSC/DSE	5	5	5	5	5	5	30
8	DSC/DSE	5	5	5	5	5	5	30
9	DSC/DSE	5	5	5	5	5	5	30
	Total	25	25	25	25	25	25	150
10	TSKC *					2	2	4
11	Extra Curricular Activities(NCC/NSS/ Sports/Martial Arts/Yoga & Meditation) *		1		1		1	3


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**GOVERNMENT DEGREE COLLEGE FOR WOMEN
HEGUMPET, HYDERABAD.
DEPARTMENT OF STATISTICS ALLOCATION OF CREDITS**

Code	Paper/ Title	Course Type	HPW	Credits
SEMESTER - I				
FIRST YEAR				
	PAPER-I: Descriptive Statistics and Probability	DSC-1A	4T+2P=6	4+1=5
SEMESTER - II				
FIRST YEAR				
	PAPER-II: Probability Distributions	DSC-1B	4T+2P=6	4+1=5
SEMESTER - III				
SECOND YEAR				
	SEC-1: UGC Specified Life Skills	SEC I	2	2
	SEC-2: Data Collection, Presentation and Interpretation	SEC II	2	2
	PAPER-III: Statistical Methods, Theory of Estimation & Vital Statistics	DSC-1C	4T+2P=6	4+1=5
SEMESTER - IV				
SECOND YEAR				
	SEC-3: UGC Specified Life Skills	SEC-3	2	2
	SEC-4: Data Scaling Techniques and Report writing	SEC-4	2	2
	PAPER-IV : Statistical Inference	DSC-1D	4T+2P=6	4+1=5
SEMESTER - V				
THIRD YEAR				
	GE: Basic Statistics	GE	4T	4
	DSE -1A : Applied Statistics I	DSE-1A	4T+2P=6	4+1=5
	DSE -1B : Analytical Statistics I	DSE-1B	4T+2P=6	4+1=5
SEMESTER - VI				
THIRD YEAR				
	DSE -2A: Applied Statistics II and Operations Research	DSE-2A	4T+2P=6	4+1=5
	DSE -2B : Analytical Statistics II	DSE-2A	4T+2P=6	4+1=5
	DSE-3: Project (Group projects)/ Optional Paper	PROJECT	4	

M. V. S.

Dr. B. G. Manjunath

**Statistics Dept
HYDERABAD**

Dr. B. G. Manjunath

Dr. B. G. Manjunath

Dr. B. G. MANJUNATH
Assistant Professor
Department of Statistics
Government Degree College for Women
Hegumpet, Hyderabad - 500 015

**GOVERNMENT DEGREE COLLEGE FOR WOMEN
BEGUMPET, HYDERABAD.**

DEPARTMENT OF STATISTICS ALLOCATION OF CREDITS

Code	Paper/ Title	Course Type	HPW	Credits
FIRST YEAR		SEMSTER - I		
	PAPER-I : Descriptive Statistics and Probability	DSC-1A	4T+2P=6	4+1=5
FIRST YEAR		SEMSTER - II		
	PAPER-II: Probability Distributions	DSC-1B	4T+2P=6	4+1=5
SECOND YEAR		SEMSTER - III		
	SEC-1: UGC Specified Life Skills	SEC I	2	2
	SEC-2: Data Collection, Presentation and Interpretation	SEC II	2	2
	PAPER-III: Statistical Methods, Theory of Estimation & Vital Statistics	DSC-1C	4T+2P=6	4+1=5
SECOND YEAR		SEMSTER - IV		
	SEC-3: UGC Specified Life Skills	SEC-3	2	2
	SEC-4: Data Scaling Techniques and Report writing	SEC-4	2	2
	PAPER-IV : Statistical Inference	DSC-1D	4T+2P=6	4+1=5
THIRD YEAR		SEMESTER - V		
	GE: Basic Statistics	GE	4T	4
	DSE -1A : Applied Statistics I	DSE-1A	4T+2P=6	4+1=5
	DSE -1B : Analytical Statistics I	DSE-1B	4T+2P=6	4+1=5
THIRD YEAR		SEMESTER - VI		
	DSE -2A: Applied Statistics II and Operations Research	DSE-2A	4T+2P=6	4+1=5
	DSE -2B : Analytical Statistics II	DSE-2A	4T+2P=6	4+1=5
	DSE-3: Project (Group projects)/ Optional Paper	PROJECT	4	

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HEAD
STATISTICS DEPT
HYDERABAD

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B.G. MANJUNATHI
Assistant Professor
Hyderabad


**GOVERNMENT DEGREE COLLEGE FOR WOMEN
BEGUMPET, HYDERABAD
Scheme of Evaluation**

The scheme of examination has been changed from 25 marks internal and 75 marks external to 40 marks for internal and 60 marks for external examination from 2019 onwards.

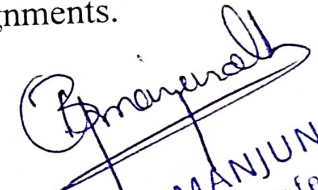
Division of 40 marks is as follows.

1. 20 marks internal assessment in the form of descriptive exam, where two internals will be conducted and average of two is considered.
2. Unit wise test in the form of 20 objective questions, half mark each and a total value of 10 marks.
3. 5 marks for Seminar/ Quiz/ group discussion and 5 marks for assignments.


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**Dr. B. S. MANJUNATH
Assistant Professor
School of Mathematics & Statistics
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HYDERABAD-500 046. T.S.**

Programme Outcomes

PO 1 Domain Expertise:

- Acquire comprehensive knowledge and skills.
- Make use of the knowledge in an innovative manner.
- Effectively apply the knowledge and skills to address various issues.

PO 2 Modern equipment Usage

- Use ICT effectively.
- Access, retrieve and use authenticated information.
- Access, retrieve and use authenticated information. Have knowledge of software applications to analyze data.

PO 3 Computing Skills and Ethics

- Develop rationale and scientific thinking process.
- Use technology intelligently for communication, entertainment and for the benefit of mankind.
- Ensure ethical practices throughout ones endeavors for the wellbeing of human race.

PO 4 Complex problem Investigation & Solving

- Predict and analyze problems.
- Frame hypotheses.
- Investigate and interpret empirical data.
- Plan and execute action.

PO 5 Perform effectively as Individuals and in Teams

- Work efficiently as an individual
- Cooperate, coordinate and perform effectively in diverse teams/groups.
- Prioritize common interest to individual interest.

PO 6 Efficient Communication & Life Skills

- Express thoughts in an effective manner
- Listen, understand and project views in a convincing manner.
- Decide appropriate media to share information

Develop skills to present significant information clearly and concisely to interested groups.

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Dr. B.G. MANJUNATH
Assistant Professor
Mathematics
500 041
S

PO 7 Environmental Sustainability


- Understand sensibly the Environmental challenges.
- Think critically on environment sustainability measures.
- Propagate and follow environment friendly practices.

PO 8 Societal contribution


- Render service for the general good of the society.
- Involve voluntarily in social development activities at Regional, National, global levels.
- Have own pride in volunteering to address societal issues viz: calamities, disasters, poverty, epidemics.
- Be a patriotic citizen to uphold the values of the nation

PO 9 Effective Project Management

- Identify the goals, objectives and components of a project and decide the appropriate time of completion.
- Plan, organize and direct the endeavors of teams to achieve the set targets in time.
- Be competent in identifying opportunities and develop strategies for contingencies.


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GOVERNMENT DEGREE COLLEGE FOR WOMEN
BEGUMPET, HYDERABAD- 500016

B.A/B.Sc Statistics I Year Semester- I Syllabus
(With Mathematics Combination)
(Examination at the end of Semester)

With effect from Academic Year – 2021-2022

Paper- I: Descriptive Statistics and Probability

(4 HPW with 4 Credits and 100 Marks (External: 60, Internal:40))

Course Objectives:

- To Describe statistical measures used in descriptive statistics
- To Compute measurers of central tendency and measures of variability
- To understand and choose the best measure of central tendency and variability for different levels of measurement.
- To Compute raw and central moments for different types of data.
- To know the use of probability in our day to day life and in the decision making.

Course Outcome:

1. **Descriptive Statistics:**

After completing this course, the students should have developed a clear understanding about :

- The Concepts of statistical population and sample, variables and attributes.
- Tabular and graphical representation of data based on variables.
- Measures of central tendency, Dispersion, Skewness and Kurtosis.
- Moments and their use in studying various characteristics of data.
- Different approaches to the theory of probability.
- Important theorems on probability and their use in solving problem.
- The concept of random variables and distribution function. Probability mass and density functions.
- To understand and interpret the expected value and variance of a random variable and various properties of expectation and variance.

UNIT-I

Descriptive Statistics: Concept of primary and secondary data, Classification of data, Measures of central tendency (Arithmetic mean, median, mode, geometric mean and harmonic mean) with simple applications, Absolute and relative measures of dispersion (range, quartile deviation, mean deviation, standard deviation and variance) with simple applications.

Importance of moments, central and non-central moments, their inter-relationships, Sheppard's correction for moments for grouped data, Measures of skewness based on quartiles and moments, kurtosis based on moments with real life examples.

UNIT-II

Probability: Basic concepts of probability, deterministic and random experiments, trial, outcome, sample space, event, operations of events, mutually exclusive and exhaustive events, equally likely and favorable events with examples, Mathematical, Statistical and Axiomatic definitions of probability, their merits and demerits. Properties of probability based on axiomatic definition.

Conditional probability and independence of events, Addition and multiplication theorems for 'n' events, Boole's inequality and Bayes' theorem, Problems on probability using counting methods and theorems.

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UNIT-III

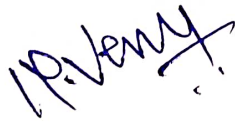
Random Variables: Definition of random variable, discrete and continuous random variables, functions of random variables, probability mass function and probability density function with illustrations. Distribution function and its properties, Transformation of one-dimensional random variable (simple 1-1 functions only).
Notion of bivariate random variable, bivariate distribution, statements of its properties, Joint, marginal and conditional distributions, Independence of random variables.

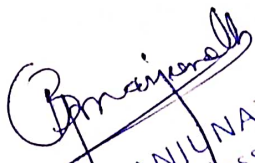
UNIT-IV

Mathematical Expectation: Mathematical expectation of a function of a random variable, Raw and central moments, covariance using mathematical expectation with examples, Addition and multiplication theorems of expectation. Chebyshev's and Cauchy-Schwartz's inequalities and their applications.
Definitions of moment generating function (m.g.f), characteristic function (c.f), cumulant generating function (c.g.f), probability generating function (p.g.f) and statements of their properties with applications.


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P. Venky


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Assistant Professor
School of Mathematics & Statistics
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HYDERABAD-500 046. T.S.


Reference books:

1. **Fundamentals of Statistics, (Vol-I)** - Goon A M, Gupta M K, Das Gupta B, The World Press (Pvt) Ltd., Kolkata.
2. **Fundamentals of Mathematical Statistics** - V. K. Kapoor and S. C. Gupta, Sultan Chand & Sons, New Delhi.

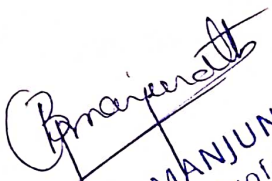
Additional References:

1. Sanjay Arora and Bansilal: New Mathematical Statistics, Satya Prakashan , New Delhi.
2. William Feller: Introduction to Probability theory and its applications, (Vol-I), Wiley.
3. M. Jagan Mohan Rao and Papa Rao: A Text book of Statistics (Paper-I).
4. Hogg, Tanis, Rao: Probability and Statistical Inference, (7th edition), Pearson.
5. K.V.S. Sarma: Statistics Made Simple: Do it yourself on PC, PHI.
6. Gerald Keller: Applied Statistics with Microsoft Excel, Duxbury, Thomson Learning.
7. Levine, Stephen, Krehbiel, Berenson: Statistics for Managers using Microsoft Excel (4th edition), Pearson Publication.


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GOVERNMENT DEGREE COLLEGE FOR WOMEN
BEGUMPET, HYDERABAD- 500016
B.A/B.Sc Statistics I Year Semester- I
(With Mathematics Combination)
(Examination at the end of Semester I)
With effect from Academic Year – 2021-2022
Practical Paper- I (with 2 HPW, Credits 1 and marks 50)
Part - 1 (Using Calculator)


1. Graphical presentation of data (Histogram, frequency polygon, Ogives) and its interpretation.
2. Diagrammatic presentation of data (Bar and Pie).
3. Computation of central tendency and dispersion measures for ungrouped and grouped data.
4. Computation of non-central and central moments – Sheppard's corrections for grouped data.
5. Computation of coefficients of Skewness - Karl Pearson's, Bowley's, β_1 and Kurtosis – β_2 and their interpretation.


Part - 2 (Using MS-Excel)

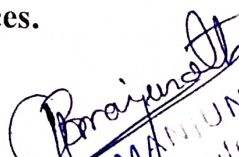
1. **Basics of Excel** - Data entry, editing and saving, establishing and copying formulae, Built in Functions - copy and paste, Find and Replace, Sorting.
2. **Basics of Excel** - Built in Functions - Filtering, Conditional formatting and creating Hyperlinks, Exporting to MS word document
3. Computation of descriptive Statistics using Pivote table - Univariate.
4. Data visualization through diagrams.
5. Computation of central tendency and dispersion measures, Coefficient of Variation for ungrouped and grouped data.
6. Computation of Coefficients of Skewness, Kurtosis using MS-Excel and interpretation.

Note : Training shall be on establishing formulae in Excel cells and deriving the results.

The Excel output shall be exported to MSWord for writing inferences.


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GOVERNMENT DEGREE COLLEGE FOR WOMEN
BEGUMPET, HYDERABAD- 500016

B.A/B.Sc Statistics I Year Semester- II Syllabus
(With Mathematics Combination)
(Examination at the end of Semester)

With effect from Academic Year – 2021-2022

Paper- II: PROBABILITY DISTRIBUTIONS

(4 HPW with 4 Credits and 100 Marks (External: 60, Internal:40))

Course Objectives:

The course is aimed at

- Providing students with a formal treatment of probability theory.
- To explain and illustrate the concept of discrete and continuous probability distributions along with their properties.
- Fostering understanding through real-world statistical applications.

Course Outcome:

- P.m.f and p.d.f of various discrete and continuous probability distributions
- Application of probability distributions to a variety of problems in diversified fields.

UNIT-I

Discrete distributions – I : Uniform and Bernoulli distributions : definitions, mean, variance and simple examples. Definition and derivation of probability mass functions of Binomial distribution, Poisson distribution, properties of these distributions: median, mode, m.g.f, c.g.f., p.g.f., c.f., and moments upto fourth order, reproductive property (wherever exists) and their real life applications. Poisson approximation to Binomial distribution.

UNIT-II

Discrete distributions – II: Negative binomial, Geometric distributions: Definitions and real life applications, properties of these distributions: m.g.f, c.g.f., p.g.f., c.f. and moments upto fourth order, reproductive property (wherever exists), lack of memory property for Geometric distribution. Poisson approximation to Negative binomial distribution.
Hyper-geometric distribution: definition, real life applications, derivation of probability function, mean, variance. Binomial approximation to Hyper-geometric distribution.

UNIT-III

Continuous distributions – I : Normal distributions – definition, properties such as m.g.f., c.g.f., c.f. and moments up to fourth order, reproductive property, wherever exists and their real life applications. Normal distribution as a limiting case of Binomial and Poisson distributions.

UNIT-IV


Continuous distributions – II : Rectangular, Exponential, Gamma distributions - definition, properties: m.g.f., c.g.f., c.f. and moments up to fourth order, reproductive property (wherever exists) and their real life applications. Beta distribution of two kinds: Definitions, mean and variance.

Reference books:

1. **Fundamentals of Statistics, (Vol-I)** - Goon A M, Gupta M K, Das Gupta B, The World Press (Pvt) Ltd., Kolkata.
2. **Fundamentals of Mathematical Statistics** - V. K. Kapoor and S. C. Gupta, Sultan Chand & Sons, New Delhi.

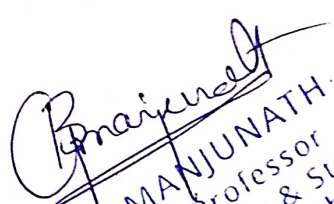
Additional References:

3. Sanjay Arora and Bansilal: New Mathematical Statistics, Satya Prakashan, New Delhi.
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9. Levine, Stephen, Krehbiel, Berenson: Statistics for Managers using Microsoft Excel (4th edition), Pearson Publication.


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Dr. B.G. MANJUNATH
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GOVERNMENT DEGREE COLLEGE FOR WOMEN
BEGUMPET, HYDERABAD- 500016
B.A/B.Sc Statistics I Year Semester- II
(With Mathematics Combination)
(Examination at the end of Semester I)
With effect from Academic Year – 2021-2022
Practical Paper- II (with 2 HPW, Credits 1 and marks 50)

Part - 1 (Using Calculator)

1. Fitting of Binomial distribution-Direct method.
2. Fitting of Binomial distribution-Recurrence relation Method.
3. Fitting of Poisson distribution-Direct method
4. Fitting of Poisson distribution-Recurrence relation Method.
5. Fitting of Negative Binomial distribution.
6. Fitting of Geometric distribution.
7. Fitting of Normal distribution-Areas method.
8. Fitting of Normal distribution - Ordinates method.
9. Fitting of Exponential distribution.

Part - 2 (Using MS-Excel)

1. Data Visualization through graphs (Histogram, frequency polygon, Ogives) using MS-Excel and their interpretation.
2. Computation of descriptive Statistics using Pivote table – Bivariate.
3. Fitting of Binomial distribution-Direct method.
4. Fitting of Poisson distribution-Direct method.
5. Fitting of Normal distribution-Areas method.
6. Fitting of Exponential distribution.

Note : Training shall be on establishing formulae in Excel cells and deriving the results.

The Excel output shall be exported to MSWord for writing inferences.

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Professor, Dept. of Statistics,
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Assistant Professor
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University of Hyderabad
HYDERABAD-500 046. T.S.

**GOVERNMENT DEGREE COLLEGE FOR WOMEN
BEGUMPET, HYDERABAD-500016
DEPARTMENT OF STATISTICS
PANNEL OF EXAMINERS
(For B.Sc I Semester)**

S.No	Name of the Examiner with Address	Semester	Paper	Title
1	Ms. S. Nirmala Lecturer in Statistics Vivekanda Govt. Degree College, Vidyanagar, Hyd. Mob: 9000509959	I	I	Descriptive Statistics and Probability
2	Ms. Sai Sri Kishore Lecturer in Statistics St. Ann's Degree College for Women, Mehdipatnam. Mob:9908277382	I	I	Descriptive Statistics and Probability
3	Mr. D. Manohar Lecturer in Statistics Sri Sai Degree College	I	I	Descriptive Statistics and Probability

**GOVERNMENT DEGREE COLLEGE FOR WOMEN
BEGUMPET, HYDERABAD-500016
DEPARTMENT OF STATISTICS
PANNEL OF EXAMINERS
(For B.Sc II Semester)**

S.No	Name of the Examiner with Address	Semester	Paper	Title
1	Ms. Rajini Devi Lecturer in Statistics Women Degree College Koti, Hyd. Mob:8977442499	II	II	Probability distributions
2	Mr. Murali Krishna Lecturer in Statistics Pulla Reddy Degree College Mehdipatnam, Hyd.	II	II	Probability distributions
3	Dr. Laxmisujatha Lecturer in Statistics Nizam College. Basheerbagh Mob: 9177507545	II	II	Probability distributions

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Osmania University,
HYDERABAD-500046, P.H.

[Signature]
Dr. B. Sujatha
Assistant Professor
Department of Mathematics & S.T.
University of Hyderabad
500 046, T.S.

GOVERNMENT DEGREE COLLEGE FOR WOMEN
BEGUMPET, HYDERABAD
Model Question Paper for B.A/B.Sc I Year, Semester I & II
Subject: Statistics

Max. Marks: 60

Time: 2 ½ hrs

SECTION- A

5 x 4 = 20 Marks

Note: Answer any 5 of the following.


1. Unit- I
2. Unit- I
3. Unit- II
4. Unit- II
5. Unit- III
6. Unit- III
7. Unit- IV
8. Unit- IV


SECTION- B

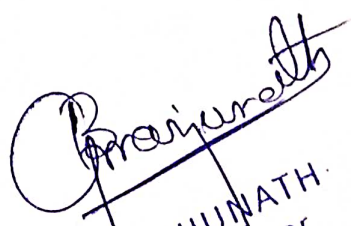
4 x 10 = 40

Note: Answer all the questions.

9. a) Unit- I
(or)
b) Unit- I
10. a) Unit- II
(or)
b) Unit- II
11. a) Unit- III
(or)
b) Unit- III
12. a) Unit- IV
(or)
b) Unit- IV


HEAD
Statistics Dept.
O.J. HYDERABAD-7


Professor, Dept. of Statistics,
MIVERSITY COLLEGE OF SCIENCE
Osmania University,
HYDERABAD-4, RA


Dr. B.G. MANJUNATH
Assistant Professor
School of Mathematics & Stat
University of Hyderabad
HYDERABAD-500 046. T

GOVERNMENT DEGREE COLLEGE FOR WOMEN
BEGUMPET, HYDERABAD
B.A/B.Sc I Year Practical Model Question Paper
Subject: Statistics

Time: 3 hrs

Max. Marks: 45+5=50


Note: Answer any Two questions in Section- A and One question in Section- B. Each question carries equal marks.

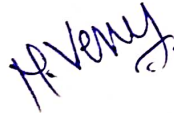
SECTION- A (Using Calculators)

- 1.
- 2.
- 3.

SECTION- B (Using MS- Excel)

- 1.
- 2.


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GOVERNMENT DEGREE COLLEGE FOR WOMEN
BEGUMPET, HYDERABAD- 500016
B.A/B.Sc Statistics II Year Semester- III Syllabus
(With Mathematics Combination)
With effect from Academic Year – 2021-2022
Paper- III: Statistical Methods, Theory of Estimation and Vital Statistics
(4 HPW with 4 credits and 100 marks (External: 60, Internal: 40))

Course Objectives:

- To understand the meaning of correlation and regression and significance of their study in statistical analysis.
- To understand and discuss various characteristics of Estimators like Consistency, Unbiasedness, Efficiency and Sufficiency along with their importance in estimation theory.
- To compute and understand the various vital measures.

Course Outcome:

- Learn about the properties of correlation and regression.
- Use of Regression analysis for estimation and prediction purpose.
- To understand the various methods of estimation.
- Distinguish among rates, ratios and proportions and among measures of mortality and fertility.

Unit –I

Bivariate data, Scattered diagram, Principle of least squares, fitting of straight line, quadratic and power curves. Concept of correlation, computation of Karl-Pearson correlation coefficient for grouped and ungrouped data and its properties. Probable Error of Correlation Coefficient, Correlation ratio, Spearman's rank correlation coefficient and its properties. Simple linear regression, correlation verses regression, properties of regression coefficients, Angles between two regression lines, Correlation and Regression for Bivariate frequency distribution, Concepts of partial and multiple correlation coefficients (only for three variables), Correlation coefficient between Observed & Estimated values.

Unit –II

Analysis of categorical data: Introduction, Notations, Dichotomy, Class and Class Frequency, Order of Class & Class frequency, Relation between class frequencies, Class symbols as operators, Consistency of data, Conditions of consistency, Independence of Attributes, Association and partial association of attributes. Various measures of association: (Yule's) for two way data and coefficient of contingency (Pearson and Tcherprow) and coefficient of colligation.

Theory of Estimation I : Point estimation of a parameter, concept of bias and mean square error of a estimate. Criteria of a good estimator- consistency, unbiasedness, efficiency and sufficiency with examples.


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Unit – III

Theory of Estimation II : Statement of Neyman's Factorization theorem, derivations of sufficient statistics in case of Binomial, Poisson, Normal and Exponential (one parameter only) distributions. Cramer – Rao Inequality, Estimation by the method of moments, Maximum likelihood estimation (MLE), statements of asymptotic properties of MLE. Concept of interval estimation. Confidence intervals of the parameters of normal population by Pivot method.

Unit – IV

Vital Statistics : Introduction, definition and uses of vital statistics. Sources of vital statistics, registration method and census method. Rates and ratios, Crude death rates, age specific death rate, standardized death rates, crude birth rate, age specific fertility rate, general fertility rate, total fertility rate. Measurement of population growth, crude rate of natural increase- Pearl's vital index. Gross reproductive rate sand Net reproductive rate, Life tables, construction and uses of life tables and Abridged life tables.

Reference Books:

1. Goon AM, Gupta MK, Das Gupta B : Outlines of Statistics , Vol-II, the World Press Pvt. Ltd., Kolkata.
2. V. K. Kapoor and S. C. Gupta: Fundamentals of Mathematical Statistics, Sultan Chand & Sons, New Delhi
3. V.K. Kapoor and S.C. Gupta : Fundamentals of Applied Statistics. Sultan Chand
4. Parimal Mukhopadhyay : Applied Statistics, New Central Book agency.

Additional References:

1. Hoel P.G : Introduction to Mathematical statistics, Asia Publishing house.
2. Sanjay Arora and Bansilal : New Mathematical Statistics Satya Prakashan , New Delhi
3. Hogg and Craig : Introduction to Mathematical statistics. Prentice Hall
4. Siegal, S., and Sidney: Non-parametric statistics for Behavioral Science. McGraw Hill.
5. Gibbons J.D and Subhabrata Chakraborti : Nonparametric Statistical Inference. Marcel Dekker.
6. Parimal Mukhopadhyay : Mathematical Statistics. New Central Book agency.
7. Conover : Practical Nonparametric Statistics. Wiley series.
8. V. K. Rohatgi and A. K. Md. Ehsanes Saleh : An introduction to probability and statistics, Wiley series.
9. Mood A M, Graybill F A, Boe's DC. Introduction to theory of statistics. TMH
10. Paramiteya Mariyu Aparameteya Parikshalu. Telugu Academy.
11. K.V. S. Sarma: Statistics made simple do it yourself on PC. PHI
12. Gerald Keller : Applied Statistics with Microsoft excel. Duxbury. Thomson Learning
13. Levin, Stephan, Krehbiel, Berenson: Statistics for Managers using Microsoft Excel.4th Edition. Pearson Publication.
14. Hogg, Tanis, Rao. Probability and Statistical Inference.7th edition. Pearson Publication.
15. Milton and Arnold (fourth Edition):Introduction to Probability and Statistics. McGraw Hill Publication.

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GOVERNMENT DEGREE COLLEGE FOR WOMEN
BEGUMPET, HYDERABAD- 500016

B.A/B.Sc II Year Statistics Semester- III
(With Mathematics Combination)

(Examination at the end of Semester III)


Practical Paper- III (Statistical Methods, Theory of Estimation and Vital Statistics)
(with 2 HPW, Credits 1 and Marks 50)

Part – A (Using Calculator)

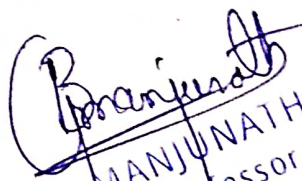
1. Generation of random samples from Uniform (0,1), Uniform (a,b), Normal and Poisson and Exponential Distributions.
2. Fitting of straight line and parabola by the method of least squares.
3. Fitting of power curves of the type $y = ax^b$, $y = ab^x$ and $y = ae^{bx}$ by the method of least squares.
4. Computation of correlation coefficient and regression lines for ungrouped data.
5. Computation of correlation coefficient, forming regression lines for ungrouped data.
6. Computation of correlation coefficient, forming regression lines for grouped data.
7. Computation of multiple and partial correlation coefficients.
8. Computation of correlation ratio.
9. Computation of Yule's coefficient of association and Pearson's, Tcherprows coefficient of contingency.
10. Computation of Morality rates and Fertility rates and Construction of complete life tables.

Part – B (Using Excel)

11. Simulation of random samples from Uniform (0,1), Uniform (a,b), Exponential, Normal and Poisson distributions.
12. Fitting of straight line and parabola by the method of least squares using.
13. Fitting of power curves of the type $y = a x^b$, $y = a b^x$ and $y = a e^{bx}$ by the method of least squares.
14. Computation of correlation coefficient, forming regression lines using MS Excel.
15. Computation of multiple and partial correlation coefficients.
16. Computation of Morality rates, Fertility rates and Reproduction rates.
17. Construction of life tables and abridged life tables.


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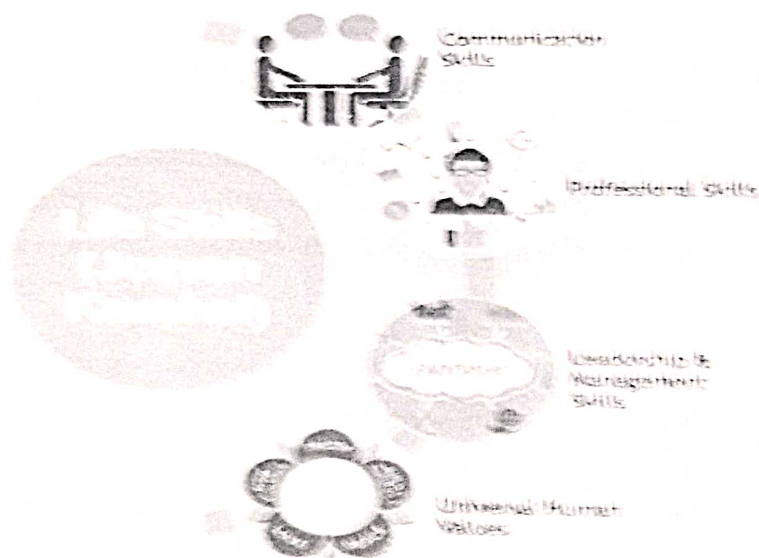

Dr. B.G. MANJUNATH
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N. Venky

GOVERNMENT DEGREE COLLEGE FOR WOMEN (AUTONOMOUS)
BEGUMPET, HYDERABAD- 500016
B.A/B.Sc Statistics II Year Semester- III Syllabus
(With Mathematics Combination)
(Examination at the end of Semester)
With effect from Academic Year – 2020-2021
SEC-1: UGC Specified Skill Enhancement Course
[2 HPW with 2 Credits and 50 Marks]

For Syllabus refer to

Curriculum for Life Skills (Jeevan Kaushal)



University Grants Commission
Bhubini Shukh Zafar Marg
New Delhi – 110 002

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GOVERNMENT DEGREE COLLEGE FOR WOMEN (AUTONOMOUS)
BEGUMPET, HYDERABAD- 500016

B.A/B.Sc Statistics II Year Semester- III Syllabus
(With Mathematics Combination)

(Examination at the end of Semester)
With effect from Academic Year – 2020-2021

(Examination at the end of Semester - III)

SEC - 2 : Data Collection, Presentation and Interpretation
[2 HPW with 2 Credits and 50 Marks]

UNIT –I

Basic Concepts on Population, Sample, Sampling unit, Parameter, Statistic, Standard error, Sample Size and its Determination.

Steps in Sample design. Selecting the Problem and necessity of defining the Problem, Designing a questionnaire and a schedule for collecting data for a set of objectives under study with illustrated examples.

Methods for collecting Primary and Secondary data and their merits and demerits.

UNIT II

Graphical computation of Data and Interpretation : Histogram, frequency curve, frequency polygon, ogive curves.


Diagrammatic computation of Data and Interpretation : Bar diagrams (simple, component, multiple, percentage Bars), Pie diagram.

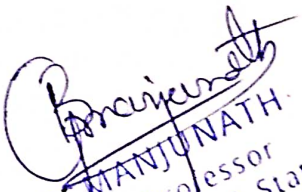
Classification and Tabulation of data. Data Interpretation techniques, Precaution in Interpretation. Data interpretation problems.

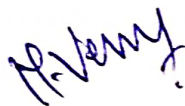
Reference Books :

1. Kotahri, C.R (2009): Research Methodology: Methods and Techniques, 2nd Revised Ed. Reprint, New Age International Publishers
2. S. P. Gupta : Statistical Methods.


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GOVERNMENT DEGREE COLLEGE FOR WOMEN (AUTONOMOUS)
BEGUMPET, HYDERABAD- 500016

B.A/B.Sc Statistics II Year Semester- IV Syllabus
(With Mathematics Combination)

(Examination at the end of Semester)
With effect from Academic Year – 2021-2022

Paper - IV: Statistical Inference

(4 HPW with 4 credits and 100 marks(External : 60, Internal : 40))

Course Objectives:

- To understand the meaning and utility of sampling in Statistics.
- Develop a framework for the null hypothesis, alternative hypothesis, level of significance, one-tailed and two-tailed tests of significance and their importance in testing of hypothesis.
- Discuss the procedure for testing of hypothesis

Course Outcome:

- To understand the concept of sampling distributions and their applications in statistical inference.
- To understand the process of hypothesis testing and its significance
- Importance of Standard Error and to draw conclusions using p-value

Unit-I

Concepts of statistical hypotheses, Null and Alternative hypothesis, Critical region, two types of errors, Level of significance and Power of a test. One and two tailed tests, test function (non-randomized and randomized). Optimum test – MP Test & UMP Test, Likelihood Ratio test, Central Limit Theorem and its uses in testing of hypothesis. Critical and significant values. Statement and Proof of Neyman-Pearson's fundamental lemma for Randomized tests. Examples in case of Binomial, Poisson, Exponential and Normal distributions and their power of the test functions.

Unit-II

Large sample tests for single sample mean, difference of means, single sample proportion, difference of proportions and difference of standard deviations. Fisher's Z-transformation for population correlation coefficient(s) and testing the same in case of one sample and two samples. Definition of order statistics and statement of their distributions.

Unit – III

Exact Sampling Distributions: Concepts of Population, Parameter, Random sample, Statistic, Sampling distribution and Standard error. Standard error of sample mean(s) and sample proportion(s). Exact sampling distributions - Statement and properties of Chi-Square, t and F distributions and their interrelationships. Tests of significance based on Chi-Square - Test for specified variance, goodness of fit and independence of attributes. Tests of significance based on student's - t – Test for single sample specified mean, difference of means for independent and related samples, sample correlation coefficient; F - test for equality of population variances.



Unit – IV


Non-parametric tests - their advantages and disadvantages, comparison with parametric tests. Measurement scale - nominal, ordinal, interval and ratio. Use of Central Limit Theorem in testing. One sample runs test, sign test and Wilcoxon-signed rank tests (single and paired samples). Two independent sample tests: Median test, Wilcoxon –Mann-Whitney U test, Wald Wolfowitz's runs test. Use of central limit theorem in testing.


Reference Books:

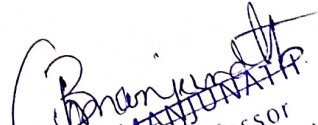
1. Goon AM, Gupta MK, Das Gupta B : Outlines of Statistics , Vol-II, the World Press Pvt. Ltd., Kolkata.
2. V. K. Kapoor and S. C. Gupta: Fundamentals of Mathematical Statistics, Sultan Chand & Sons, New Delhi

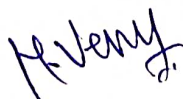
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1. Hoel P.G : Introduction to Mathematical statistics, Asia Publishing house.
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GOVERNMENT DEGREE COLLEGE FOR WOMEN
BEGUMPET, HYDERABAD- 500016
B.A/B.Sc II Year Statistics Semester- IV
(With Mathematics Combination)
(Examination at the end of Semester IV)
Practical Paper- IV (Statistical Inference)
(with 2 HPW, Credits 1 and Marks 50)


Part – A (Using Calculator)


1. Large sample tests for mean(s), proportion(s), Standard deviation(s) and correlation coefficient.
2. Computation of Mortality rates, Fertility rates and Reproduction rates.
3. Computation of life tables.
4. Small sample tests for single mean and difference of means and correlation coefficient.
5. Paired t-test.
6. Small sample test for single and difference of variances.
7. Chi – Square test for goodness of fit and independence of attributes.
8. Nonparametric tests for two independent samples (Median test, Wilcoxon Mann Whitney - U test, Wald - Wolfowitz's runs test)

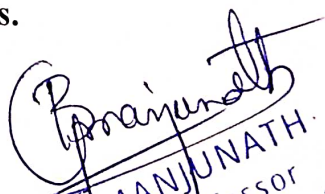
Part – B (Using Excel)

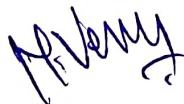
9. Use of Look up and Reference functions for data analysis.
10. Creating and assigning Macros.
11. Construction of various rates and life tables.
12. Small sample tests for mean(s), paired t-test and correlation coefficient .
13. Small sample test for single and difference of variances.
14. Chi – Square test for goodness of fit and independence of attributes.
15. Nonparametric tests for single and related samples (sign test and Wilcoxon signed rank test) and one sample runs test.

Note : Training shall be on establishing formulae in Excel cells and deriving the results.
The Excel output shall be exported to MSWord for writing inferences.


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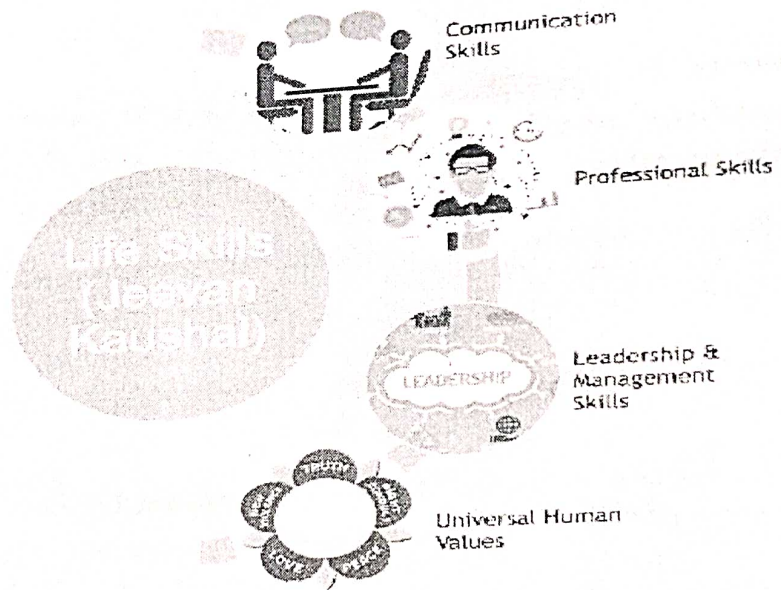

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M. Venky

GOVERNMENT DEGREE COLLEGE FOR WOMEN
BEGUMPET, HYDERABAD- 500016
B.A/B.Sc Statistics II Year Semester- IV Syllabus
(With Mathematics Combination)
(Examination at the end of Semester)
With effect from Academic Year – 2020-2021
SEC – 3 - UGC Specified Skill Enhancement Course
[2 HPW with 2 Credits and 50 Marks]

For Syllabus refer to

Curriculum for Life Skills
(Jeevan Kaushal)



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Dr. B.G. MANJUN
Assistant Prof
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GOVERNMENT DEGREE COLLEGE FOR WOMEN
HEGUMPET, HYDERABAD- 500016
B.A/B.Sc Statistics II Year Semester- IV Syllabus
(With Mathematics Combination)
(Examination at the end of Semester)
With effect from Academic Year – 2020-2021
(Examination at the end of Semester - IV)
SEC - 4 : Data Scaling Techniques and Report writing
[2 HPW with 2 Credits and 50 Marks]

UNIT – I


Qualitative and Quantitative data, Measurement of Scales: nominal, ordinal, interval and ratio scales, Scale Classification Bases, Important Scaling Techniques, Scale Construction Techniques, Developing Likert-type Scales, Factor scales and Cumulative Scales their advantages and limitations.


UNIT-II

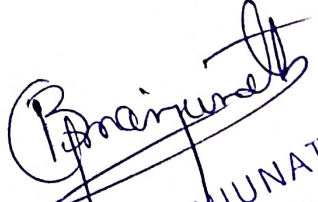
Interpretation and Report Writing: meaning of interpretation, technique of interpretation, precautions in interpretation, significance of report writing, different steps in writing report, layout of the research report, types of reports, oral presentation, mechanics of writing a research report.

Reference Books :

1. SC Gupta and VK Kapoor : Fundamentals of Applied Statistics, Sultan Chand & Sons
2. Goon AM, Gupta MK, Das Gupta B : Fundamentals of Statistics , Vol-I, The World Press Pvt. Ltd., Kolkata.


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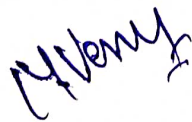



GOVERNMENT DEGREE COLLEGE FOR WOMEN
BEGUMPET, HYDERABAD- 500016

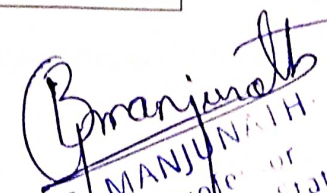
DEPARTMENT OF STATISTICS
PANEL OF EXAMINERS

S.No.	Name	Designation	Semester	Title
1	Dr. Yugandar St. Francis Degree College for Women, Begumpet, Hyderabad Ph no: 9849651251	Lecturer in Statistics	Sem- III	Statistical Methods and Theory of Estimation.
2	Ms. Ayesha Nasreen DBPM College, Hyderabad Ph. No: 8297922526	Lecturer in Statistics	Sem- III	Statistical Methods and Theory of Estimation.
3	Mr. Selva Kumar Bhavan's College, Sainikpuri Mob:	Lecturer in Statistics	Sem – III	Statistical Methods and Theory of Estimation.
4	Mr. G. Govardhan MNR Degree College, Hyderabad Ph. No: 9848019845	Lecturer in Statistics	Sem-IV	Statistical Inference
5	Ms. Sangeetha Kasturba Gandhi Degree College, Hyderabad. Ph. No: 9949362545	Lecturer in Statistics	Sem -IV	Statistical Inference
6	Ms. Lakshmi Prasanna RBVRR, Hyderabad	Lecturer in Statistics	Sem- IV	Statistical Inference


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GOVERNMENT DEGREE COLLEGE FOR WOMEN
BEGUMPET, HYDERABAD
Model Question Paper for B.A/B.Sc II Year, Semester III & IV
Subject: Statistics
Paper: III & IV

Max. Marks: 60

Time: 2 hrs

SECTION- A

Note: Answer any Five of the following. Each question carries 3 marks. $5 \times 3 = 15$ Marks

1. UNIT-I
2. UNIT-I
3. UNIT-II
4. UNIT-II
5. UNIT-III
6. UNIT-III
7. UNIT-IV
8. UNIT-IV

SECTION- B


4 x 10 = 40 Marks

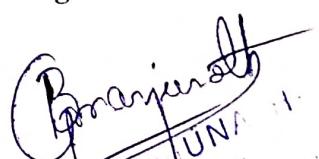
Note: Answer all questions.

9. a) UNIT-I
(or)
b) UNIT-I
10. a) UNIT-II
(or)
b) UNIT-II
11. a) UNIT-III
(or)
b) UNIT-III
12. a) UNIT-IV
(or)
b) UNIT-IV

Internals are for 40 Marks (Assessment-20 marks, MCQs – 10 Marks, Assignment-5 Marks & Seminar-5Marks)


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GOVERNMENT DEGREE COLLEGE FOR WOMEN
BEGUMPET, HYDERABAD- 500016

Model Question Paper for B.A/B.Sc II Year, Semester III & IV Practicals

Subject: Statistics

Paper: III & IV

Time: 3 hrs

Max. Marks: 50


Solve any THREE problems choosing at least one from each Section.
(3Qx15m=45m) and Record: 5m

Section-A

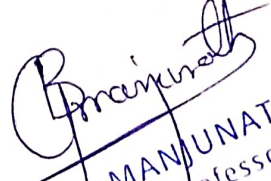
1. From Part 1
2. From Part 1
3. From Part 1

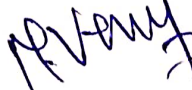
Section - B

4. From Part 2
5. From Part 2


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**GOVERNMENT DEGREE COLLEGE FOR WOMEN
BEGUMPET, HYDERABAD- 500016
DEPARTMENT OF STATISTICS
PANNEL OF EXAMINERS
(For SEC-2)**

S.No	Name of the Examiner with Address	Semester	Title
1	Mr. Chandan Babu Lecturer in Statistics Bhavan's College, Sainikpuri Mob:9392252883 (or) 7981649427	III	Data Collection, Presentation and Interpretation
2	Ms. S. Jayasree Lecturer in Statistics RBVRR college for women Mob: 9849236602	III	Data Collection, Presentation and Interpretation
3	Dr. D. Lalitha Devi Lecturer in Statistics Kasturba Degree College East Maradpally, Secunderabad Mob:9290614936	III	Data Collection, Presentation and Interpretation

**GOVERNMENT DEGREE COLLEGE FOR WOMEN
BEGUMPET, HYDERABAD- 500016
DEPARTMENT OF STATISTICS
PANNEL OF EXAMINERS
(For SEC-4)**

S.No	Name of the Examiner with Address	Semester	Title
1	Ms. Anitha Lecturer in Statistics St. Pious College, Nacharam Mob:8179717914	IV	Data Scaling Techniques and Report writing
2	Ms.D. Sumalatha Lecturer in Statistics Koti Womens College Mob: 9291434772	IV	Data Scaling Techniques and Report writing
3	Ms. Rajini Lecturer in Statistics Bhavan's College, Sainikpuri Ph. No: 9949021332	IV	Data Scaling Techniques and Report writing

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GOVERNMENT DEGREE COLLEGE FOR WOMEN
BEGUMPET, HYDERABAD- 500016

MODEL QUESTION PAPER FOR SEC – 2& 4

Max. Mar: 40

Time : 1 ½ hr

SECTION-A

Note: Answer any Four of the following questions. Each question carries 4 marks $4 \times 4 = 16$

1. Unit-I
2. Unit-I
3. Unit-I
4. Unit-II
5. Unit-II
6. Unit-II


SECTION-B


Note: Answer the following question.


2 x 12 = 24 Marks

1. a) Unit-I
(or)
b) Unit-I
2. a) Unit- II
(or)
b) Unit- II

Note: Internal is for 10 Marks

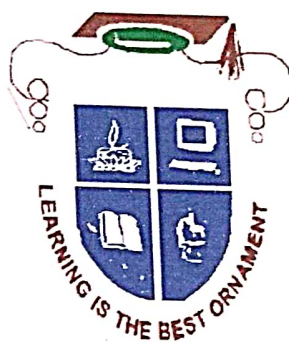

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**GOVERNMENT DEGREE COLLEGE FOR WOMEN
BEGUMPET, HYD-16
(An Autonomous College of Osmania University)**

**CHOICE BASED CREDIT SYSTEM
(CBCS)**



SYLLABUS

For

B. Sc III Year

Under Graduate Programme

DEPARTMENT OF STATISTICS

(2021-22)

GOVERNMENT DEGREE COLLEGE FOR WOMEN (AUTONOMOUS)
BEGUMPET, HYDERABAD- 500016
B.A/B.Sc Statistics III Year Semester- V Syllabus
(With Mathematics Combination)
(Examination at the end of Semester)
For the Academic Year – 2021-2022
Paper V- Sampling Theory, Statistical Quality Control and Time series
(4 HPW with 4 credits and 100 marks (External : 60, Internal : 40))

Course Objective:

- To study the Principles of sample survey and main steps involved in selecting a sample.
- To study different methods of sampling techniques like Simple random sampling, Stratified random sampling and Systematic sampling
- Understand the role of statistical tools in quality improvement and how a control chart is used to detect assignable causes.
- Advanced understanding of the concepts of time series and their applications.

Course Outcome:

- Identify and describe common methods of sampling
- To understand the factors to be considered while selecting a sample.
- Recognize the forecasting methods available for time series with specific components.
- Construct and interpret control charts for variables and attributes.

UNIT-I

Sample Surveys: Concepts of population, sample, sampling unit, parameter, statistic, sample frame and standard error. Principal steps in sample surveys - need for sampling, census versus sample surveys, sampling and non- sampling errors, sources and treatment of non-sampling errors, advantages and limitations of sampling.

Sampling Methods: Types of sampling: Subjective, probability and mixed sampling methods. Methods of drawing random samples with and without replacement. Estimates of population mean, total, and proportion, their variances and the estimates of variances in Simple Random Sampling With and Without Replacement


UNIT-II

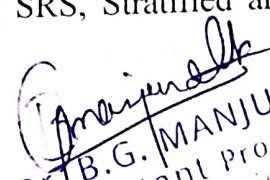
Estimates of population mean, total, and proportion, their variances and the estimates of variances in the following methods.

- (i) Stratified Random Sampling with Proportional and Neyman allocation, and
- (ii) Systematic Sampling when $N = nk$.

Comparison of relative efficiencies. Advantages and disadvantages of SRS, Stratified and Systematic sampling methods.


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UNIT-III


Statistical Quality Control: Importance of SQC in industry. Dimensions of quality. Statistical basis of Shewart control charts. Construction of control charts for variables (mean, range and standard deviation) and attributes (p, np with fixed and varying sample sizes) and their Interpretation. Control charts for attributes (c and u charts with fixed and varying sample sizes) and their Interpretation. Natural tolerance limits and specification limits. process capability index and modified control charts. **Acceptance sampling plans:** Concept of AQL and LTPD. Producers risk and consumer's risk Single and Double sampling plans for attributes and their OC and ASN functions. Design of single and double sampling plans for attributes using Binomial and Poisson distributions. Construction of OC and ASN functions.


UNIT-IV

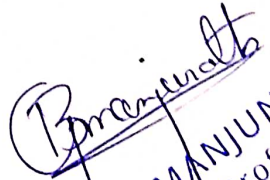
Time series: Time series and its components with illustrations, additive, multiplicative and mixed models. Determination of trend by least squares and moving average methods. Growth curves and their fitting with reference to Modified exponential, Gompertz and Logistic curves. Determination of seasonal indices by Ratio to moving average, ratio to trend and link relative methods.

Reference Books:

1. V.K. Kapoor and S.C. Gupta : Fundamentals of Applied Statistics. Sultan Chand
2. Parimal Mukhopadhyay : Applied Statistics, New Central Book agency.
3. Daroga Singh and Chowdhary: Theory and Analysis of Sample survey designs. Wiley Eastern.
4. M.R.Saluja : Indian Official Statistics. ISI publications.
5. B.L.Agarwal: Basic Statistics. New Age publications.
6. S.P.Gupta : Statistical Methods. Sultan Chand and Sons.
7. Anuvartita Sankhyaka Sastram – Telugu Academy.
8. Arora, Sumeet Arora, S. Arora: Comprehensive Statistical Methods. S.Chand.
9. A.M.Goon, M.K.Gupta, B. Dasgupta: Fundamentals of Statistics Vol II World Press Private Ltd., Calcutta
10. A.M.Goon, M.K.Gupta, B. Dasgupta An outline of Statistical Theory Vol II World Press Private Ltd., Calcutta 17.
11. D.C. Montgomery: Introduction to Statistical Quality Control. Wiley
12. R.C.Gupta: Statistical Quality Control.


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GOVERNMENT DEGREE COLLEGE FOR WOMEN (AUTONOMOUS)

BEGUMPET, HYDERABAD- 500016

B.A/B.Sc Statistics III Year Semester- V Syllabus

(With Mathematics Combination)

(Examination at the end of Semester)

For the Academic Year – 2021-2022

**Practical Paper-V - Sampling Theory, Statistical Quality Control and Time series
(2 HPW, with 1 Credit)**

Part – A (Using Calculator)

Estimation of population mean, population total and variance of these estimates by

1. Simple random sampling with and without replacement. Comparison between SRSWR and SRSWOR
2. Stratified random sampling with proportional and optimum allocations. Comparison between proportional and optimum allocations with SRSWOR
3. Systematic sampling with $N = nk$. Comparison of Systematic sampling with Stratified and SRSWOR
4. Measurement of trend by method of least squares and moving averages.
5. Determination of seasonal indices by the method of Ratio to moving averages.
6. Determination of seasonal indices by the method of Ratio to trend.
7. Determination of seasonal indices by the method of link Relatives.
8. Construction of \bar{X} , R and σ - charts.
9. Construction of p, np, charts with fixed and varying n.
10. Construction of c and u charts.
11. Designing a single sampling plan and construction of its OC and ASN curves.
12. Designing a double sampling plan and construction of its OC and ASN curves.

Part – B (Using Excel or R Programming)

Statistical Quality Control

13. Construction of \bar{X} , R and σ - charts.
14. Construction of p and np charts with fixed n.
15. Construction of p and np charts with varying n.
16. Construction of c and u charts.

Time Series Analysis

17. Measurement of trend by method of least squares and moving averages.
18. Determination of seasonal indices by the method of Ratio to moving averages.
19. Determination of seasonal indices by the method of Ratio to trend.
20. Determination of seasonal indices by the method of link Relatives.

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GOVERNMENT DEGREE COLLEGE FOR WOMEN (AUTONOMUS)
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DEPARTMENT OF STATISTICS
PANNEL OF EXAMINERS
(For B.Sc V Semester)

S.No	Name of the Examiner with Address	Semester	Paper	Title
1	Ms.T. Vedavathi Asst. Prof in Statistics Govt. City College, Hyd. Mob: 9490411357	V	V	Sampling Theory, Statistical Quality Control and Time series
2	Dr. Ch. Lakshmisujata Lecturer in Statistics Nizam College, Basheerbagh Mob: 9177507545	V	V	Sampling Theory, Statistical Quality Control and Time series
	Ms.Sri Vani Lecturer in Statistics St. Pious Degree College Mob: 7780748983	V	V	Sampling Theory, Statistical Quality Control and Time series

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GOVERNMENT DEGREE COLLEGE FOR WOMEN (AUTONOMOUS)

BEGUMPET, HYDERABAD- 500016

B.Sc Statistics III Year Semester- V Syllabus

(With Mathematics Combination)

(Examination at the end of Semester)

For the Academic Year – 2021-2022

Paper VI - GE–Basic Statistics

(4 HPW, Credits 4 and Marks 100)

UNIT I

Introduction: Definition and scope of Statistics, concepts of statistical population and sample. Data: quantitative and qualitative, attributes, variables, scales of measurement - nominal, ordinal, interval and ratio. Presentation: tabular and graphic, including histogram and ogives.

UNIT II

Measures of Central Tendency: mathematical and positional. Measures of Dispersion: range, quartile deviation, mean deviation, standard deviation, coefficient of variation, moments, skewness and kurtosis.

UNIT III


Bivariate data: Definition, scatter diagram, simple, partial and multiple correlation (3 variables only), rank correlation. Simple linear regression, principle of least squares and fitting of polynomials and exponential curves.

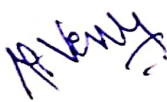

UNIT IV

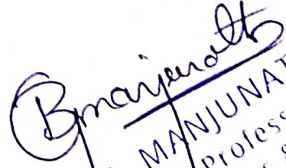
Theory of attributes, consistency of data, independence and association of attributes, measures of association and contingency.

Reference Books :

1. Goon A.M., Gupta M.K. and Dasgupta B. (2002): Fundamentals of Statistics, Vol. I & II, 8th Edn. The World Press, Kolkata.
2. Miller, Irwin and Miller, Marylees (2006): John E. Freund's Mathematical Statistics with Applications, (7th Edn.), Pearson Education, Asia.
3. Mood, A.M. Graybill, F.A. and Boes, D.C. (2007): Introduction to the Theory of Statistics
4. V.K.Kapoor and S.C.Gupta: Fundamentals of Mathematical Statistics, Sultan Chand & Sons, New Delhi.
5. S.P. Gupta : Statistical Methods


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**GOVERNMENT DEGREE COLLEGE FOR WOMEN
(AUTONOMOUS)
BEGUMPET, HYDERABAD-500016
DEPARTMENT OF STATISTICS
PANNEL OF EXAMINERS
(For B.Sc V Semester Paper VI - GE-Basic Statistics)**

S.No	Name of the Examiner with Address	Semester	Paper	Title
1	Mr. Madhusudan Rao Lecturer in Statistics Aurora Degree College Mob:	V	VI	Basic Statistics
2	Mr. Shiva Kumara Lecturer in Statistics IIMC, Lakdikapool Mob:7207720676	V	VI	Basic Statistics
3	Mr. Mohan Babu Lecturer in Statistics Sai Sudhir College Mob:	V	VI	Basic Statistics

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M. Venky

GOVERNMENT DEGREE COLLEGE FOR WOMEN (AUTONOMOUS)
BEGUMPET, HYDERABAD- 500016
B.A/B.Sc Statistics III Year Semester- VI Syllabus
(With Mathematics Combination)
(Examination at the end of Semester)
For the Academic Year – 2021-2022
Paper- VII: Design of Experiments, Vital statistics and Index Numbers
(4 HPW with 4 credits and 100 marks (External : 60, Internal : 40))

Course Objective:

- To describe analysis of variance and various design of experiments.
- To compute and understand the various vital measures.
- To define as well as describe how various index numbers are calculated. and explain its use.

Course Outcome:

- Understand the potential practical problems in its implementation.
- Construct optimal or good designs for a range of practical experiments.
- Appreciate the advantages and disadvantages of a design for a particular experiment.
- Describe how the analysis of the data from the experiment should be carried out
- Distinguish among rates, ratios and proportions and among measures of mortality and fertility.
- Interpret and use a range of index numbers commonly used in the business sector
- To Perform calculations involving simple, composite and weighted index numbers

UNIT –I

Analysis of Variance and Design of Experiments : Concept of Gauss-Markoff linear model with examples, statement of Cochran's theorem, ANOVA – one-way, two-way classifications with one observation per cell Expectation of various sums of squares, Statistical 1 analysis, Importance and applications of design of experiments.

UNIT –II

Principles of experimentation: Analysis of Completely randomized Design (C.R.D), Randomized Block Design (R.B.D), Latin Square Design (L.S.D) including one missing observation, expectation of various sum of squares. Comparison of the efficiencies of above designs.

UNIT – III

Vital statistics: Introduction, definition and uses of vital statistics. Sources of vital statistics, registration method and census method. Rates and ratios, Crude death rates, age specific death rate, standardized death rates, crude birth rate, age specific fertility rate, general fertility rate, total fertility rate. Measurement of population growth, crude rate of natural increase- Pearl's vital index. Gross reproductive rate sand Net reproductive rate, Life tables, construction and uses of life tables and Abridged life tables.

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References:

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UNIT – IV

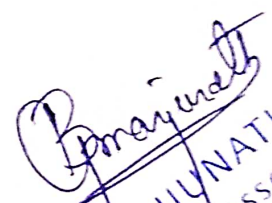
Index Numbers: Concept, construction, uses and limitations of simple and weighted index numbers. Laspeyres's, Paasche's and Fisher's index numbers, criterion of a good index number, problems involved in the construction of index numbers. Fisher's index as an ideal index number. Fixed and chain base index numbers. Cost of living index numbers and wholesale price index numbers. Base shifting, splicing and deflation of index numbers.

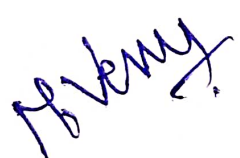
Reference Books:

1. V.K.Kapoor and S.C.Gupta : Fundamentals of Applied Statistics. Sultan Chand
2. ParimalMukhopadhyay : Applied Statistics . New Central Book agency.
3. M.R.Saluja : Indian Official Statistics. ISI publications.
4. B.L.Agarwal: Basic Statistics. New Age publications.
5. S.P.Gupta : Statistical Methods. Sultan Chand and Sons.
6. Pratirupa Sidhanthamulu – Telugu Academy. Prayoga Rachana and Visleshana – Telugu Academy.


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**GOVERNMENT DEGREE COLLEGE FOR WOMEN (AUTONOMUS)
BEGUMPET, HYDERABAD- 500016**

**B.A/B.Sc Statistics III Year Semester- VI Syllabus
(With Mathematics Combination)**

(Examination at the end of Semester)

For the Academic Year – 2021-2022

Paper- VIII: Operations Research

(4 HPW with 4 credits and 100 marks (External : 60, Internal : 40))

Course Objective:

- To impart knowledge in concepts and tools of Operations Research.
- To understand mathematical models used in Operations Research.
- To apply these techniques constructively to make effective business decisions.

Course Outcome:

- Formulate and solve problems as graphs.
- Develop linear programming (LPP) models, transportation, transshipment, assignment and sequencing problems.
- Solve the problems using special solution algorithms.

UNIT –I

Operations Research: Meaning and scope of OR. Convex sets and their properties. Definition of general LPP. Formulation of LPP. Solution of LPP by graphical method. Statements of Fundamental theorem of LPP and other related theorems. Simplex algorithm.

UNIT –II

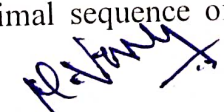
Concept of artificial variables. Big –M /Penalty method and two-phase simplex methods. Concept of degeneracy and resolving it. Concept of duality of LPP. Dual Primal relationship. Statement of Fundamental Theorem of Duality.

UNIT –III

Definition of transportation problem, TPP as a special case of LPP, Initial basic feasible solutions by North-West Corner Rule, Matrix minimum method and VAM. Optimal solution through MODI tableau and stepping stone method for balanced and unbalanced transportation problem. Degeneracy in TP and resolving it. Concept of Transshipment problem.

UNIT –IV

Formulation and description of Assignment problem and its variations. Assignment problem as special case of TP and LPP. Unbalanced assignment problem, optimal solution using Hungarian method and traveling salesman problem and its solution. Problem of Sequencing. Optimal sequence of N jobs on two and three machines without passing.



Reference Books:

1. Kanti Swaroop, P.K.Gupta and ManMohan: Operations Research. Sultan Chand.
2. S.D. Sharma: Operations Research
3. J.K. Sharma: Operations Research Theory and Applications. Macmillan Publishers India LTD.
4. Parikriya Parishodhana - Telugu Academy.

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B.A/B.Sc Statistics III Year Semester- VI Syllabus
(With Mathematics Combination)
(Examination at the end of Semester)
For the Academic Year – 2021-2022
Practical Paper-VI: Theory Paper VII and VIII
(with 2 HPW, 1 Credit)


Part – A (Using Calculator)

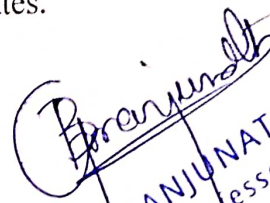
1. Analysis of CRD.
2. Analysis of RBD and Comparison of RBD with CRD with and without missing observation.
3. Analysis of RBD with one missing observation and computation of Critical Difference.
4. Analysis of LSD and Comparison of LSD with RBD with CRD.
5. Analysis of LSD with one missing observation and computation of Critical Difference.
6. Computation of Morality rates and Fertility rates and Construction of complete life tables.
7. Base shifting, splicing and Deflation.
8. Solution of L.P. problem by simplex method.
9. Solution of L.P. problem by Big-M Method.
10. Two-phase simplex method.
11. IBFS for a transportation problem by North-West corner rule, Matrix minimum method and Vogel's approximation method and also Optimum solution to balanced and unbalanced transportation problem by MODI method.
12. Optimum solution to balanced and unbalanced Assignment problem by Hungarian method and also Solution of traveling salesman problem.
13. Computation of Optimal Sequence and idle time for N jobs on 2 and 3 machines.

Part – B (Using Excel or R Programming)

14. Analysis of CRD.
15. Analysis of RBD with and without missing observation. Comparison of RBD with CRD.
16. Analysis of LSD with and without missing observation. Comparison of LSD with RBD and CRD.
17. Computation of Morality rates, Fertility rates and Reproduction rates.
18. Construction of life tables and abridged life tables.


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DEPARTMENT OF STATISTICS
PANNEL OF EXAMINERS
(For B.A/B.Sc VI Semester)

S.No	Name of the Examiner with Address	Semester	Paper	Title
1	K.Parimala Diana Sudheer Lecturer in Statistics Aurora's Degree College Mob.9100000578	VI	VII	Design of Experiments, Vita statistics and Index Numbers
2	Ms. Sandhya Lecturer in Statistics Stanley Degree College, Abids Mob: 701357088	VI	VII	Design of Experiments, Vita statistics and Index Numbers
3	Ms.Kumudam Lecturer in Statistics St. Francis Xavier Degree College Barkatpura, Hyd.	VI	VII	Design of Experiments, Vita statistics and Index Numbers
4	T. Prashanthi Lecturer in Statistics Sujatha Degree College Mob: 9014180301	VI	VIII	Operations Research
5	Ms. Sai Sri Kishore Lecturer in Statistics St. Ann's Degree College for Women, Mehdipatnam. Mob:9908277382	VI	VIII	Operations Research
6	Mr. MVLN Shekaran Lecturer in Statistics Megha Degree College Mob:	VI	VIII	Operations Research

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GOVERNMENT DEGREE COLLEGE FOR WOMEN (AUTONOMOUS)

BEGUMPET, HYDERABAD

Model Question Paper for B.A/B.Sc III Year, Semester V & VI

Subject: Statistics

Paper: V, VII & VIII

Time: 2 ½ hrs

Max. Marks: 60

SECTION- A

Note: Answer any Five of the following. Each question carries 4 marks. $5 \times 4 = 20$ Marks

1. UNIT-I
2. UNIT-I
3. UNIT-II
4. UNIT-II
5. UNIT-III
6. UNIT-III
7. UNIT-IV
8. UNIT-IV


SECTION- B


Note: Answer all questions.


4 x 10 = 40 Marks

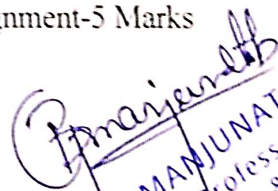
9. a) UNIT-I
(or)
b) UNIT-I
10. a) UNIT-II
(or)
b) UNIT-II
11. a) UNIT-III
(or)
b) UNIT-III
12. a) UNIT-IV
(or)
b) UNIT-IV

Internals are for 40 Marks (Assessment-20 marks, MCQs – 10 Marks, Assignment-5 Marks & Seminar-5Marks)


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