



# SRR & CVR GOVT. DEGREE COLLEGE (Autonomous)



PHONE NO : 9848732916

NAAC : B+ (III Cycle with CGPA : 2.60) - Estd: 1937

WEBSITE : [www.srrcvr.ac.in](http://www.srrcvr.ac.in)

ISO 9001 - 2015 Certified

EMAIL : [srrandcvr@gmail.com](mailto:srrandcvr@gmail.com)

Institution is ranked by NIRF 101 -150 band at NIRF - 2020

## BOARD OF STUDIES

(Under Graduate)

A.Y 2020-2021



## STATISTICS

I, II, III & V SEMESTERS

Minutes of Meeting  
& Curriculum/Syllabi

**DEPARTMENT OF STATISTICS**



# SRR & CVR GOVT. DEGREE COLLEGE

(Autonomous)

NAAC accredited with 'B' Grade

Machavaram, Vijayawada – 520 004, Krishna District.

Cell. 94922 34488 Ph. 0866-2430060 Fax: 0866-2441092 www.srrevr.org srrandevr@gmail.com



## Minutes of the meeting of the UG Board of Studies in the Subject of Statistics., A. Y:2020-21

The meeting of the Up gradation of Syllabus UG Board of Studies in the Subject of Statistics held on 03-12-2020 at 3.00 p.m., in Department of Mathematics & Statistics at SRR & CVR Govt. Degree College (Autonomous), Vijayawada-520004.

The following members attended the meeting: (Offline/Online/ Blended)

1. Smt .K.V.Naga Lakshmi, (Incharge & Chairperson)
2. Prof.K. Rosaiah M.Sc, Ph.D (University Nominee)
3. B.Neelavendra Rao M.Sc(Rtd) (Subject expert)
4. Sri. G. Chakravarthi M.Sc (Subject expert)
5. Smt. D. Babitha (Faculty Member)
6. Kum.G.Bindhu sri (Student Nominee)

*Rosaiah*

Agenda:

- Item 1: Approval of syllabus for Semester I, II, III & V for the academic year 2020-2021
- Item 2: Approval of Question paper blue print and model question paper
- Item 3: Approval of the list of paper setters and examiners
- Item 4: Any other item with the approval of the chair.

The Chairman, Board of Studies welcomed the members and initiated the discussion on the syllabus for I, II, III and V semesters. He apprised the members of Board of Studies and the guidelines of the UGC, APSHE and the CCE regarding the framing of syllabus, and the recommended evaluation ratio for internal and external examinations. The members discussed in detail the various aspects presented before them and unanimously resolved the following:


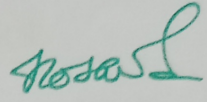
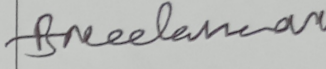
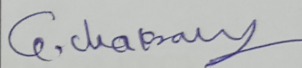
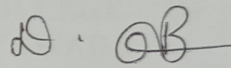
Resolutions:

1. Resolved to approve the present CBCS Revamped syllabus for semester 3rd, & 5th.
2. Resolved to approve the revised CBCS Syllabus for semester I and II on the recommendations of Andhra Pradesh State Council for Higher Education.
3. Resolved to approve the division of marks for internal and external examinations i.e 40  
Marks for internal and 60 Marks for external along with the suggested blue print and model question paper.
4. Resolved to enhance the theory examination time from two & half Hours to three Hours as majority of the Students requested.
5. Resolved to conduct the external examinations either in offline, online or blended in view of Pandemic situation.
6. Resolved to approve the list of paper setters and external examiners submitted by the department.
7. Resolved to approve the division of internal marks i.e.
  - a) 10Marks for Internal Exams (Two).
  - b) 10 Marks for Assignments (Two).
  - c) 10 Marks for Project.
  - d) 5 Marks for Attendance.
  - e) 5Marks for Seminar.
8. Resolved to approve the syllabus of bridge course in Statistics.

*Sri Neelam Anand*

*D. B.*  
*G. Bindu sri*

Signatures of the members of the Board of Studies:

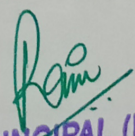
S.NO	Name & Designation	Status	Signature
1	Smt .K.V.Naga Lakshmi Lecturer in Mathematics, SRR & CVR Govt Degree College(A), Vijayawada	Incharge of the Dept & Chairman, BOS	
2	Prof.K. Rosaiah <del>Lecturer in</del> Statistics, Acharya Nagarjuna University, Nagarjuna Nagar, Guntur	University Nominee	
3	Sri.B.Neelavendra Rao Lecturer in Statistics, Govt. Degree College (w) , Autonomous, Guntur Dist.	Subject Expert	
4	Sri.G. Chakravarthi Lecturer in Statistics, P.B.Siddhartha college of Arts & Science (A), Vijayawada	Subject Expert	
5	Smt. D. Babitha Lecturer in Statistics, SRR & CVR Govt Degree College(A), Vijayawada	Faculty Member	
6	Kum.G.Bindhu sri	Alumni	G. Bindu Sri.

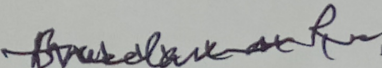
Counter Signed by:

Principal

SRR & CVR Govt Degree College (A)

Vijayawada

  
PRINCIPAL (FAC)  
SRR & CVR GOVT. DEGREE COLLEGE  
(Autonomous)  
Machavaram, VIJAYAWADA-520 004.

B) 

G. Bindu Sri.

DEPARTMENT OF STATISTICS

BOS MEETING APPROVED THE FOLLOWING EXAMINERS

LIST OF EXAMINERS FOR AUTONOMOUS

S.NO	NAME OF THE LECTURER	DESIGNATION	COLLEGE
1	DR.N. SRINIVASA RAO	LECTURER IN STATISTICS	ANDHRA LOYOLA COLLEGE , VIJAYAWADA.
2	G.CHAKRAVARTHI	LECTURER IN STATISTICS	P.B SIDDHARTHA COLLEGE OF ARTS & SCIENCE, VIJAYAWADA
3	E.MURALI KRISHNA	LECTURER IN STATISTICS	P.B SIDDHARTHA COLLEGE OF ARTS & SCIENCE, VIJAYAWADA
4	K.NARASIMHA RAO	LECTURER IN STATISTICS	CHAITANYA DEGREE COLLEGE, NANDIGAMA, KRISHNA Dt.
5	DR.V.VASUNDHARA DEVI	LECTURER IN STATISTICS	GOWTHAM DEGREE COLLEGE, VIJAYAWADA.
6	K.BALA PRASANNA	LECTURER IN STATISTICS	SARADA DEGREE COLLEGE, VIJAYAWADA
7	T.NAGESH	LECTURER IN STATISTICS	TRIVENI DEGREE COLLEGE, VIJAYAWADA.

DEPARTMENT OF STATISTICS

BOS MEETING APPROVED THE FOLLOWING EXAMINERS

PANEL FOR PAPER SETTERS FOR AUTONOMOUS

S.NO	NAME OF THE LECTURER	DESIGNATION	COLLEGE
1	DR. N. VISWAM	LECTURER IN STATISTICS	HINDU COLLEGE, GUNTUR
2	DR. N. MADHAVI	LECTURER IN STATISTICS	GDC RAJAHMUNDRY, EAST GODAVARI.
3	DR.N. SRINIVASA RAO	LECTURER IN STATISTICS	ANDHRA LOYOLA COLLEGE , VIJAYAWADA.
4	G.CHAKRAVARTHI	LECTURER IN STATISTICS	P.B SIDDHARTHA COLLEGE OF ARTS & SCIENCE, VIJAYAWADA
5	E.MURALI KRISHNA	LECTURER IN STATISTICS	P.B SIDDHARTHA COLLEGE OF ARTS & SCIENCE, VIJAYAWADA
6	K.NARASIMHA RAO	LECTURER IN STATISTICS	CHAITANYA DEGREE COLLEGE, NANDIGAMA, KRISHNA Dt.
7	P.RAGHU	LECTURER IN STATISTICS	JKC COLLEGE , GUNTUR
8	DR.VARA PRASAD	LECTURER IN STATISTICS	GDC,NELLORE
9	V.SARAJA	LECTURER IN STATISTICS	MARY STELLA COLLEGE, VIJAYAWADA.
10	V.NARASIMHA RAJU	LECTURER IN STATISTICS	DNR COLLEGE, BHIMAVARAM
11	G.RADHIKA	LECTURER IN STATISTICS	K.B.N COLLEGE, VIJAYAWADA.
12	B.RAMESH	LECTURER IN STATISTICS	ANR COLLEGE ,GUDIVADA

**STRUCTURE OF REVISED/NEW C.B.C.S. MODEL CURRICULUM IN  
STATISTICS  
(I & II Semesters)**

Yr.	Sem & Course (Th / Lab)	Course Code	Course Title	Workload Hrs./week	Credits	Max. Marks		
						Intrnl.	Extrnl	Total
I	I Sem. Course-I Theory	STA N-1306	Descriptive Statistics	4 Hrs	4	40	60	100
	I Sem Course-I Lab	STA N-1306P	Practical – I	2 Hrs	1	25	25	50
	II sem Course-II Theory	STA N-2306	Probability & Distributions	4 Hrs	4	40	60	100
	II sem Course-II Lab	STA N-2306P	Practical – II	2 Hrs	1	25	25	50
I		Bridge Course	Basics of Statistics	Total 10 Hrs		50		50

**STRUCTURE OF EXISTED (OLD) C.B.C.S. MODEL CURRICULUM IN  
STATISTICS  
(III & V Semesters)**

Yr.	Sem & Course (Th / Lab)	Course Code	Course Title	Workload Hrs./week	Credits	Max. Marks		
						Intrnl.	Extrnl	Total
II	III Sem Course-III Theory	STA 3306	Statistical Methods	4 Hrs	3	40	60	100
	III Sem Course-III Lab	STA 3306P	Practical-III	3 Hrs	2	25	25	50
III	V Sem Paper V Theory	STA 5306-5	Sampling Techniques & Design of Experiments	3 Hrs	3	40	60	100
	V Sem Paper V Lab.	STA 5306-5 P	Practical-V	3 Hrs	2	25	25	50
	V sem Paper VI Theory	STA 5306-6	Quality & Reliability	3 Hrs	3	40	60	100
	V sem Paper VI Lab	STA 5306-6 P	Practical-VI	3Hrs	2	25	25	50

**SRR&CVR GOVT. DEGREE COLLEGE(A): VIJAYAWADA**  
**B.A/B.Sc., STATISTICS (WM) CBCS REVISED SYLLABUS 2020-21**  
**Semester – I (CBCS With Maths Combination Common to BA/BSc)**  
**Paper - I: Descriptive Statistics**

No. of Hours/week :4

credits : 4

**UNIT-I**

**Moments:** Central and Non-Central moments and their interrelationship. Sheppard's correction for moments. Skewness and kurtosis.

**UNIT-II**

**Curve fitting:** Bi- variate data, Principle of least squares, fitting of degree polynomial. Fitting of straight line, Fitting of Second degree polynomial or parabola, Fitting of power curve and exponential curves.

**UNIT-III**

**Correlation:** Meaning, Types of Correlation, Measures of Correlation: Scatter diagram, Karl Pearson's Coefficient of Correlation, Rank Correlation Coefficient (with and without ties), Bi-variate frequency distribution, correlation coefficient for bi-variate data and simple problems. Concept of multiple and partial correlation coefficients (three variables only ) and properties

**UNIT-IV**

**Regression :** Concept of Regression, Linear Regression: Regression lines, Regression coefficients and its properties, Regressions lines for bi-variate data and simple problems. Correlation vs regression.

**UNIT-V**

**Attributes :** Notations, Class, Order of class frequencies, Ultimate class frequencies, Consistency of data, Conditions for consistency of data for 2 and 3 attributes only , Independence of attributes , Association of attributes and its measures, Relationship between association and colligation of attributes, Contingency table: Square contingency, Mean square contingency, Coefficient of mean square contingency, Tschuprow's coefficient of contingency.

**Text Books:**

1. V.K.Kapoor and S.C.Gupta: Fundamentals of Mathematical Statistics, Sultan Chand & Sons, New Delhi.
- 2 BA/BSc I year statistics - descriptive statistics, probability distribution - Telugu Academy
  - a. Dr M.Jaganmohan Rao, Dr N.Srinivasa Rao, Dr P.Tirupathi Rao, Smt.D.Vijayalakshmi.
12. 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
- Credits 2**

**Practicals - Paper – I**

1. Graphical presentation of data (Histogram, frequency polygon, Ogives).
2. Diagrammatic presentation of data (Bar and Pie).
3. Computation of measures of central tendency (Mean, Median and Mode)
4. Computation of measures of dispersion (Q.D, M.D and S.D)
5. Computation of non-central, central moments, 1 and 2 for ungrouped data.
6. Computation of non-central, central moments, 1 and 2 and Sheppard's corrections for grouped data.
7. Computation of Karl Pearson's coefficients of Skewness and Bowley's coefficients of Skewness.
8. Fitting of straight line by the method of least squares
9. Fitting of parabola by the method of least squares
10. Fitting of power curve of the type by the method of least squares.
11. Fitting of exponential curve of the type and by the method of least squares.
12. Computation of correlation coefficient and regression lines for ungrouped data
13. Computation of correlation coefficient, forming regression lines for grouped data
14. Computation of Yule's coefficient of association
15. Computation of Pearson's, Tcherprows coefficient of contingency

**Note: Training shall be on establishing formulae in Excel cells and derive the results. The excel output shall be exported to MS word for writing inference.**

**Course Learning Outcomes**

Students will acquire

- 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, their organization and evaluation of summary measures such as measures of central tendency and dispersion etc.
- 3) knowledge of other types of data reflecting quality characteristics including concepts of independence and association between two attributes,
- 4) insights into preliminary exploration of different types of data.
- 5) Knowledge of correlation, regression analysis, regression diagnostics, partial and multiple correlations.

**SRR & CVR GOVT DEGRESS COLLEGE (Autonomous)**

**VIJAYAWADA-520004**

**BLUE PRINT FOR QUESTION PAPER SETTERS**

**Time: 3hrs**

**Marks: 60**

<b>Unit No</b>	<b>No. of essay question 8 marks</b>	<b>No. of short question 4 marks</b>	<b>Toatal no. of question with choice</b>	<b>Total marks allotted to the units</b>	
<b>Unit-I</b>	<b>2</b>	<b>2</b>	<b>4</b>	<b>24</b>	
<b>Unit-II</b>	<b>2</b>	<b>2</b>	<b>4</b>	<b>24</b>	
<b>Unit-III</b>	<b>2</b>	<b>2</b>	<b>4</b>	<b>24</b>	
<b>Unit-IV</b>	<b>2</b>	<b>2</b>	<b>4</b>	<b>24</b>	
<b>Unit-V</b>	<b>2</b>	<b>2</b>	<b>4</b>	<b>24</b>	
<b>Total no. of questions with choice</b>				<b>20</b>	<b>120</b>
<b>Total no. of marks with choice</b>					

**S.R.R & C.V.R Govt DEG COLLEGE (Autonomous) VJA :: 2020-2021**

**Department of statistics.**

**Model question paper**

**I year -B.S.c (with maths combination)**

**Semester-I CBCS paper-I :: Descriptive Statistics**

**Time :3hrs.**

**Max marks :60marks**

**Section-A**

**Answer any five of the following questions:**

**5x4=20marks**

1. Explain about Skewness ?
2. What is Sheppard's correction? what will be the corrections for the first four moments ?
3. Explain about Fitting Straight Line ?
4. Explain about Bi-Variate Data ?
5. Write types of Correlation?
6. Explain Karl Pearson's Coefficient of Correlation?
7. Explain the Regression coefficient and its Properties?
8. Distinguish between correlation & regression?
9. Explain the 2x2 contingency table ?
10. Define Attributes and Association of Attributes.

**Section-B**

**Answer all the following questions:-**

**5x8=40m**

- 11)(A) Explain Relationship between Central and Non -central Moments.  
(Or)  
(B) Explain the methods of Measuring Skewness and kurtosis of a Frequency distribution
- 12.(A) Explain about Fitting of second degree parabola.  
(Or)  
(B) Explain about Principle of Least Square.
- 13.)(A) Explain the Concept of Multiple and Partial Correlation Coefficients and their Properties.  
(Or)

(B) Explain the properties of Correlation.

14) (A) Explain Regression line on X on Y

(Or)

(B) Define Regression? Write properties of regression?

15) (A) Define consistency. What are the condition for consistency of data

(Or)

(B) Show that relationship between Q & Y i.e,  $Q = \frac{2Y}{1+Y^2}$

# **SRR&CVR GOVT. DEGREE COLLEGE(A): VIJAYAWADA**

## **B.Sc-STATISTICS (WM) CBCS REVISED SYLLABUS 2020-21**

### **Semester – II (CBCS With Maths Combination Common to BSc)**

#### **Paper - II: Probability Theory and Distributions**

No. of Hours/week : 04

credits 4

#### **UNIT-I**

**Introduction to Probability:** Basic Concepts of Probability, random experiments, trial, outcome, sample space, event, mutually exclusive and exhaustive events, equally likely and favourable outcomes. Mathematical, Statistical, axiomatic definitions of probability. Conditional Probability and independence of events, Addition and multiplication theorems of probability for 2 and for n events. Boole's inequality and Baye's theorem and its applications in real life problems.

#### **UNIT-II**

**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. For given pmf, pdf calculation of moments, coefficient of skewness and kurtosis. Bivariate random variable - meaning, joint, marginal and conditional Distributions, independence of random variables and simple problems.

#### **UNIT- III**

**Mathematical expectation :** Mathematical expectation of a 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 and their properties. Chebyshev and Cauchy - Schwartz inequalities.

#### **UNIT-IV**

**Discrete Distributions:** Binomial, Poisson, Negative Binomial, Geometric distributions: Definitions, means, variances, M.G.F, C.F, C.G.F, P.G.F, additive property if exists. Poisson approximation to Binomial distribution. Hyper-geometric distribution: Definition, mean and variance.

#### **UNIT - V**

**Continuous Distributions:** Rectangular, Exponential, Gamma, mean, variance, M.G.F, C.G.F, C.F.  
**Normal Distribution:** Definition, Importance, Properties, M.G.F, CF, additive property, Beta Distributions of first kind and second kind –mean, variance & H.M.

**Text Books:**

1. V.K.Kapoor and S.C.Gupta: Fundamentals of Mathematical Statistics, Sultan Chand & Sons, New Delhi.
- 2 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.
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 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. 7<sup>th</sup> edition. Pearson.

**Credits 2**

**Practicals -Paper – II**

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.

Note: Training shall be on establishing formulae in Excel cells and derive the results. The excel output shall be exported to MS word for writing inference.

**Course Learning Outcomes:**

Students will acquire

- 1) ability to distinguish between random and non-random experiments,
- 2) knowledge to conceptualize the probabilities of events including frequentist and axiomatic approach. Simultaneously, they will learn the notion of conditional probability including the concept of Bayes' Theorem,
- 3) knowledge related to concept of discrete and continuous random variables and their probability distributions including expectation and moments,
- 4) knowledge of important discrete and continuous distributions such as Binomial, Poisson, Geometric, Negative Binomial and Hyper-geometric, normal, uniform, exponential, beta and gamma distributions.
- 5) acumen to apply standard discrete and continuous probability distributions to different situations.

**SRR & CVR GOVT DEGRESS COLLEGE (Autonomous)**

**VIJAYAWADA-520004**

**BLUE PRINT FOR QUESTION PAPER SETTERS**

**Time: 3hrs**

**Marks: 60**

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<b>Unit No</b>	<b>No. of essay question 8 marks</b>	<b>No. of short question 4 marks</b>	<b>Toatal no. of question with choice</b>	<b>Total marks allotted to the units</b>	
<b>Unit-I</b>	<b>2</b>	<b>2</b>	<b>4</b>	<b>24</b>	
<b>Unit-II</b>	<b>2</b>	<b>2</b>	<b>4</b>	<b>24</b>	
<b>Unit-III</b>	<b>2</b>	<b>2</b>	<b>4</b>	<b>24</b>	
<b>Unit-IV</b>	<b>2</b>	<b>2</b>	<b>4</b>	<b>24</b>	
<b>Unit-V</b>	<b>2</b>	<b>2</b>	<b>4</b>	<b>24</b>	
<b>Total no. of questions with choice</b>				<b>20</b>	<b>120</b>
<b>Total no. of marks with choice</b>					

**S.R.R & C.V.R Govt DEG COLLEGE (Autonomous) VJA :: 2020-2021 Department of statistics.**  
**Model question paper**  
**I year B.A/B.S.c (with maths combination)**  
**Semester-I-CBCS paper-II :: probability Theory and distributions**

**Time :3hrs.**

**Max marks :60marks**

**Section-A**

**Answer any five of the following questions:**

**5x4=20marks**

1. State and prove addition theorem for two events of probability?
2. State and prove Boole's in equality?
3. Explain the terms probability mass function and probability density function?
4. Explain distribution function with respect to discrete random variable?
5. Define M.G.F and write their properties?
6. State Cauchy-Schwartz inequality?
7. Drive the M.G.F of Binomial distribution?
8. Derive M.G.F of Geometric distribution?
9. Define Gamma distribution with respect to single and two parameters
10. Write the importance of normal distribution

**Section-B**

**Answer all the questions each question carries Eight marks**

**5x8=40m**

11. (a) Define the following terms :

- (i) Exhaustive events.      (ii) favourable events  
(iii) Mutually exclusive events. (iv) Equally likely events.

(Or)

(b) State and prove baye's theorem.

12. (a) Explain (i) point ,marginal , conditional distribution and also explain independence of random Variable

(Or)

(b) Joint distribution of X and Y are by  $f(X,Y)=4XYe^{-(X^2 + Y^2)}$ ;  $X>0$ :  $Y>0$  , test whether X and Y are Independent also find the condition density of X given  $Y=y$ .

13.(a) State and prove chebychev's inequality.

(Or)

(b) State and prove addition & multiplication theorems of expectations

14. (a) Derive Poisson distribution as a limiting form of a binomial distribution

(Or)

(b) Define Geometric distribution. Derive the mean and variance

15.(a) Define Exponential distribution. Derive the memory less property of exponential distribution

(Or)

(b) Define normal distribution and explain the chief characteristics of normal distribution.

**SRR & CVR Govt Degree College (A), Vijayawada**  
**BA/BSC II YEAR : STATISTICS SYLLABUS**  
**(With Mathematics Combination)**  
**Semester - III CBCS**  
**Paper - III Statistical Methods**

**Unit-I**

Correlation: Def., scatter diagram, its coefficient and its properties. , scatter diagram, computation of correlation coefficient for ungrouped data. Spearman's rank correlation coefficient, properties of Spearman's correlation coefficients and problems.

**Unit-II**

Regression: simple linear regression, properties of regression coefficients. Regression lines, Concept of Correlation ratio, partial and multiple correlation coefficients, correlation versus regression and their problems.

**Unit – III**

Curve fitting: Method of least square - Fitting of linear, quadratic, Exponential and power curves and their problems.

**Unit-IV**

Attributes : Introduction, Nature, and consistency and mention its conditions. Independence and association of attributes, co-efficient of association, coefficients of contingency and their problems.

**Unit –V**

Exact sampling distributions: Concept of population, Parameter, random sample, statistic, sampling distribution, standard error. Statement and Properties of  $\chi^2$ , t, F distributions and their inter relationships.

**Text books**

1. BA/BSc II year statistics - statistical methods and inference - Telugu Academy by A. Mohanrao, N.Srinivasa Rao, Dr R.Sudhakar Reddy, Dr T.C. Ravichandra Kum.
2. K.V.S. Sarma: Statistics Made Simple: Do it yourself on PC. PHI.
3. Fundamentals of Mathematics statistics: VK Kapoor and SC Gupta.

**Reference Books:**

1. Outlines of statistics, Vol II : Goon Gupta, M.K.Guptha, Das Gupta B.
2. Introduction to Mathematical Statistics : Hoel P.G.

**Semester –III****Practicals –PAPER-III**

Conduct any 6 (Ms-exel is compulsory)

1. Fitting of straight line.
2. Fitting of exponential curves.
3. Fitting of power curve.
4. Computation of correlation coefficient & Fitting of Regression lines.
5. Rank correlation coefficient.
6. Computation of Contingency coefficients.
7. MS-Excel methods any for the Serial Numbers 1,2,4,5.

**Course Learning Outcomes:**

- 1) knowledge of other types of data reflecting quality characteristics including concepts of independence and association between two attributes,
- 2) insights into preliminary exploration of different types of data.
- 3) Knowledge of correlation, regression analysis, regression diagnostics, partial and multiple correlations.

**SRR & CVR GOVT DEGRESS COLLEGE (Autonomous)**

**VIJAYAWADA-520004**

**BLUE PRINT FOR QUESTION PAPER SETTERS**

**Time: 3hrs**

**Marks: 60**

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<b>Unit No</b>	<b>No. of essay question 8 marks</b>	<b>No. of short question 4 marks</b>	<b>Toatal no. of question with choice</b>	<b>Total marks allotted to the units</b>	
<b>Unit-I</b>	<b>2</b>	<b>2</b>	<b>4</b>	<b>24</b>	
<b>Unit-II</b>	<b>2</b>	<b>2</b>	<b>4</b>	<b>24</b>	
<b>Unit-III</b>	<b>2</b>	<b>2</b>	<b>4</b>	<b>24</b>	
<b>Unit-IV</b>	<b>2</b>	<b>2</b>	<b>4</b>	<b>24</b>	
<b>Unit-V</b>	<b>2</b>	<b>2</b>	<b>4</b>	<b>24</b>	
<b>Total no. of questions with choice</b>				<b>20</b>	<b>120</b>
<b>Total no. of marks with choice</b>					

**S.R.R & C.V.R GOVT. DEG.COLLEGE Autonomous)VJA.: 2020-2021**

**Department of Statistics**

**Model Question Paper**

**YEAR B.A/B.Sc (with maths Combination) Semester - III**

**CBCS Paper - III : Statistical Methods**

**Time :3hrs**

**Max.Marks:60 Marks**

**Section - A**

**Answer any five of the following questions**

**5x4=20 marks**

- 1.) Define correlation. What are the types of correlation?
- 2.) Explain the Scattered diagram?
- 3.) Distinguish between correlation & regression?
- 4.) Explain the multiple regression coefficients?
- 5.) Define curve fitting. How do you fit the principles of least squares?
- 6.) Explain the fitting of an Exponential curve of the type  $y = a$
- 7.) Define independence of attributes and its criteria's of them
- 8.) Explain the 2x2 contingency table
- 9.) Define the terms (i) Population (ii) Sample
- 10.) Explain the concept of sampling distribution of a statistic

**Section- B**

**Answer all the following questions**

**5x8=40 marks**

11. Define karal Pearson's coefficient, s.t it is not effected by change of origin and scale

(or)

b) Derive spearman's rank correlation coefficient is lies between -1 and 1

12.) a) Define Regression. What are the properties of regression coefficient

(or)

b) Derive the regression line of Y on X

13.) a) Explain the fitting of Straight line

(or)

b) Explain the procedure of fitting of Second degree parabola.

14) a) Define consistency. What is the condition for Consistency of data?

(or)

b) S.T relationship between Q & Y i.e.,  $Q = \frac{2Y}{1+Y^2}$

15) a) Define t-distribution and its properties

(or)

b) Establish the relationship between F and  $\chi^2$  distribution

**S.R.R & C.V.R GOVT . DEGREE COLLEGE(A)**  
**DEPARTMENT OF STATISTICS**  
**III B.Sc STATISTICS CBCS SYLLABUS 2020-2021**  
**(with mathematics Combination)**  
**SEMESTER –V**

**Paper V:Sampling techniques and Design of experiments**

**Time:3hrs.**

**Max.Marks.100(40 int+60 ext)**

**Unit – I**

Sampling theory principle steps in a sample survey, census versus sample survey ,sampling and non-sampling errors,types of sampling subjective, probability and mixed sampling methods(10L)

**Unit – II**

Simple random samapling meaning and methods to draw estimation of population mean ,variances in SRSWR and SRSWOR (12L)

**Unit – III**

stratified random sampling with proportional Neyman allocations of sizes in stratification,variances in these methods systematic sampling when  $N=nk$ , comparisons of the relative efficiencies, advantages, and disadvantages of above methods of sampling.(10L)

**Unit – IV**

Analysis of variance - Introduction, definition and assumptions. ANOVA one-way classification with one observation per cell. ANOVA two-way classification with one observation per cell. Concept of Gauss – Markoff linear model, statement of Cochran’s theorem and Mathematical analysis. (10L)

**Unit – V**

Importance and applications of design of experiments. Principles of experimentation, Analysis of Completely randomized design (C.R.D), Randomized Block design (R.B.D) and Latin square design (L.S.D) including one missing observation. (13L)

**List of reference books:**

1. V.K.Kapoor and S.C.Gupta: Fundamentals of Applied Statistics, Sultan Chand
2. S.P. Gupta: Statistical Methods, Sultan Chand and Sons.
3. Daroga Singh and Chowdhary: Theory and Analysis of Sample survey designs, Wiley Eastern.
4. B.L. Agrawal: Basic Statistics, New age publications.

**SEMESTER-V**

**PRACTICALS PAPER-V**

Time:3hrs.

50Marks(25Internal+25External)

- 1.)Estimation of population mean,variance by SRSWOR
- 2.)Estimation of population mean,variance by SRSWR
- 3.)Comparison of proportional ,optimal allocaitons with SRSWOR
- 4.)Systematic sampling
- 5.)ANOVA-CRD
- 6.)ANOVA-RBD
- 7.)ANOVA-LSD
- 8.)Ms-EXCEL PRACTICALS ON ANOVA

**EXTERNAL EXAMINATION METHOD**

**ANSWER ANY TWO FROM THE GIVEN 3**

**EACH CARRIES 12.5 MARKS**

**SCHEME**

**AIM :1**

**PROCEDURE:4**

**CALCULATION:6.5**

**INFERENCE:1**

**INTERNAL ASSESSMENT:**

**EXISTING PROCEDURE MAY BE FOLLOWED**

**Course Learning Out Comes:**

The students shall get

- 1) Introduced to various statistical sampling schemes such as simple, stratified and systematic sampling.
- 2) An idea of conducting the sample surveys and selecting appropriate sampling techniques,
- 3) Knowledge about comparing various sampling techniques.
- 4) Carry out one way and two way Analysis of Variance,
- 5) Understand the basic terms used in design of experiments,
- 6) Use appropriate experimental designs to analyze the experimental data.

**SRR & CVR GOVT DEGRESS COLLEGE (Autonomous)**

**VIJAYAWADA-520004**

**BLUE PRINT FOR QUESTION PAPER SETTERS**

**Time: 3hrs**

**Marks: 60**

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Unit No	No. of essay question 8 marks	No. of essay question 4 marks	Toatal no. of question with choice	Total marks allotted to the units	
Unit-I	2	2	4	24	
Unit-II	2	2	4	24	
Unit-III	2	2	4	24	
Unit-IV	2	2	4	24	
Unit-V	2	2	4	24	
Total no. of questions with choice				20	120
Total no. of marks with choice					

**S.R.R & C.V.R GOVT . DEGREE COLLEGE(A)::2020-21**

**DEPARTMENT OF STATISTICS**

**MODEL PAPER**

**SEMESTER –V**

**Paper V:Sampling techniques and Design of experiments**

**Time:3h**

**Max marks:60**

Section – A

Answer any FIVE questions

5x4=20marks

1. Discuss briefly the basic principles of sample survey.
2. Discuss the various non-sampling errors
3. Prove that in simple random sampling without replacement the sample mean square is an unbiased estimate of the population mean square.
4. In SRSWOR, the sample mean is an un-biased estimator of population mean.
5. Methods of obtaining Stratified Random Sampling.
6. Explain the systematic random sampling.
7. Explain ANOVA and its assumptions.
8. Explain Cochran's theorem.
9. Explain missing plot technique in R.B.D.
10. Explain basic principles of experimentation

Section - B

Answer ALL questions

5 X 8 = 40M

11. A) Explain the principle steps involved in a sampling survey.

OR

B) Explain the advantages of sampling survey over complete census and also explain the limitations of sampling.

12. A) In SRSWOR, Derive the variance of sample mean.

OR

B) Compare the variance of SRSWOR ,Optimum and Neyman allocations

13. A) Write the advantages and disadvantages of Stratified Random sampling

OR

B) Explain Neyman and Optimum allocations in stratification

14. A) Explain ANOVA for one-way classification.

OR

B) State the mathematical model used in ANOVA of two-way layout by discussing its statistical analysis.

15. A) What do you mean by C.R.D? Explain its Statistical analysis.

OR

B) Discuss the layout completely for Latin Square Design.

**S.R.R & C.V.R GOVT . DEGREE COLLEGE(A)**  
**DEPARTMENT OF STATISTICS**  
**III B.Sc STATISTICS CBCS SYLLABUS 2020-2021**  
**(with mathematics Combination)**  
**SEMESTER –V**  
**Paper - VI Quality and Reliability**

Time :3hrs

Max.Marks:60

**Unit-I**

Importance of SQC in industry, statistical basis of shewart's control charts, uses of control charts. Interpretation of control charts, control limits, Natural tolerance limits and specification limits.

**Unit – II**

Variable Control Chart: Construction of Mean and Rangecharts for variables, Attribute Control charts – np, p Charts, C Chart

**Unit-III**

Acceptance sampling plans: Scope, Producer's risk and consumer's risk. Concepts of AQL and LTPD.

**Unit-IV**

Sampling Plans: Single and double sampling plans, OC and ASN functions, Double and single Sampling plans for attributes using Binomial.

**Unit-V**

Reliability: Introduction, failure rates, Hazard function, estimation of reliability, exponential distribution as life model, its memory less property.

**Text Books:**

- 1.BA/BSc III year paper - IV Statistics - applied statistics - Telugu academy by Prof.K.Srinivasa Rao,
- Dr D.Giri. Dr A.Anand, Dr V.PapaiiahSastry.
2. Fundamentals of applied statistics : VK Kapoor and SC Gupta
3. S.K Sinha: Reliability and life testing. Wiley Eastern.

**Reference Books :**

- 1..R.C.Gupta: Statistical Quality Control.

**Semester – V**

**Practicals –PAPER-VI**

**Conduct any 6 (Ms-excel is compulsory)**

1. Construction of Mean and Range charts.
2. Construction of p-chart-Fixed sample size.
3. Construction of p-chart-variable sample size
4. Construction of np-Chart .
5. Construction of C-Chart.
6. MS-Excel methods for the Serial Number 1.
7. MS-Excel methods for the Serial Numbers 2 to 4 .

**Course Out Comes (CO's):**

After completion of this course, the students shall get

CO 01 understand the concept of quality control in industry

CO 02: apply the techniques of process control for checking and diagnosis of lack of quality

CO 03: apply the sampling and rectification plans to control the quality of product

CO 04: understand the reliability of successful running of an item and learn hazard function-  
exponential distribution as a special case

**SRR & CVR GOVT DEGRESS COLLEGE (Autonomous)**

**VIJAYAWADA-520004**

**BLUE PRINT FOR QUESTION PAPER SETTERS**

**Time: 3hrs**

**Marks: 60**

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Unit No	No. of essay question 8 marks	No. of short question 4 marks	Toatal no. of question with choice	Total marks allotted to the units	
Unit-I	2	2	4	24	
Unit-II	2	2	4	24	
Unit-III	2	2	4	24	
Unit-IV	2	2	4	24	
Unit-V	2	2	4	24	
Total no. of questions with choice				20	120
Total no. of marks with choice					

**S.R.R & C.V.R GOVT . DEGREE COLLEGE(A)**

**III B.Sc STATISTICS:2020-21**

**CBCS SYSTEM**

**SEMESTER -V**

**Model Question Paper**

**Paper – VI: Quality and Reliability**

**Time:3hrs**

**Max Marks:60**

**Section –A**

**Answer any FIVE questions**

**5x4=20M**

1. Explain the process control and product control.
2. What are the 4 M's in S.Q.C.?
3. Distinguish between charts for variables and attributes.
4. Explain 3 sigma control limits..
5. Define the terms i)AQL ii) LTPD.
6. Write about ASN function of single sampling plan?
7. Write the applications of C-chart
8. Explain Single Sampling plan
9. Explain Hazard function
10. Explain Reliability function.

**Section - B**

**Answer all the questions**

**5x8=40M**

11. What do you understand by statistical quality control? Discuss briefly its need and its utility in industry.  
OR
12. Explain Statistical Basis for the control charts.  
OR
13. Explain the construction of Mean and Range charts  
OR
14. Explain the construction of C-chart  
OR
15. Define the terms i) AQL ii) LTPD & iii) AOQL  
OR
16. Explain i) Producer's Risk ii) Consumer's Risk.  
OR
- 17 Explain the procedure for Double Sampling Plans  
OR
- 18 Write the OC and ASN functions for Single sampling Plan  
OR
- 19 Explain Bathtub Curve in Reliability  
OR
- 20 Explain the Memory less Property of Exponential Distribution

**SRR & CVR Govt Degree College (A), Vijayawada-520004**

**DEPARTMENT OF STATISTICS**

**BRIDGE COURSE IN STATISTICS**

**(Under Credit Based Continuous Evaluation Grading System)**

**Bridge Course:**

With a view to enhance the comprehension in Statistics a bridge course is framed to first semester B.Sc programme students. The essentials and fundamentals of Statistics are necessary to understand the subject at an easy and this will lead to a better appreciation of the subject.

**Objective:**

The bridge course aims to act as a buffer for the new entrants with an objective to provide adequate time for the transition to hard core of degree course. This gives them a breather, to prepare themselves before the onset of course for first year degree programme. During this interaction with the faculty and their classmates the students will be equipped with the knowledge and the confidence needed to take on bigger challenges in future.

**Design:**

The course consist of 10 Hrs of interactive sessions and an internal examination designed by the department which is compulsory for all students.

**BASICS OF STATISTICS**

**Syllabus:**

**10Hours**

The objective of this paper is to throw light on the role of statistics in different fields with special reference to business and economics.

- Importance of Statistics, Scope, primary and secondary data
- It gives the students to review good practice in presentation and the format most applicable to their own data.
- The measures of central tendency or averages reduce the data to a single value which is highly useful for making comparative studies.
- The measures of dispersion throw light on reliability of average and control of variability