B.A SYLLABUS (SEMESTER WISE) 2020-2021

Semester	Paper	Subject	Hrs.	Credits	IA	ES	Total
FIRST YEAR							
Semester I	Paper-I	Quantitative Statistics	4	3	50	50	100
Semester I	Paper-I	Practical's	2	2	0	50	50
Semester II	Paper-II	Descriptive Statistics	4	3	50	50	100
Semester II	Paper-II	Practical's	2	2	0	50	50
SECOND YEAR							
Semester III	Paper-III	Probability and Probability Distributions	4	3	50	50	100
Semester III	Paper-III	Practical's	2	2	0	50	50
Semester IV	Paper-IV	Basics of Statistical Methods	4	3	50	50	100
Semester IV	Paper-IV	Practical's	2	2	0	50	50
THIRD YEAR							
Semester V	Paper-V	Basics of Statistical Inference	3	3	40	60	100
	Paper-V	Practical's	2	2	0	50	50
	Paper-VI	Theory of Sampling	3	3	40	60	100
	Paper-VI	Practical's	2	2	0	50	50
Semester VI	Paper-VII	ELECTIVE-1: Applied Statistics	3	3	40	60	100
	Paper-VII	ELECTIVE-2: Actuarial Statistics	3	3	40	60	100
	Paper-VII	ELECTIVE-3: Stochastic Processes and its applications	3	3	40	60	100
	Paper-VII	Practical's	2	2	0	50	50
	Cluster (A)	A1- Basics of Operation Research	3	3	40	60	100
		Practical	2	2	0	50	50
		A2-Computer Applications	3	3	40	60	100
		Practical	2	2	0	50	50
		Project & Viva voce	5	5	20	80	100
Semester	Cluster	B1-Official Statistics	3	3	40	60	100

VI	(B)	and Design of Experiments					
		Practical	2	2	0	50	50
		B2-Mortality and Actuarial Statistics	3	3	40	60	100
		Practical	2	2	0	50	50
		Project & Viva voce	5	5	20	80	100
	Cluster (C)	C1-Testing of Hypothesis	3	3	40	60	100
		Practical	2	2	0	50	50
		C2-Decision Making Analysis	3	3	40	60	100
		Practical	2	2	0	50	50
		Project & Viva voce	5	5	20	80	100

Total Hrs. required: 60   **Total Credits: 03**
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OBJECTIVE: Quantitative Statistics main aim is to develop ability to perform the four basic operators and also develop skills in measurement, approximation and estimation .This paper will help the student can understand statistics easily based on performing some basic concepts of mathematics which are related to statistics

Unit-1

Set Theory: Basics of Set theory, types of sets, equal and equivalent sets, finite and infinite sets, Venn Diagrams, Operation on sets intersection of sets and differences of two sets

Unit-II
Sequences and Series: Sequence ,Series and functions, types of functions;   Solution of simultaneous linear equations, Quadratic equations.

Unit-III
Progressions- AP, GP, HP; Permutations, Combinations, Binomial theorem and their Related problems.

Unit-IV
Elementary Matrices: Definition and types of matrices, Addition, Subtraction, Scalar Multiplication of matrices.

Unit-V
Determinant of matrix, Transpose of a Matrix, Inverse and Rank of 3 X 3 matrices only. Solution of simultaneous linear equations by matrix methods- Cramer's Rule and Matrix Inversion methods.

- ➢ **(Skill Development) : Data Collection, Field Visit-Survey and Practicals**
- ➢ **Employability : Guest Lectures, Assignments, Seminars, student seminars**
  video lessons

Practical's- Semester-I
Conduct any 6 Practical's.
1. Solution to Simultaneous Linear equations
2. Progressions- AP, GP, HP
3. Addition, Subtraction, Multiplication of Matrices.
4. Determinant of a Matrix
5. Solution of equations by Matrix methods.
6. Simple differentiation
7. Integrations

TEXT BOOKS

1. Differential Calculus- SanthiNarayana.
2. Outlines of Matrices-Schaum.

Reference Books

1 S.P.Gupta: Statistical Methods. Sultan Chand
2 S.C.Gupta and V.K.Kapur: Fundamentals of Mathematical Statistics. Sultan Chand.
3. MoulikaGanithamuSambavyata - Telugu Academy.
4. Quantitative Techniques I- Sultan Chand Publication.

SEMESTER-I: Quantitative Statistics
Model blue print for the Question Paper setter

Max. Marks: 50   **Time: 2 1/2 Hrs.**

Unit / Chapter name	Short Answer Questions	Essay Questions	Marks allotted to the Unit/Chapter
Unit-I: Set theory	**2**	**2**	**22**
Unit II: Sequences and Series	**2**	**1**	**14**
Unit-III: Progressions	**2**	**1**	**14**
Unit-IV: Elementary Matrices	**3**	**2**	**25**
Unit-V: Determinant of matrix	**1**	**1**	**11**
Total No. of Questions including choice (17)			
Total marks allotted to all questions including choice			**86**

Time: 2 ½ hrs.   **Max Marks-50**

MODEL PAPER

SECTION-A

Answer any SIX questions   **6x3=18M**

1. Obtain the roots of the quadratic equation $ax^2 + bx + c = 0$
2. Explain permutation and combination with examples.
3. Write short notes on Arithmetic progression
4. Define finite set, infinite set with their examples
5. $n_{c3} = n_{c5}$ find n
6. Define matrix and its properties
7. Explain Different types of functions
8. Explain Venn Diagram
9. Define Series and Sequence with Suitable Examples
10. Explain Binomial Theorem

SECTION-B

Answer any FOUR Questions   **4x8=32M**

11. If A= $\{1,2,3,4,5,6,7,8,9\}$ B=$\{3,5,7\}$ and C= $\{2,4,6\}$
     Prove the following equation $AU(BUC) = (AUB)UC$

12. Find the sum and product of the roots of the equation $x^2+4x+3 = 0$

13. Find sum of 'n' terms of the series 7+77+777+……….

14. Explain types of Matrices

15. Solve the following equations by Cramer method
$$2x - y = 5, \qquad 3x + 2y = -3$$

16. If A $=$ $\begin{matrix} 1 & -1 & 3 \\ 4 & 2 & -1 \\ 1 & 3 & 1 \end{matrix}$ then find A^{-1}

17. Define Set and Explain Different types of Sets

GOVERNMENT COLLEGE (A), RAJAMAHENDRAVARAM
II B.A.   SEMESTER: III 2020-21
PAPERE III-Probability and Probability Distributions
(Non-Mathematics Combination)

Total hrs. Required: 60	**Total no. of credits: 03**

Objective: The aim of the paper is to Distinguish between discrete and continuous random variables, find probabilities associated with a discrete probability distribution. Compute the mean and variance of a discrete probability distribution. Find probabilities associated with other distributions and also know various applications of distributions

Unit-I
Probability: Definitions of random experiment, outcome, sample space, event, mutually exclusive event, equally likely events, favorable events, classical, statistical and axiomatic definitions of probability. Addition and multiplication theorems for two events, Conditional probability. Bayes' theorem statement and problem based on it.

Unit- II
Random Variable: Discrete-Probability mass function, Continuous random variable-Probability density function, distribution function of a random variable and properties.

Unit-III
Mathematical Expectation: M.G.F, C.G.F, P.G.F and C.F and their properties

Unit-IV:
Discrete Distributions: Binomial, Poisson, Geometric distributions-definitions, means, variances and applications of these distributions. Additive property if exists, Simple problems.

Unit-V:
Continuous Distributions: Rectangular, Normal, Exponential distributions-definitions and their properties, Simple problems.

- ➢ **(Skill Development) : Data Collection, Field Visit-Survey and Practicals**
- ➢ **Employability : Guest Lectures, Assignments, Seminars, student seminars** video lessons

Practical's-Semester-III
1. Non central moments
2. Central moments
3. Sheppard's corrections
4. Skewness and kurtosis
5. Coefficients of association and colligation
6. Baye's theorem-problems.

Text Books:
1. S.P.Gupta: Statistical Methods. Sultan Chand
2. Sambavyata - Telugu Academy
3. V.K.Kapoor and S.C.Gupta: Fundamentals of Mathematical Statistics.

Reference Books:
1. Goon, Gupta and Das Gupta: Fundamentals of Statistics. Volume I .World Press
2. K.V.S. Sarma: statistics Made Simple: do it yourself on PC.   PHI

SEMESTER-III: Probability and Probability Distributions
Model blue print for the Question Paper setter

Max. marks: 50   **Time: 2 1/2 Hrs.**

Unit / Chapter name	Short Answer Questions	Essay Questions	Marks allotted to the Unit/Chapter
Unit-I: Probability	**2**	**1**	**18**
Unit II: Random Variable	**2**	**1**	**18**
Unit-III: Mathematical Expectation	**1**	**1**	**14**
Unit-IV: Discrete Distributions	**1**	**2**	**24**
Unit-V: Continuous Distributions	**2**	**1**	**18**
Total No. of Questions including choice (14)	**8**	**6**	**92**
Total marks allotted to all questions including choice			

Time: 2 ½ hrs   MODEL PAPER   Max Marks: 50

SECTION-A

Answer any FIVE questions.   **5 x 4 = 20M**

1. Write short note on Probability

2. Define P.G.F and C.F

3. Define (i) Mutually Exclusive events
     (ii) Exhaustive events
     (iii) Equally likely events

4. Write short note on Random variables

5. Define Poisson Distribution and its properties

6. Explain p.m.f and p.d.f

7. Give the applications of Normal distribution

8. What is the probability that 4 S's come consecutively in the word MISSISSIPPI

SECTION-B

Answer any THREE questions   **3 x10=30M**

9. Write about Binomial distribution and its properties

10. Define Normal distribution. Mention its properties

11. Define M.G.F and its Properties

12. Define (i) Classical definition of probability

    (ii) Statistical definition of probability
    (iii) Axiomatic definition of probability
     (iv) Personalistic probability

13. A random variable X has the following probability function

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

   Find K, P (X < 6), P (X ≥ 6), P (0 < X < 5)

14. Prove the following results

   (i) E (X + Y) = E (X) + E (Y)
   (ii) E (XY) = E(X) E(Y)

Government College (A) Rajamahendravaram
B.A III Year: Statistics Syllabus 2020-21
Semester-V CBCS
PAPER V- Basics of Statistical Inference
(Without mathematical derivations)

Total hrs. Per week: 03   **Total credits: 03**

Objective: The course aims at providing an introduction to statistical inference and its application to predictive statistical models. The first part of the course will focus on basic probability. Subsequently, the course will deal with the theory of statistical inference (point estimation, interval estimation, hypothesis testing).

Unit-I
Theory of Estimation: Definitions of population, sample, parameter, statistic, sampling distribution of a statistic, standard error. Estimation-Criteria of a good estimator, meaning of interval estimation

Unit-II
Statistical Hypothesis- Null and alternative hypothesis, level of significance, Type I and Type II errors, Tailed tests in Hypothesis, Power of the test.Neyman-Pearson-Lemma,

Unit-III
Large Sample test
Large sample tests for proportion (single & double), means (single & double), and standard deviations. Simple Problems

Unit-IV
Small Sample tests: Tests of significance based on chi-square, t and F, chi-square test for independence of attributes, t-test for single, double and paired tests, Variance Ratio test (F-test) , ANOVA Test ,Simple Problems

Unit-V
Non-Parametric tests: Advantages, Disadvantages, Sign test, Median test and Run test for two sample cases only.

- ➢ **(Skill Development) : Data Collection, Field Visit-Survey and Practicals**
- ➢ **Employability : Guest Lectures, Assignments, Seminars, student seminars** video lessons

Text Books:
1 Statistical methods-S.P.Gupta
2 Fundamentals of statistics-Goon Gupta and Das Gupta Vol I and Vol II

Reference Books:
1. AnuvarthithaSankyakaSastramu – Telugu Academy book.
2. Applied Statistics-V.K.Kapoor&S.C.Gupta
3. Applied Statistics-ParimalMukhopadhyay.

Practical's-Semester-V
Conduct any 6 Practical's
1. Large sample tests-Mean(s)
2. Large sample tests-Proportion(s)
3. Small sample tests-t for Mean(s)
4. F-test for variance ratio
5. Chi square test for independence of attributes
6. N.P.tests-Run test, Median test, Sign test.
7. N.P Tests

SEMESTER-V: Basics of Statistical Inference
Model blue print for the Question Paper setter

Max. marks: 60   **Time: 3 Hrs.**

Unit / Chapter name	Short Answer Questions	Essay Questions	Marks allotted to the Unit/Chapter
Unit-I: Theory of Estimation	**2**	**2**	**28**
Unit II: Statistical Hypothesis	**2**	**1**	**18**
Unit-III: Large Sample test	**1**	**1**	**14**
Unit-IV: Small Sample tests	**1**	**1**	**14**
Unit-V: Non-Parametric tests	**2**	**2**	**28**
Total No. of Questions including choice (15)	**8**	**7**	
Total marks allotted to all questions including choice			**102**

PAPER V- Basics of Statistical Inference
(Without mathematical derivations)

Time: 3hrs   **MODEL PAPER**   Max Marks: 60

SECTION-A

Answer any FIVE questions   5 x 4 = 20M

1. Explain Interval Estimation

2. Explain Null Hypothesis and Alternative Hypothesis

3. Explain Type I and Type II errors

4. Distinguish between large sample tests and small sample tests

5. Write short note on F-test

6. Write about Sign test for single sample

7. Write Short note on Chi-Square Goodness of fit

8. Discuss the advantages and disadvantages of Non parametric methods

SECTION-B

Answer any FOUR questions   4 X10=40M

9. Explain the criteria of a good estimator

10. Define Statistic & Sampling distribution. Obtain the sampling distribution of mean

11. What is Testing of Hypothesis? Write procedure for testing of Hypothesis?

12. Explain the large sample test for equality of two means

13. Explain chi-square test for independence of attributes.

14. Explain the difference between parametric tests, Non-parametric tests?

15. State and Prove NP-Lemma

Government College (A) Rajamahendravaram
B.A III Year: Statistics Syllabus 2020-21
PAPER VI- Theory of Sampling
(Without Mathematical derivations)

Total hrs. Per week: 03   **Total credits: 03**

Objective: **The aim of this paper is to introduce you to the statistical aspects associated with the design and analysis of sample surveys, and to develop your understanding of the principles and methods used to design survey sampling schemes. Basic theory underpinning survey inference will be introduced, focusing on methodology for survey-based estimation for population totals and related quantities for some standard sample designs**

Unit-I
Basics of Sampling: Population, sample, sampling versus census, sample survey meaning, Sampling and Non-sampling errors, Limitations of sampling

Unit-II
Sampling Methods: Principle steps in a sample survey. Types of sampling- Simple random sampling, Stratified random sampling, Systematic sampling. Cluster Sampling

Unit-III
Simple Random Sampling method: SRSWR, SRSWOR, Random number table method and lottery system method. Sample mean is an unbiased estimate of population mean, sample mean of variance.

Unit-IV
Stratified Random Sampling: Meaning of Stratified random sampling, merits and demerits. Definitions of Proportional and Optimum allocations**.**

Unit-V
Systematic Random Sampling: Definition of systematic random sampling. Comparison of SRSWOR (problem), stratified and systematic samplings.
Additional Inputs: Multi-Stage Sampling

> ➤ **(Skill Development) : Data Collection, Field Visit-Survey and Practicals**
> ➤ **Employability : Guest Lectures, Assignments, Seminars, student seminars**
>   video lessons

Text Books:
1 Statistical methods-S.P.Gupta
2 Fundamentals of statistics-Goon Gupta and Das Gupta Vol I and Vol II

Reference Books:
1. AnuvarthithaSankyakaSastramu – Telugu Academy book.

2. Applied Statistics-V.K.Kapoor&S.C.Gupta
3. Applied Statistics-ParimalMukhopadhyay.

Practical's-Semester-V
1. Estimation of Population mean in SRSWR
2. Estimation of population variance in SRSWR
3. Estimation of population mean in SRSWOR
4. Estimation of population variance in SRSWOR
5. Comparison of SRSWOR with optimum and proportional allocations
6. Comparison of SRSWOR, stratified and systematic samplings**.**

SEMESTER-V: Theory of Sampling
Model blue print for the Question Paper setter

Max. marks: 60   **Time: 3 Hrs.**

Unit / Chapter name	Short Answer Questions	Essay Questions	Marks allotted to the Unit/Chapter
Unit-I: Basics of Sampling	**2**	**2**	**28**
Unit II: Sampling Methods	**2**	**1**	**18**
Unit-III: Simple Random Sampling method	**1**	**2**	**24**
Unit-IV: Stratified Random Sampling	**1**	**1**	**14**
Unit-V: Systematic Random Sampling	**2**	**1**	**18**
Total No. of Questions including choice (15)	**8**	**7**	
Total marks allotted to all questions including choice			**102**

GOVERNMENT COLLEGE (A), RAJAMAHENDRAVARM
III B.A.   SEMESTER: V 2020-21
Paper VI- Theory of Sampling

Time: 3hrs   MODEL PAPER   Max Marks: 60

SECTION-A

Answer any FIVE questions   **5x4= 20M**

1. **Write short note on Sampling?**

2. **Explain the limitations of Sampling**

3. **Explain Questionnaire and Schedule**

4. **Explain about Census method**

5. **Define SRSWR and SRSWOR**

6. **Explain Stratified sampling**

7. **What are merits and demerits of Systematic sampling**

8. **Stratified sampling vs. Systematic Sampling**

SECTION-B

Answer any FOUR questions   **4 x10=40M**

9.   **What is Sample Survey? What are the main steps involved in a sample survey?**

10. **Explain about different types of sampling**

11.   **Discuss sampling and non-sampling errors**

12. **Explain the methods of drawing Simple Random Sampling With Replacement**

13. **Explain types of allocations in stratified sampling .Write Merits and demerits of it?**

14.   **Explain systematic sampling with suitable example and how do you compare Systematic sampling with SRSWOR?**

15. **Define Simple Random Sampling. Show that sample mean is an unbiased estimator of Population mean in SRSWOR**