

**B.A SYLLABUS (SEMESTER WISE) 2019-2020**

Semester	Paper	Subject	Hrs.	Credits	IA	ES	Total
<b>FIRST YEAR</b>							
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
<b>SECOND YEAR</b>							
Semester III	Paper-III	Statistical Methods	4	3	40	60	100
Semester III	Paper-III	Practical's	2	2	0	50	50
Semester IV	Paper-IV	Probability Distributions	4	3	40	60	100
Semester IV	Paper-IV	Practical's	2	2	0	50	50
<b>THIRD YEAR</b>							
Semester V	Paper-V	Basics of Statistical Inference	3	3	40	60	100
	Paper-V	Practical's	2	2	0	50	50
	Paper-VI	Elective I: Theory of Sampling	3	3	40	60	100
		Elective II: Demography	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
		ELECTIVE-2: Actuarial Statistics	3	3	40	60	100
		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	Practical	2	2	0	50	50
		Practical	2	2	0	50	50
	A2-Computer Applications	Practical	2	2	0	50	50
		Practical	2	2	0	50	50
	Project & Viva voce		5	5	40	60	100

<b>Semester VI</b>	<b>Cluster (B)</b>	<b>B1-Official Statistics and Design of Experiments</b>	<b>3</b>	<b>3</b>	<b>40</b>	<b>60</b>	<b>100</b>
		<b>Practical</b>	<b>2</b>	<b>2</b>	<b>0</b>	<b>50</b>	<b>50</b>
		<b>B2-Mortality and Actuarial Statistics</b>	<b>3</b>	<b>3</b>	<b>40</b>	<b>60</b>	<b>100</b>
		<b>Practical</b>	<b>2</b>	<b>2</b>	<b>0</b>	<b>50</b>	<b>50</b>
		<b>Project &amp; Viva voce</b>	<b>5</b>	<b>5</b>	<b>40</b>	<b>60</b>	<b>100</b>
	<b>Cluster (C)</b>	<b>C1-Testing of Hypothesis</b>	<b>3</b>	<b>3</b>	<b>40</b>	<b>60</b>	<b>100</b>
		<b>Practical</b>	<b>2</b>	<b>2</b>	<b>0</b>	<b>50</b>	<b>50</b>
		<b>C2-Decision Making Analysis</b>	<b>3</b>	<b>3</b>	<b>40</b>	<b>60</b>	<b>100</b>
		<b>Practical</b>	<b>2</b>	<b>2</b>	<b>0</b>	<b>50</b>	<b>50</b>
		<b>Project &amp; Viva voce</b>	<b>5</b>	<b>5</b>	<b>40</b>	<b>60</b>	<b>100</b>

**GOVERNMENT COLLEGE (A): RAJAMAHENDRAVARAM**

**B.A I Year: Statistics Syllabus**

**(For Non-Mathematics Combination)**

**Semester-I CBCS: 2019-20**

**Quantitative Statistics**

**(Without Mathematical Derivations)**

**Total Hrs. required: 60**

**Total Credits: 03**

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**Unit-1**

**Concept of sequences and series:** Fundamentals of sets and functions, types of functions; Solution of simultaneous linear equations, quadratic equations.

**Unit-II**

**Progressions-** AP, GP, HP; permutations, combinations, Binomial theorem and their Related problems.

**Unit-III**

**Elementary Matrices:** Definition and types of matrices, addition, subtraction, scalar multiplication of matrices.

**Unit-IV**

**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.

**Unit-V**

**Differentiations:** Fundamentals of Algebra, Derivatives of algebraic and exponential functions. Maxima and minima of a function. Integration basics, Integration by parts and by substitutions.

**TEXT BOOKS**

1. Differential Calculus- Santhi Narayana.
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. Moulika Ganithamu Sambavyata - Telugu Academy.
4. Quantitative Techniques I- Sultan Chand Publication.

**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

**GOVERNMENT COLLEGE (A) RAJAMAHENDRAVARAM**  
**FIRST SEMESTER END EXAMINATION 2019-20**  
**I BA – STATISTICS (SEMESTER-I)**  
**QUANTITATIVE STATISTICS**

Time: 2 ½ hrs.

Max Marks-50

**MODEL PAPER**

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**SECTION-A**

Answer any **FOUR** Questions

**5X4=20M**

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. State and explain Binomial theorem
8. Find the derivative of  $Y = X^2 + 2X + 1$

**SECTION-B**

Answer any **THREE** Questions

**3x8=24M**

9. If  $A = \{1,2,3,4,5,6,7,8,9\}$   $B = \{3,5,7\}$  and  $C = \{2,4,6\}$   
Prove the following equation  $A \cup (B \cap C) = (A \cup B) \cap C$
10. Find the sum and product of the roots of the equation  $x^2 + 4x + 3 = 0$
11. Find sum of 'n' terms of the series  $7 + 77 + 777 + \dots$
12. Explain types of Matrices
13. Solve the following equations by Cramer method  
 $2x - y = 5, \quad 3x + 2y = -3$

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

**SECTION-C**

Answer any **THREE** the questions

**3x2=6M**

15. Define Sequence
  16. Define scalar matrix and rank of a matrix
  17. Differentiate  $Y = 2x + 1$
  18. Find  $\int x^3 + 1 \, dx$
  19. Define Series
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**GOVERNMENT COLLEGE (A), RAJAMAHENDRAVARAM**  
**II B.A. SEMESTER: III 2019-20**  
**(For Non-Mathematics Combination)**  
**Statistical Methods**  
**(Without mathematical derivations)**

**Total hrs. Required: 60**

**Total no. of credits: 03**

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**Unit- I**

**Attributes:** Classes, 2x2, manifold classification, class frequencies, ultimate class frequencies, Contingency tables, association and independence of attributes, consistency of data, coefficient of colligation.

**Unit-II**

**Moments:** Central and on-central moments, Sheppard's corrections for moments Skewness, kurtosis and their measures.

**Unit-III**

**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- IV**

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

**Unit-V**

**Mathematical Expectation:** M.G.F, C.G.F, P.G.F and C.F and their properties

**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

**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.

**GOVERNMENT COLLEGE (A), RAJAMAHENDRAVARAM**  
**II B.A. SEMESTER: III 2019-20**  
**(For Non-Mathematics Combination)**  
**Statistical Methods**  
**(Without mathematical derivations)**

**Time; 3hrs**

**MODEL PAPER**

**Max Marks: 60**

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**SECTION-A**

**Answer any FIVE of the following questions.**

**5 x 4 = 20M**

1. Explain independence of two attributes
2. Explain about kurtosis
3. Define (i) Mutually exclusive events  
(ii) Exhaustive events  
(iii) Equally likely events
4. A 100 page book is opened at random. What is the probability that the page opened is Having a prime number?
5. Write the properties of Distribution function.
6. If X is a random variable, then show that  $V(ax + b) = a^2 v(X)$ , where a and b are Constants
7. Define M.G.F and write its properties
8. Write short note on Attributes

**SECTION-B**

**Answer any FOUR questions**

**4 x 8 = 32M**

9. Write the consistency conditions for a given data for (i) single attributes (ii) two Attributes and (iii) three attributes.
10. Using the following given class frequencies, find the remaining class Frequencies.  
 $N = 23,713$ ,  $(A) = 1618$ ,  $(B) = 2015$ ,  $(C) = 770$ ,  $(AB) = 587$ ,  $(AC) = 428$ ,  
 $(BC) = 335$ ,  $(ABC) = 156$
11. Define (i) Raw moments (ii) Central moments. Express the central moments in terms of raw moments.
12. Explain various measures of skewness.
13. Define (i) Classical definition of probability  
(ii) Statistical definition of probability  
(iii) Axiomatic definition of probability  
and write their limitations.
14. 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,  $P(X < 6)$ ,  $P(X \geq 6)$ ,  $P(0 < X < 5)$

15. Prove the following results

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

**SECTION-C**

**Answer any FOUR questions**

**4x2= 8M**

- 16. Define Yule's coefficient of colligation
- 17. Give the Sheppard's corrections for moments
- 18. Define Bayes Theorem
- 19. Define characteristic function.
- 20. Define Sample space and Event
- 21. Define Skewness

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# Government College (A) Rajamahendravaram

B.A III Year: Statistics Syllabus 2019-20

(For Non-Mathematics Combination)

Semester-V CBCS

Basics of Statistical Inference

(Without mathematical derivations)

Total hrs. Per week: 03

Total credits: 03

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## 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.

## 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. Anuvarthitha Sankyaka Sastramu – Telugu Academy book.
2. Applied Statistics-V.K.Kapoor & S.C.Gupta
3. Applied Statistics-Parimal Mukhopadhyay.

## 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



**GOVERNMENT COLLEGE (A), RAJAMAHENDRAVARAM**  
**III B.A. SEMESTER: V 2019-20**  
**(For Non-Mathematics Combination)**  
**Basics of Statistical Inference**  
**(Without mathematical derivations)**

**Time: 3hrs**

**MODEL PAPER**

**Max Marks: 60**

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**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 X8=32M**

9. Explain the criteria of a good estimator
10. Define Statistic & Sampling distribution. Obtain the sampling distribution of mean  $\bar{X}$
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. Explain Procedure for Median Test

**SECTION-C**

**Answer any FOUR questions.**

**4x2=8M**

16. Define Population and Sample with suitable examples?
17. Define Simple and Composite Hypothesis?
18. Write the properties of F-test?
19. Write the uses of t-test?
20. What is ANOVA test?
21. What are Level of Significance and Power of the test?

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# Government College (A) Rajamahendravaram

B.A III Year: Statistics Syllabus 2019-20

(For Non-Mathematics Combination)

Theory of Sampling (Elective-I)

(Without Mathematical derivations)

Total hrs. Per week: 03

Total credits: 03

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## Unit-I

**Sampling theory:** 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: Cluster Sampling, Multi-Stage Sampling

## 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. Anuvarthitha Sankyaka Sastramu – Telugu Academy book.
2. Applied Statistics-V.K.Kapoor & S.C.Gupta
3. Applied Statistics-Parimal Mukhopadhyay.

## 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.

**GOVERNMENT COLLEGE (A), RAJAMAHENDRAVARAM**  
**III B.A. SEMESTER: V 2019-20**  
**(For Non-Mathematics Combination)**  
**Theory of Sampling (Elective-I)**

**Time: 3hrs**

**MODEL PAPER**

**Max Marks: 60**

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**SECTION-A**

**Answer any FIVE questions**

**5 x 4 = 20M**

1. Write short note on Sampling?
2. Explain the limitations of Sampling
3. Explain types of collecting information
4. Explain about Census method
5. Define SRSWR and SRSWOR
6. Explain Stratified sampling
7. Explain about Mixed Sampling
8. What are merits and demerits of Systematic sampling

**SECTION-B**

**Answer any FOUR questions**

**4 x8=32M**

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

**SECTION-C**

**Answer any FOUR questions**

**4x2=8M**

**16. Define population and Parameter with suitable example**

**17. Define sampling frame with suitable example**

**18. Define Cost Function**

**19. Write the applications of Sampling**

**20. Define Stratum and Strata**

**21. What is sampling Fraction**

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# **Government College (A) Rajamahendravaram**

**B.A III Year: Statistics Syllabus 2019-20**

**(For Non-Mathematics Combination)**

**Semester-V (Elective-II)**

**Demography**

**Total hrs. Required: 60**

**Total credits: 03**

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## **Unit-I**

**Introduction of Demography Nature and scope. Brief history of the development of Demographic work in India. Evolution of Indian Census 1872 – 1981 rates and ratios Standardization of rates.**

## **Unit-II**

**Techniques of measuring Mortality factors effecting mortality-Crude death Rate (CDR), Age Specific death rate (ASDR), Standardised death rate (STDR)**

## **Unit-III**

**Techniques of measuring Fertility – Factors effecting fertility- Crude Birth rate (CBR), Age Specific Fertility Rate (ASFR), Total Fertility Rate (TFR)**

## **Unit-IV**

**Life tables Components, Description and construction and uses of life tables, Abridged life tables.**

## **Unit-V**

**Population growth models – linear, exponential, Measurement of population growth, Crude rate of natural increase, Pearle’s vital index, Gross reproductive rate(GRR) and Net reproductive rate (NRR).**

## **Text Books:**

- (1). B.D. Misra: The study of Population.**
- (2). D.J.Bogue: Principles of Demography.**
- (3). Sarma P.V.S: Statistical Techniques in Population studies (Telugu Academy)**

## **Practical’s-Semester-V**

- (1). Calculation of crude death rate (CDR) crude birth rate (CBR) Sex ratio (SR) Child women rate (CWR).**
- (2). Drawing of Age sex pyramid.**
- (3). Measures of Mortality – Infant mortality Standardized Mortality rate.**
- (4). Measures of Fertility General Fertility rate (GFR) Age specific fertility rate (ASFR) Total fertility rate (TFR).**
- (5). Gross reproduction rate (GRR) and net reproduction rate (NRR).**
- (6). Life tables.**
- (7). Growth models linear.**
- (8). Growth models exponential trend**

# **Government College (A) Rajamahendravaram**

**III B.A. SEMESTER: V (Elective-II) 2019-20**

**(For Non-Mathematics Combination)**

**Demography**

**Time: 3hrs**

**MODEL PAPER**

**Max Marks: 60**

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## **Section-A**

**Answer any FIVE of the following questions.**

**5 x 4 = 20M**

- 1) Explain rates and ratios
- 2) Explain standardization rates
- 3) Explain mortality
- 4) Explain fertility
- 5) Explain the uses of RT
- 6) Describe the life table
- 7) Describe the purpose of growth models
- 8) Explain about census

## **SECTION-B**

**Answer Any FOUR of the following questions**

**4 x8=32M**

- 9 Explain the nature and scope of Demography.
- 10 Briefly give the history of development of Demographic work in India.
- 11 Explain the techniques of measuring mortality.
- 12 What are the various factors affecting mortality? Explain
- 13 Explain the techniques of measuring Fertility.
- 14 Explain about life tables
- 15 Explain the use of population growth models

## **Section-C**

**Answer any FOUR of the following questions**

**4x2=8M**

16. Define Demography

17. What is meant by Standardization?

18. Define age sex pyramid

19. Define GRR

20. Define NRR

21. Write the uses of life table

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