www.gcrjy.ac.in
GOVERNMENT COLLEGE (AUTONOMOUS), RAJAHMUNDRY
Estd: 1853; An Autonomous Institution & Accredited by NAAC at Grade 'A+'
East Godavari District -533 105, Andhra Pradesh, India
(Affiliated to Adikavi Nannayya University, Rajamahendravaram, A.P -533296)
Dr. Ramachandra R K, M.Sc., Ph.D.
PRINCIPAL
e-mail: gcrjy1853@gcrjy.ac.in

MODEL PAPERS

2025-2026

DEPARTMENT OF STATISTICS

BOARD OFSTUDIES (B.O.S)

SEMESTER -1,2,3,4,5,6

SEMESTER-I

MAJOR/MINOR	COURSE
I BSC STATISTICS (HONOURS)	
MAJOR - I	M1:Descriptive Statistics
MAJOR - II	M2:Random Variable and Mathematical Expectations

GOVERNMENT COLLEGE(A) RAJAHMUNDRY
CBCS SYLLABUS (Semester Wise) 2025-26
I B.Sc Statistics/Semester-I
Course-1-Descriptive Statistics (Major Paper)
MODEL PAPER

Time: 2 1/2 hrs. Max Marks: 50

SECTION-A

Answer any FIVE questions. 5X4= 20M

1	Explain about limitation of statistics.	BT1	PO1	CO2
2	Write about classification of data.	BT3	PO5	CO2
3	Analyze about nominal and ordinal measurement of scale.	BT2	PO3	CO3
4	Explain about properties of A.M	BT1	PO2	CO3
5	Show that Karl pearson coefficient of skewness lies between ± 3.	BT3	PO2	CO5
6	Explain the Presentation of data	BT3	PO1	CO5
7	Explain the Mean Deviation	BT3	PO2	CO5
8.	Explain about kurtosis and types.	BT2	PO2	C04

SECTION – B

Answer Any THREE questions. 3X10=30M

9	Explain about scope of Statistics.	BT1	PO2	C01
10	Illustrate about graphical representation of data.	BT1	PO1	CO2
11	Describe briefly about measures of central tendency.	BT2	PO2	CO3
12	Explain in detailed about measures of dispersion	BT1	PO2	CO3
13	Explain about moments and its types.	BT2	PO1	C04
14	Central and Non – Central moments and their interrelationship.	BT2	PO2	C04

GOVERNMENT COLLEGE(A) RAJAHMUNDRY
CBCS SYLLABUS (Semester Wise) 2025-26
I B.Sc Statistics/Semester-I
COURSE-2: RANDOMVARIABLESANDMATHEMATICALEXPECTATIONS (Major Paper)
Time: 2 ½ hrs **MODEL PAPER** **Max Marks: 50**

SECTION-A

Answer any FIVE questions. 5 X4 =20M

1	Write short note on Random variables?	BT1	PO1	CO2
2	Explain Cauchy - Schwartz inequalities	BT3	PO5	CO2
3	Explain p.m.f and p.d.f ?	BT2	PO3	CO3
4	Explain Bi-variate Random Variables?	BT1	PO2	CO3
5	Explain CF and its Properties? .	BT3	PO2	CO5
6	Explain Population, sample with examples	BT3	PO1	CO5
7	What are WLLN?	BT3	PO2	CO5
8.	What is Lindberg – Levy CLT?	BT2	PO2	C04

SECTION – B

Answer Any THREE questions. 3X10=30M

9 1. A random variable X has the following function BT1 PO2 C01

X	-2	-1	0	1	2	3
P(X)	0.1	K	0.2	2K	0.3	K

Find (i) Mean and variance
(ii)Construct distribution function and drawitsgraph

10	Explain Distribution function and its properties ?	BT1	PO1	CO2
11	Explain i)E(X+Y)= E(X)+E(Y) ii)E(XY)=E(X)E(Y)	BT2	PO2	CO3
12	Explain Chebyshev Inequality	BT1	PO2	CO3
13	Explain MGF and its Properties	BT2	PO1	C04
14	Explain about concept of Central limit theorem?	BT2	PO2	C04

SEMESTER-II

MAJOR/MINOR	COURSE
I BSC STATISTICS (HONOURS)	
MAJOR - III	M3 :THEORTICAL DISCRETE DISTRIBUTION
MAJOR - IV	M4 : THEORTICAL CONTINUOUS DISTRIBUTION

GOVERNMENT COLLEGE (A) RAJAMAHENDRAVARAM
CBCS SYLLABUS (Semester Wise) 2025-26
I B.Sc Statistics/Semester-I
COURSE3:Theoretical Discrete Distributions (Major Paper)

Time: 2 ½ hrs **MODEL PAPER** **Max Marks: 50**

SECTION-A

Answer any FIVE questions. 5 X4 =20M

1. Define Bernoulli distribution? BT1,PO2,C01

2. Explain about Binomial distribution? BT2,PO2,C04

3. Define Poisson distribution? BT3,PO5,C02

4. Explain Additive Property Of Geometric Distribution? BT2,PO2,C02

5. Define Geometric distribution? BT3,PO4,C03

6. Discuss about MGF and CF of Binomial Distribution? BT1,PO2,C01

7. ExplainMGF and CGF of Geometric Distribution? BT1,PO2,C05

8. Explain Hypergeometric Distribution BT1,PO2,C03

SECTION-B

Answer any THREE questions 3X10=30M

9. Explain Binomial Distribution and its Additive Property BT1,PO2,C01

10. Fit a Poisson Distribution for the following data BT1,PO2,C02

X	0	1	2	3	4	5	6	7
F	0	4	13	28	42	20	6	2

11. Explain Mean and Variance though mgf of Geometric DistributionBT1,PO2,C03

12. ExplainMoments of Poisson Distribution BT1,PO2,C02

13. Lack of memory property of Geometric Distribution BT1,PO2,C04

14. Explain about HyperGeometricDistribution BT1,PO2,C05

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GOVERNMENT COLLEGE (A) RAJAMAHENDRAVARAM
CBCS SYLLABUS (Semester Wise) 2025-26
I B.Sc Statistics/Semester-I
COURSE4:Theoretical Continuous Distributions (Major Paper)

Time: 2 ½ hrs **MODEL PAPER** **Max Marks: 50**

SECTION-A

Answer any FIVE questions. 5 X4 =20M

1. Write short note on Continuous Random variables BT1,PO1,CO1
2. Explain applications of Uniform Distribution? BT2,PO1,CO5
3. Describe MGF of Exponential distribution. BT3,PO2,CO5
4. Explain Applications of Normal Distribution BT3,PO1,CO2
5. Explain Distribution Function of Exponential Distribution BT1,PO2,CO5
6. Explain Application and properties of t Distribution. BT2,PO2,CO3
7. Explain Applications of Beta Distribution BT3,PO2,CO5
8. Explain about χ^2-Distribution BT1,PO1,CO5

SECTION-B

Answer any THREE questions 3X10=30M

9. Explain Moments of Rectangular Distribution BT3,PO1,CO1
10. Explain Moments of Exponential Distribution BT2,PO1,CO2
11. Explain It's Functions of Exponential Distribution Mgf,Cf&Cgf BT1,PO1,CO3
12. Describe briefly about the Beta distribution of second kind and derive it's mean and variance.
13. Lack of memory property of Exponential distribution BT3,PO1,CO3
14. Define Normal distribution and derive it's properties. BT1,PO1,CO4

1. Explain about Student'st-distribution BT1,PO1,CO5

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SEMESTER-III

MAJOR/MINOR	COURSE
II BSC STATISTICS (HONOURS)	
MAJOR – 3	M3 :THEORTICAL DISCRETE DISTRIBUTION
MAJOR – 4	M4 : THEORTICAL CONTINUOUS DISTRIBUTION
MAJOR – 5	M5: STATISTICAL METHODS
MAJOR – 6	M6: STATISTICAL INFERENCE
II BSC COMPUTATIONAL MATHEMATICS (HONOURS)	
MINOR – 2	STATISTICAL METHODS

GOVERNMENT COLLEGE (A) RAJAMAHENDRAVARAM
CBCS SYLLABUS (Semester Wise) 2025-26
II B.Sc Statistics/Semester-III
COURSE3:Theoretical Discrete Distributions (Major Paper)

Time: 2 ½ hrs **MODEL PAPER** **Max Marks: 50**

SECTION-A

Answer any FIVE questions. 5 X4 =20M

1. Define Bernoulli distribution? BT1,PO2,C01

2. Explain about Binomial distribution? BT2,PO2,C04

3. Define Poisson distribution? BT3,PO5,C02

4. Explain Additive Property Of Geometric Distribution? BT2,PO2,C02

5. Define Geometric distribution? BT3,PO4,C03

6. Discuss about MGF and CF of Binomial Distribution? BT1,PO2,C01

7. ExplainMGF and CGF of Geometric Distribution? BT1,PO2,C05

8. Explain Hypergeometric Distribution BT1,PO2,C03

SECTION-B

Answer any THREE questions 3X10=30M

9. Explain Binomial Distribution and its Additive PropertyBT1,PO2,C01

10. Fit a Poisson Distribution for the following data BT1,PO2,C02

X	0	1	2	3	4	5	6	7
F	0	4	13	28	42	20	6	2

11. ExplainMean and Variance though mgf of Geometric DistributionBT1,PO2,C03

12. ExplainMoments of Poisson DistributionBT1,PO2,C02

13. Lack of memory property of Geometric Distribution BT1,PO2,C04

14. Explain about HyperGeometricDistribution BT1,PO2,C05

GOVERNMENT COLLEGE (A) RAJAMAHENDRAVARAM
CBCS SYLLABUS (Semester Wise) 2025-26
II B.Sc Statistics/Semester-III
COURSE4:Theoretical Continuous Distributions (Major Paper)

Time: 2 ½ hrs **MODEL PAPER** **Max Marks: 50**

SECTION-A

Answer any FIVE questions. 5 X4 =20M

1. Write short note on Continuous Random variables BT1,PO1,CO1
2. Explain applications of Uniform Distribution? BT2,PO1,CO5
3. Describe MGF of Exponential distribution. BT3,PO2,CO5
4. Explain Applications of Normal Distribution BT3,PO1,CO2
5. Explain Distribution Function of Exponential Distribution BT1,PO2,CO5
6. ExplainApplication and properties of t Distribution. BT2,PO2,CO3
7. Explain Applications of BetaDistribution BT3,PO2,CO5
8. Explain about χ^2-Distribution BT1,PO1,CO5

SECTION-B

Answer any THREE questions 3X10=30M

9. Explain Moments of Rectangular Distribution BT3,PO1,CO1
10. Explain Moments of Exponential Distribution BT2,PO1,CO2
11. Explain It's Functions of Exponential Distribution Mgf,Cf&Cgf BT1,PO1,CO3
12. Describe briefly about the Beta distribution of second kind and derive it’s mean and variance.
13. Lack of memory property of Exponential distributionBT3,PO1,CO3
14. Define Normal distribution and derive it’s properties. BT1,PO1,CO4
15. Explain about Student‘st-distribution BT1,PO1,CO5

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GOVERNMENT COLLEGE (A) RAJAMAHENDRAVARAM
CBCS SYLLABUS (Semester Wise) 2025-26
II B.Sc Statistics/Semester-III
COURSE 5:STATISTICAL METHODS(Major Paper)

Time: 2 ½ hrs **MODEL PAPER** **Max Marks: 50**

SECTION-A

Answer any FIVE questions. 5 X4 =20M

1. Define Correlation and types of correlation. BT2,PO2,CO1
2. Explain about tied ranks BT2,PO2,CO5
3. Define Regression and its types BT1,PO2,CO3
4. Explain about principal of Least Squares. BT3,PO3,CO1
5. Explain about Fitting of Exponential Curve BT3,PO3,CO2
6. Describe about Consistency of data. BT3,PO3,CO2
7. Define Association of attributes BT1,PO2,CO3
8. Describe Order of class frequencies. BT1,PO3,CO5

SECTION-B

Answer any THREE questions 3X10=30M

9. Explain Derive Spearman's Rank correlation coefficient.BT3,P03,CO1

10.Fit a Straight line of the form to the following data BT3,PO2,C01

X	2	4	6	8	10	12
Y	10	14	19	25	31	36

11. Explain Regression lines X on Y BT3,P02,CO1

12. Compute Correlation Coefficient for the following data BT3,PO2,C01

X	20	14	36	29	5	11
Y	19	9	25	10	2	6

13.Explain about Partial and Multiple Correlations BT3,PO3,C03

14. Explain about Consistency of Data? BT3,PO2,C01

GOVERNMENT COLLEGE (A) RAJAMAHENDRAVARAM
CBCS SYLLABUS (Semester Wise) 2025-26
II B.Sc Statistics/Semester-III
COURSE 6: STATISTICAL INFERENCE

Time: 2 ½ hrs **MODEL PAPER** **Max Marks: 50**

SECTION-A

Answer any Five questions. 5 X 4 =20M

1. Explain short note on Estimation? BT3,PO3,CO1
2. Explain about ConfidenceIntervals? BT2,PO2,CO2
3. Define null and alternative hypothesis? BT1,PO2,CO2
4. Explain types of errors? BT1,PO3,CO5
5. Explain single proportion? BT1,PO2,CO3
6. Explain F-test for equality of variances BT1,PO3,CO5
7. What are Non parametric tests and its assumptions? BT3,PO1,CO5
8. Explain Sign test? BT3,PO1,CO5

SECTION-B

Answer any THREE questions 3X10=30M

9. Explain criteriaofagoodestimator BT3,PO3,CO1
10. Explain MLE BT2,PO2,CO5
11. State and Prove NP-Lemma BT1,PO2,CO2
12. Explain Single and two means concept in Large Samples BT1,PO2,CO5
13. Explain about Chi-square test goodness of fit BT1,PO2,CO3
14. Explain Non parametric test vs parametric test BT1,PO3,CO5

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GOVERNMENT COLLEGE (A) RAJAMAHENDRAVARAM
CBCS SYLLABUS (Semester Wise) 2025-26
II BSC COMPUTATIONAL MATHEMATICS (HONOURS) / Semester-III
COURSE 5: STATISTICAL METHODS (Minor Paper)

Time: 2 ½ hrs **MODEL PAPER** **Max Marks: 50**

SECTION-A

Answer any FIVE questions. 5 X4 =20M

9. Define Correlation and types of correlation. BT2,PO2,CO1

10. Explain about tied ranks BT2,PO2,CO5

11. Define Regression and its types BT1,PO2,CO3

12. Explain about principal of Least Squares. BT3,PO3,CO1

13. Explain about Fitting of Exponential Curve BT3,PO3,CO2

14. Describe about Consistency of data. BT3,PO3,CO2

15. Define Association of attributes BT1,PO2,CO3

16. Describe Order of class frequencies. BT1,PO3,CO5

SECTION-B

Answer any THREE questions 3X10=30M

9. Explain Derive Spearman's Rank correlation coefficient.BT3,P03,CO1

10.Fit a Straight line of the form to the following data BT3,PO2,C01

X	2	4	6	8	10	12
Y	10	14	19	25	31	36

11. Explain Regression lines X on Y BT3,P02,CO1

12. Compute Correlation Coefficient for the following data BT3,PO2,C01

X	20	14	36	29	5	11
Y	19	9	25	10	2	6

13.Explain about Partial and Multiple Correlations BT3,PO3,C03

14. Explain about Consistency of Data? BT3,PO2,C01

SEMESTER-IV

MAJOR/MINOR	COURSE
II BSC STATISTICS (HONOURS)	
MAJOR – 7	M7: THEORY OF SAMPLING
MAJOR – 8	M8: DESIGN OF EXPERIMENTS
MAJOR – 9	M9: NUMERICAL ANALYSIS
II BSC COMPUTATIONAL MATHEMATICS (HONOURS)	
MINOR – 3	THEORY OF SAMPLING
MINOR – 4	DESIGN OF EXPERIMENTS

GOVERNMENT COLLEGE (A) RAJAMAHENDRAVARAM
CBCS SYLLABUS (Semester Wise) 2025-26
II B.Sc Statistics/Semester-IV
COURSE 7: THEORY OF SAMPLING (Major Paper)

Time: 2 ½ hrs **MODEL PAPER** **Max Marks: 50**

SECTION-A

Answer any FIVE questions. 5 X4 =20M

1. Explain short note on types of Sampling. BT1,PO1,CO2
2. Explain about Sampling Errors and Non-sampling errors BT3,PO3,CO2
3. Explain SRSWR vs SRSWOR BT2,PO1,CO2
4. Explain allocations in Stratified Sampling BT2,PO2,CO5
5. Explain Random numbers method BT3,PO3,CO2
6. Explain Systematic Sampling BT3,PO3,CO1
7. Explain NSSO BT3,PO3,CO5
8. Explain National Statistical Commission BT2,PO1,CO2

SECTION-B

Answer any THREE questions 3X10=30M

9. Explain principal steps in sample survey. BT2,PO2,CO5

(OR)

10. Show that $E(s^2)=S^2$ in SRSWOR. BT2,PO2,CO3
11. Comparison of variance of SRS, StRS and SYS for a linear trend BT4,PO5,CO4

(OR)

12. Show that $V(\bar{y}_{opt})<=V(\bar{y}_{prop})<=V(\bar{y}_{srswor})$ BT2,PO2,CO3
13. Define Systematic sampling and write it's advantages and disadvantages. BT1,PO2,CO3

(OR)

14. Explain the roles and responsibilities of C.S.O BT2,PO2,CO2

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GOVERNMENT COLLEGE (A) RAJAMAHENDRAVARAM
CBCS SYLLABUS (Semester Wise) 2025-26
II B.Sc Statistics/Semester-IV
COURSE 8:DESIGN AND ANALYSIS OF EXPERIMENTS (Major Paper)

Time: 2 ½ hrs **MODEL PAPER** **Max Marks: 50**

SECTION-A

Answer any FIVE questions. 5 X4 =20M

1. Write about assumptions of ANOVA. BT1,PO3,CO2
2. Write Short note on ANOVA BT1,PO3,CO1
3. Define completely randomized design (CRD) BT2,PO3,CO1
4. Explain about fixed effect & random effect model. BT3,PO2,CO4
5. Describe about applications for RBD. BT1,PO3,CO5
6. Write about advantages and disadvantages of LSD. BT2,PO3,CO3
7. Compare the Efficiencies of RBD over LSD BT3,PO3,CO3
8. Describe Yates procedure to find factorial effect totals. BT1,PO2,CO4

SECTION-B

Answer any THREE questions 3X10=30M

9. Explain ANOVAtwowayclassification BT1,PO3,CO5
10. One way Classification Model Problem BT3,PO2,CO4

Four Varieties of Fertilizers have been applied to Five plots each. the yield given below

Varieties	Plots				
	I	II	III	IV	V
1	1.9	2.2	2.6	1.8	2.1
2	2.5	1.9	2.3	2.6	2.2
3	1.7	1.9	2.2	2.0	2.1
4	2.1	1.8	2.5	2.3	2.4

11. Explain about CRD BT2,PO2,CO3
12. Explain missing plot technique is RBD BT2,PO2,CO3
13. Explain about LSD BT2,PO1,CO1
14. Explain 2^3factorialexperiments BT1,PO1,CO1

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GOVERNMENT COLLEGE (A) RAJAMAHENDRAVARAM
CBCS SYLLABUS (Semester Wise) 2025-26
II B.Sc Statistics/Semester-IV
COURSE 9: NUMERICAL ANALYSIS (Major Paper)

Time: 2 ½ hrs **MODEL PAPER** **Max Marks: 50**

SECTION-A

Answer any FIVE questions. 5 X4 =20M

1. Given y0 = 3 , y1 = 12 , y3 = 200 , y4 = 100 . Find $\Delta^4 y0$ without forming difference table
2. Find the missing term in the following data.

□	0	1	2	3	4
□	1	3	9	..	81

3. Given that √12500 = 111.803399, √12510 = 111.848111, √12520 =111.892806, √12530 = 1.937483. □*h*□□ □□ □□□□□ □□□□□□□□ □□□□□□□ □*h*□□ √12516 =111.874930
4. Explain Newton's Divided difference formula and Lagrange's formula
5. Find $f^1(1)$ for □(□)=1/(1+x^2) using the following table .

X	1.0	1.1	1.2	1.3	1.4
Y	0.5000	0.4524	0.4098	0.3717	0.3378

6. Find $f^1(2.5)$ from the following table

X	1.5	1.9	2.5	3.2	4.3	5.9
Y	3.375	6.059	13.625	29.368	73.907	196.57

7. Evaluate $\int^1(4□ - 3□^2)□□$ taking 10 intervals by trapezoidal rule
8. Using Taylor's series method, find □(0.1) correct to four decimal places if□′ = □ − $□^2$and □(0) = 1.

SECTION-B

Answer any THREE questions 3X10=30M

9. State and prove Newton – Gregory formula for forward interpolation with equal intervals
10. From the following table , find the number of students who obtain less than 45 marks .

Marks	30-40	40-50	50-60	60-70	70-80
No.of students	31	42	51	35	31

11. Find $f^1(0.6)$ and $f^{11}(0.6)$ from the following table .

x	0.4	0.5	0.6	0.7	0.8
f(x)	1.5836	1.7974	2.0442	2.3275	2.6510

12. Apply Gauss forward formula to find the value of u9 if u0 = 14 , u4 = 24 , u8 = 32 , u16 = 40.
13. Evaluate the integral $\int^{5.2}$ log □ □□ using Weddle's rule.
14. Given □□ = □ − □ with y(0) = 2 , find y(0.1) and y(0.2) correct to four decimal places by using Runge – Kuttamethod .

GOVERNMENT COLLEGE (A) RAJAMAHENDRAVARAM
CBCS SYLLABUS (Semester Wise) 2025-26
II BSC COMPUTATIONAL MATHEMATICS (HONOURS) / SEMESTER-IV
COURSE 7: THEORY OF SAMPLING (Minor Paper)

Time: 2 ½ hrs **MODEL PAPER** **Max Marks: 50**

SECTION-A

Answer any FIVE questions. 5 X4 =20M

15. Explain short note on types of Sampling. BT1,PO1,CO2

16. Explain about Sampling Errors and Non-sampling errors BT3,PO3,CO2

17. Explain SRSWR vs SRSWOR BT2,PO1,CO2

18. Explain allocations in Stratified Sampling BT2,PO2,CO5

19. Explain Random numbers method BT3,PO3,CO2

20. Explain Systematic Sampling BT3,PO3,CO1

21. Explain NSSO BT3,PO3,CO5

22. Explain National Statistical Commission BT2,PO1,CO2

SECTION-B

Answer any THREE questions 3X10=30M

23. Explain principal steps in sample survey. BT2,PO2,CO5

(OR)

24. Show that $E(s^2)=S^2$ in SRSWOR. BT2,PO2,CO3

25. Comparison of variance of SRS, StRS and SYS for a linear trend BT4,PO5,CO4

(OR)

26. Show that $V(\bar{y}_{opt})<=V(\bar{y}_{prop})<=V(\bar{y}_{srswor})$ BT2,PO2,CO3

27. Define Systematic sampling and write it's advantages and disadvantages. BT1,PO2,CO3

(OR)

28. Explain the roles and responsibilities of C.S.O BT2,PO2,CO2

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GOVERNMENT COLLEGE (A) RAJAMAHENDRAVARAM
CBCS SYLLABUS (Semester Wise) 2025-26
II BSC COMPUTATIONAL MATHEMATICS (HONOURS) / SEMESTER-IV
COURSE 8:DESIGN AND ANALYSIS OF EXPERIMENTS (Minor Paper)

Time: 2 ½ hrs **MODEL PAPER** **Max Marks: 50**

SECTION-A

Answer any FIVE questions. 5 X4 =20M

15. Write about assumptions of ANOVA. BT1,PO3,CO2

16. Write Short note on ANOVA BT1,PO3,CO1

17. Define completely randomized design (CRD) BT2,PO3,CO1

18. Explain about fixed effect & random effect model. BT3,PO2,CO4

19. Describe about applications for RBD. BT1,PO3,CO5

20. Write about advantages and disadvantages of LSD. BT2,PO3,CO3

21. Compare the Efficiencies of RBD over LSD BT3,PO3,CO3

22. Describe Yates procedure to find factorial effect totals. BT1,PO2,CO4

SECTION-B

Answer any THREE questions 3X10=30M

23. Explain ANOVAtwowayclassification BT1,PO3,CO5

24. One way Classification Model Problem BT3,PO2,CO4

Four Varieties of Fertilizers have been applied to Five plots each. the yield given below

Varieties	Plots				
	I	II	III	IV	V
1	1.9	2.2	2.6	1.8	2.1
2	2.5	1.9	2.3	2.6	2.2
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4	2.1	1.8	2.5	2.3	2.4

25. Explain about CRD BT2,PO2,CO3
26. Explain missing plot technique is RBD BT2,PO2,CO3

27. Explain about LSD BT2,PO1,CO1
28. Explain 2^3factorialexperiments BT1,PO1,CO1

SEMESTER-V

(LONG TEAM INTERNSHIP)

SEMESTER-VI

MAJOR/MINOR	COURSE
III BSC STATISTICS (HONOURS)	
MAJOR – 10	M10: APPLIED STATISTICS
MAJOR – 11	M11: COMPUTATIONAL TECHNIQUES AND R PROGRAMMING
MAJOR – 12	M12: OPERATION RESEARCH
MAJOR – 13	M13: OPTIMIZATION TECHNIQUES
III BSC COMPUTATIONAL MATHEMATICS (HONOURS)	
MINOR – 5	APPLIED STATISTICS
MINOR – 6	COMPUTATIONAL TECHNIQUES AND R PROGRAMMING

GOVERNMENT COLLEGE (A) RAJAMAHENDRAVARAM
CBCS SYLLABUS (Semester Wise) 2025-26
III B.Sc Statistics/Semester-VI
COURSE 10:APPLIED STATISTICS (Major Paper)

Time: 2 ½ hrs **MODEL PAPER** **Max Marks: 50**

SECTION-A

Answer any FIVE questions. 5 X4 =20M

1. Write about Time Series and its components. BT1,PO3,CO2
2. Explain Cost of living Index numbersBT1,PO3,CO1
3. Whatare the sources of vital statistics BT2,PO3,CO1
4. Explain Gross reproduction rate and Net reproduction rate. BT3,PO2,CO4
5. Explain Methods population growth rates. BT1,PO3,CO5
6. Explain the method of Simple averagesBT2,PO3,CO3
7. Explain Abridged life tablesBT3,PO3,CO3
8. Explain the use of National incomeBT1,PO2,CO4

SECTION-B

Answer any THREE questions 3X10=30M

9. Explain the components of Time series?BT1,PO3,CO5
10. Explain the problems involved in the construction of index numbersBT3,PO2,CO4
11. Explain the criteria of a good index number?BT2,PO2,CO3
12. Explain the functions and organization of CSO?BT2,PO2,CO3
13. Explain about various death rates? BT2,PO1,CO1
14. Explain life table and its Construction ?BT1,PO1,CO1

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GOVERNMENT COLLEGE (A) RAJAMAHENDRAVARAM
CBCS SYLLABUS (Semester Wise) 2025-26
III B.Sc Statistics/Semester-VI
COURSE 11:COMPUTATIONAL STATISTICS AND R PROGRAMMING (Major Paper)
Time: 2 ½ hrs **MODEL PAPER** **Max Marks: 50**

SECTION-A

Answer any FIVE questions. 5 X4 =20M

1. Define computer. What is the difference between System and Application software. BT1,PO3,CO2
2. What are the different types of computer StoragesBT1,PO3,CO1
3. Explain about creating charts in MS – ExcelBT2,PO3,CO1
4. Explain about R Programming. And write down the features of R ProgrammingBT3,PO2,CO4
5. What are the input and output function available in R ProgrammingBT1,PO3,CO5
6. Describe the process of creating, saving and editing a workbook in MS ExcelBT2,PO3,CO3
7. Explain how do you represent data in RBT3,PO3,CO3
8. What is a cell and cell address? How can you restrict someone from copying a cell from your worksheet?BT1,PO2,CO4

SECTION-B

Answer any THREE questions 3X10=30M

9. Explain the various computer language. BT1,PO3,CO5
10. What is Operating System? Discuss about some popular Operating SystemsBT3,PO2,CO4
11. What is a function in MS Excel? Explain the various Statistical functions available in MS Excel.BT2,PO2,CO3
12. Explain how to perform one-way ANOVA using a data analysis Pak. Also explain how to predict the R square value from the output.BT2,PO2,CO3
13. Write a R program to create a matrix, taking a given vector of numbers as input and perform matrix addition and multiplicationBT2,PO1,CO1
14. Define operators. Explain arithmetic and relational operators in R-ProgrammingBT1,PO1,CO1

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GOVERNMENT COLLEGE (A) RAJAMAHENDRAVARAM
CBCS SYLLABUS (Semester Wise) 2025-26
III B.Sc Statistics/Semester-VI
COURSE 12:OPERATIONS RESEARCH (Major Paper)

Time: 2 ½ hrs **MODEL PAPER** **Max Marks: 50**

SECTION-A

Answer any FIVE questions. 5 X4 =20M

1. Explain the formulation of LPP BT1,PO3,CO2
2. Write advantages and disadvantages of O.R BT1,PO3,CO1
3. Explain General LPP BT1,PO3,CO1
4. How do you obtain a sequence? BT1,PO3,CO5
5. Explain Concept of Two –Phase Method BT1,PO3,CO1
6. Explain the slack and surplus Variables
7. Explain assignment problem as a special case of TP. BT1,PO3,CO1
8. Explain the concept of Artificial Variable TechniqueBT1,PO3,CO1

SECTION-B

Answer any THREE questions 3X10=30M

9. Describe the Nature and Scope of O.R BT1,PO3,CO1
10. Solve the Following LPP by using Graphical Method BT1,PO3,CO2
    Maximize $Z=45X_1+80X_2$
    Subject to const: $5X_1+20X_2 \leq 400$ $10X_1+15X_2 \leq 450$ $X_1, X_2 \geq 0$
11. Use simplex Method to solve the following LPP BT1,PO3,CO2
    Maximize $Z=X_1-X_2+3X_3$
    Subject to const: $X_1+X_2+X_3 \leq 10$ $2X_1-X_3 \leq 2$ $2X_1-2X_2+3X_3 \leq 0$, $X_1, X_2, X_3 \geq 0$
12. Mathematical formulation of LPP. graphical solution of LPP BT1,PO3,CO3
13. Solve the following LPP using duality.BT1,PO3,CO4
14. Dual simplex method. BT1,PO3,CO5

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GOVERNMENT COLLEGE (A) RAJAMAHENDRAVARAM
CBCS SYLLABUS (Semester Wise) 2025-26
III B.Sc Statistics/Semester-VI
COURSE 13:OPTIMIZATION TECHNIQUES (Major Paper)

Time: 2 ½ hrs **MODEL PAPER** **Max Marks: 50**

SECTION-A

Answer any FIVE questions. 5 X4 =20M

1. Explain pure and mixed strategies. BT1,PO3,CO1
2. Explain different types of inventories. BT1,PO3,CO2
3. Explain the determination of EOQ with one price break. BT1,PO3,CO3
4. Write about game theory. BT1,PO3,CO2
5. Write basic steps in PERT technique BT1,PO3,CO5
6. Write rules for drawing net work diagram. BT1,PO3,CO5
7. Explain Errors in networking BT1,PO3,CO4
8. Write short note on queuing theory. BT1,PO3,CO4

SECTION-B

Answer any THREE questions 3X10=30M

9. Find optimal strategies for the games for which for the pay off matrices are given below also find the value of the game.(PROBLEM)BT1,PO3,CO1
10. Write procedure of graphical method to solve 2Xn gamesBT1,PO3,CO2
11. a) Explain the cost associate with inventoriesBT1,PO3,CO3
    b) Explain probabilistic inventory models without setup cost
12. Find the optimum time of completion of project ,when the time of completion of eachtaskis as follows :A<D ,E ; B,D< F ; C<G ;B ,G<H ;F,G< I.BT1,PO3,CO4

Task	A	B	C	D	E	F	G	H	I
Time	23	8	20	16	24	18	19	4	10

13. Explain the differences between CPM and PERTBT1,PO3,CO5
14. Explain any two models in Poisson queuing system.BT1,PO3,CO5

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GOVERNMENT COLLEGE (A) RAJAMAHENDRAVARAM
CBCS SYLLABUS (Semester Wise) 2025-26
III BSC COMPUTATIONAL MATHEMATICS (HONOURS) /Semester-VI
COURSE 10:APPLIED STATISTICS (Minor Paper)
Time: 2 ½ hrs **MODEL PAPER** **Max Marks: 50**

SECTION-A

Answer any FIVE questions. 5 X4 =20M

15. Write about Time Series and its components. BT1,PO3,CO2

16. Explain Cost of living Index numbersBT1,PO3,CO1

17. Whatare the sources of vital statistics BT2,PO3,CO1

18. Explain Gross reproduction rate and Net reproduction rate. BT3,PO2,CO4

19. Explain Methods population growth rates. BT1,PO3,CO5

20. Explain the method of Simple averagesBT2,PO3,CO3

21. Explain Abridged life tablesBT3,PO3,CO3

22. Explain the use of National incomeBT1,PO2,CO4

SECTION-B

Answer any THREE questions 3X10=30M

23. Explain the components of Time series?BT1,PO3,CO5

24. Explain the problems involved in the construction of index numbersBT3,PO2,CO4
25. Explain the criteria of a good index number?BT2,PO2,CO3
26. Explain the functions and organization of CSO?BT2,PO2,CO3
27. Explain about various death rates? BT2,PO1,CO1
28. Explain life table and its Construction ?BT1,PO1,CO1

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GOVERNMENT COLLEGE (A) RAJAMAHENDRAVARAM
CBCS SYLLABUS (Semester Wise) 2025-26
III BSC COMPUTATIONAL MATHEMATICS (HONOURS) /Semester-VI
COURSE 11:COMPUTATIONAL STATISTICS AND R PROGRAMMING (Minor Paper)
Time: 2 ½ hrs **MODEL PAPER** **Max Marks: 50**

SECTION-A

Answer any FIVE questions. 5 X4 =20M

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SECTION-B

Answer any THREE questions 3X10=30M

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26. Explain how to perform one-way ANOVA using a data analysis Pak. Also explain how to predict the R square value from the output.BT2,PO2,CO3

27. Write a R program to create a matrix, taking a given vector of numbers as input and perform matrix addition and multiplicationBT2,PO1,CO1

28. Define operators. Explain arithmetic and relational operators in R-ProgrammingBT1,PO1,CO1

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CERTIFICATE COURSE

S.NO	COURSE
1	DATA ANALYSIS USING R-PROGRAMMING

GOVERNMENT COLLEGE(AUTONOMOUS) RAJAHMUNDRY

DEPARTMENT OF STATISTICS

UG-CERTIFICATECOURSE-2025-26

Common for all B.A, B.Sc, B.Com, / SEMESTER-IV

DATA ANALYSIS USING R-PROGRAMMING

(Model Paper)

Time- 2 Hours **Marks-50M**

SECTION-A

Answer any FIVE questions. All question carries equal marks 5x10=50 M

1. Define Data Analytics and Explain Scope and Development of Data Analytics
2. Explain types of Classification in Data Analytics with examples
3. Explain various variables and Data types in R-programming?
4. Explain Terms Control Structures, Array, Matrix, Vectors, Factors, Functions
5. Explain Data Visualization using R Reading and getting data into R
6. Explain Charts and Graphs in R language
7. Explain any probability distributions using R
8. Explain Non-Parametric tests using R with examples