SRI.A.S.N.M. GOVERNMENT COLLEGE (A), PALAKOL, W.G.DT.

DEPARTMENT OF STATISTICS

BOARD OF STUDIES MEETING

2023-2024

DATE: 11-09-2023

SRI A.S.N.M. GOVERNMENT COLLEGE (A), PALAKOL. W.G.DT

(Affiliated to Adikavi Nannaya University, Rajahmahendravaram)

(Accredited with NAAC 'B+' Grade with 2.67 CGPA)

2023-2024

DEPARTMENT OF STATISTICS

Constitution of Board of Studies

Board of Studies Chairman	:	**K.Bhadrachalam** Lecturer in Computer Science(Incharge of Statistics)
University Nominee	:	**Dr. N.Srinivasa Rao** H.O.D of Statistics Andhra Loyola college,Vijayawada
Subject Experts	:	**1) Dr. N.Madhavi** Hod of Statistics, GDC(A),RAJAHMAHENDRAVARAM **2)Dr.N.VISWAM** H.O.D OF STATISTICS Hindu College, Guntur
Lecturer	:	S.SREEDEVI Lecturer in Statistics SRI A.S.N.M GOVT COLLEGE (A) PALAKOL,W.G.DT
Industrialist	:	**Sri K. Rajasekar Reddy** **Director, Manohari Plastic Industries,** **Penugonda, West Godavari Dt.**
Alumni	:	Sri B.Nagesh Palakol, W.G.Dt
Student	:	A.KARUNA KUMARI,IIIM.S.DS

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DEPARTMENT OF STATISTICS

It is proposed to conduct Board of Studies of Statistics meeting on 11-09-2023 in the Department. Hence the following subject experts are requested to attend the same.

Board of Studies Chairman	:	**K.Bhadrachalam** Lecturer in Computer Science(Incharge of Statistics)
University Nominee	:	**Dr. N.Srinivasa Rao** H.O.D of Statistics Andhra Loyola college,Vijayawada
Subject Experts	:	**1) Dr. N.Madhavi** Hod of Statistics, GDC(A),RAJAHMAHENDRAVARAM **2) Dr.N.VISWAM** HOD OF STATISTICS HINDU COLLEGE, GUNTUR
Lecturer	:	S.SREEDEVI Lecturer in Statistics SRI A.S.N.M GOVT COLLEGE (A) PALAKOL,W.G.DT
Industrialist	:	**Sri K. Rajasekar Reddy** **Director, Manohari Plastic Industries,** **Penugonda, West Godavari Dt.**
Alumni	:	SriB.Nagesh Palakol, W.G.Dt
Student	:	A. KARUNA KUMARI III MSDs

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DEPARTMENT OF STATISTICS

2023-2024

Agenda:

1. **To approve the revised curriculum by APSCHE for Final year (V Semester& VI Semester) from the Academic year 2023-2024.**
2. To approve First and Second years exist BOS syllabus.
3. **To prescribe the Syllabi Suggest by University, with modification if not Exceeding 20% to suit the local needs, to be implement from the Academic Year 2023-2024**
4. **To select paper setter and examiners for theory and practical which ever applicable from the panel of Readers /Lecturers working in some reputed colleges**
5. **To approve 40 marks for Internal assessment and 60 marks for theory assessment of first year Students from the academic year 2023-2024.**
6. **To approve 25 marks for Internal assessment and 75 marks for theory assessment of second Year and final year students.**
7. **To approve 35% pass mark of semester end theory assessment examinations and Overall 40%Pass mark of both internal and external examination.**
8. **To approve Community service projects, Internships to the admitted batch.**
9. **To approve blue print and model question paper pattern for theory and practical wherever Applicable for semester examinations.**
10. **To approve introduce certificate course "Bio-Statistics" for statistics students for this Acadamic year 2023-2024.**
11. **Research, Teaching, Extension and other Academic activities in the department suggest, Methodologies for innovate methods for Teaching and Learning.**
12. **To approve Course Codes for all semesters of Statistics.**
13. **Any other with the permission of the chairman.**



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DEPARTMENT OF STATISTICS

2023-2024

B.Sc., STATISTICS *(WITH MATHEMATICS)*

COURSE STRUCTURE *(SEMESTER –II,III,IV&V)*

Semester	Paper	Subject	Hrs	Credits	Marks		
					IA	EA	Total
II	I	DESCRIPTIVE STATISTICS	3	3	40	60	100
		Practical_2	2	1	0	50	50
III	III	STSTISTICAL INFERENCE	4	4	25	75	100
		PRACTICAL -3	2	1	0	50	50
IV	IVA	Sampling Techniques &Designs of Experiments	4	4	25	75	100
		PRACTICAL-4	2	1	0	50	50
	IVB	APPLIED STATISTICS	4	4	25	75	100
		PRACTICAL-5	2	1	0	50	50
V	V	Operations Research -I	4	4	25	75	100
		PRACTICAL-6	2	1	0	50	50
		Operation Research -II	4	4	25	75	100
		PRACTICAL-7	2	1	0	50	50

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DEPARTMENT OF STATISTICS

To approve the following the course codes for 1ST& 2ND semesters of B.Sc Statistics (WM)

S.No	Course Code	Name of the Course
1	BSST22T	DESCRIPTIVE STATISTICS
2	BSST33T	STATISTICAL INFERENCE
3	BSST44T BSST45T	Sampling techniques and designs of experiments Applied Statistics
4	BSST54T BSST55T	Operations Research –I Operations Research-II

For understanding purpose the above course codes are generated in the following manner **upto 5th semester**

1. First Two characters : BS means B.Sc
2. Third & Fourth characters : ST means Statistics
3. Fifth character : 1/2 indicates the Semester number
4. Sixth character : 1/2 indicates Paper Number
5. Seventh character : T means Theory

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2023-2024

DEPARTMENT OF STATISTICS

Pattern of Mid-Term Examinations

I Mid Examination

S.No	Type of Questions	No.of Questions given	No.of Questions Answered	Marks alloted	Total Marks
1	Bits or Multiple Choice Questions	10	10	1/2	5
2	Very Short Questions	7	5	2	10
3	Essay Questions	3	1	5	5
Total Marks					20

II Mid Examination

S.No	Type of Questions	No.of Questions given	No.of Questions Answered	Marks alloted	Total Marks
1	Short Questions	2	1	10	10
2	Essay Questions	2	1	5	5
Total Marks					15

Assignments- 5 Marks
Seminars/GD/Field trips etc.- 5 Marks
Clean and Green - 5 Marks
Total – 50 Marks
Scale down to 40 For First and Second year
Scale down to 25 For Third year.

SRI.A.S.N.M GOVERNMENT COLLEGE (A), PALAKOL, W.G.DT.

BLUE PRINT FOR THE STATISTICS (WM) MODEL PAPER
FOR SEMESTER END EXTERNAL EXAMINATIONS
PAPER – II DESCRIPTIVE STATISTICS

S.No	Unit No	SHORT ANSWER QUESTIONS			ESSAY QUESTIONS		
		Number of Questions given	Number of Questions to be Answered	Marks Allotted	Number of Questions given	Number of Questions to be Answered	Marks Allotted
1	I	02	Answer any 5 Questions out of given 10 questions	4	02	Answer Any 5 questions out of given 10 questions	5X8=40 marks
2	II	02		4	02		
3	III	02		4	02		
4	IV	02		4	02		
5	V	02		4	02		
Total		10	05	20	10	05	40

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BLUE PRINT FOR THE STATISTICS (WM) MODEL PAPER
FOR SEMESTER END EXTERNAL EXAMINATIONS
PAPER – III STATISTICAL INFERENCE

S.No	Unit No	SHORT ANSWER QUESTIONS			ESSAY QUESTIONS		
		Number of Questions given	Number of Questions to be Answered	Marks Allotted	Number of Questions given	Number of Questions to be Answered	Marks Allotted
1	I	02	Answer any 5 Questions out of given 10 questions	5	02	Answer Any 5 questions out of given 10 questions	5X10=50 marks
2	II	02		5	02		
3	III	02		5	02		
4	IV	02		5	02		
5	V	02		5	02		
Total		10	05	25	10	05	50

SRI.A.S.N.M GOVERNMENT COLLEGE (A), PALAKOL, W.G.DT.

BLUE PRINT FOR THE STATISTICS (WM) MODEL PAPER
FOR SEMESTER END EXTERNAL EXAMINATIONS
PAPER – IV SAMPLING TECHNIQUES AND DESIGN OF EXPERIMENTS

S.No	Unit No	SHORT ANSWER QUESTIONS			ESSAY QUESTIONS		
		Number of Questions given	Number of Questions to be Answered	Marks Allotted	Number of Questions given	Number of Questions to be Answered	Marks Allotted
1	I	02	Answer any 5 Questions out of given 10 questions	5	02	Answer Any 5 questions out of given 10 questions	5X10=50 marks
2	II	02		5	02		
3	III	02		5	02		
4	IV	02		5	02		
5	V	02		5	02		
Total		10	05	25	10	05	50

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BLUE PRINT FOR THE STATISTICS (WM) MODEL PAPER
FOR SEMESTER END EXTERNAL EXAMINATIONS
PAPER – V APPLIED STATISTICS

S.No	Unit No	SHORT ANSWER QUESTIONS			ESSAY QUESTIONS		
		Number of Questions given	Number of Questions to be Answered	Marks Allotted	Number of Questions given	Number of Questions to be Answered	Marks Allotted
1	I	02	Answer any 5 Questions out of given 10 questions	5	02	Answer Any 5 questions out of given 10 questions	5X10=50 marks
2	II	02		5	02		
3	III	02		5	02		
4	IV	02		5	02		
5	V	02		5	02		
Total		10	05	25	10	05	50

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BLUE PRINT FOR THE STATISTICS (WM) MODEL PAPER
FOR SEMESTER END EXTERNAL EXAMINATIONS
PAPER – VI(A) OPERATIONS RESEARCH-II

S.No	Unit No	SHORT ANSWER QUESTIONS			ESSAY QUESTIONS		
		Number of Questions given	Number of Questions to be Answered	Marks Allotted	Number of Questions given	Number of Questions to be Answered	Marks Allotted
1	I	02	Answer any 5 Questions out of given 10 questions	5	02	Answer Any 5 questions out of given 10 questions	5X10=50 marks
2	II	02		5	02		
3	III	02		5	02		
4	IV	02		5	02		
5	V	02		5	02		
Total		10	05	25	10	05	50

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BLUE PRINT FOR THE STATISTICS (WM) MODEL PAPER
FOR SEMESTER END EXTERNAL EXAMINATIONS
PAPER – VII(A) OPERATIONS RESEARCH-II

S.No	Unit No	SHORT ANSWER QUESTIONS			ESSAY QUESTIONS		
		Number of Questions given	Number of Questions to be Answered	Marks Allotted	Number of Questions given	Number of Questions to be Answered	Marks Allotted
1	I	02	Answer any 5 Questions out of given 10 questions	5	02	Answer Any 5 questions out of given 10 questions	5X10=50 marks
2	II	02		5	02		
3	III	02		5	02		
4	IV	02		5	02		
5	V	02		5	02		
Total		10	05	25	10	05	50

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2023-2024

DEPARTMENT OF STATISTICS

Smt. S. Sreedevi, incharge of BOS meeting for statistics which has been held on 11-9-2023 Request the academic council to consider and approve the changes in the syllabus of all semesters and approve certificate course "Bio-Statistics" is recommended by the board of studies for the academic year 2023-24 and also recommended syllabi and Core structure prescribed by AKNU for all semesters .

Members Presented: chairman

Board of studies

1. 
2. 
3. 

SRI.A.S.N.M GOVERNMENT COLLEGE (A), PALAKOL, W.G.DT.

B.Sc DEGREE EXAMINATION
STATISTICS (WM)
(W.E.F 2023-2024 ADMITTED BATCH)

SEMESTER-II
COURSE 1: DESCRIPTIVE STATISTICS

Theory **Credits: 3** **3 hrs/week**

I. Learning Outcomes

After successful completion of the course students will be able to:

1. To acquaint with the role of statistics in different fields with special reference to business and economics.
2. To review good practice in presentation and the format most applicableto their own data.
3. To learn the measures of central tendency or averages reduce the data to a single value which is highly useful for making comparative studies.
4. To familiar with the measures of dispersion throw light on reliability of average and control of variability.
5. To deal with the situation where there is uncertainty and to measure that uncertainty by using the probability, which is essential in all research areas.

II. Syllabus

Unit – 1: Statistical Description of Data

Origin, history and definitions of Statistics. Importance, Scope and Limitations of Statistics. Functions Function of Statistics – Collection, Presentation, Analysis and Interpretation. Collection of data – primary and secondary data and its methods. Classification of data – Quantitative, Temporal, Spatial. Presentation of data – Textual, Tabular – essential parts

Unit – 2:

Measurement Scales – Nominal, Ordinal, Ratio and Interval. Frequency distribution and types of frequency distributions, forming a frequency distribution. Diagrammatic representation of data- Historiagram, Bar, Multiple bar and Pie with simple problems. Graphical representation of data: Histogram, frequencypolygon and Ogives with simple problems.

Unit – 3: Measures of Central Tendency (MCT)

Arithmetic Mean – properties, methods. Median, Mode, Geometric Mean (GM), Harmonic Mean (HM). Calculation of mean, median, mode, GM and HM for grouped and ungrouped data. Median and Mode through graph. Empirical relation between mean, media and mode. Features of good average.

Unit – 4: Measures of Dispersion

Concept and problems – Range, Quartile Deviation, Mean Deviation and Standard Deviation, Variance. Central and Non – Central moments and their interrelationship. Sheppard's correction for moments. Skewness and its methods, kurtosis.

Unit – 5: Elementary 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 and simple problems. Boole's inequality, Bayes theorem and its applications in real life problems.

SEMESTER-II

COURSE 1: DESCRIPTIVE STATISTICS

Practical **Credits: 1** **2 hrs/week Syllabus**

1. Writing a Questionnaire in different situations.
2. Forming a grouped and ungrouped frequency distribution table.
3. Diagrammatic presentation of data – Bar, multiple Bar and Pie.
4. Graphical presentation of data – Histogram, frequency polygon, Ogives.
5. Computation of measures of central tendency – Mean, Median and Mode.
6. Computation of measures of dispersion – Q.D., M.D and S.D.
7. Computation of non-central, central moments, $\beta 1$ and $\beta 2$ for ungrouped data.
8. Computation of non-central, central moments, $\beta 1$ and $\beta 2$ and Sheppard's corrections for grouped data
9. Computation of Karl Pearson's and Bowley's Coefficients ofSkewness.

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.

III. References

1. S. C. Gupta & V. K. Kapoor: Fundamentals of Mathematical Statistics, Sultan Chand & Sons, New Delhi.
2. O. P. Gupta: Mathematical Statistics, Kedar nath Ram nath & Co.
3. P. N. Arora & S. Arora: Quantitative Aptitude Statistics – Vol II, S. Chand & Company Ltd.
4. K. Rohatgi & Ehsanes Saleh: An Introduction to Probability and Statistics, John Wiley & Sons.

IV. Suggested Co-curricular Activities:

1. Training of students by related industrial experts
2. Assignments including technical assignments if any.
3. Seminars, Group Discussions, Quiz, Debates etc. on related topics.
4. Preparation of audio and videos on tools of diagrammatic and graphical representations.
5. Collection of material/figures/photos/author photoes of related topics.
6. Invited lectures and presentations of stalwarts to those topics.
7. Visits/field trips of firms, research organizations etc.

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B.Sc DEGREE EXAMINATION
STATISTICS(WM)
(W.E.F 2023-24 ADMITTED BATCH)
STRUCTURE OF QUESTION PAPER
(COMMON TO IInd SEMESTER)

Time: 3 Hours **Max. Marks : 60**

SECTION – A

Answer any FIVEQuestions :- 5 X 4 = 20M

1..

2.

3.

4.

5.

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7.

8.

9.

10

SECTION-B

Answer any FIVEquestions :- *5 X 8= 40M*

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18.
19.
20.

Instruction to Paper Setter :

Two short answer questions (5 Marks) and two essay questions (10 Marks) must be given from each unit.

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B.Sc DEGREE EXAMINATION

STATISTICS(WM)

(W.E.F 2020-21 ADMITTED BATCH)

II B.Sc. Statistics – Semester - III

Paper III - STATISTICAL INFERENCE

(w. e. f 2021-2022)

UNIT-I : (Shorts -2, Essays– 2)

Concepts: Population, Sample, Parameter, statistic, Sampling distribution, Standard error.Convergence in probability and convergence in distribution, law of large numbers, and central limit theorem (statements only). Student's t- distribution, F – Distribution, χ^2-Distribution: Definitions, properties and their applications.

UNIT-II : (Shorts -2, Essays– 2)

Theory of estimation : Estimation of a parameter, criteria of a good estimator – unbiasedness, consistency, efficiency, &sufficiency and. Statement of Neyman's factorization theorem. Estimation of parameters by the method of moments and maximum likelihood (M.L), properties of MLE's. Binomial, Poisson &Normal Population parameters estimate by MLE method. Confidence Intervals.

UNIT-III : (Shorts -1, Essays– 1)

Testing of Hypothesis : Concepts of statistical hypotheses, null and alternative hypothesis, critical region, two types of errors, level of significance and power of a test. One and two tailed tests. Neyman-Pearson's lemma. Examples in case of Binomial, Poisson, Exponential and Normal distributions.

UNIT – IV : (Shorts -2, Essays– 2)

Large sample Tests:large sample test for single mean and difference of two means, confidence intervals for mean(s). Large sample test for single proportion, difference of proportions. Standard_deviation and correlation coefficient(s).

SmallSampletests:t-testforsinglemean,differenceofmeansandpairedt-test.□2-testforgoodness of fit and independence of attributes. F-test for equality ofvariances.

UNIT – V : (Shorts -1, Essays– 1)

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

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. RavichandraKumar.
2. K.V.S. Sarma: Statistics Made Simple: Do it yourself on PC.PHI.

REFERENCE BOOKS:

1. Fundamentals of Mathematics statistics : VK Kapoor and SCGuptha.
2. Outlines of statistics, Vol II : Goon Guptha, M.K.Guptha, Das GupthaB.
3. Introduction to Mathematical Statistics : HoelP.G.

Hogg Tanis Rao: Probability and Statistical Inference. 7th edition.Pearson

PRACTICALS - PAPER –III

1. Large sample test for singlemean
2. Large sample test for difference ofmeans
3. Large sample test for singleproportion
4. Large sample test for difference ofproportions
5. Large sample test for difference of standarddeviations
6. Large sample test for correlationcoefficient
7. Small sample test for singlemean
8. Small sample test for difference ofmeans
9. Small sample test for correlationcoefficient
10. Paired t-test(pairedsamples).
11. Small sample test for single variance(χ 2 - test)
12. Small sample test for difference ofvariances(F-test)
13. χ 2 - test for goodness of fit and independence ofattributes
14. Nonparametric tests for single sample(run test, sign test and Wilcoxon signed ranktest)
15. Nonparametric tests for related samples (sign test and Wilcoxon signed ranktest)
16. Nonparametric tests for two independent samples (Median test, Wilcoxon –Mann- Whitney - U test, Wald - Wolfowitz' s runstest)

Note: Training shall be on establishing formulae in Excel cells and deriving the results. The excel output shall be exported to MS Word for writinginferences.

Course Learning Outcomes

The students will acquire

1. Concept of law large numbers and their uses
2. Concept of central limit theorem and its uses in statistics
3. concept of random sample from a distribution, sampling distribution of a statistic, standard error of important estimates such as mean and proportions,
4. knowledge about important inferential aspects such as point estimation, test of hypotheses and associated concepts,
5. knowledge about inferences from Binomial, Poisson and Normal distributions as illustrations,
6. concept about non-parametric method and some important non-parametric tests.

SEMESTER-III
PAPER-III
BLUE PRINT

Time: 3Hrs. Max.Marks:75

PART-I (5 x 5 = 25 M)

Answer any FIVE Questions, each question carries FIVE marks.

Unit - I	: 2 question
Unit - II	: 2 questions
Unit - III	: 1 question
Unit - IV	: 2questions
Unit - V	: 1 question

PART-II (5 x 10 M= 50 M)

Answer any FIVE questions.

Unit - I	: 2 questions
Unit - II	: 2 questions
Unit – III	: 2 questions
Unit - IV	: 2 questions
Unit - V	: 2 questions

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B.Sc DEGREE EXAMINATION
STATISTICS(WM)
(W.E.F 2020-21 ADMITTED BATCH)

II B.Sc. Statistics – Semester - III

Paper III - Statistical Inference

Model Question Paper (Theory) (w. e. f 2021-2022)

Time: 3Hrs Max Marks: 75

PART-I

Answer any FIVE Questions, each question carries FIVE marks. 5x5M =25M

1. Explain about parameter and statistic.
2. Derive the relation between t and F distributions.
3. Explain about the confidence intervals.
4. State the Neymann's Factorization theorem.
5. Explain about the Types of errors.
6. Write the procedure for paired t test.
7. Write the procedure for testing single proportion in large samples.
8. Write the advantages and disadvantages of Non parametric tests.

PART-II

Answer any FIVE questions..

Each question carries 10 marks. 5x10M = 50M

9. Define F distribution and write the properties and applications of the distribution.
10. Derive the relation between F and Chi- square distributions.
11. Explain the criteria of good estimator.
12. State and prove Cramer Rao's inequality.
13. State and prove Neymann Pearson Lemma.
14. Obtain the Best critical Region for Binomial Distribution.
15. Write the procedure for testing two means in large samples.
16. Write the procedure for testing the two variances.
17. Explain about the median test for two samples.
18. Explain about the Wilcoxon Signed rank test for two sam

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B.Sc DEGREE EXAMINATION
STATISTICS(WM)
(W.E.F 2020-21 ADMITTED BATCH)

II B.Sc. Statistics – Semester - IV

Paper IV: Sampling Techniques and Designs of Experiments

(w. e. f 2021-2022)

UNIT-I: (Shorts -2, Essays– 2)

Simple Random Sampling (with and without replacement): Notations and terminology, various probabilities of selection. Random numbers tables and its uses. Methods of selecting simple random sample, lottery method, method based on random numbers. Estimates of population total, mean and their variances and standard errors, determination of sample size, simple random sampling of attributes.

UNIT II: (Shorts -2, Essays– 2)

Stratified Random Sampling: Stratified random sampling, Advantages and Disadvantages of Stratified Random sampling, Estimation of population mean, and its variance. Stratified random sampling with proportional and optimum allocations. Comparison between proportional and optimum allocations with SRSWOR.

Systematic sampling: Systematic sampling definition when N = nk and merits and demerits of systematic sampling - estimate of mean and its variance. Comparison of systematic sampling with Stratified and SRSWOR.

UNIT III : (Shorts -2, Essays– 2)

Analysis of variance : Analysis of variance(ANOVA) –Definition and assumptions. One-way with equal and unequal classification, Two way classification.

Design of Experiments: Definition, Principles of design of experiments, CRD: Layout, advantages and disadvantage and Statistical analysis of Completely Randomized Design(C.R.D).

UNIT IV : (Shorts -1, Essays– 1)

Randomized Block Design (R.B.D) and Latin Square Design (L.S.D) with their layouts and Analysis, MissingplottechniqueinRBDandLSD.EfficiencyRBDoverCRD,EfficiencyofLSDoverRBDand CRD.

UNIT V : (Shorts -1, Essays– 1)

Factorial experiments – Main effects and interaction effects of 2^2 and 2^3 factorial experiments and their Statistical analysis. Yates procedure to find factorial effect totals.

Text Books:

1. Telugu AcademyBA/BSc III year paper - III Statistics - applied statistics - Telugu academy

by Prof.K.Srinivasa Rao, Dr D.Giri. Dr A.Anand, Dr V.PapaiahSastry.

2. K.V.S. Sarma: Statistics Made Simple: Do it yourself on PC.PHI.

Reference Books:

1. Fundamentals of applied statistics : VK Kapoor and SC Gupta.

2. Indian Official statistics - MR Saluja.

3.Anuvarthita Sankyaka Sastram - TeluguAcademy .

Practicals - Paper –IV

Sampling Techniques:

Estimation of population mean and its variance by

1. Simple random sampling with and without replacement. Comparison between SRSWR and SRSWOR.
2. Stratified random sampling with proportional and optimum allocations. Comparison between proportional and optimum allocations with SRSWOR.
3. Systematic sampling with N=nk. Comparison of systematic sampling with Stratified andSRSWOR.

Design of Experiments:

4. ANOVA - one - way classification with equal and unequal number of observations
5. ANOVA Two-way classification with equal number of observations.
6. Analysis ofCRD.
7. Analysis of RBD Comparison of relative efficiency of CRD with RBD
8. Estimation of single missing observation in RBD and itsanalysis
9. Analysis of LSD and efficiency of LSD over CRD andRBD
10. Estimation of single missing observation in LSD and itsanalysis
11. Analysis of 2^2 with RBD layout
12. Analysis of 2^3 with RBDlayout

Note: Training shall be on establishing formulae in Excel cells and deriving the results. The excel output shall be exported to MS Word for writinginferences.

Course Learning Outcomes

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.

PAPER -IV
BLUE PRINT

Time: 3Hrs. **Max.Marks:75**

PART-I (5 x 5 = 25 M)

Answer any FIVE Questions, each question carries FIVE marks.

Unit - I	: 2question
Unit - II	: 2 questions
Unit - III	: 2 question
Unit - IV	: 1 questions
Unit - V	: 1 questions

PART-II (5 x 10 M= 50 M)

Answer any FIVE questions.

Each question carries 10 marks.

SECTION-A

Unit - I	: 2 questions
Unit - II	: 2 questions
Unit – III	: 2 question
Unit - IV	: 2 questions
Unit - V	: 2 questions

SRI.A.S.N.M GOVERNMENT COLLEGE (A), PALAKOL, W.G.DT.

B.Sc DEGREE EXAMINATION
STATISTICS(WM)
(W.E.F 2020-21 ADMITTED BATCH)

II B.Sc. Statistics – Semester - IV

Paper IV: Sampling Techniques and Designs of Experiments

Model Question Paper (Theory) (w. e. f 2021-2022)

Time: 3Hrs Max Marks: 75

PART-I

Answer any FIVE Questions, each question carries FIVE marks. 5x5M =25M

1. Explain about the sampling errors.
2. In SRSWOR prove that sample mean is an unbiased estimator of population mean.
3. Write down the advantages and disadvantages of simple random sampling.
4. Define proportional and optimum allocation.
5. State the Cochran's theorem.
6. Explain the about the local control.
7. Explain about the efficiency of RBD over CRD.
8. Explain about the factorial experiments.

PART-II

Answer any FIVE questions. Choosing at least TWO questions from each section.
Each question carries 10 marks. 5x10M = 50M

SECTION – A

9. Explain the various steps involved in sampling survey.
10. In SRSWOR prove that

$$V(\bar{y}) = \frac{N-n}{Nn}S^2$$

11. Prove that $V(\overline{y_{st}}) = \frac{N-n}{Nn}\Sigma p_i s_i^2$

i i

12. Define stratified random sampling and systematic random sampling.
    With usual notations prove that

$$V_{opt} < V_{prop} < V_{ran}$$

13. Explain the ANOVA one way classification.
14. Explain about the statistical analysis of two way classification with merits and demerits.
15. Explain about the layout and statistical analysis of RBD.
16. Explain the missing plot technique in LSD.
17. Explain the 2^3 factorial experiments with statistical analysis.
18. Explain the statistical analysis of 2^2 factorial experiment

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B.Sc DEGREE EXAMINATION
STATISTICS(WM)
(W.E.F 2020-21 ADMITTED BATCH)

II B.Sc. Statistics – Semester - IV

Paper V: APPLIED STATITICS

(for 2020-23 batch w. e. f 2021-2022)

UNIT I: (Shorts -2, Essays– 2)

Time Series : Time Series and its components with illustrations, additive, multiplicativemodels. Trend: Estimation of trend by free hand curve method, method of semi averages.Determination of trend by least squares (Linear trend, parabolic trend only), moving averages method.

UNIT II: (Shorts -2, Essays– 1)

Seasonal Component: Determination of seasonal indices by simple averages method, ratio to moving average, Ratio to trend and Link relative methods, Deseasonalization.

UNIT III: (Shorts -2, Essays– 1)

Growth curves: Modified exponential curve, Logistic curve and Grompertz curve, fitting of growth curves by the method of three selected points and partial sums.Detrending. Effect of elimination of trend on other components of the time series

UNIT IV: (Shorts -2, Essays– 2)

Index numbers:Concept, construction, problems involved in the construction of index numbers, uses and limitations. Simple and weighted index numbers. Laspayer's, Paasche's and Fisher's index numbers, Criterion of a good index number, Fisher's ideal index numbers. Cost of living index number and wholesale price index number.

UNIT V: (Shorts -2, Essays– 2)

Vital Statistics:Introduction, definition and uses of vital statistics, sources of vital statistics.

Measures of different Mortality and Fertility rates, Measurement of population growth. Life tables: construction and uses of life tables.

Text Books:

1. Fundamentals of applied statistics : VK Kapoor and SCGupta.

BA/BSc III year paper - III Statistics - applied statistics - Telugu academy by

1. prof.K.Srinivasa Rao, Dr D.Giri. Dr A.Anand, Dr V.PapaiahSastry.
2. Anuvarthita Sankyaka Sastram - TeluguAcademy.
3. Mukopadhyay, P (2011). Applied Statistics, 2nd ed. Revised reprint, Books and Allied Pvt. Ltd.
4. Brockwell, P.J. and Devis, R.A. (2003). Introduction to Time Series Analysis. Springer.
5. Chatfield, C. (2001). Time Series Forecasting., Chapman & Hall.
6. Srinivasan, K. (1998). Demographic Techniques and Applications. Sage Publications
7. Srivastava O.S. (1983). A Text Book of Demography. Vikas Publishing House

Practical Paper –V

Time Series:

1. Measurement of trend by method of moving averages(odd and evenperiod)
2. Measurement of trend by method of Least squares(linear andparabola)
3. Determination of seasonal indices by method simpleaverages
4. Determination of seasonal indices by method of Ratio to movingaverages
5. Determination of seasonal indices by method of Ratio totrend
6. Determination of seasonal indices by method of Linkrelatives

Index Numbers:

7. Computation of simple indexnumbers.
8. Computation of all weighted index numbers.
9. Computation of reversaltests.

Vital Statistics:

10. Computation of various Mortalityrates
11. Computation of various Fertilityrates
12. Computation of various Reproductionrates.
13. Construction of LifeTables

Note: Training shall be on establishing formulae in Excel cells and deriving the results. The excel output shall be exported to MS Word for writinginferences.

SEMESTER-IV
BLUE PRINT

Time: 3Hrs. **Max.Marks:75**

PART-I (5 x 5 = 25 M)

Answer any FIVE Questions, each question carries FIVE marks.

Unit - I	: 2question
Unit - II	: 1 questions
Unit - III	: 1 question
Unit - IV	: 2 questions
Unit - V	: 2 questions

PART-II (5 x 10 M= 50 M)

Answer any FIVE questions.

Each question carries 10 marks.

SECTION-A

Unit - I	: 2 questions
Unit - II	: 2 questions
Unit – III	: 2 question
Unit - IV	: 2 questions
Unit - V	: 2 questions

II B.Sc. Statistics – Paper V

Paper V: APPLIED STATISTICS

Model Question Paper (Theory) (for 2020-23 batches w. e. f 2020-2021)

Time: 3Hrs Max Marks: 75

PART-I

Answer any FIVE Questions, each question carries FIVE marks. 5x5M =25

1. Explain the different models on time series.
2. Explain the method of semi averages to estimate the trend.
3. Explain the method of simple averages to find seasonal indices.
4. Explain the Gompertz curve.
5. Explain about the whole sale price index number.
6. Define Laspayer's and Paasche's price index numbers.
7. Define Gross reproduction rate.
8. Write the applications of Vital statistics.

PART-II

Answer any FIVE questions.

Each question carries 10 marks. 5x10M = 50M

SECTION – A

9. Define time series and explain the components of time series.
10. Fit a second degree parabola to the following data and obtain trend values.

Year sales in	2002	2003	2004	2005	2006
1000rs	10	12	13	10	8

11. Explain the link relative method to find seasonal indices with merits and demerits.
12. Explain the ratio to trend method to find seasonal indices with merits and demerits.
13. Explain the Logistic curve with properties.
14. Fit a Gompertz curve to the following data by the method of partial sums and obtain the trend values

Year	1	2	3	4	5	6	7	8	9
Population(millions)	2.4	3.2	5.5	30.4	50.5	63.1	70.3	72.4	73.3

15. Define index number and explain what are the problems involved in construction of index numbers.
16. Explain the various price and quantity index numbers.
17. Define life table and explain the components of life table.
18. Define vital statistics, write the uses and explain the sources of vital statistics.

SRI A.S.N.M. GOVERNMENT COLLEGE (A), PALAKOL. W.G.DT

(Affiliated to Adikavi Nannaya University, Rajahmahendravaram)

(Accredited with NAAC 'B+' Grade with 2.67 CGPA)

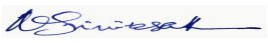
DEPARTMENT OF STATISTICS (WM)

After through discussions the following resolutions are made

1. It is resolved to approve the revised curriculum by APSCHE for Final year (V Semester& VI Semester) from the Academic year 2023-2024.
2. It is resolved to approve Second and third years exist BOS syllabus.
3. It is resolved to prescribe the Syllabi suggest by university with modification if any not exceeding 20% to suit the local needs ,to be implemented from the Acadamic year2023-2024.
4. It is resolved to select paper setters and examiners for theory and practical which ever applicable from the panel of Readers/Lecturers working in some reputed colleges.
5. It is resolved to approve 40 marks for Internal assessment and 60 marks for theory assessment of first year students from the academic year 2023-2024
6. It is resolved to approve 25 marks for Internal assessment and 75 marks for theory assessmentof second year and Final year students.
7. It is resolved to approve 35% pass mark of semester end theory assessment examinations and Overall 40% pass mark of both Internal and external examination.
8. It is resolved to approve Community service projects, Internships to the admitted batch.
9. It is resolved to approve blue print and model question paper pattern for theory and practical wherever applicable for semester examination.
9. It is resolved to approve Introduce certificate course "Bio-Statistics "for this Acadamic year
10. Research, Teaching, Extension and other Academic activities in the department suggest,methodologies for innovate methods for Teaching and Learning.
11. It is resolved to approve Course Codes for all semesters of Statistics .
12. It is resolved to approve any other modification with the permission of chairman.

Members Present: **Chairman**

Board of Studies

1. 
2. 
3. 

Sri A.S.N.M GOVT DEGREE COLLEGE (A)
PALAKOL,WESTGODAVARI DISTRICT

B. Sc	**Semester: V** (Skill Enhancement Course- Elective)	**Credits: 4**
Course: 6A	**Operations Research - I**	**Hrs/Wk: 4**

Objective: The Objective of the paper is to introduce the basic concepts of Operational Research andlinear programming to the students.

Learning Outcomes:

After learning this course, the student will be able

1. To know the scope of Operations Research
2. To link the OR techniques with business environment and life sciences
3. To convert real life problems into mathematical models
4. To find a solution to the problem in different cases
5. To inculcate logical thinking to find a solution to the problem

Syllabus UNIT I:

Introduction of OR – Origin and development of OR – Nature and features of OR –Scientific Method in OR – Modeling in OR – Advantages and limitations of Models-General Solution methods of OR models

– Applications of Operation Research. Linear programming problem (LPP) - Mathematical formulation of the problem - illustrations on Mathematical formulation of Linear programming of problem. Graphical solution of linear programming problems. Some exceptional cases - Alternative solutions, Unbounded solutions, non-existing feasible solutions by Graphical method.

UNIT II:

General linear programming Problem (GLP) – Definition and Matrix form of GLP problem, Slack variable, Surplus variable, unrestricted Variable, Standard form of LPP and Canonical form of LPP. Definitions of Solution, Basic Solution, Degenerate Solution, Basic feasible Solution and Optimum Basic Feasible Solution. Introduction to Simplex method and Computational procedure of simplex algorithm. Solving LPP by Simplex method (Maximization case and Minimization case)

UNIT III:

Artificial variable technique - Big-M method and Two-phase simplex method, Degeneracy in LPP and method to resolve degeneracy. Alternative solution, Unbounded solution, Non existing feasible solution and Solution of simultaneous equations by Simplex method.

UNIT IV:

Duality in Linear Programming –Concept of duality - Definition of Primal and Dual Problems, General rules for converting any primal into its Dual, Economic interpretation of duality, Relation between the solution of Primal and Dual problem (statements only). Using duality to solve primal problem.Dual Simplex Method.

UNIT V:

Post Optimal Analysis - Changes in cost Vector **C** , Changes in the Requirement Vector **b** andchanges in the Coefficient Matrix **A**. Structural Changes in a LPP.

REFERENCE BOOKS:

1. S.D. Sharma, Operations Research, KedarNath Ram Nath& Co, Meerut.
2. KantiSwarup, P.K.Gupta, Manmohn, Operations Research, Sultan Chand and sons, New Delhi.
3. J.K. Sharma, Operations Research and Application, Mc.Millan and Company, New Delhi.
4. GassS.I : Linear Programming. Mc Graw Hill.
5. HadlyG : Linear programming. Addison-Wesley.
6. Taha H.M: Operations Research: An Introduction : Mac Millan.

Sri A.S.N.M GOVT DEGREE COLLEGE (A)
PALAKOL,WESTGODAVARI DISTRICT

B. Sc	**Semester: V** (Skill Enhancement Course- Elective)	**Credits: 1**
Course: 6A	**Operations Research - I Lab**	**Hrs/Wk: 2**

Practical/Lab to be performed on a computer using OR/Statistical packages

1. To solve Linear Programming Problem using Graphical Method with
   (i) Unbounded solution
   (ii) Infeasible solution
   (iii) Alternative or multiple solutions.
2. Solution of LPP with simplex method.
3. Problem solving using Charnes-M method.
4. Problem solving using Two Phase method.
5. Illustration of following special cases in LPP using Simplex method
   (i) Unrestricted variables
   (ii) Unbounded solution
   (iii) Infeasible solution
   (iv) Alternative or multiple solutions.
6. Problems based on Principle of Duality.
7. Problems based on Dual simplex method.
8. Problems based on Post Optimal Analysis.

Practical's Skills Outcomes:

On successful completion of this practical course, student shall be able to:

1. Solve LPP using Graphical method
2. Solve the LPP using Simplex method, Big M method and Two Phase method
3. Solve the problems using principle of duality
4. Solve the Problems using Dual Simplex method
5. Solve the problems for Post Optimal Analysis

Co-Curricular Activities:

a) Mandatory:

1. For Teacher:

Teacher shalltrainstudentsinthefollowingskillsfor15hours,byTaking relevant outside data(Field/Web).

1. To Solve the LPP using Graphical method
2. To Solve the LPP using Simplex method, Big M method and Two Phase Methods
3. To solve the LPP using Dual Simplex method

2. For Student: Fieldwork; Each student individually shall undertake field work and submit areport not exceeding 10 pages in the given format on the work-done in the areas like the following**,** by choosing any one of the aspects.

1. Collecting the data and to perform OR techniques-Simplex method(or)
2. Collecting the data and and to conduct post optimal analysis

3. Max.marks for Field WorkReport:05.

4. **Suggested Format for Fieldwork Report**: Titlepage, Student Details, Index page,Stepwise work-done, Findings, Conclusions and Acknowledgements.

5. Unittests(IE).

b) Suggested Co-Curricular Activities:

1. Assignments/collectionofdata,Seminar,Quiz,Groupdiscussions/Debates
2. Visitst any specified areas for doing survey and data collection
3. Invited lectures and presentations on related topics by experts in the specified area.

Sri A.S.N.M GOVT DEGREE COLLEGE (A)
PALAKOL,WESTGODAVARI DISTRICT

MODEL QUESTION PAPER (Semester End)

B. Sc DEGREE EXAMINATIONS

SMESTER -V (Skill Enhancement Course-Elective)

Course 6A: Operations Research - I

Time: 3 Hrs. **Max Marks: 75**

SECTION-A

Answer any FIVE questions. All questions carry equal marks. **5 x 5= 25M**

1. Explain the advantages of OR.
2. Explain graphical solution of LPP.
3. Explain Canonical and standard forms of LPP.
4. Discuss basic solution and degenerate solution.
5. Explain artificial variable technique.
6. Discuss degeneracy in LPP.
7. Explain the general rules for converting primal into its dual.
8. Explain deletion of existing constraint.

SECTION-B

Answer any FIVE questions..
Each question carries 10 marks.

5x10M = 50M

9. Explain the origin and development of OR.
10. Solve the following LPP graphically.

Maximize $Z = 45X_1 + 80X_2$
Subject to constraints $5X_1 + 20X_2 \leq 400$
$10X_1 + 15X_2 \leq 450$
and $X_1, X_2 \geq 0$

11. Explain simplex algorithm.

12. Solve the following LPP using simplex method

Maximize $Z = 5X_1 + 3X_2$

Subject to constraints $3X_1 + 5X_2 \leq 15$

$5X_1 + 2X_2 \leq 10$

and $X_1, X_2 \geq 0$

13. Explain Big- M method.

14. Solve the following LPP using Big – M method

Maximize $Z = 2X_1 + 3X_2$

Subject to constraints $X_1 + X_2 \geq 5$

$X_1 + 2X_2 \geq 6$

and $X_1, X_2 \geq$

15. Explain the concepts of duality and obtain the dual of the following LPP.

Maximize $Z = X_1 + 2X_2 + 3X_3$

Subject to constraints $3X_1 + X_2 - 2X_3 \leq 7$

$2X_1 + 4X_2 \geq 12$

$4X_1 - 3X_2 + 3X_3 \leq 10$

and $X_1, X_2, X_3 \geq 0$

16. Explain dual simplex method and solve the following problem by it.

Min $Z = 2X_1 + X_2$

Subject to constraints

$3X_1 + X_2 \geq 3$

$4X_1 + 3X_2 \geq 6$

$X_1 + 2X_2 \geq 3$

and $X_1, X_2 \geq 0$

17. Explain the changes in the coefficient of the objective function.

18. Discuss the changes in the components a_{ij} of the vector $a_j \in B$ for the given LP.

Max $Z = CX$

$AX = b$

$X \geq 0$

Sri A.S.N.M GOVT DEGREE COLLEGE (A)
PALAKOL,WESTGODAVARI DISTRICT

	Semester: V (Skill Enhancement Course- Elective)	**Credits: 4**
Course: 7A	**Operations Research - II**	**Hrs/Wk: 4**

Objective: To enrich the knowledge of students with advanced techniques of linear programming problem along with real life applications.

Learning Outcomes:

After learning this course, the student will be able

1. To solve the problems in logistics
2. To find a solution for the problems having space constraints
3. To minimize the total elapsed time in an industry by efficient allocation of jobs to the suitablepersons.
4. To find a solution for an adequate usage of human resources
5. To find the most plausible solutions in industries and agriculture when a random environmentexists.

Syllabus

UNIT I:

Transportation Problem - Introduction, Mathematical formulation of Transportation problem. Initial Basic feasible solution of Transportation problem - North-West corner rule, Lowest cost entry method, Vogel's approximation method. Method of finding optimal solution-MODI method(U-V method). Degeneracy in transportation problem, Resolution of degeneracy, Unbalanced transportation problem. Maximization TP.Transhipment Problem.

UNIT II:

Assignment Problem - Introduction, Mathematical formulation of Assignment problem, Reduction theorem (statement only), Hungarian Method for solving Assignment problem, Unbalanced Assignment problem. The Traveling salesman problem, Formulation of Traveling salesman problem as an Assignment problem and Solution procedure.

UNIT III:

Sequencing problem: Introduction and assumptions of sequencing problem, Sequencing of n jobs and one machine problem. Johnson's algorithm for n jobs and two machines problem- problems with n-jobs on two machines, algorithm for n jobs on three machines problem- problems with n- jobs on three machines, algorithm for n jobs on m machines problem, problems with n-jobs on m-machines.

UNIT IV:

Network Scheduling: Basic Components of a network, nodes and arcs, events and activities–

Rules of Network construction – Time calculations in networks - Critical Path Method (CPM) and PERT.

UNIT V:

Game Theory: Two- person zero-sum games. Pure and Mixed strategies. Maxmin and Minimax Principles - Saddle point and its existence. Games without Saddle point-Mixed strategies.Solution of 2 x 2 rectangular games. Graphical method of solving 2 x n and m x 2 games. Dominance Property.

REFERENCE BOOKS:

1. S.D. Sharma, Operations Research, KedarNath Ram Nath& Co, Meerut.
2. KantiSwarup, P.K.Gupta, Manmohn, Operations Research, Sultan Chand and sons, New Delhi.
3. J.K. Sharma, Operations Research and Application, Mc.Millan and Company, New Delhi.
4. Gass: Linear Programming. Mc Graw Hill.
5. Hadly :Linrar programming. Addison-Wesley.
6. Taha : Operations Research: An Introduction : Mac Millan.
7. Dr.NVS Raju; Operations Research, SMS education,

Sri A.S.N.M GOVT DEGREE COLLEGE (A)
PALAKOL,WESTGODAVARI DISTRICT

B. Sc	**Semester: V** (Skill Enhancement Course- Elective)	**Credits: 1**
Course: 7A	**Operations Research - II Lab**	**Hrs/Wk: 2**

Practical/Lab to be performed on a computer using OR/Statistical packages

1. IBFS of transportation problem by using North- West corner rule, Matrix minimum method and VAM
2. Optimum solution to balanced and unbalanced transportation problems by MODI method (both maximization and minimization cases)
3. Solution of Assignment problem using Hungarian method (both maximization and minimizationcases),
4. Solution of sequencing problem—processing of n jobs through two machines
5. Solution of sequencing problem - processing of n jobs through three machines
6. To perform Project scheduling of a given project (Deterministic case-CPM).
7. To perform Project scheduling of a given project (Probabilistic case-PERT).
8. Graphical method of solving form x 2 and 2 x n games.
9. Solution of m x n games by dominance rule.
10. Linear programming method for solving m x n games.

Practical's Skills Outcomes:

On successful completion of this practical course, students hall be able to:

1. Find IBFS by using North- West corner rule, Matrix minimum method and VAM
2. Find Optimum solution to balanced and unbalanced transportation problems by MODI method (both maximization and minimization cases)
3. Find Solution of Assignment problem using Hungarian method (both maximization and minimization cases),
4. Find Solution of sequencing problem—processing of n jobs through two machines and threemachines
5. perform Project scheduling of a given project (Deterministic case-CPM) and (Probabilistic case-PERT).
6. Solve for m x 2 and 2 x n games using Graphical method
7. Find Solution of m x n games by dominance rule.
8. Solve m x n games by Linear programming method

Co-Curricular Activities:

a) Mandatory:

1. **For Teacher:** Teacher shall train students in the following skills for 15hours,by Taking relevant outside data(Field/Web).
    1. To find IBFS by using North- West corner rule, Matrix minimum method and VAM for the given Transportation Problem.
    2. To Find Optimum solution to balanced and unbalanced transportation problems byMODI method (both maximization and minimization cases).
    3. To find the Assignment of n jobs to n persons using Hungarian method
    4. To find processing of n jobs through two machines and three machines usingSequencing
        a. Problem
    5. To solve network problems using PERT and CPM techniques
    6. To Solve form x 2 and 2 x n games using Graphical method
    7. ToFind Solution of m x n games by dominance rule.
    8. Solve m x n games by Linear programming method
2. **For Student: Fieldwork;** Each student individually shall undertake field work and submit a report not exceeding 10 pages in the given format on the work-done in the areas like the following**,** by choosing any one of the aspects.
    1. Collecting the data and to perform OR techniques(or)
    2. Visiting Transportation places and Companies

3. Max.marks for Field WorkReport:05.

4. **Suggested Format for Fieldwork Report:** Title page, Student Details, Index page, Step wise work-done, Findings, Conclusions and Acknowledgements.

5. Unittests(IE).

b) Suggested Co-Curricular Activities:

1. Assignments/collectionofdata,Seminar,Quiz,Groupdiscussions/Debates
2. Visitsto any specified areas for doing survey and data collection
3. Invited lectures and presentations on related topics by experts in the specified area.

Sri A.S.N.M GOVT DEGREE COLLEGE (A)
PALAKOL,WESTGODAVARI DISTRICT

MODEL QUESTION PAPER (Semester End)

B. Sc DEGREE EXAMINATIONS SMESTER -V

(Skill Enhancement Course- Elective)

Course 7A: Operations Research – II

Time:3 hrs **Max Marks: 75**

SECTION-A

Answer any FIVE questions. All questions carry equal marks. **5 x 5= 25M**

1. Explain transportation table.
2. Explain VAM method.
3. Explain assignment problem as a particular case of LPP and TP.
4. Explain the concepts of sequencing problem.
5. Explain the procedure of Graphical method for two jobs on m – machines.
6. Discuss rules for drawing net-work diagram.
7. Explain the method of dominance.
8. Discuss travelling sales man problem.

SECTION-B

Answer any FIVE questions..

Each question carries 10 marks. **5x10M = 50M**

9. Define Transportation Problem.Explain MODI method
10. Obtain IBFS by using VAM to the following TP.

		Destinations				Capacities
		D1	D2	D3	D4	
	O1	6	6	4	4	5
Origins	O2	7	9	1	2	7
	O3	6	5	16	7	8
	O4	11	9	10	2	10
Requirement		10	5	10	5	

11. Define Assignment problem and explain algorithm of Hungarian Method.

12. Obtain the optimum assignment schedule to the following matrix.

	Machines			
	I	II	III	IV
Jobs	15	14	12	16
	23	22	25	24
	31	34	32	33
	21	32	44	53

13. Explain Johnson's algorithm to obtain optimum sequence for n jobs and two machines.
14. A company has six jobs on hand, coded A to F/ All the jobs have to go through two machinesand I and II. The time required for the jobs on each machine in hour is given below.

Jobs	A	B	C	D	E	F
Machine - I	1	4	6	3	5	2
Machine – II	3	6	8	8	1	5

Draw a sequence table scheduling the six jobs on the two machines.

15. Explain the basic steps in PERT/ CPM techniques and its applications.
16. Discuss the rules for drawing network diagram.

17. Find optimal strategy of the following game.

		B		
		I	II	III
A	I	-3	-2	6
	II	2	0	2
	III	5	-2	-4

18. olve the following 2x4 game.

		I	II	III	IV
A	I	2	2	3	-1
	II	4	3	2	6

Theory Examination Pattern:

Theory Examination Question Paper ---------- 75 Marks

Section---A ---------- 50 Marks

Section –B ---------- 25 Marks

Section-A------Each Unit Consists of 10 Marks with internal choice

Section-B ----- Consists of 25 Marks out of which the questions must be framed from all units.

Scheme of Practical Examination:

Practical Examinations will be conducted at the end of Odd Semesters with internalexaminersandthe End of even Semesters by the external examiners.

Practical Examination : 50 Marks

1 out of 5 Practical Problems the student has to answer/solve 3questions.Each question problem carries 12 Marks ---------- 12 x 3 = 36 Marks

Splitting of marks for each problem:Aim-- --2 Marks

Method and Formulae -------- 4 Marks

Solution ------ 5 Marks

Conclusion/Inference - 1

Mark Maintenanc &Record 10 MarksViva..... 4 Mark

Sri A.S.N.M GOVT DEGREE COLLEGE (A)
PALAKOL,WESTGODAVARI DISTRICT

SYLLABUS FOR CERTIFICATE COURSE
2023-2024

TOPIC : **BIO – STATISTICS - HOURS 30**

UNIT I : INTRODUCTION TO STATISTICS : Definition advantages and limitations. Frequency distribution

UNIT II : MEASURES OF CENTRAL TENDENCY : Arithmetic Mean Median Mode for grouped and ungroped data MEASURES OF DISPERSION : Standard deviation variance and CV

UNIT III Normal distribution and its properties introduction to sampling : Random sampling , Concept of SE of mean.

UNIT IV Test of Significancs : introduction, Types of errors , NH, LOS and DF steps in testing of hypothesis Large Sample Test : Test for means, Z – Test.

Small sample Test : One and two sample t – test and Paired t – test , Chisqare test , F –test

UNT V : INTRODUCTION Experimental Design : Basic prinsples , ANOVA its assumttions, CRD layout , analysis with equal and unequal replication , RBD & LSD Layout and Analysis

MODEL PAPER

MAX MARKS : 50

UNIT I - 10 Multiple choice Question - 10 X 1=10M

UNIT II - 10 Multiple choice Question - 10 X 1=10M

UNIT III - 10 Multiple choice Question - 10 X 1=10M

UNIT IV - 10 Multiple choice Question - 10 X 1=10M

UNIT V - 10 Multiple choice Question - 10 X 1=10M



Sri A.S.N.M GOVT DEGREE COLLEGE (A)
PALAKOL,WESTGODAVARI DISTRICT

ADDITIONAL INPUTS
DEPARTMENT OF STATISTICS
2023-2024

SEMISTER	PAPER	UNIT	ADDITIONAL INPUTS
II	Descriptive statistcs	I V	Drafting a Questionnaire,Diffrence between and Schedule. Coefficient of Variation (CV) Combined mean and SD.
III	Statistical Inference	III	Randomized& Non Randomized tests
IV	Applied Statistics	IV V	Base Shifting,Splicing&Definition of Index Numbers Abridged Life tables
V	Operations Research – I	IV V	Formulation of Dual Problem,Primal-Dual Pair In Matrix Form INVENTORY::Introduction of Inventory,Types of Inventory models
	Operations Research – II	I	Queueing theoy :; Introduction,Queueing system,&Queueing Problems

MEMBERS

3. 

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