

**S.S.JAIN SUBODH P.G.COLLEGE (AUTONOMOUS)  
RAMBAGH CIRCLE, JAIPUR-302015**

**Department of Statistics**

**Semester I**

**Paper-STAT101: Probability Theory**

**Duration: 3 hrs.**

**(Min. Marks/Max. Marks): (30/75)for science and (28/70)for arts.**

**Internal assessment (CIA): 21/20 (science/arts)**

**External assessment = 54 /50 (science/arts)**

**Note: There will be two parts of end semester theory paper.**

**Part A Question 1 is compulsory comprises ten very short answer questions.**

**Candidate has to attempt any seven questions. Each question carry 2 marks. (science/arts)**

**Part B The paper will consist four questions with internal choice. Each question will carry ten marks for science and nine marks for arts.**

**Unit I**

**Important concept of probability theory:** Random experiment : Trial, Events and their types. Definitions of probability. Sample point and sample space. Axiomatic approach of probability. Special cases with mathematical probability and statistical probability. Addition and Multiplication theorems of probability. Conditional probability. Bayes theorems and its application (Simple problems only)

**Unit II**

**Random Variable:** Definition with illustrations, Types of Random Variable. Probability Mass Function. Probability Density Function. Definition and its properties. Joint Probability Distribution, Marginal and Conditional Probability Distribution and density functions (Continuous and Discrete Cases)

**Unit III**

**Mathematical Expectation:** Expectation of a random Variables and its simple properties. Addition and Multiplication Theorems of Expectation. Definition of Variance and Covariance and Properties. Raw and Central Moments,

**Unit IV**

**Generating Function:** Moment and cumulant Generating Function with properties. Characteristic function with properties and numerical.

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**Department of Statistics**

**Semester I**

**Paper- STAT102: Descriptive Statistics**

**Duration: 3 hrs.**

**(Min. Marks/Max. Marks): (30/75)for science and (28/70)for arts.**

**Internal assessment (CIA): 21/20 (science/arts)**

**External assessment = 54 /50 (science/arts)**

**Note: There will be two parts of end semester theory paper.**

**Part A Question 1 is compulsory comprises ten very short answer questions.**

**Candidate has to attempt any seven questions. Each question carry 2 marks. (science/arts)**

**Part B The paper will consist four questions with internal choice. Each question will carry ten marks for science and nine marks for arts.**

**Unit I**

**Types of Data:** Concepts of a statistical data. Nature of data, . Categories of data Primary Data and Secondary Data. Method of collection of data. Classification of data : Qualitative and Quantitative data; Geographical & Chronological Data.

**Unit II**

**Presentation of Data:** Diagrammatic Presentation of Data, Tabular presentation of data, Construction of tables, Types of tables. Frequency distribution- Discrete, grouped, continuous and cumulative. Graphical presentation of data- Histogram, frequency polygon, frequency curve and ogives.

**Unit III**

**Statistical analysis of Quantitative Data:** Different types of scales- nominal, ordinal, intervals and ratio. Univariate Data- Measures of central tendency (Arithmetic Mean, Median, Mode, Geometric Mean, Harmonic Mean)

**Unit IV**

**Measures of Dispersion:** Definition and Properties of a Good Measure of Dispersion, Range, Quartile Deviation, Mean Deviation. Standard Deviation, Coefficient of Variation. Moments : Definition and relationship , Absolute and relative measure of Skewness and Kurtosis based on quantiles and moments. Sheppard's Correction for moments (without proof) .

## Practical Paper- STAT 103

Max marks :	For Science –75	{ 45 ESE 30 CIA
	For Arts –60	{ 36 ESE 24 CIA
Written Paper (03 hours)	Science –21 Marks	Arts - 18Marks
Class performance & Viva-Vice	Science –10 (6 + 4)	Arts - 08 ( 5 + 3)
Record work and Viva-Voce (03 hours)	Science –14 (9 + 5)	Arts - 10( 7 + 3)

1. Measure of central tendency : Mean, Median and Mode.
2. Measure of dispersion : (i) Mean deviation (ii) Quartile deviation (iii) Standard deviation (iv) coefficient of variation
3. Moments and various measures of skewness and kurtosis based on moment.
4. Graphical representation by (i) Histogram (ii) Frequency curve (iii) Ogives.

### Reference:

1. Kapoor V.K. & Gupta S.C.: Fundamental of Mathematical Statistics, Sultan Chand and Sons, New Delhi
2. Goon A.N., Gupta M.K., Das Gupta B. (1991): Fundamentals of Statistics, Val.I & II, World Press, Calcutta.
3. Gupta S. P. : Statistical Methods, Sultan Chand and Sons, N. Delhi.
4. Elhance D.N. : Fundamental of Statistics
3. Bhatt B.R. Srivenkatramanna T and Rao Mashaya K.S. (1997) : Statistics : A Beginner's Text , Vol.ii, New Age International (p) Ltd. , New Delhi.
4. Croxton F.E. , Crowden D.J. and Kellin S (1973) : Applied General Statistics, Prentice Hall of India, New Delhi.

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**Department of Statistics**

**Semester II**

**Paper- STAT 201: Statistical Analysis of Bivariate Data and Finite Difference**

**Duration: 3 hrs.**

**(Min. Marks/Max. Marks): (30/75)for science and (28/70)for arts.**

**Internal assessment (CIA): 21/20 (science/arts)**

**External assessment = 54 /50 (science/arts)**

**Note: There will be two parts of end semester theory paper.**

**Part A Question 1 is compulsory comprises ten very short answer questions.**

**Candidate has to attempt any seven questions. Each question carry 2 marks. (science/arts)**

**Part B The paper will consist four questions with internal choice. Each question will carry ten marks for science and nine marks for arts.**

**Unit I**

**Statistical Organisation in India:** CSO, NSSO and their Functions. Definition(only): Population Statistics, Agricultural Statistics, Livestock and Poultry Statistics, Forest Statistics, Fisheries Statistics, Mining and Quarrying Statistics, Industrial Statistics Trade Statistics, Labour Statistics, National Income Statistics, Financial Statistics

**Unit II**

**Curve fitting and Theory of Attributes:** Principle of least square, fitting of straight line, Parabola and curves reducible to straight line (exponential and power curve). Class frequency, order of a class frequency, ultimate class frequency, consistency of data, independence, and association of attributes. Various measures of association.

**Unit III**

**Statistical Analysis of Bivariate data:** Correlation analysis-scatter diagram, Karl-Pearson's coefficient of correlation and its properties. Correlation of bivariate frequency distribution, Regression analysis-Fitting of regression lines, regression coefficients and their properties

**Unit IV**

**Finite Difference:** Operators  $E, \Delta$  their relationship and properties. Factorial notation. Difference table and fundamental theorem of finite differences. Estimation of one and two missing terms. Meaning of interpolation and extrapolation. Newton's forward and backward formulae for equal intervals, Lagrange's Formulae, Divided Difference Formulae and numerical problems.

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**Department of Statistics**

**Semester II**

**Paper- STAT 202: Univariate Distribution**

**Duration: 3 hrs.**

**(Min. Marks/Max. Marks): (30/75)for science and (28/70)for arts.**

**Internal assessment (CIA): 21/20 (science/arts)**

**External assessment = 54 /50 (science/arts)**

**Note: There will be two parts of end semester theory paper.**

**Part A Question 1 is compulsory comprises ten very short answer questions.**

**Candidate has to attempt any seven questions. Each question carry 2 marks. (science/arts)**

**Part B The paper will consist four questions with internal choice. Each question will carry ten marks for science and nine marks for arts.**

**Unit I**

**Discrete Distributions:** Bernoulli distribution. Moments, Cumulants, mode, moment generating function, Characteristic function, Additive property and Recurrence relation for the moments and cumulants for Binomial and Recurrence relation for moments only Poisson Distribution.

**Unit II**

**Discrete Distributions:** Geometric Distribution: moments, moment generating function, Lack of memory. Idea of Hyper-geometric and Negative Binomial Distribution.

**Unit III**

**Continuous Distributions:** Normal and Rectangular Distribution : Mode, Median, Moments, Moment Generating Function, Cumulants Generating Function, Mean deviation.

**Unit IV**

**Continuous Distribution:** Idea of Exponential, Cauchy, Beta first and second kind. Gamma Distribution: Moment generating function, Cumulant generating function and Additive property.

## Practical Paper- STAT 203

Max marks :	For Science –75	} 45 ESE 30 CIA
	For Arts –60	

Written Paper (03 hours)	Science –21 Marks
	Arts - 18Marks
Class performance & Viva-Vice	Science –10 (6 + 4)
	Arts - 08( 5 + 3)
Record work and Viva-Voce (03 hours)	Science –14 (9 + 5)
	Arts - 10( 7 + 3)

1. Computation of Correlation (i) Simple correlation (ii) Rank correlation
2. Computation of Spearman's rank correlation.
3. Theory of Attributes.
4. Interpolation Problems based on Newton and Lagrange's Formulae.
5. Fitting of straight line and parabola.
6. Fitting of binomial and Poisson and normal.

### Reference:

1. Kapoor V.K. & Gupta S.C.: Fundamental of Applied Statistics, Sultan Chand and Sons, New Delhi
2. Goon A.N., Gupta M.K., Das Gupta B. (1991): Fundamentals of Statistics, Val. I & II, World Press, Calcutta.
3. Croxton F.E. Cowden D.J. (1969): Applied General Statistics, Prentice Hall of India.
4. Rohatgi V.K. (1967): An Introduction to Probability Theory and Mathematical Statistics, John Wiley & Sons.

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**Department of Statistics**

**Semester IV**

**Paper- STAT 301: Applied Statistics (I)**

**Duration: 3 hrs.**

**(Min. Marks/Max. Marks): (30/75)for science and (28/70)for arts.**

**Internal assessment (CIA): 21/20 (science/arts)**

**External assessment = 54 /50 (science/arts)**

**Note: There will be two parts of end semester theory paper.**

**Part A Question 1 is compulsory comprises ten very short answer questions.**

**Candidate has to attempt any seven questions. Each question carry 2 marks. (science/arts)**

**Part B The paper will consist four questions with internal choice. Each question will carry ten marks for science and nine marks for arts.**

**Unit I**

**Time Series Analysis:** Definition and its different components, illustrations, additive and multiplicative models. Different Methods for determination of trend and seasonal variation along with their merits and demerits.

**Unit II**

**Educational Statistics:** Methods of standardization of scales, Z-scores, t-scores, Standard scores, Percentile scores. Intelligence quotient: Definition and its measurement and uses, Validity of test scores, Reliability of test scores and their determination.

**Unit III**

**Statistical Quality Control:** Concept of SQC, Process control and product control causes of variation in quality, General theory of control charts control limits sub grouping, Summary of out of control criteria.

**Unit IV**

**Control Charts for variables:** Construction of Mean and Range charts concept of defects and defective and their merit and demerits. Control charts for attributes: construction of np-chart, p- chart, c-chart and their merits and demerits.

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**Semester III**

**Paper- STAT 302: Applied Statistics (II)**

**Duration: 3 hrs.**

**(Min. Marks/Max. Marks): (30/75)for science and (28/70)for arts.**

**Internal assessment (CIA): 21/20 (science/arts)**

**External assessment = 54 /50 (science/arts)**

**Note: There will be two parts of end semester theory paper.**

**Part A Question 1 is compulsory comprises ten very short answer questions.**

**Candidate has to attempt any seven questions. Each question carry 2 marks. (science/arts)**

**Part B The paper will consist four questions with internal choice. Each question will carry ten marks for science and nine marks for arts.**

**Unit I**

**Demographic Method:** Sources of demographic: data census, register, adhoc survey, hospital records. Measurement of mortality: crude death rate, Specific death rates, infant mortality rates, Standardized death rate. Fertility: Crude Birth Rate, General Fertility Rate Specific Fertility Rate, Total Fertility Rate, Measurement Of Population Growth : Gross Reproduction Rate, Net Reproduction Rate.

**Unit II**

**Life Table:** Meaning of life table, Relation between different columns of life table, uses of life table and its limitations. Complete life table: Construction and its main features, Mortality rate.

**Unit III**

**Economic statistics:** Index numbers: Definition Applications uses and limitation. Price relatives, quantity & value relatives, Link and Chain relative. Cost of living index number.

**Unit IV**

**Construction of Index numbers:** Problems involved in computation of index number. Use of averages, simple aggregative and weighted average methods. Laspeyre's , Paasche's and fisher's index number. Tests for index numbers. Consumer price index.



## Practical Paper- STAT 303

Max marks :	For Science –75	{ 45 ESE 30 CIA
	For Arts –60	{ 36 ESE 24 CIA

Written Paper (03 hours)	Science –21 Marks
	Arts - 18 Marks
Class performance & Viva-Vice	Science –10 (6 + 4)
	Arts - 08 (5 + 3)
Record work and Viva-Voce (03 hours)	Science –14 (9 + 5)
	Arts - 10 (7 + 3)

1. Determination of trend by (i) Least square method (ii) Moving average method.
2. Determination of seasonal variation by (i) Simple average method (ii) Ratio of trend method (iii) Ratio to moving average method.
3. Drawing of X, R, np, p and C-Charts.
4. Computation of mortality and fertility rates. Construction of life tables.
5. Construction of index numbers by Laspeyre's, Paasche's, Fisher's, Chain Base Indices. Consumer price index.
6. Tests for index numbers

### Reference:

1. Kapoor V.K. & Gupta S.C.: Fundamental of Applied Statistics, Sultan Chand and Sons, New Delhi
2. Goon A.N., Gupta M.K., Das Gupta B. (1991): Fundamentals of Statistics, Val. I & II, World Press, Calcutta.
3. Croxton F.E. Cowden D.J. (1969): Applied General Statistics, Prentice Hall of India.
4. Rohatgi V.K. (1967): An Introduction to Probability Theory and Mathematical Statistics, John Wiley & Sons.

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**Semester IV**

**Paper- STAT 401: Statistical Inference**

**Duration: 3 hrs.**

**(Min. Marks/Max. Marks): (30/75)for science and (28/70)for arts.**

**Internal assessment (CIA): 21/20 (science/arts)**

**External assessment = 54 /50 (science/arts)**

**Note: There will be two parts of end semester theory paper.**

**Part A Question 1 is compulsory comprises ten very short answer questions.**

**Candidate has to attempt any seven questions. Each question carry 2 marks. (Science/arts)**

**Part B The paper will consist four questions with internal choice. Each question will carry ten marks for science and nine marks for arts.**

**Unit I**

**Testing of Hypothesis** :Simple Composite null and Alternative hypothesis, types of error, critical region. BCR (Best critical region) Neyman Person's Lemma (statement only) and its application. BCR in case of Binomial Poisson and Normal population

**Unit II**

**Theory of Estimation:** Point Estimation- problems for point estimation; Criterion of a good estimation (Unbiasedness, Consistency, Efficiency, Sufficiency). Minimum Variance Unbiased Estimation. Method of estimation: Method of moments and methods of maximum likelihood.

**Unit III**

**Interval Estimation:** Definition of Confidence interval and confidence coefficient. Confidence interval for mean, variance, difference of means and ratio of variances for normal populations and large sample test.

**Unit IV**

**Large Sample Test:** Testing of single mean, Proportion, Testing of difference of means and proportion. Non-Parametric Tests- Definition, Merits and Limitation. Sign test (for one sample and two sample cases) Run test, Median test.

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**Department of Statistics**

**Semester IV**

**Paper- STAT 402: Sampling Distribution and Stochastic Convergence**

**Duration: 3 hrs.**

**(Min. Marks/Max. Marks): (30/75)for science and (28/70)for arts.**

**Internal assessment (CIA): 21/20 (science/arts)**

**External assessment = 54 /50 (science/arts)**

**Note: There will be two parts of end semester theory paper.**

**Part A Question 1 is compulsory comprises ten very short answer questions.**

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**Part B The paper will consist four questions with internal choice. Each question will carry ten marks for science and nine marks for arts.**

**Unit I**

**Sampling distribution:** Concept of statistic and its sampling distribution, sampling distribution for mean of Binomial, Poisson, and Normal Distribution. Chi-square Distribution mean, variance and m.g.f. and its applications.

**Unit II**

**t-Distribution:** Definition of Student's-t & Fisher's-t Statistic, property and Applications of t-Distribution for testing -Single mean, difference of two means, observed sample correlation-coefficient .

**Unit III**

**F-distribution:** Definition, Mean, Variance and Mode application of F distribution testing of equality of two variances relationship between t, F and chi-square distributions (without proof).

**Unit IV**

**Stochastic convergence:** Chebyshev's inequality and its generalized form, weak law of large numbers. Borel zero one-law. Borel Cantelli lemma.

## Practical Paper- STAT 403

Max marks :	For Science –75	{ 45 ESE 30 CIA
	For Arts –60	{ 36 ESE 24 CIA

Written Paper (03 hours)	Science –21 Marks
	Arts - 18 Marks
Class performance & Viva-Vice	Science –10 (6 + 4)
	Arts - 08 (5 + 3)
Record work and Viva-Voce (03 hours)	Science –14 (9 + 5)
	Arts - 10 (7 + 3)

1. Best critical region for Binomial and Poisson and Normal distribution
2. Non- parametric tests: Sign test, Run test and Median test (for large samples)
3. Tests of significance based on t, Chi-square, F, Testing of significance of sample correlation coefficient.
4. Large sample tests for mean and proportions, tests of goodness of fit and independence of attributes on contingency tables.

### References:

1. Croxton F. E. Cowden D.j. (1969); Applied General Statistics, Prentice Hall of India.
2. Goon A.M. Gupta M.K. Das Gupta B. (1986) Fundamentals of Statistics, Vol.II, World Press Calentta.
3. Gupta S.C. & Kapoor v.k.: Fundamentals of Applied Statistics, Sultan Chand and Sons, New Delhi.

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**Department of Statistics**

**Semester V**

**Paper- STAT 501: Sample Survey (I)**

**Duration: 3 hrs.**

**(Min. Marks/Max. Marks): (30/75)for science and (28/70)for arts.**

**Internal assessment (CIA): 21/20 (science/arts)**

**External assessment = 54 /50 (science/arts)**

**Note: There will be two parts of end semester theory paper.**

**Part A Question 1 is compulsory comprises ten very short answer questions.**

**Candidate has to attempt any seven questions. Each question carry 2 marks. (science/arts)**

**Part B The paper will consist four questions with internal choice. Each question will carry ten marks for science and nine marks for arts.**

**Unit I**

**Concepts of population:** Definition of population, sample, parameter, estimate, estimator and statistic, need for sampling over complete enumerations, Principles of sample survey. Sampling and non sampling error.

**Unit II**

**Probability and non-probability Sampling:** Methods of drawing a random sample from finite population, accuracy and precision of an estimator. Simple random sampling with and without replacement, Simple random sampling for attributes.

**Unit III**

**Stratified random Sampling:** Meaning and advantages of Stratified random sampling, Estimation of the population mean and its variance. Optimum and proportional allocation and their comparison with SRS WOR.

**Unit IV**

**Systematic Sampling:** Meaning and sample selection procedures, advantages and disadvantages, variance of the estimated mean, Comparison of systematic with SRSWOR and Stratified random sampling.

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**Department of Statistics**

**Semester V**

**Paper- STAT 502: Design of Experiment**

**Duration: 3 hrs.**

**(Min. Marks/Max. Marks): (30/75)for science and (28/70)for arts.**

**Internal assessment (CIA): 21/20 (science/arts)**

**External assessment = 54 /50 (science/arts)**

**Note: There will be two parts of end semester theory paper.**

**Part A Question 1 is compulsory comprises ten very short answer questions.**

**Candidate has to attempt any seven questions. Each question carry 2 marks. (science/arts)**

**Part B The paper will consist four questions with internal choice. Each question will carry ten marks for science and nine marks for arts.**

**Unit I**

**Analysis of Variance:** Linear model & its different types, Analysis of Variance technique. ANOVA for one-way and two-way classified data (with one observation per cell & fixed effect model); Expectation of Sum of squares, Critical difference. Effects of violations of basic assumptions of ANOVA; Transformations.

**Unit II**

**Design of Experiments:** Need for design of experiments, fundamental principles of design of experiments. Uniformity Trials, Choice of size and shape of plots, Experimental error, Efficiency of design.

**Unit III**

**Completely randomized design (CRD), Randomised block design (RBD)-** Their advantages & usage. Analysis, Least square estimates, Expectation of sum of square of CRD and RBD. Efficiency of RBD over CRD.

**Unit IV**

**Latin square design (LSD) :** Analysis, least square estimates; expectation of sum of squares; efficiency of LSD over CRD & RBD.

## Practical Paper- STAT 503

Max marks:	For Science –75	{ 45 ESE 30 CIA
	For Arts –60	{ 36 ESE 24 CIA

Written Paper (03 hours)	Science –21 Marks
	Arts - 18Marks
Class performance & Viva-Vice	Science –10 (6 + 4)
	Arts - 08 ( 5 + 3)
Record work and Viva-Voce (03 hours)	Science –14 (9 + 5)
	Arts - 10( 7 + 3)

1. Simple random sampling WR and WOR.
2. Stratified sampling.
3. Systematic sampling.
4. Analysis of one way classified (CRD).
5. Analysis of two way classified (RBD).
6. Analysis of LSD.
7. Efficiency of RBD over CRD

### Reference:

1. Des Raj (2001): Sample Survey Theory. Narosa Publishing House.
2. Singh, Daroga & Chaudhary, F.S. (1989): Theory and analysis of sample surveys Designs. Wiley Eastern Ltd.
3. Gupta S.C. , Kapoor V.K. : Fundamental of Applied Statistics, Sultan Chand & Sons, New Delhi.
4. Sukhatme et al. (1984): Sampling Theory and Methods,. Statistical Publishing seems Surveys Designs. Wiley Eastern Ltd.

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**Semester VI**

**Paper- STAT 601: Sample Survey II**

**Duration: 3 hrs.**

**(Min. Marks/Max. Marks): (30/75)for science and (28/70)for arts.**

**Internal assessment (CIA): 21/20 (science/arts)**

**External assessment = 54 /50 (science/arts)**

**Note: There will be two parts of end semester theory paper.**

**Part A Question 1 is compulsory comprises ten very short answer questions.**

**Candidate has to attempt any seven questions. Each question carry 2 marks. (science/arts)**

**Part B The paper will consist four questions with internal choice. Each question will carry ten marks for science and nine marks for arts.**

**Unit I**

**Cluster Sampling:** Cluster sampling (equal size): Meaning, advantages and disadvantages, estimation of population mean.

**Unit II**

**Ratio sampling:** Ratio Method of estimation (first approximation only) Meaning, bias of ratio estimators, variance efficiency of ratio estimate with SRSWOR

**Unit III**

**Regression Method:** Regression Method of estimation (first approximation only) Meaning, Simple Regression Estimate, Expected value and variance of simple regression estimate. Comparison with SRSWOR and ratio estimators.

**Unit IV**

**Two Stage Sampling:** Definition of Two stage sampling, Estimation of Population mean and its Variance. Comparison with SRS.



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**Department of Statistics**

**Semester VI**

**Paper- STAT 602: Design of experiment and Computational Techniques**

**Duration: 3 hrs.**

**(Min. Marks/Max. Marks): (30/75) for science and (28/70)for arts.**

**Internal assessment (CIA): 21/20 (science/arts)**

**External assessment = 54 /50 (science/arts)**

**Note: There will be two parts of end semester theory paper.**

**Part A Question 1 is compulsory comprises ten very short answer questions.**

**Candidate has to attempt any seven questions. Each question carry 2 marks. (science/arts)**

**Part B The paper will consist four questions with internal choice. Each question will carry ten marks for science and nine marks for arts.**

**Unit I**

**One way and Two way Design and Missing Plot Technique:** ANOVA with m-observation per cell for one way design and ANOVA with m-observation per cell for two way design. Missing plot techniques: Define missing plot technique. Estimation of single missing value in RBD & LSD.

**Unit II**

**Factorial Experiments and BIBD:**  $2^2$  and  $2^3$  experiments. Illustrations, main effects. Interaction effects & their analysis of factorial experiments. Define BIBD and relation between its parameter.

**Unit III**

**Operating system:** Types and Functions of an Operating system. MS-DOS-internal & External commands, windows: Graphical Users interface, Control Penal, find Features, Windows Explore. Creating, Copying Folders and Files and Creating Short Cuts, Delete and Undelete Files.

**Unit IV**

**Programming Concepts:** Types of Programming Language. Programming Techniques. Drawing Flow charts Algorithms. Structured Programming Techniques. Development of Flow chart and Algorithms for simple Mathematical & Statistical Problems like Computation of Mean, Median, Mode, Standard Deviation, Correlation Coefficient.

## Practical Paper- STAT 603

Max marks :	For Science –75	{ 45 ESE 30 CIA
	For Arts –60	{ 36 ESE 24 CIA

Written Paper (03 hours)	Science –21 Marks
	Arts - 18 Marks
Class performance & Viva-Vice	Science –10 (6 + 4)
	Arts - 08 (5 + 3)
Record work and Viva-Voce (03 hours)	Science –14 (9 + 5)
	Arts - 10 (7 + 3)

1. Regression method of estimation
2. Ratio methods of estimation.
3. Cluster sampling
4. Analysis of  $2^2$  &  $2^3$  factorial design.
5. Construction of Flowcharts and Algorithms for Statistical Problems.

### References:

1. Das M.N. & Giri N.E. (1986): Design and Analysis of Experiments, Springer Varlag
2. Gupta S. C. Kapoor V.K. : Fundamentals of Applied Statistics. Sultan Chand & Sons. New Delhi.
3. Goon A. M. , Gupta M.K. Das Gupta B (1986): Fundamental of Statistics. Vol-II, World Press Kolkutta.
4. Nagpal D. P. : Computer Fundamentals, Wheeler Publishing, New Delhi.
5. Stallings : Operating Systems. PHI