

STATISTICS

III Semester(B.A./B.Sc)

Examination to be held in the years Dec 2015, 2016 and 2017

Paper Code: ST 301(Theory) Title: STATISTICAL INFERENCE

Duration: 3 Hours

Max Marks: 100

Credit: 4 Credit

Theory Examination: 80

Internal Assesment: 20

Objectives: The main objectives of this course is to provide knowledge to the students about the theory of estimation, obtaining estimates of unknown parameters using different methods, testing of Hypothesis, Test of significance and use of non-parametric test in the situations where parametric tests are not applicable.

Unit-I

The concept of sampling distribution, standard error and its significance, sampling distribution of Chi Square, t and F with derivations, properties of these distributions and their inter relations.

Unit-II

Estimation: Problem of estimation; point estimation, interval estimation, criteria for a good estimator, unbiasedness, consistency, efficiency and sufficiency with examples. Method of moments and maximum likelihood and application of these method for obtaining estimates of parameters of binomial, Poisson and normal distributions, properties of M.L.E's (without proof), merits and demerits of these methods.

Unit-III

Testing of Hypothesis: Statistical hypothesis, Null and alternative hypothesis, simple and composite hypothesis, two types of error, critical region, power of test, level of significance. Best Critical Region, NP Lemma, its applications to find most powerful in case of binomial. Poisson and normal distributions.

Unit IV

Small sample tests based on t, F and Chi-square distribution and test based on normal distribution, confidence interval for single mean, difference of means and variance (only for normal case)confidence interval for single mean, difference of means and variance (only for normal case). Test of significance for large samples for attributes and variable, proportions and means, single sample, two samples (both paired and independent).

Unit V

Non- parametric tests: Concept of Non-parametric tests, advantages of Non-parametric tests over parametric tests. Sign test for single sample and two sample problems (for paired and independent samples), Wilcoxon-signed rank test, Mann-Whitney U-test, run test. Median test and test for independence based on Spearman's rank correlation.

Note for paper setting:

The question paper will contain three Sections. Section A will contain compulsory ten very short answer type questions of 1 mark each. Section B will contain 7 short answer type questions of 5 marks each at least one question from each unit and the student has to attempt any five questions. Section C will contain 10 long answer type questions, two from each unit, of 9 marks each and the student has to attempt five questions selecting one from each unit.

Internal Assesment (Total Marks:20)

20 marks for theory paper in a subject reserved for internal assesment shall be distributed as under:

- (i) Class Test: 10 marks
- (ii) Two written Assignments/Project reports: 10 marks(05 marks each)

Books Recommended

1. Goon, Gupta and Dass Gupta: An outline of statistical inference Vol-II
2. H.C. Saxena; Statistical inference.
3. Gibbons, J.D.: Non-parametric statistical inference.
4. Kendall and Stuart: The advanced theory of statistics Vol-II
5. Connor W.J.: Practical Non-parametric Inference
6. Hogg.V. and Craig A.T.: Introduction of Mathematical Statistics.
7. Mood and Graybill: An introduction to theory of Statistics.
8. Srivastava and Srivastava: Statistical Inference: Testing of Hypothesis

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III Semester(B.A./B.Sc)

Examination to be held in the years Dec 2015, 2016 and 2017

Paper Code: ST 301(Practical)

Title: STATISTICAL COMPUTING –III

Maximum Marks: 50

External Assesment: 25

Internal Assesment: 25

Objectives: The objective of the course is to expose the students to the real life applications of Statistical Tools.

Syllabus: There shall be at least fifteen computing exercises covering the applications of Statistics based on the entire syllabus of Course ST 301(Theory).

Distribution of Internal Assesment(25 Marks)

(i)I Assesment: 06 marks

(ii)II Assesment: 06 marks

(iii)Class Test: 08 marks

(iv)Attendance: 05 marks

STATISTICS

IV Semester(B.A./B.Sc)

Examination to be held in the years May 2016, 2017 and 2018

Paper Code: ST 401(Theory) Title: STATISTICAL INFERENCE

Duration: 3 Hours

Max Marks: 100

Credit: 4 Credit

Theory Examination: 80

Internal Assessment: 20

Objectives: To introduce the techniques of sampling designs and experimental designs for drawing inferences from data.

Unit- I

Complete enumeration Vs sample enumeration; advantages and disadvantages of sample survey, objectives of sampling, principal steps in a sample survey, limitations. of sampling, sampling and non sampling errors, types of sampling, probability sampling purposive sampling and mixed sampling, random numbers. Simple random sample from finite population, S.R.S. with & without replacement, estimation of mean and variance and their unbiasedness, merits and demerits of SRS.

Unit- II

Meaning of Stratification, Method of Stratified sampling and its advantages and disadvantages. Mean and Variance of Stratified sampling, Method of allocation: equal allocation, Proportional allocation, optimum allocation/Neyman allocation, comparison of stratified random sampling with SRS.

Unit- III

Systematic sampling, Cluster sampling with equal and unequal cluster sizes, estimation of mean and variance.

Unit- IV

Analysis of variance for one way and two way classification, basic principles of design of experiment, concept and analysis of completely randomized design, randomized block design, advantages and disadvantages of these design.

Unit- V

Concept and analysis of Latin square of design, one missing plot technique for RBD and LSD. Factorial experiments, their advantages, Factorial experiments for 2^2 and 2^3 design, main effects, interaction and their analysis.

Note for paper setting:

The question paper will contain three Sections. Section A will contain compulsory ten very short answer type questions of 1 mark each. Section B will contain 7 short answer type questions of 5 marks each at least one question from each unit and the student has to attempt any five questions. Section C will contain 10 long answer type questions, two from each unit, of 9 marks each and the student has to attempt five questions selecting one from each unit.

Internal Assessment (Total Marks:20)

20 marks for theory paper in a subject reserved for internal assesment shall be distributed as under:

- (i) Class Test: 10 marks
- (ii) Two written Assignments/Project reports: 10 marks(05 marks each)

Books Recommended

1. F.S. Choudhary and Daroga Singh: Sampling Theory
2. Cochran W.J.: Sampling Technique
3. Sukhatme P.V. and Sukhatme B.V. :Sampling theory survey with applications.
4. Murty, M.N.: Sampling theory and methods
5. Honson and others: Sample survey methods and theory Vol-I
6. Gupta and Kapoor; fundamental of applied Statistics.
7. Fisher, RA. ; Design of experiments
8. Phase V.G. and Sukhatme P.V. :Statistical methods for agricultural workers.
9. Umaraji, RR: Prob. And statistical methods.
10. Srivastava S.R; Applied Statistics.
11. Goon, Gupta, Dass Gupta; Fundamentals of Statistics Vol-II,

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IV Semester(B.A./B.Sc)

Examination to be held in the years May 2016, 2017 and 2018

Paper Code: ST 401(Practical)

Title: STATISTICAL COMPUTING –IV

Maximum Marks: 50

External Assesment: 25

Internal Assesment: 25

Objectives: The objective of the course is to expose the students to the real life applications of Statistical Tools.

Syllabus: There shall be at least fifteen computing exercises covering the applications of Statistics based on the entire syllabus of course ST 401(Theory).

Distribution of Internal Assesment(25 Marks)

(i)I Assesment: 06 marks

(ii)II Assesment: 06 marks

(iii)Class Test: 08 marks

(iv)Attendance: 05 marks

STATISTICS

V Semester(B.A./B.Sc)

Examination to be held in the years December 2016, 2017 and 2018

Paper Code: ST 501(Theory) Title: APPLIED STATISTICS-I

Duration: 3 Hours

Max Marks: 100

Credit: 4 Credit

Theory Examination: 80

Internal Assessment: 20

Objectives: The main objective of this course is to provide knowledge to the students about applied statistics such as Demographic methods, Economic statistics, Time series analysis and Econometrics

Unit-I

Demographic Methods: Source of demographic data-census, register, adhoc survey, hospital records, demographic profiles of Indian census, Measurement of mortality and life table-crude death rates, infant mortality rate, measurement of fertility-crude birth rates, general fertility rate, total fertility rate gross reproduction rate, net reproduction rate.

UNIT-II

Economic Statistics; Index number its definition, application of index number, price relative quantity or volume relative, link and chain relative problem involved in computational of index numbers, use of averages, simple aggregate and weighted averages methods. Laspeyre's, Paasche's and Fisher's index number, consumer price index.

Unit-III

Static laws of demand and supply, price elasticity of demand, analysis of income and allied size distribution, Pareto distribution, graphical test, fitting of pareto law, log-normal distribution and its properties, Lorenz curve and Gini's Coefficients.

Unit-IV

Time series Analysis:- Economic time series, its components, illustration, additive and multiplicative models, determination of trend, analysis of seasonal fluctuations, construction of seasonal indices. Logistic and Modified exponential growth curves.

Unit-V

Econometrics: Definition, scope and goals of econometrics; specification of the model; variables in mathematical form of the model, simple Regression. Analysis, stochastic and non-stochastic of relation, Estimation Regression. Parameters, Least square estimation and its properties, parametric function, estimable function, BLUE, Gauss Markov setup and theorem.

Note for paper setting:

The question paper will contain three Sections. Section A will contain compulsory ten very short answer type questions of 1 mark each. Section B will contain 7 short answer type questions of 5 marks each at least one question from each unit and the student has to attempt any five questions. Section C will contain 10 long answer type questions, two from each unit, of 9 marks each and the student has to attempt five questions selecting one from each unit.

Internal Assesment (Total Marks:20)

20 marks for theory paper in a subject reserved for internal assesment shall be distributed as under:

- (i) Class Test: 10 marks
- (ii) Two written Assignments/Project reports: 10 marks(05 marks each)

Books Recommended

1. Croxton F.E. and 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 Calcutta.
3. Guide of current Indian official Statistics: Central Statistical Organization, Govt. of India, New Delhi.
4. Saluja M.P. Indian official Statistical systems. Statistical Publishing Society, Calcutta.

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V Semester(B.A./B.Sc)

Examination to be held in the years December 2016, 2017 and 2018
Paper Code: ST 501(Practical) Title: STATISTICAL COMPUTING –V

Maximum Marks: 50
External Assesment: 25
Internal Assesment: 25

Objectives: The objective of the course is to expose the students to the real life applications of Statistical Tools.

Syllabus:There shall be at least fifteen computing exercises covering the applications of Statistics based on the entire syllabus of course STT 351.

Distribution of Internal Assesment(25 Marks)

- (i)I Assesment: 06 marks
- (ii)II Assesment: 06 marks
- (iii)Class Test: 08 marks
- (iv)Attendance: 05 marks

STATISTICS

VI Semester(B.A./B.Sc)

Examination to be held in the years May 2017, 2018 and 2019

Paper Code: ST 601(Theory) Title: APPLIED STATISTICS-II

Duration: 3 Hours

Max Marks: 100

Credit: 4 Credit

Theory Examination: 80

Internal Assessment: 20

Objective: The main objective of this course is to provide knowledge to the students about statistical quality control and computational techniques of Numerical Analysis and LPP

Unit- I

Indian applied statistical system; Present official statistical system in India, Method of collection of official statistics, Role and Functions of MOSPI, ESO, NSSO and Directorate of Economics and Statistics of J&K Government. Importance of statistical methods in industrial research and practice, types of inspections, determination of tolerance limits.

Unit- II

General theory of control charts, cause of variation in quality, control limits, sub-grouping, summary of out of control and criteria charts for attributes, np-chart, p-chart, c-chart, charts for variables: mean and Range - Charts, design of mean and Range charts versus P charts, process capability studies.

Unit- III

Principle of acceptance sampling:- Problem of lot tolerance, stipulation of good and bad lots, producers and consumer risks, single and double sampling plans their OC functions, concept of AOL, LTPD, AOOL, average amount of inspection and ASN function. Rectifying inspection plan, Sampling Plan, Concept of $6-\sigma$ limits.

Unit- IV

Computational technique: difference table and method of interpolation, Newton and Lagrange's method of interpolation, divided difference, numerical differentiation and integration, Trapezoidal rule, Simpson 1/3 and 3/8 rule.

Unit-V

Linear Programming: elementary theory of convex set, definition of general LPP, Formulation problem of LPP. Example of LPP, problem occurring in various fields, graphical and simplex method of solving an LPP, artificial variable, duality of LPP.

Note for paper setting:

The question paper will contain three Sections. Section A will contain compulsory ten very short answer type questions of 1 mark each. Section B will contain 7 short answer type questions of 5 marks each at least one question from each unit and the student has to attempt any five questions. Section C will contain 10 long answer type questions, two from each unit, of 9 marks each and the student has to attempt five questions selecting one from each unit.

Internal Assessment (Total Marks:20)

20 marks for theory paper in a subject reserved for internal assessment shall be distributed as under:

- (i) Class Test: 10 marks
- (ii) Two written Assignments/Project reports: 10 marks(05 marks each)

Books Recommended

1. Brownlee K.A. (1960): Statistical Theory and Methodology in Science and Engineering. John Wiley and Sons
2. Grant E.L. (1964): Statistical quality control. McGraw Hill.
3. Duncan A.J. (1974); Quality control and Industrial Statistics. Taraporewala and sons.
4. Gass S.I. (1975) Linear Programming methods and applications. Mc Graw Hill.
5. Rajaraman, V (1981): Computer Oriented Numerical Methods. Prentice hall.
6. Sastry S.S. (1987) : Introductory methods of numerical analysis. Prentice hall
7. Taha H.A. (1989): Operation Research: An Introduction. Macmillan Publishing

Additional References

8. Broker H.A. and Liberman G.T. (1962): Engineering Statistics. Prentice Hall.
9. Cowden D.J (1960): Statistical Methods in Quality Control. Asia Publishing Society.
- 10.Gavin W.W. (1960): Introduction to linear programming. Mc Graw Hill.
- 11.Mahajan M.2001): Statistical Quality Control. Dhanpat Rai and Co. (P)Ltd.
- 12.Rao S.S.(1984); Optimization Theory and Applications. Wiley Eastern.

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VI Semester(B.A./B.Sc)

Examination to be held in the years May 2017, 2018 and 2019

Paper Code: ST 601(Practical)

Title: STATISTICAL COMPUTING –VI

Maximum Marks: 50

External Assesment: 25

Internal Assesment: 25

Objectives: The objective of the course is to expose the students to the real life applications of SQC and Computational techniques.

Syllabus:There shall be atleast fifteen computing exercises covering the applications based on the entire syllabus of course ST 601(Theory).

Distribution of Internal Assesment(25 Marks)

(i)I Assesment: 06 marks

(ii)II Assesment: 06 marks

(iii)Class Test: 08 marks

(iv)Attendance: 05 marks.