Paper Code: UGESTAT 101
STATISTICAL METHODS

Credit -6, Maximum Marks: 100, Time: 03 Hours

UNIT I

Introduction: Definition and scope of Statistics, concepts of statistical population and sample. Data: quantitative and qualitative, attributes, variables, scales of measurement - nominal, ordinal, interval and ratio. Presentation: tabular and graphic, including histogram and ogives. [3 Questions]

UNIT II

Measures of Central Tendency: mathematical and positional. Measures of Dispersion: range, quartile deviation, mean deviation, standard deviation, coefficient of variation, moments, skewness and kurtosis. [3 Questions]

UNIT III

Bivariate data: Definition, scatter diagram, Karl Pearson product moment correlation coefficient and its properties, rank correlation. Simple linear regression, principle of least squares and fitting of polynomials and exponential curves.

[3 Questions]

UNIT IV

Theory of attributes, consistency of data, independence and association of attributes, measures of association and contingency. [3 Questions]

NOTE: USE OF SIMPLE CALCULATOR IS ALLOWED IN EXAMINATION.

SUGGESTED READING:

1. Goon A.M., Gupta M.K. and Dasgupta B. (2002): Fundamentals of Statistics, Vol. I & II, 8th Edn. The World Press, Kolkata.
2. Miller, Irwin and Miller, Marylees (2006): John E. Freund's Mathematical Statistics with Applications, (7th Edn.), Pearson Education, Asia.
3. Mood, A.M. Graybill, F.A. and Boes, D.C. (2007): Introduction to the Theory of Statistics, 3rd Edn., (Reprint), Tata McGraw-Hill Pub. Co. Ltd.
4. Fundamentals of Mathematical Statistics , S. C. Gupta & V.K. Kapoor

Paper Code: UGESTAT 202
INTRODUCTORY PROBABILITY

Credit -6, Maximum Marks: 100, Time:03 Hours

UNIT I

Probability: Introduction, random experiments, sample space, events and algebra of events. Definitions of Probability – classical, statistical, and axiomatic. Conditional Probability, laws of addition and multiplication, independent events, theorem of total probability, Bayes' theorem and its applications. [3 Questions]

UNIT II

Random Variables: Discrete and continuous random variables, p.m.f., p.d.f. ,c.d.f. Illustrations of random variables and its properties. Two dimensional random variables: discrete and continuous type,joint, marginal and conditional p.m.f. and p.d.f. [3 Questions]

UNIT III

Mathematical expectation, variance, moments and moment generating function.
Chebychev's inequality,De-Moivre Laplace and Lindeberg-Levy Central Limit Theorem (C.L.T.).

[3 Questions]

UNIT IV

Standard probability distributions: Uniform(discrete),Binomial, Poisson, geometric,uniform(continuous), normal, exponential. [3 Questions]

NOTE: USE OF SIMPLE CALCULATOR IS ALLOWED IN EXAMINATION.

SUGGESTED READING:
1. Hogg, R.V., Tanis, E.A. and Rao J.M. (2009): Probability and Statistical Inference, Seventh Ed, Pearson Education, New Delhi.
2. Miller, Irwin and Miller, Marylees (2006): John E. Freund's Mathematical Statistics with Applications, (7th Edn.), Pearson Education, Asia.
3. Myer, P.L. (1970): Introductory Probability and Statistical Applications, Oxford & IBH Publishing, New Delhi
4. Fundamentals of Mathematical Statistics , S. C. Gupta & V.K. Kapoor.

Paper Code: UGESTAT 303

STATISTICAL INFERENCE & INDEX NUMBERS

Credit -6, Maximum Marks: 100, Time:03 Hours

UNIT I

Estimation of population mean, confidence intervals for the parameters of a normal distribution (one sample and two sample problems). The basic idea of significance test. Null and alternative hypothesis. Type I & Type II errors, level of significance. [3 Questions]

UNIT II

Categorical data: Tests of proportions, tests of association and goodness-of-fit using Chi- square test, Sign test, Wilcoxon two-sample test. [3 Questions]

UNIT III

Analysis of variance, one-way and two-way classification. Brief exposure of three basic principles of design of experiments, treatment, plot and block. Analysis of completely randomized design, randomized complete block design. [3 Questions]

UNIT IV

Index numbers: Definition, Criteria for a good index number, different types of index numbers. Construction of index numbers of prices and quantities, consumer price index number. Uses and limitations of index numbers. [3 Questions]

NOTE: USE OF SIMPLE CALCULATOR IS ALLOWED IN EXAMINATION.

SUGGESTED READING:

1. Daniel, Wayne W., Bio-statistics: A Foundation for Analysis in the Health Sciences. John Wiley (2005).
2. Goon, A.M., Gupta M.K. & Das Gupta, Fundamentals of statistics, Vol.-I & II (2005).
3. Dass, M. N. &Giri, N. C.: Design and analysis of experiments. John Wiley.
4. Dunn, O.J Basic Statistics: A primer for the Biomedical Sciences .(1964, 1977) by John Wiley.
5. Bancroft, Holdon Introduction to Bio-Statistics (1962) P.B. Hoebar New York.
6. Goldstein, A Biostatistics-An introductory text (1971). The Macmillion New York.
7. Fundamentals of Mathematical Statistics , S. C. Gupta & V.K. Kapoor
8. Fundamentals of Applied Statistics , S. C. Gupta & V.K. Kapoor.

Paper Code: UGESTAT 404

APPLIED STATISTICS

Credit- 6, Maximum Marks: 100, Time:03 Hours

UNIT I

Economic Time Series: Components of time series, Decomposition of time series- Additive and multiplicative model with their merits and demerits, Illustrations of time series. Measurement of trend by method of free-hand curve, method of semi-averages and method of least squares (linear, quadratic and exponential curves).Measurement of seasonal variations by method of simple averages. [4 Questions]

UNIT II

Statistical Quality Control: Importance of statistical methods in industrial research and practice. Determination of tolerance limits. Causes of variations in quality: chance and assignable. General theory of control charts, process & product control, Control charts for variables: X- bar and R-charts. Control charts for attributes: p and c-charts. [4 Questions]

UNIT III

Demographic Methods: Introduction, measurement of population,rates and ratios of vital events. Measurement of mortality: CDR, SDR (w.r.t. Age and sex), IMR, Standardized death rates. Life (mortality) tables: definition of its main functions and uses. Measurement of fertility and reproduction: CBR, GFR, and TFR. Measurement of population growth: GRR, NRR. [4 Questions]

NOTE: USE OF SIMPLE CALCULATOR IS ALLOWED IN EXAMINATION.

SUGGESTED READING:

1. Mukhopadhyay, P. (1999): Applied Statistics, New Central Book Agency, Calcutta.

2. Gun, A.M., Gupta, M.K. and Dasgupta, B. (2008): Fundamentals of Statistics, Vol. II, 9th Edition World Press, Kolkata.
3. Gupta, S. C. and Kapoor, V.K. (2008): Fundamentals Of Applied Statistics, 4th Edition(Reprint), Sultan Chand & Sons
4. Montogomery, D. C. (2009): Introduction to Statistical Quality Control, 6th Edition, Wiley India Pvt. Ltd.
5. Fundamentals of Applied Statistics , S. C. Gupta & V.K. Kapoor