STATISTICS

SYLLABUS FOR HIGHER SECONDARY COURSE

Objectives :

The main objectives of the course are to enable students ..

a. to acquire knowledge on basic statistical concepts.
b. to acquire the skill of statistical analysis of data from real life situation in a scientific manner.
c. to acquire knowledge on the basic aspects of statistical reasoning and drawing conclusions.
d. to create an aptitude for Statistics for those students who show a promise for higher studies and creative work in Statistics.
e. to develop aptitude for applications of statistical techniques in Biological Sciences, Social Sciences, Education and Psychology.

STATISTICS

SYLLABUS FOR HIGHER SECONDARY FINAL YEAR COURSE

One Paper **Three Hours** **Marks 100**

Unitwise Distribution of Marks and Periods :

Unit No.	Title	Marks	Periods
Unit-I :	Calculus of Finite difference	20	45
Unit-2 :	Theory of Probability	40	65
Unit-3 :	Elementary Theory of Sampling and Test of Significance	25	50
Unit-4 :	Sample Survey	15	40
	Total	**100**	**200**

Unitwise Distribution of Course contents :

Unit-1 : Calculus of Finite Difference :

Operators A and E. Construction of diagonal Difference tables. Estimation of missing values, Idea of interpretation. Statements and applications of Newtons Forward, Backward and Longranges interpolation formulae. Idea of numerical integration, General quadrature formula. Statement and applications of trapezoidal rule, Simpsons $\frac{1}{3}$ rd rule and Simpsons $\frac{3}{8}$ th rule along with the conditions under which they are derived.

Unit-2 : Theory of Probability :

Basic concepts of Random experiment, Sample point, Sample space and Event occurrence of an event, Union and intersection of events. Complement of an event. Certain and null events. Exhaustive, Mutually exclusive and equally likely events. Probability of an event. Classical, Emperical and axiomatic (without introducing idea of measure theory). Unconditional probability, conditional probability, Dependent and independent events. Addition rule of Probability, Generalized Addition rule of Probability (upto three events). Statements and application of multiplication rule of Probabilities.

Random Variable and Distribution :

Random variable; Discrete and continuous distribution of a random variable, p.mJ. and p.d.f., density function. Representation of discret probability distribution. Probability curve of a continuous distribution, Mathematical expectation of a random variable. Mathematical expectation of the function of a random variable. Theorems on expectation of the sum and product of random variables - only application (without derivation).

Idea of Barnoulli Trials; Binomial distribution; Mathematical form, occurrence of the distribution, Derivation of the distribution, Calculation of Mean and variance. Poission distribution; Mathematical form, Occurence of the distribution, derivation as a limiting form of Binomial distribution, calculation of mean and variance. Normal distribution, Mathematical form (without proof). Important properties and their applications. Derivation of distribution of standard normal variate and its applications.

Unit-3 : Elementary Theory of Sampling and Test of Significance :

Sample and Sampling. Random sampling, Parameter and Statistic.

Sampling distribution. Unbiased estimate of a parameter. Standard error of sampling mean and sample preparation for random sampling (without Derivation) - simple applications. Statistical hypothesis - Null hypothesis alternative hypothesis, Level of significance. Test (only two tailed test) for a hypothetical population mean on the basis of information supplied by a random sample drawn from a normal having known standard deviation (application only). Students 't' test (only two tailed test) for an assumed mean (examples only), Large sample test (only two tailed test) for proportion (examples only). Examples on use of frequency x^2 for testing independence of attributes in 2×2 table.

Unit-4 : Sample Survey :

Sample survey and complete enumeration. Basic principles of sample survey, validity of optimization. Principal steps in a survey, Errors in a survey. Sampling and non sampling errors. Advantage of sample survey over complete enumeration.

Simple random sampling with and without replacement - method of selection of SRS making use of Table of random number, Estimation Population mean and total, use of formula - mean and estimated population total. Limitations of SRS. Idea of stratified random sampling. Estimation of population mean (method of allocation not included). Preparation of Questionnaire and schedule. Idea of pilot survey.

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