

**DEPARTMENT OF MATHEMATICS**  
**MAHATMA GANDHI UNIVERSITY**  
**M.Sc. Mathematics**  
**Semester III**  
**Interdisciplinary Paper**

**Basic Statistics**

**Unit I**

Origin, Importance and growth of Statistics, Collection and tabulation of data. Frequency distribution. Graphical and Pictorial representation of data. Measures of central tendency: Mean, Median and Mode their merits and demerits with examples. Partition Values: Quartiles, Deciles and percentiles and examples.

Measures of dispersion: Range and standard deviation, coefficient of variation. Central and non-Central moments, coefficient of Skewness and Kurtosis, Examples.

**Unit II**

Review of permutations and combinations. Deterministic and random experiment, Sample space, event mutually exclusive, equally likely and independent events with examples. Mathematical, Statistical and axiomatic definition of probability. Addition theorem, conditional probability and multiplication theorem of probability. Statistical independence and Bayes theorem –simple examples (all theorems without proofs and only statements).

**Unit III**

Definition and sample examples of random variables and distribution function, probability mass function and probability density function. Mathematical expectation and moments-simple examples.

Discrete probability distributions: Bernoulli, Binomial, Poisson, Geometric, and Negative binomial distributions (concept, definition, statements of mean and variance only) with real life examples.

**Unit IV**

Concept of testing Statistical hypothesis-Definition of Null and Alternative hypothesis, Critical region, Types of errors, level of Significance and Power of a Test.

Tests of significance based on Chi-Square, t and F distributions and ANOVA (One and Two way) with examples (No mathematical derivation only methodology).

References:

1. Charles M. Grinstead and Laurie Snell, J: Introduction to Probability, American Mathematical Society.
2. S.P. Gupta: Statistical Methods.
3. B.S. Agarwal: Basic Statistics.