

ST3 C12: STATISTICAL TESTING OF HYPOTHESES

UNIT I

Basic concepts in testing of hypothesis, randomized tests, Neymann- Pearson lemma and most powerful tests, monotone likelihood ratio (MLR) property, uniformly most powerful (UMP) tests, construction of uniformly most accurate (UMA) confidence intervals using UMP tests, uniformly most powerful unbiased (UMPU) tests, construction of uniformly most accurate unbiased (UMA) confidence intervals using UMPU tests, Locally most powerful (LMP) and locally most powerful unbiased (LMPU) tests.

UNIT II

Similar regions tests, Neymann structure tests, likelihood ratio (LR) tests and their properties, LR tests for testing equality of mean and variance of two normal populations.

UNIT III

Sequential probability ratio tests (SPRT), Properties of SPRT, Construction of sequential probability ratio tests, Wald's fundamental identity, Operating characteristic (OC) function and Average sample number (ASN) functions.

UNIT IV

Non-parametric tests-- sign test, signed rank test, Chi-square tests, Kolmogorov-Smirnov one sample and two samples tests, median test, Mann-Whitney U-test, Wilcoxon test, test for randomness, Wald-Wolfowitz run test for equality of distributions, Kruskal-Wallis one-way analysis of variance, Friedman's two-way analysis of variance.

Text Books:

1. Rohatgi V.K. (1976) An Introduction to Probability Theory and Mathematical Statistics, John Wiley & Sons, New York.
2. Manojkumar Srivastava and Namita Srivastava (2009) Statistical Inference: Testing of Hypothesis, Eastern Economy Edition, PHI Learning Pvt. Ltd., New Delhi.

References Books:

1. Gibbons J.K. (1971) Non-Parametric Statistical Inference, McGraw Hill.
2. Casella G. and Berger R.L. (2002) Statistical Inference, Second Edition Duxbury, Australia.
3. Lehman E.L. (1998) Testing of Statistical Hypothesis. John Wiley, New York.
4. Wald A. (1947) Sequential Analysis, Wiley, Doves, New York.
5. Dudewicz E.J. and Mishra S.N. (1988) Modern Mathematical Statistics, John Wiley & Sons, New York.
6. Siegel S. and Castellan Jr. N. J. (1988) Non-parametric Statistics for the Behavioral Sciences, McGraw Hill, New York.
7. Rao C.R. (1973) Linear Statistical Inference and its Applications, Wiley.