Syllabus of CET for Admission to M.Sc. Statistics

2019-2020

Measures of central tendency : Arithmetic Mean, Geometric Mean, Harmonic Mean, Median and Mode; **Measures of Variation** : Range, Mean Deviation, Standard Deviation, Coefficient of Variation, Quartiles, Percentiles, Measures of Skewness and Kurtosis. **Types of data:** Qualitative and Quantitative data. Scale of Measurements (Nominal, Ordinal, Interval and Ratio).Concept of Probability, Laws of Probability (Statements only); Random Variable;

Probability Distributions: Binomial, Poisson, Geometric, Hypergeometric, Normal distributions, Exponential, Gamma, Beta (properties and applications).

Sampling Techniques: Concept and definitions, Types of sampling: Purposive and Random Sampling. Simple Random Sampling Stratified Random Sampling and Systematic Random Sampling.

Test of significance: Types of Hypothesis, Types of Error, Critical Region; Large sample tests for proportions and means; small sample tests; Application of t, chi-square, F-tests.

Correlation: Simple Correlation, Karl Pearson's Correlation, Multiple Correlation and Partial Correlations, Properties of Correlation Coefficient Regression; **Regression:** Regression Coefficient, Properties of Regression Coefficient, Fitting of Regression Curve (Linear and Non-linear).

Design and Analysis of Experiment: one way and two way ANOVA, principles of design of expts, CRD, RBD, LSD

Operations Research: Linear programming problem (LPP) Transportation problem, Assignment problem.

Industrial Statistics: variable and attribute control charts, OC curve, and acceptance sampling plans **vital Statistics:** index numbers

Real analysis: introduction to n dimensional Euclidean space and metric space system of real numbers countable and uncountable sets countability of rational numbers unaccountability of real numbers supremum and infimum of set of real numbers interior point, limit point of a set open set dense and compact sets real valued function continuity.

Vector Algebra: vector space, subspace, linear dependence & independence, basis, dimension of vector space, Example of vector spaces, algebra of linear transformations. Orthonormal basis and orthogonal projection of vector.

Algebra of matrices: row and column space of matrix, elementary matrices, determinants, rank and inverse of a matrix, null space and nullity, partitioned matrices. Real quadratic forms, reduction and classification of quadratic forms, index and signature, triangular reduction of a positive definite matrix. Characteristics roots and vectors, Caley – Hamilton theorem and applications.