Faculty of Science

M.Sc. (Data Science)

DEPARTMENT OF STATISITICS & OPERATIONS RESEARCH
ALIGARH MUSLIM UNIVERSITY ALIGARH

Syllabus for Entrance Test

Section I: Mathematics (20 Questions)

Sequence and series, convergence of sequence of real numbers. Functions and their properties, limits, continuity and differentiability of functions, function optima, increasing and decreasing functions. Matrix algebra and its properties. Elementary set theory, vector space, subspaces, linear transformations, rank, nullity, eigen values, system of linear equations.

Section II: Statistics (25 Questions)

Data types and their presentation. Measures of central tendency, measures of dispersion, measures of skewness and kurtosis. Karl-Pearson correlation and Spearman rank correlation. Regression analysis.

Definition and axioms of probability, probability of events, addition rule, conditional probability, independence of events, multiplication rule and Bayes' theorem. Random variables, probability mass function, probability density function, cumulative distribution function. Mathematical expectation. Distribution of functions of random variables.

Some standard discrete and continuous distributions: binomial, geometric, negative binomial, Poisson, hypergeometric, uniform, exponential, gamma, beta and normal.

Sampling distribution of t, X^2 and F. Properties of good estimators. Method of estimation (maximum likelihood method and method of moments).

Section III: Linear Programming Problems and Statistical Quality Control (25 Questions)

Linear programming problem (LPP), graphical and simplex method, artificial variable method, concept of duality in LPP, dual simplex method. Transportation and assignment problems. Basics of statistical quality control, statistical quality control charts (variables and attributes).

Section IV: Computer Science (15 Questions)

Basics of computer science. C/C++ programming concepts. Introduction to R language, data objects in R, vector, matrix, and data frame, listed data objects. Defining new function and programming tools. Data import and export. Operations on matrices. Graphics with R.

Section V: General Awareness and Reasoning (15 Questions)

Logical, analytical, and mathematical reasoning. Verbal and non-verbal reasoning.

Note: There will be 100 MCQs, carrying one mark each.