

**Syllabus of the Delhi University Entrance Test for
Master of Operational Research (MOR) Programme-2020**

English Language: Passages for comprehension, test of vocabulary (synonyms and antonyms), elementary grammar and syntax.

Analytical Ability and Reasoning: Pattern recognition, logic, Venn diagrams

Operational Research: Definition & scope of Operational Research, Simple Linear Programming Problems, Graphical & Simplex method, basics of Duality, Simple Transportation and Assignment Problems. Characteristics of Inventory System, Simple Economic Lot Size Inventory models, Reorder Level, Simple single period Stochastic Inventory Model. Definition of Queues and their characteristics, Queueing Models with Markovian Input and Markovian Service, M/M/1 & M/M/C Models. Definitions of Reliability, Availability, Reliability of multicomponent systems, failure time distributions: exponential and Weibull.

Mathematics:

Vector Space, subspace and its properties, linear independence and dependence of vectors, matrices, rank of a matrix, reduction to normal forms, linear homogenous and non-homogenous equations, Cayley-Hamilton theorem, characteristic roots and vectors. De Moivre's theorem, relation between roots and coefficient of nth degree equation, solution to cubic and biquadratic equation, transformation of equations.

Calculus: Limit and continuity, differentiability of functions, successive differentiation, Leibnitz's theorem, partial differentiation, Euler's theorem on homogenous functions, tangents and normals, asymptotes, singular points, curve tracing, reduction formulae, integration and properties of definite integrals, quadrature, rectification of curves, volumes and surfaces of solids of revolution.

Differential Equations: Linear, homogenous, separable equations, first order higher degree equations, algebraic properties of solutions, linear homogenous equations with constant coefficients, solution of second order differential equations. Linear nonhomogenous differential equations.

Real Analysis: Neighbourhoods, open and closed sets, limit points and Bolzano Weierstrass theorem, continuous functions, sequences and their properties, limit superior and limit inferior of a sequence, infinite series and their convergence. Rolle's theorem, mean value theorem, Taylor's theorem, Taylor's series, Maclaurin's series, maxima and minima, indeterminate forms.

Statistics: Measures of central tendency and dispersion and their properties, skewness and kurtosis, introduction to probability, theorems of total and compound probability, Bayes theorem, random variables, probability mass and density functions, mathematical expectation, moment generating functions, Binomial, Poisson, Geometric, Exponential and Normal distributions and their properties, method of least squares, correlation and regression,

introduction to sampling, sampling distributions and tests of significance based on t, Chi-square and F-distributions.

Computer Science: Flowcharts and algorithms, Number system: decimal, binary, octal, hexadecimal; Truth values, Logical operations, Logic functions and their evaluation. Computer basics, Computer generations and classifications, Fundamentals of high level languages, Fundamentals of Operating System, C Programming Language.