

Chennai Mathematical Institute

M.Sc. Data Science

The entrance examination will primarily check mathematical aptitude and the ability to logically interpret data. Candidates should be familiar with following topics:

- **School Level Mathematics**

Arithmetic and geometric progressions; arithmetic, geometric and harmonic mean; polynomials, matrices (basic operations, inverse, transpose), determinants, solving linear equations, prime numbers and divisibility, GCD, LCM, modular arithmetic, logarithms, basic properties of functions (domain, range, injective, bijective, surjective), elementary calculus (differentiation, maxima-minima, integration and its applications)

- **Discrete Mathematics**

Sets and relations, combinations and permutations, elementary counting techniques, pigeonhole principle, binomial theorem, mathematical induction, boolean logic and truth tables

- **Probability Theory**

Elementary probability theory, conditional probability, and Bayes theorem; random variables, density functions, distribution functions; standard distributions (Gaussian etc.); expectation and variance; data interpretation; summary statistics

- **Programming**

Ability to read and interpret algorithms written in simple pseudocode (variables, conditionals, loops)

Suggested textbooks

There are many books that cover this material. The questions asked will only test basic concepts. Here are a few suggestions.

1. C.L. Liu: *Elements of Discrete Mathematics*, McGraw Hill (1986)
2. Norman Biggs: *Discrete Mathematics*, Oxford University Press (2002)
3. Sheldon M. Ross: *A First Course in Probability (9th ed)*, Pearson (2013)
4. Henk Tijms: *Understanding Probability*, Cambridge University Press (2012)
5. R.G. Dromey: *How to Solve it By Computer*, Pearson (2006)