MT-102 Quantitative Reasoning-II

Logic, Logical and Critical Reasoning

Introduction and importance of logic; Inductive, deductive and adductive approaches of reasoning; Propositions, arguments (valid; invalid), logical connectives, truth tables and propositional equivalences; Logical fallacies; Venn Diagrams; Predicates and quantifiers; Quantitative reasoning exercises using logical reasoning concepts and techniques.

Mathematical Modeling and Analyses

Introduction to deterministic models; Use of linear functions for modeling in real-world situations; Modeling with the system of linear equations and their solutions; Elementary introduction to derivatives in mathematical modeling; Linear and exponential growth and decay models; Quantitative reasoning exercises using mathematical modeling.

Statistical Modeling and Analyses

Introduction to probability models; Basic concept of Normal distribution and Binomial distribution with simple applications, Bivariate analysis, scatter plots; Pearson correlation; Simple linear regression, Concept of statistical Inference in decision making; Chi-square test of association, Quantitative Reasoning exercises using statistical modeling.

Textbook(s)

1. Kenneth H. Rosen, “Discrete Mathematics and its Applications”, 7th edition, by McGraw-Hill, 2010.
2. C, William Briggs, Using & Understanding Mathematics: A Quantitative Reasoning Approach (7th Edition) Pearson Education, Inc. (2019).

Reference Book(s)

1. Eric Zaslow, Quantitative Reasoning: Thinking in Numbers, Cambridge University Press (2020)