

MBA First Year (1st Semester)
Paper – 105 : Quantitative Techniques

Objective:

The main objective is to provide the knowledge of basic mathematics and statistics and its techniques which will be used in business, industry etc.

Unit - I

(a). **Numbers:** Natural Numbers, Integers, Divisor of an Integer, g.c.d and l.c.m. of two Integers, Prime Integer, Rational Numbers, Irrational Numbers, Real Numbers, Absolute Value of Real Numbers, Complex Numbers, Modulus amplitude form of Complex Number.

(b). **Set Theory:** Subset, Superset, Power of a set, Set Operations such as Union, Intersection, Difference, Symmetric Difference and Cartesian Product of two sets. Venn Diagram.

(c). **Relation and Function:** Special types of relations in a set, Equivalence relation, Functions, Types of Function, Logarithmic Function and its properties.

Unit - II

(a). Derivatives of first and second order, Increasing and Decreasing Functions, Maxima and Minima, Point of Inflexion, Convex and Concave Functions. Application of differentiation in business.

(b). **Indefinite Integrals:** Integration of some standard functions, Method of substitution, Integration by parts, Application of Integration in Business.

(c). **Matrix Theory:** Definition and types of Matrices, Addition, Scalar Multiplication and Multiplication of Matrices, Transpose of a Matrix, Determinant of a square matrix, Row and Column Operations on a Matrix, Rank of a Matrix, Solution of System of Linear Equations by Matrix Method.

Unit - III

Measure of Central Tendencies and Dispersions: Mean, Median, Mode and Weighted averages – Concepts and Applications. Range, Quartiles, Percentiles, Mean Deviation and Standard Deviation - Concepts and Applications.

Unit - IV

Moments, Cumulants, Measures of Skewness, Kurtosis, Correlation and Regression Lines, Karl Pearson's Coefficient of Correlation, Rank Correlation.

Analysis of Time-series, Components of Time-series, Least Squares Method, Moving Averages. Test of Significance of Mean and Difference of Means for Large and Small Samples, Use of Chi-square, t and F distribution in testing of Hypothesis.

Unit – V

(a). Probability: Axiomatic and Classical Definitions, Events, Laws of Probability, Conditional Probability, Baye's Theorems; Independent Events.

(b). Random Variable: Simple definitions of Distribution function, Probability Mass Function, Probability Density Function, Expectation, Moment Generating Function, Some important Discrete and Continuous distribution functions such as Binomial, Poisson and Normal; Uniform distribution, Exponential distribution, Bivariate distribution: Marginal, Conditional Probability, Mass Function and Probability Density Function.

Suggested Readings:

1. B. C. Mehta & G. K Madhani: Mathematics for Economists, Sultan Chand & Sons, New Delhi
2. J. D. Gupta, P. K. Gupta: Mathematics for Business and Economist, TMH, New Delhi
3. Principles of Statistics: Ramendu Roy, Prayag Pustak Bhawan, Allahabad
4. Fundamental of Statistics Vol. I & II, A. M. Goon, M. K. Gupta & B. Das Gupta, World Press Pvt. Ltd., Kolkata
5. An Outline of Statistical Theory Vol. I: A. M. Goon, M. K. Gupta & B. Das Gupta, World Press Pvt. Ltd., Kolkata