Subject Code : RMCNS3

PAPER III – MATHEMATICAL AND STATISTICAL METHODS

Module 1 : Differential Calculus

1. Functions of one or two variables – Homogenous Function – Revenue and cost functions – Applications in Economics.
2. Rules of derivatives of Y = f(X) – First and second order derivatives – Partial derivatives (simple problems).
3. Maxima, Minima and their applications in Economics.

Module 2 : Matrix Algebra

1. Determinants – Properties – Cramer's rule.
2. Matrices – Addition, Subtraction, Multiplication and Inverse of a matrix – Solving a system of linear equations.
3. Leontief's open static Input – Output model – Hawkin Simon conditions – Output for a given final demand.

Module 3 : Collection and presentation of data

1. Collection of data – Census and sample method – Random versus Non-random sampling.
2. Primary data – Direct Personal Investigation – Sending Enumerators – Sending Questionnaires by post – Criteria for a good questionnaire – Sources of secondary data.
3. Classification of data – Tabulation – Bar and Pie Diagrams – Frequency graphs.

Module 4 : Descriptive Statistical Measures

1. Average, Mean, Median and Mode – Relative merits and demerits.
2. Dispersion – Range, Standard Deviation – Coefficient of variation.
3. Skewness – Tests of skewness – Pearson's and Bowley's Coefficient of Skewness.

Module 5 : Quantifying Relations

1. Correlation – Simple, Partial and Multiple – Pearson and Spearman's method.
2. Regression – Linear and non-linear – Least squares method of estimating regression lines.
3. Association of attributes. Yule's Coefficient and Chi-square method.

Text Books :

1. Elhance, D.N. (2003) Fundamentals of statistics (Kitab Mahal: New Delhi).
2. Gupta, S.P. (2000) Statistical Methods (Sultan Chand : New Delhi).

3. Metha and Madnani (1995) Mathematics for Economists (Sultan Chand : New Delhi).
4. Veerachamy, R (1998) Quantitative Techniques (New Age International – New Delhi).

Reference Books :

1. Allen R.G.D. (1984) Mathematical Analysis for Economists (Macmillan : London)
2. Chiang, A.C. (1998) Fundamentals methods of Mathematical Economics (McGraw Hill : New Delhi).
3. Croxton and Cowden (1973) Applied General Statistics (New Delhi: Prentice Hall of India).
4. Dowling Edward T (1996) Mathematical Methods (Schaum series : New York).
5. Miller, R.K. (1995) Introduction to Statistics for Business and Economics (St. Martin Bros. New York).