M.A. 1st Semester
Paper-103 (Compulsory)

Time : 3 Hrs.
Max. Marks : 100
External : 80
Internal : 20

QUANTITATIVE METHODS-I

Note: (i) Nine Question will be set in all and students will be required to attempt 5 questions.

  (ii) Question No. 1 will be compulsory and will consist of 8 short answer type questions of 2 marks spread over the entire syllabus (2*8=16 marks).

  (iii) For the remaining four questions, students will attempt 1 out of 2 questions from each of the four units (16 marks each).

PREAMBLE

The main objective of this paper is to train the students to use the techniques of mathematical and statistical analysis, which are commonly applied to understand and analyze economic problems. The emphasis of this paper is on understanding economic concepts with the help of mathematical methods rather than learning mathematics itself. Hence in this paper a student will be initiated into various economic concepts, which are amenable to mathematical treatment. The paper also deals with simple tools and techniques, which will help a student in data collection, presentation, analysis and drawing inferences about various statistical hypotheses.

Unit-I

Concept of Matrix and Determinant – their types, simple operations on matrices, matrix inversion and rank of matrix; Solution of simultaneous equations through Cramer's rule and Matrix inverse method. Introduction to input-output analysis.

Unit - II

Rules of differentiation; Elasticity and their types; Rules of Partial differentiation and interpretation of partial derivatives; Problems of maxima and minima in single and multivariable functions; Unconstrained and constrained optimization in simple economic problems.

Unit - III

Concept and simple rules of integration; Application to consumer's and producer's surplus. Difference equations – Solution of first order and second order difference equations; Applications in trade cycle models; Growth models and lagged market equilibrium models.

Unit - IV

Linear programming – Basic concept, Nature of feasible, basic and optimal solution; Solution of linear programming problem through graphical and simplex method.

Concept of a game; Two-person Zero-sum game; value of a game; strategies- simple and mixed; Dominance rule; Solution of a game by linear programming.

Basic Reading List

- Mathematics for Economics by Michael Hoy etal, PHI, New Delhi, 2004.

- Quantitative Methods for Business and Economics by Adil H. Mouhammed, PHI, New Delhi, 2003.

- Quantitative Methods by D.R. Aggarwal
- Basic Mathematics for Economists by R.C. Joshi, New Academic Publishing
- Leontief, W. (1936) Quantitative input-output relations in the economic systems of the United States. Review of Economics and Statistics, Vol 18, pp.105-125.
- Miller, R.E. and P.D. Blair (1985) Input-Output Analysis: Foundations and Extensions. Prentice-Hall, Englewood Cliffs, New Jersey.
- Proops, J., Faber, M. and Wagenhals, G. (1993) Reducing CO2 Emissions: A Comparative Input-Output Study for Germany and the UK, Springer-Verlag, Heidelberg.
- Aggarwal, H.S. : Modren Micro -Economics, Konark, New Delhi, 1998.
- Taro Yamane, Mathematics for Economists, PHI, 1973.
- Quantitative Techniques in Management by N.D. Vohra, TMH.
- Operations Research by R. Wagnor
- Operations Research by Hamdy A. Taha
- Allen R.G.D. (1974), Mathematical Analysis for Economists, Macmillan Press, London.
- Black, J. and J.F. Bradley (1973), Essential Mathematics for Economists, John Wiley and Sons.
- Chiang, A.C. (1986), Fundamental Methods of Mathematical Economics (3rd Edition), McGraw Hill, New Delhi.