M.A. Economics (Final) 2020-21

Group A

Paper IX-A

5109 A

Mathematical Economics

Objective: This course is designed to equip students to understand the economic concepts and theories with the application of mathematical tools and techniques to refine the verbal logic. Mathematical economics deals with various applications of mathematical tools and techniques in defining and developing economic relationships. This course has been accordingly designed to include various mathematical techniques/methods/models related to the different parts of microeconomics, macroeconomics and development theory

Unit I

Consumer Behaviour Analysis

Utility Function and types of Utility function, Indifference curve and Its Characteristics. Ordinal Utility Maximisation, Slutsky Equation – Income, Substitution and Price Effects, Derivation of Ordinary and Compensated Demand Curve, Elasticity of Demand. Theory of Revealed Preference, Consumer Behaviour under Uncertainty- N-M Theorem. Linear expenditure system.

Unit II

Production Analysis

Production Function –Homogenous and Non-Homogeneous Production Function, Stages of Low of Variable Proportion, Properties of Cobb-Douglas and CES Production functions; Concept of VES and Translog Production Function, Producer's equilibrium under constraints. Simple derivation of Short and Long run Cost Functions and their relations, Concept of modern approaches to theory of Cost, Concept of Revenue Functions, Total, Average and Marginal Revenue, Relation between AR, MR and Elasticities. Input Demand Function.

Unit III

Market Analysis

Product and factor market equilibrium; Existence, uniqueness and stability of equilibrium: Marshallian and Walrasian equilibrium conditions. Dynamic equilibrium with lagged

adjustment-Cobb-Web Model. Price determination in Perfect Competition and Monopoly. Pricing under Monopolistic Competition.

Pricing under Duopoly- The Cournot Model and the Stackelberg Model. Collusive Oligopoly. Kinked Demand Curve Model. Bilateral Monopoly.

Unit IV

Macro Economic Analysis

Employment and Output Determination with fixed and flexible Prices (IS-LM, Aggregate Demand and Aggregate Supply Analysis. Concept of Static and Dynamic Multiplier and Accelerator, Samuelson and Hicks Trade cycle model.

Harrod Domar Growth Model; Neoclassical growth model of Solow, Meade , Kaldor Model growth models with technological progress; Endogenous Growth Model of Romer and Harris-Todaro Model of Rural-Urban Migration.

Unit V

Operational Research Analysis

Linear Programming – Basic concepts and Solution of LPP through Simplex Method, Primal and Dual problem, Game Theory – Concept of Game, Two Person Zero Sum Game, Pay-off Matrix, Pure and Mixed Strategies, Maximin in and Minimax criteria and Saddle Point, Non-constant Sum Game, Prisoner's Dilemma, Linear Programming Equivalence.

Input-Output Model – Static and Dynamic Model, Closed and Open Input Output Model, Solution of Input Output Model, Hawkins Simon conditions

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Reading List:

1. Allen, R.G.D. (1974) – Mathematical Analysis for Economists, Macmillan Press and ELBS, London.
2. Arrow, K. J. and M. Intrigator (Eds.) (1982) – Handbook of Mathematical Economics, Vol. I, II and III, North Holland, Amsterdam.
3. Chiang, A.C. (1986) – Fundamental Methods of Mathematical Economics, McGraw Hill, New York.
4. Henderson, J. M. and R. E. Quandt (1980) – Microeconomic Theory: A Mathematical Approach, McGraw Hill, New Delhi.
5. Madnani, G.M.K. (2008) – Mathematical Economics, Oxford and IBH Publishing Co. Pvt. Ltd., New Delhi.
6. Madnani, G.M.K.- Arthshastra Me Ganit Ke Prayog (Hindi Version).

7. Mankiw, N. G. and D. Romer (Eds.) (1991) – New Keynesian Economics (2 Vols.), MIT Press, Cambridge, Mass.
8. Mehta, B. C. (1987) – Mathematical Economics: Microeconomic Models. Sultan Chand and Sons, New Delhi.
9. Mehta, B.C. and G.M.K. Madnani (2008) – Mathematics for Economists, Sultan Chand and Company, New Delhi.
10. Nash, J. F. (1996) – Essays on Game Theory, Cheltenham, U.K.
11. Sydsaeter K.and P. Hammond (2002). Mathematics for Economic Analysis, Pearson Educational Asia, Delhi.