PONDICHERRY UNIVERSITY
SYLLABUS FOR ENTRANCE EXAMINATION
(Ph. D in AGRICULTURAL ECONOMICS)

MICRO ECONOMIC THEORY AND APPLICATIONS

Basic Concepts and Consumer Choice

Scarcity and Choice – Theory of Consumer Behaviour – Cardinal and ordinal utility approaches – Utility maximization under indifference curve approach – Graphical and mathematical approaches – Income effect and substitution effect -normal and inferior goods- Engel Curve - Applications of Indifference curve analysis – Indirect utility function – Hicks and Slutsky theorem - Consumer'surplus,Labour-leisuremodelandcomparisonofincomesupportvs. Food subsidy policies. Revealed Preference Hypothesis. Derivation of demand curve from utility maximization problem– Demand functions – Elasticity of demand.

Theory of Production and Costs

Production functions: single variable - average and marginal product, variable proportions, stages of production. Two variables - isoquants, returns to scale and to a factor; factor prices; Technical progress; cost minimization and output maximization; Elasticity of substitution. Expansion path and the cost function Concept of economic cost; Short run and long run cost curves; increasing and decreasing cost industries; envelope curve; L-shaped cost curves; economies of scale; revenue and expenditure, elasticity and marginal revenue; Firm equilibrium and profit – Economics of Uncertainty.

Market Forms

Behavior of profit maximizing firms and the production process- Perfect competition: Equilibrium of the market. Long run industry supply, applications: effects of taxes and subsidies; Monopoly: Equilibrium; supply; multi-plant firm; monopoly power; dead weight loss; price discrimination; Monopolistic Competition: Product differentiation; equilibrium of the firm in the industry-with entry of new firms and with price competition. Comparison with pure competition. Duoploy: Cournot model and reaction curves; Stackelberg's model, Bertrand model; Oligopoly.

Factor Markets

Theory of distribution – Marginal productivity theory of distribution in perfectly competitive markets - Labour and land markets - basic concepts (derived demand, productivity of an input,marginalproductivityoflabour,marginalrevenueproduct);demand for labour; input demand curves; shifts in input demand curves; competitive labour markets; Economic rent and quasi rent

General Equilibrium and Welfare Economics

General Equilibrium Theory – 2X2X2 general equilibrium model. Derivation of general equilibrium conditions using Edgeworth box approach and mathematical approach. Welfare Economics – Pareto Optimality – Social welfare criteria – Uncompensated and compensated Consumer Welfare - Arrow's General Possibility Theorem – Amartya Sen's Capability Approach to well-being.

AGRICULTURAL PRODUCTION ECONOMICS

Concepts of Production Economics

Nature, scope and significance of agricultural production economics – Agricultural Production processes, character and dimensions - spatial, temporal – Centrality of production functions, assumptions of production functions.

Production Functions

Commonly used forms - Properties, limitations, specification, estimation and interpretation of commonly used production functions.

Factors and Theory of Production

Factors of production, classification, interdependence, and factor substitution. Determination of optimal levels of production and factor application – Optimal factor combination and Least Cost Combination of production – Theory of product choice; selection of optimal product combination.

Concepts of Cost

Cost functions and cost curves, components, and cost minimization – Duality theory–cost and production functions and its applications – Profit function and its estimation – Derivation of firm's Input demand and output supply functions – Economies and diseconomies of scale.

Dynamics of Economic Assessment

Technology in agricultural production, nature and effects and measurement – Measuring efficiency in agricultural production; technical, allocative and economic efficiencies-Yield gap analysis -concepts- types and measurement - Nature and sources of risk, modelling and coping strategies.

AGRICULTURAL MARKETING AND PRICE ANALYSIS

Agricultural Marketing: Concepts & Problems

Review of Concepts in Agricultural Marketing – Characteristics of Agricultural product and Production – Problems in Agricultural Marketing – Demand based, Supply based and Institutional based. Market intermediaries and their role – Need for regulation in the present context – Marketable & Marketed surplus estimation. Marketing Efficiency – Structure Conduct and Performance analysis – Vertical and Horizontal integration – Integration over space, time and form – Vertical co-ordination - Box-Jenkins Model.

Aspects of Agricultural Marketing

Different Forms of marketing: Co-operatives Marketing – APMC Regulated Marketing – Direct marketing, Farmer Producer Companies, e-NAM and marketing under e-NAM, e-marketing / m-marketing - Contract farming and Retailing, Organized retailing - Supply Chain Management –State trading, Warehousing and other Government agencies – Performance and Strategies –Market infrastructure needs, performance and Government role – Organised retailing – Value Chain Finance – Logistic functions – Marketing mix, segmentation, Consumerism and consumer rights.

Use of Information Technology

Role of Information Technology and telecommunication in marketing of agricultural commodities - Market research – Market information service – electronic auctions (e-bay), e-Chaupals, AGMARK net and Domestic and Export market Intelligence Cell(DEMIC)–Latest developments in Online marketing – Market led extension.

Dynamics of Price

Theory of storage – storage decision making – Spatial and temporal price relationship – price forecasting – time series analysis – time series models 'spectral analysis – Price discovery – Price policy and economic development–non-price instruments.

Future marketing and Government

Introduction to Commodities markets and future trading - Basics of commodity futures – Operation Mechanism of Commodity markets – Price discovery - Hedging and Basis - Fundamental analysis – Technical Analysis –Role of Government/ SEBI in promoting commodity trading and regulatory measures - Recent marketing reforms - EXIM Policy- Role of WTO – Agreement on Agriculture – Recent trends in agricultural export and imports.

MACRO ECONOMICS AND POLICY

Introduction: Measurement and Concepts and Classical Macro Economics

Basic concepts and scope of Macro-economics, National Income Accounting: Methods of measurement of key macro-economic aggregates, relationship of national income and other aggregates (with numerical exercises), real and nominal income. Say's Law, Quantity Theory of Money, aggregate labour supply and demand of labour, Classical theory of determining output, wages and prices.

Income and Spending: Keynesian Framework

Simple Keynesian model of income determination; Keynesian Multiplier- aggregate spending, taxation, transfer payments, foreign spending, balanced budget; budget surplus (with numerical exercises).

Theories of Aggregate Consumption and Investment

Absolute Income Hypothesis, Relative Income Hypothesis, Fisher's Inter-temporal Choice Model, Life-Cycle and Permanent Income Hypotheses; Profits and Accelerator Theory.

Money, Interest, Income and Inflation

Money and classical theories of Money and Price – Keynesian theory of money and Friedman Restatement theory of money - Supply of Money - Supply of Money – Crypto Currency and Block chain technology, - Public Finance, Tax policies, Excise duty, GST, Goods market equilibrium - IS curve; Demand for Money, the Liquidity Preference Theory – Liquidity Trap; asset market equilibrium- LM curve; simultaneous equilibrium in goods and asset market - effect of fiscal and monetary policy Central banking. Inflation: Nature, Effects and control; Types of inflation – demand pull, cost push - stagflation, core inflation, hyperinflation; Phillips curve.

Inflation, Unemployment and Balance of Payment

International Trade - Balance of Payment – Foreign Exchange Rate determination - Business cycles

APPLIED ECONOMETRICS

Introduction to CNLRM & OLS

Introduction – relationship between economic theory, mathematical economics, models and Econometrics – centrality of hypothesis testing – methodology of econometrics –correlation & regression analysis.

Estimation of Regression and Test of Significance

Basic two variable regression model – assumptions, estimation and interpretation – approaches to estimation – OLS methods and its properties – extensions to multivariable models – multiple regression estimation and interpretation.

Violation of CNLRM Assumptions

Violation of regression assumptions – Testing for the presence of multicollinearity - Zero-order correlation matrix - Auxiliary regressions - Eigen values, condition index and Variance inflation factor. Consequences and remedial measures for multicollinearity. Heteroscedasticity problem –Diagnostic techniques to identify Heteroscedasticity – Graphical method – Park test - Goldfeld – Quandt test and White's test. Consequences and remedial measures for heteroscedasticity - Weighted least Squares and transformation of original model - The problem of autocorrelation – Diagnostic techniques for autocorrelation – Graphical method, Durbin – Watson 'd' test – Breusch – Godfrey Test – Consequences and remedial measures for autocorrelation.

Dummy Variables and Panel Data

Dummy variable regression models – intercept and slope dummy – interaction dummy estimation and interpretation – Dummy dependent variable models – Linear probability models, logit and probit models-estimation and interpretation.

Simultaneous Equations & Multivariate Analysis

Simultaneous equation models – structural equations – reduced form equations – identification and approaches to estimation.

AGRICULTURAL FINANCE AND PROJECT IMPACT ANALYSIS

Basic concepts: A Review

Role and Importance of Agricultural Finance. Financial Institutions and Credit Flow to Rural/ Priority Sector. Agricultural Lending – Direct and Indirect Financing – Financing through Co-operatives, NABARD, Commercial Banks and RRBs. District Credit Plan and Lending to Agriculture /Priority Sector. Capital Formation in Agriculture. Non-banking financial institutions, Small finance banks. Recent Banking Reforms and its Impact on Agriculture. Digitization of banking sector. Micro-Financing and Role of

MFI's - NGO's and SHGs/ JLGs. Financial Inclusion – Credit Linked Rural Development Programmes.

Appraisal of Farm Credit Proposals

Lending to farmers – The concept of 3C's, 7P's and 3R's of credit. Estimation of Technical Feasibility, Economic Viability and Repaying Capacity of Borrowers and Appraisal of Credit Proposals. Understanding lenders and developing better working relationship and Supervisory Credit System. Overdue Problem – Causes, Consequences and Mitigating Measures. Credit Rationing. Credit Inclusion – Credit Widening and Credit Deepening. Macro finance assessment.

Farm Financial Analysis

Financial Decisions – Investment, Financing, Liquidity and Solvency. Preparation of financial statements - Balance Sheet, Cash Flow Statement and Profit and Loss Account. Ratio Analysis and Assessing the performance of farm/firm.

Project Overview and Impact Analysis

Project Approach in Financing Agriculture. Project cycle - Identification, Preparation, Appraisal, Financing and Implementation of Projects. Project Appraisal – Financial, Economic and Environmental Appraisal of Investment Projects. Project Appraisal Techniques –Undiscounted Measures. Time Value of Money – Use of Discounted Measures – NPV, B-C Ratio, IRR, Modified IRR and Sensitivity analysis. Agreements, Supervision, Monitoring and Evaluation phases in Appraising Agricultural Investment Projects. Net Work Techniques – PERT and CPM. Project Impact Evaluation - meaning, Prospective versus Retrospective Impact Evaluation, Ethical Considerations - Impact evaluation for policy decision; Preparing for an evaluation - Initial Steps, Constructing a Theory of Change, Specifying Evaluation Questions, Selecting Outcome and Performance Indicators; Methods of Impact Evaluation – Causal Inference and Counter factuals, Randomized Assignment, Instrumental Variables, Regression Discontinuity Design, Difference-in-Differences, Propensity Score Matching.

Risks and its Management

Risks in Financing Agriculture. Risk Management Strategies and Coping Mechanism. Crop Insurance Programmes – Review of Different Crop Insurance Schemes - Yield and Weather Based Insurance Schemes and their Applications – PMFBY and its features – Information asymmetry in Farm financing – Adverse selection and Moral hazard issues.

LINEAR PROGRAMMING

Introduction of LP

Decision Making – Concepts of decision making. Introduction to linear programming, uses of LP in Different fields, graphic solution to problems, Different form of LP.

Methods of Solving LP

Simplex Method: Concept of simplex Method, solving profit maximization and cost minimizations problems. Formulation of farms and non-farm problems as linear programming models and solutions.

Duality in LP and Sensitivity Analysis

Extension of Linear Programming models: Duality theory – definition of dual Problems – Duality Theorems – Dual simplex method – Primal dual method. Sensitivity analysis. Transportation problems.

Game Theory

Game Theory – Concepts of game theory, two-person constant sum, zero sum game, saddle point, solution to mixed strategies, the rectangular game as Linear Programming.

Risk Programming

Risk and Uncertainty – Planning under Risk – Risk programming – MOTAD – Data Envelopment Analysis (DEA).

RESEARCH METHODOLOGY FOR SOCIAL SCIENCES

Concepts of Research Methodology

Importance and Scope of Research in Agricultural Economics. Types of Research – fundamental vs Applied Research. Qualitative vs Quantitative Research. Concept of Researchable Problem – Research Prioritization–Selection of Research Problem.

Research Process and Hypothesis

Approaches to Research – Research Process. Project Proposals – Contents and Scope – Different Types of Projects to Meet Different Needs – Trade-Off Between Scope and Cost of the Study. Review of Literature-online sources. Purpose Statement. Research Design and Techniques – Types of Research Design. Framing and Testing Hypothesis – Meaning – Characteristics – Types of Hypothesis - Setting of Objectives and Hypotheses –testing of hypothesis.

Sampling

Sampling Theory and Sampling Design – Sampling Error – Methods of Sampling – Probability and Non-Probability Sampling Techniques – Criteria to Choose. Sampling Distribution –z, t, χ^2 and F.-Methods of Conducting Survey – Reconnaissance Survey and Pre-Testing.

Data Collection

Data Collection – Assessment of Data Needs – Sources of Data Collection – Discussion on Sampling under Different Situations. Participatory Rural Appraisal (PRA) Technique. Experimental methods-Randomized Control Trails–Natural Experimental methods and Quasi Natural Experimental Methods, Mailed Questionnaire and Interview Schedule – Structured, Unstructured, Open Ended and Closed Ended Questions. Scaling Techniques. Preparation of Schedule – Problems in Measurement of Variables in Agriculture. Interviewing Techniques and Field Problems – online survey methods.

Data Analysis and Report Writing

Coding, Editing – Tabulation – Validation of Data. Tools of Analysis – Data Processing. Hypotheses-Testing of Hypothesis – Parametric and Non–Parametric Testing. Multivariate analysis–factor analysis 'PCA' cluster analysis. Interpretation of Results – Preparing Research Report/ Thesis–Universal Procedures for Preparation of Bibliography – Writing of Research Articles – publication ethics - plagiarism–reference management.