

Paper II**Agriculture (Degree Standard)****Code: 491****Unit I: Importance of Agriculture (10 Questions)**

Importance of Agriculture in Indian Economy and its sectoral relationship - Agricultural Development through five year plans in India and Tamil Nadu - Growth pattern of crops in India and Tamil Nadu in terms of area, production and productivity - Government Agricultural Policies – Agricultural development through NITI AAYOG – import and export – role of NSC, FCI and PDS - Sustainable Developmental Goals.

Unit II: Fundamentals of Crop Production (20 Questions)

Factors of Production - Agricultural seasons of India and Tamil Nadu - Cropping patterns in India and Tamil Nadu - package of practices of different crops – Agro-Climatic zones of India and Tamil Nadu and their features - Weather and Climate - Weather forecasting – Remote sensing and GIS application - Climate change and its impact – Minimal tillage practices – Stress mitigating technologies including microorganisms – Nanoparticles and their applications – Natural farming and Bio-inoculants – Organic certification and standards – Drone technology in Agriculture.

Unit III: Natural Resource Management (20 Questions)

Soil - Soil structure - Factors influencing soil structure - Physical and Chemical properties - Effect of nutrient availability and plant growth – Soil health - Problem soils and their management - Soil survey - its objectives and scope - Soil fertility and productivity – Soil testing – Chemistry of Macro and Micro Nutrient – Soil health - Integrated Nutrient Management - Dry farming - Rainfed agriculture - Conservation of soil and water - Watershed and waste land development. Land use pattern and planning - Size and distribution of holdings - types and systems of farming - Water resources development and management - Command area development - Ground water Development and Conjunctive use - Water use efficiency - Quality of irrigation water - Its effect in soil and crops - Management of poor quality water for crop growth.

Unit IV: Crop Management & Allied Agricultural Activities (24 Questions)

Cropping systems and integrated farming - Recycling of agricultural waste - Organic manures, green manures, bio fertilizers - Balanced usage - integrated nutrient management - Physiological disorders in crop plants and their management - Plant growth regulators – Regulation of flowering – Classification of stresses – Physiological adaptation of crop plants for abiotic stress - Irrigation management of different crops, Mushroom cultivation, bee keeping, silkworm rearing etc., Energy in Agricultural production - Sources - Solar, wind, animal,

biomass and biogas - Mechanization in agriculture - Tractors & tillers - Agricultural implements and Machineries and their usage - livestock and poultry rearing.

Unit V: Crop Improvement (26 Questions)

Principles of breeding - Breeding methods in self, cross and vegetatively propagated crops - Modern tools in crop improvement – Heterosis breeding and Hybrid seed production technologies – Synthetic and composites – Breeding for biotic, abiotic and quality traits. Latest varieties of major crops in Tamil Nadu – Variety release procedures - Application of bio technology in Agriculture - Tissue culture & its significance - Transgenic Plants - Marker assisted selection – Markers - mapping population - speed breeding - Plant Genetic Resources: Collection, conservation and exchange- Crop varietal protection-PPV& FR authority and its role.

Unit VI: Seed Science and Technology (20 Questions)

Seeds - Importance of quality seeds in Agriculture – Nucleus, Breeder, foundation, certified and labelled seeds – Characterisation of good quality seeds - Seed certification techniques and processing in Tamil Nadu - Seed testing – Seed testing laboratories-ISTA standards for seed testing - seed village concept Seed Act - Seed coating and priming technologies - Seed enhancement technologies – Varietal deterioration of crops – causes and maintenance – Post harvest handling of seeds.

Unit VII: Crop Protection Principles and Practices (24 Questions)

Importance of pest, disease, nematodes and weed management in agriculture – categories of pests, diseases, nematodes and weeds - pest and disease surveillance and weather forecasting on pest and disease incidence - Symptoms of damages, biology and control measures of pest, disease and nematodes of major crops in Tamil Nadu - Integrated pest, disease and nematode management in crop production - Pesticides and their use in IPM – mode of action - Pattern - plant protection equipments and their use - Plant quarantine - Storage pests, disease and nematodes and their management - Importance of biological control in pest, disease and nematode management - Weeds - Major weeds and their control – Pollinators and their safety – Banned and Next generation agro-chemicals.

Unit VIII: Farm Business and Finance Management (20 Questions)

Farm business management - Principles of farm business management – Types and systems of farms Classical Production Functions - Cost concepts - Management of resources - Farm Planning and budgeting - Investment analysis – Risk and uncertainties in Agriculture - Agricultural credit system in India - Multi credit delivery system - Role of nationalized banks, NABARD and Regional Rural Banks - Lead Bank Scheme - Service area approach - Scale of finance-Credit Worthiness-3Rs,5Cs and 7Ps of credit Crop Insurance - Kisan Credit Cards (KCC) - Agricultural Insurance Company.

Unit IX: Agricultural Marketing and Market Intelligence (20 Questions)

Marketing - Agricultural marketing - Market structure – Marketing Efficiency - Price Spread- Market Integration-Market Risk-Speculation and hedging - Market Institutions- Warehouses and rural godowns - Agmark-Cooperatives - Commodity Boards – Agri business management – Farmer Producer Organisations and Agri-business incubation - Principles of Management- Entrepreneurship - Development - Forms of Business organizations - Agricultural Price Policy - CACPMSP - FRP- Procurement Price Policies for agricultural development - Economic liberalization - WTO and its impact on agricultural export - IPR – APEDA – International trading in agricultural commodities - Importance of Agriculture in Indian economy - Land size and distribution of holdings and land use pattern in Tamil Nadu - Agriculture under Five Year Plans (FYPs) - Food Security - Public Distribution Systems (PDS) - Buffer Stock.

Unit X: Agricultural Extension: Principles and Methods (16 Questions)

Extension methods for transfer of technology - AV aids-Communication models - Use of ICT in transfer of technology-Diffusion and adoption- Pre and post independent rural development initiatives: key features, strength and weakness of individual programmes - Programme planning and evaluation methods- Rural sociology - key features of Indian rural system-value system-social change- rural migration. Role of women in Agriculture – Social organisations and Non-Governmental organisations – Extensions / Agricultural Developmental programs by ICAR / Government –e-Agriculture and Digital Tools.