SYLLABUS

for

RURAL AGRICULTURE EXTENSION OFFICER (RAEO)

Total Question -100 Total Marks -100

AGRICULTURE

History of Agricultural development. Agricultural related revolutions. Area Production, Productivity of different crops, fertilizer consumption, irrigation in India and Chhattisgarh. National and International Agricultural Research Organizations in India and Chhattisgarh.

AGRONOMY :

Definition, scope and importance and its relationship with other sciences. Agro-climatic zones of India and Chhattisgarh. Classification of Crops. Factors affecting crop production. Tillage. Cropping system, Farming system. Crop Rotation, Crop diversification. Sustainable Agriculture. Rainfed farming, Dry farming. Agronomical methods of water conservation. Contingent plans for aberrant weather conditions. Package of Practices of field crops: Origin, geographic distribution, economic importance, soil and climatic requirement, varieties, cultural practices, yield and fertilizer, weed, insect pest and disease Management of Cereals, Pulses, Oilseeds, major Fiber crops, major forage crops, cash crops.

WATER MANAGEMENT :

Irrigation: definition and objectives, water resources and irrigation development in India and Chhattisgarh; Soil plant water relationships. Methods of soil moisture estimation, evapo-transpiration and crop water requirement; effective rainfall, scheduling of irrigation; Methods of irrigation; measurement of irrigation water, Irrigation efficiency and water use efficiency. Water requirements of different crops. Watershed management-definition and concept. Drainage-importance and methods.

AGRICULTURAL METEOROLOGY & CROP PHYSIOLOGY :

Definition, Scope and practical utility. Atmosphere, its composition and properties. Weather and climate, Global warming. Cyclone and anti cyclones. Weather hazards. Seed Physiology, Physiological maturity, Harvestable maturity, Seed viability & vigour, Germination, Crop Water Relations, Transpiration, Photosynthesis, Respiration, Plant Growth Regulators, C3 and C4 plants.

ENTOMOLGY AND PATHOLOGY :

Morphology, Systematic & Ecology of insects (major cereals, pulses & oilseeds of Chhattisgarh), Integrated Pest Management & Beneficial Insects, Stored Grain Pests and storage structures, Plant Pathogens and their classification, Introductory Nematology.

SOIL SCIENCE :

Pedological and edaphological concepts, Weathering, Soil formation, Components of soils, Soil profile, Soil physical properties, soil of Chhattisgarh, land capability classification, Soil-water Relationship, Humus, C: N ratio. Essential Plant Nutrients : Role, Available Forms, mobility, deficiencies and toxicities, Problematic soils and their management, Soil fertility and productivity. Factors influencing Fertilizer Use Efficiency (FUE). Different types of manures and fertilizer.

GENETICS AND PLANT BREEDING :

Mendel's laws of inheritance and exceptions to the laws; Types of gene action, Multiple alleles, Pleiotropism, Penetrance and expressivity; Cytoplasmic inheritance, Mutation, Concepts of DNA and RNA. Classification of plants, Botanical description, Floral biology, Emasculation and Pollination techniques. Modes of reproduction, Modes of pollination. Hybridization. Heterosis. Mutation breeding. Introduction & Importance of Seed Production, Characters of good quality seed, Different classes of seed, seed Enforcement Laws.

EXTENSION EDUCATION AND AGRICULTURAL EXTENSION :

Meaning, Definition, Scope and Importance. Social Stratification. Social Values and Attitudes in Agricultural Extension. Differences between Community Development and Extension Education. Agricultural Development Programmes. Communication.

ECONOMICS :

Meaning, Definition, Divisions of Economics; Agricultural Economics: Meaning, Definition; Basic Concepts. Principles of Demand and Supply. Production Economics and Farm Management.

Basic Concepts of Livestock and Pisciculture.

HORTICULTURE :

Definition and importance of Horticulture, Division of Horticulture, package & practices (Origin, Climate, economic importance, Soil, Varieties, Water, Fertilizer, weed, Disease & Insect Management, Yield) of fruit crops, Plantation crops, vegetable crops, root crops, tuber crops, perennial vegetables, flowers, aromatic & medicinal plants with reference to Chhattisgarh. Protected cultivation and post harvest-technology of horticultural crops. Principles & method of training and pruning of fruit crops, types & use of growth regulators in horticulture, ornamental gardens, rejuvenation of old orchards. Cropping systems, Intercropping, multitier cropping, mulching. Concepts of Seed production and plant propagation-methods and their merits & demerits, nursery techniques, apomixes, propagation structures, principles of landscape gardening & orchard management. Importance of water management in horticultural crops, irrigation scheduling, method of irrigation. Irrigation management in different types of soil, water requirement of horticultural crops.

BIOTECHNOLOGY :

Introduction & Importance, Nature of genetic material, nucleic acids, DNA replication, Sex determination, Linkage, Mapping, Chromosomes, Hereditary defects, Mutation, Plant Cell, Biochemistry & Metabolism of Carbohydrates, Lipids & Proteins, Enzymes & Vitamins. Biosynthesis metabolism, Introduction of terpenoids, alkaloids, phenolics and their applications in food and pharmaceuticals industries.

AGRICULTURE ENGINEERING :

Surveying & leveling - Types, equipments & methods, Irrigation-Classification of projects, water sources, water lifting devices, irrigation measurement & instruments, Soil erosion & their types and engineering control measures. Equipments & machines- Tillage, Inter-culture, plant protection & harvesting, land development & soil Conservation, post harvest management for agricultural & horticultural produces.