

## OPTIONAL SUBJECT

### AGRICULTURE

Agriculture, its importance in national economy, Factors determining agro-ecological zones and geographic distribution of crop plants.

Importance of crop plants, cultural practices for cereal, pulses, oilseed, fibre, sugar, tuber, and fodder crops and scientific basis for these crop rotations, multiple and relay cropping, intercropping and mixed cropping.

Soil as medium of plant growth and its composition mineral and organic constituents of the soil and their role in crop production, chemical, physical and micro-biological properties of soils. Essential plant nutrients (macro and micro) their functions, occurrence, cycling in soils. Principles of soil fertility, and its evaluation for judicious, fertilizer use. Organic manures and bio-fertilizers inorganic fertilizers, integrated nutrient management.

Principles of plant physiology with reference to plant nutrition, absorption, translocation and metabolism of nutrient.

Diagnosis of nutrient deficiencies and their amelioration, photosynthesis and respiration, growth and development, auxins and hormones in plant growth.

Cell and Cell organelles . Cell division, Reproductive cycle, Principles of genetics, gene-interaction, sex determination, linkage and recombination, mutation, extrachromosomal inheritance, polyploidy. Origin and domestication of crop plants. Genetic resources- conservation and utilization. Floral biology in relation to selfing and crossing. Genetic basis of plant breeding, pureline selection, mass selection, male sterility and incompatibility and their use in plant breeding. Pedigree back-cross method of selection. Heterosis and its exploitation. Development of hybrids composites and synthetics. Important varieties, hybrids, composites and synthetics of major crops. Seeds and seed production techniques.

Important fruit and vegetable crops of India, method of propagation-sexual and asexual. Package and practices and their scientific basis. Crop rotation, intercropping companion crops, role of fruits and vegetables in human nutrition, post-harvest handling and processing of fruits and vegetables. Landscaping and ornamental horticulture, commercial floriculture, Medicinal and aromatic plants.

Serious pests and diseases affecting major crops. Principles of control of crop pests and diseases, integrated management. Proper use and maintenance of plant protection equipment.

Principles of economics as applied to agriculture. Farm planning and optimum resource-use efficiency and maximising income and employment. Farm systems and their spatial distribution, their significant roles in regional economics development.