PAPER – 3 (AG-I, AG II & AG III)

AG – I: AGRICULTURAL PHYSICS AND CHEMISTRY

Agricultural Physics

Unit, measurement, Vernier, screw gauge, Force-analysis, force parallelogram, momentum of force, equilibrium of forces, velocity and acceleration, speed, laws of motion, gravitational motion, acceleration due to gravity, circular motion, Centrifugal and centripetal forces, pressure, Capillary force and tension, atmospheric surface-barometer, Boyle"s law, friction and simple example of its laws, Working of common pumps, operation, performance, power and energy, heat and temperature, radiation, convection and conduction, heat conductance, specific heat in relation to solids, physical change in the solid due to heat, latent heat, relationship between heat and work, dewpoint, relative humidity and its determination, formation of clouds, fogfrost, snow and halls, weather and its forecasting.

Agricultural Chemistry

Matter - solid and liquid, physical and chemical changes, element, mixture, compound, laws of chemical combination, laws of conservation, laws of proportion, laws of gases, explanation of above laws in reference to atomic principle, atomic laws, new & old concepts, definition, simple explanation and inter-relationship of the following:

Valency, atomic weight, molecular weight, equivalent weight, structure of atom, Avogadro's hypothesis and its uses, ionic theory, difference between atom and ion, explanation of the following with the help of ionic theory, electrolysis, acid, alkali, salt, water, hydrolysis and neutralisations, oxidation and reduction, classification of elements.

Inorganic Chemistry: Water and its hardness, methods of treatment of hard water and soft water, occurrence of compounds, properties and uses of the followings elements nitrogen, ammonia, nitric acid, carbon, carbondioxide, phosphoric acid, sulphurdioxide, sulphuric acid, chlorine, hydrochloric acid. Occurrence properties, uses and their functions in the plants of the following: Sodium, sodium chloride, sodium hydroxide, sodium carbonate, sodium bicarbonate, sodium phosphate, sodium nitrate, potassium sulphate, Calcium, calcium oxide, calcium carbonate, calcium sulphate and calcium nitrate, Iron, sulphate and iron phosphate, aluminium, aluminium sulphate and aluminium phosphate Nitrogen cycle, Fixation of nitrogen in the soil, function of Super-phosphate and phosphorus in plant, nitrogen fertilizers.

Organic Chemistry: Formation of organic compounds, physical properties, nomenclature, general knowledge of the following compounds, simple formulae, general properties and main uses, Structural formula of the following: Hydrocarbon (saturated and unsaturated) alcohol ethylalchol and glycol, aldehyde and ketones, formaldehyde, acetone, amine and oxide, methyl and ethylamine, urea, Acids: acetic, benzoic, lactic, Oxalic acids, fats and oils, soap and saponification, carbohydrates, glucose, fructose, starch, simple methods of making benzene and phenol and their properties.

AG – II: AGRICULTURAL ENGINEERING AND STATISTICS

Agricultural Engineering

Properties of different materials used in agricultural implements, Classification of plough their merits, comparison, common troubles in their operation and precautions, maintenance, assembly, cost and conparasion of cultivation harrow, hoe, float, scraper and seed drill, draft of implements. Their measurements, factors affecting draft. Water lifts, their discharge, capacities, command area, and cost of irrigation (water lifts should include common water lifts and low lift pumps). Tillage and ploughing,

types of ploughing and their merits. Types and objects tillage. Chemical and Physical effects of tillage practices for different crops. Transmission of power through gears. Pulleys and belts, hand operated chaff cutters, cane crusher, winnowing fan, and splad threshers.

Agricultural Statistics

Collection of data, classification and tabulation, frequency distribution, mean and their kinds, merits and demerits. Measurements of dispersion.

AG – III: AGRONOMY & AGRICULTURAL BOTANY

Agronomy

Crops: Cultivation, practices of common crops of India and their varieties..
Soils: Origin, classification and physical properties of soils, soil conservation.

Manures And Manuring: Nutrients for plants growth, uptake of N.P.K. organic and inorganic fertilizers, farmyard and green manures, their properties and method of application, knowledge of following manures and fertilizer: FYM, compost, urinated soil, castor and groundnut cake, ammonium sulphate, sodium nitrate, suoer phosphate, potassium sulphate, urea, CAN ammonium chloride and mixtures.

Irrigation & Drainage: Methods, measurement and type of irrigation and drainage systems, Cultivation practices of common vegetable and fruit crops.

Agricultural Botany

External morphology of plants, function and modification of stem, root and leaves, structure and function of different parts of flower, type of inflorescence, pollen and pollination, classification, structure, germination and disperasal of seeds, type of function and their dispersal, internal morphology of plant cell, reproductive organs of angiosperms, knowledge of structure of rlltharis, Absorption, Respiration, Transpiration and carbon assimilation, root pressure, Translocation of foods and storage, Introductory knowledge of Taxonomy and plant kingdom specilly Regional and Horticultural plants laminaries, Cruciferease, Leguminaceae, Cucurbitaceae, Solonaceae, Malbaceae, Elementry Knowledge of mosses, ferns, mucors, bacteria.