

**SCHEME AND SYLLABUS OF EXAMINATION FOR THE PURPOSE OF
FILLING UP THE POST OF WDO/ADO/HDO IN THE SIKKIM STATE
AGRICULTURE SERVICE**

1. The examination will consist of 2 papers:-

PAPERS	SUBJECT	FULL MARKS	TIME ALLOWED
PAPER-I	General English & General Knowledge	100 MCQ	2.00 hours.
PAPER-II	Agriculture	300 MCQ &Conventional	3.00 hours.
VIVA-VOCE		- 50 marks	

2. PAPER-I: GENERAL ENGLISH

The question will be designed to test the candidate's understanding and command of the English language. The patterns of questions would be broadly as follows:-

- (1) Comprehension of given passage.
- (2) Grammar.
- (3) Usages and Vocabulary

General Knowledge: Knowledge of current events of local, National and International importance.

3. PAPER -II: Agriculture

AGRONOMY

Agro climatic zones of India and Sikkim and Crop distribution.

seeds and sowing, tillage and tilth, crop density and geometry, Crop nutrition, manures and fertilizers, nutrient use efficiency, water resources, soil-plant-water relationship, crop water requirement, water use efficiency, irrigation- scheduling criteria and methods, quality of irrigation water, logging. Weeds- importance, classification, crop weed competition, concepts of weed management principles and methods, herbicides- classification, selectivity and resistance, allelopathy. Growth and development of crops, factors affecting growth and development, plant ideotypes, crop rotation and its principles, adaptation and distribution of crops, crop management technologies in problematic areas, harvesting and threshing of crops.

Definition and objective of crop rotation intensity of cropping multiple cropping, inter cropping, rain fed cropping, mixed cropping, cropping system and farming system.

Details of Crop Production Technology- Cereals, Pulses, oilseeds.

Plant Physiology

Absorption of water and its movement inside plant. Factors affecting solute absorption and transpiration, evapotranspiration, mineral nutrition, enzymes and enzymic activity in different physiological process, carbon assimilation, respiration and photorespiration, nitrogen and fat metabolism, growth hormone and their importance in Agriculture/Horticulture photoperiodism and vernalisation and their importance in Agriculture.

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GENETICS AND PLANT BREEDING

Cell component, concept of cytoplasmic inheritance mutation, evolution, elementary concept of gene, gene action, DNA, RNA. Principle of inheritance, interaction of gene and modification of F₂ ratios, linkage and crossing over. Plant breeding as modern science, classification of crops according to breeding behavior. Application of breeding method. Application of principle of plant breeding to the improvement of major crops like rice, wheat, maize, pulses and oil seeds.

SOIL SCIENCE

Composition of soil, soil texture, soil structure, soil water. Soil colloids-mineral and organic, their natures and properties. Concept of soil PH. Development of acid/alkali soil.

Organic matter-humus, its formation nature and properties, CN ratio in soil and its significance. Important biological process in soil, amination, Ammonification, Nitrification, denitrification and nitrogen fixation.

Concept of soil productivity and fertility Essential elements for plant, their forms availability and function. Deficiency symptom of nutrients in plant. Fixation and release of nutrient in soil, classification of nutrient. Factors affecting loss of plant nutrient.

Nitrogen fixation, symbiotic and non sym-biotic. Biofertilizers and their use. Chemical fertilizers, organic manures- their composition, classification, method of application. Different types of soil micro-organism Decomposition of organic matter in soil. Concept of soil profile, details study of soil profile. Land capability classification, soil survey, definitions, purpose and types.

PLANT PATHOLOGY

Concept of disease in plant, importance of plant disease. Classification of plant disease. Various parasitic and non parasitic, causes of plant disease. Diagnosis of plant disease. Stages of disease development i.e. inoculation penetration, infection, invasion, growth and reproduction, affect of environment including adaphic factors in plant disease. Principles of disease management. Concept of integrated control measure.

Common disease of major field crops, major pulses and oil seeds. Their causal organism, disease symptom and control measures. Importance of microbiology classification of microorganism different types of bacteria, brief classification of bacteria structure and classification of moulds and virus. Antibiotics and antibodies. Microbiology of soil and water air, and food. Antibiotics and antibodies.

Nematodes their pathogenesis, relationship with other microorganism.

ENTOMOLOGY AND NEMATOLOGY

Different types of harmful and useful insects. Identification nature and extent of damage caused by insect, life history, seasonal occurrence management practices of major part of field crops, pulses and oilseeds. Productive insect with special reference to sericulture, apiculture and lac culture. Stored grain pest and their control, rodent and their control measures. Different method of pest control with special reference to IPM, classification of pesticides and their physical, chemical and biological properties, types of formulation, insecticide and precautionary measures. Different types of plant protection equipments their maintenance and use in the field.

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EXTENSION EDUCATION

Definition, meaning, objective of extension. Extension organization in India, importance of extension education in Agriculture and Rural Development. Teaching learning process. Classification and characteristics of extension reading methods, factors of influencing selection combination and use of extension teaching method. Role of AV aids in extension. Process and planning and evaluation. Basic concept of Extension Reform- ATMA, KVK. Participatory approaches in Agriculture Extension.

AGRIL. ECONOMICS AND FARM MANAGEMENT

Basic concept like wants goods, wealth, welfare value price, consumption, exchange factors of production, law of diminishing return. Farm of business organization. National income, per capita income.

Basic concept of economic and Agril. Economics, Division of Agril. Economics, importance of the subject.

Farming system and types of Farm, Diversified farming and mixed farming. Intensity of cropping, Hazard in Agriculture and economic developments.

Importance of farm management its relationship with other science. Advantages of Farm records and accounts.

System of book keeping. Types of Farman record and act physical of financial. Principles involved in Farm Management decision. Management of Farm labour and wage record. Planning labour, use for higher efficiency estimation of different kind of labour required in farm. Cost of production and return to Farm. Cost of fencing, irrigation, Farm layout. Agriculture marketing cooperation.

Problems of acquisition and organization of Farm.

AGRIL. ENGINEERING

Scope of farm mechanization-benefits and limitation, sources of farm power, IC engines, elementary, knowledge about tractors, types and system soil tillage implements inter-culture, implements/equipments harvesting and threshing equipments. Soil-plant water relationship. Drainage engineering, surveying and leveling. Introduction of post harvest and technology, grain storage, processing. Field structures and practices to control erosion by water. Different system of soil and water conservation.

Organic Farming

Declaration and strategies for attending organic farming in Sikkim. Basic concept on principles of organic farming. Vermicomposting, green manuring, recycling of organic residues, Biofertilizers, PGPR, Microbial consortium ; Soil improvement and amendments; Use of biocontrol agents, biopesticides pheromones, trap crops, bird perches; Weed management; Certification, Quality considerations, labeling and accreditation processors, marketing, exports.

Horticulture Course

Study organic production technology of major fruit crops viz. Kiwifruit, pear, plum, pomegranate, strawberry, mango, litchi, guava, papaya, banana etc.

High density planting, canopy management, training and pruning methods in fruit crops, rootstocks and propagation, fruit varieties etc.

Organic production technology of major vegetable crops viz. Cole crops, leafy vegetables, root vegetables, tomato, potato, beans etc.

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Organic production technologies of major spices viz. Large cardamom, ginger, turmeric, cherry pepper,

Nutrient management in organic production system by using different organic nutrient sources viz. Vermicompost, FYM, poultry manure, goat manure, green manure etc.

Organic management of disease and pests in fruits and vegetable crops.

Effect of climate change on fruits and vegetable crops production.

About post harvest management viz. Cool chain, pre-cooling unit, packaging houses, short and long term cold stores etc.

Methods for quick transfer of developed technologies/ extension activities.

Marketing floriculture, Bee keeping Mushroom, Medicinal plants, Bamboo management, water management, rejuvenation of orange orchard, management of cardamom plantation.

Organic farming and certification system

History and definition of Organic Farming

Principles, concept and types of Organic Farming

Advantages and disadvantages of Organic and Conventional Farming system

On farm organic inputs and production technology. (Rural compost, vermin compost, madhyam compost, biodynamic compost, herbal compost, herbal tea, Jivamrit, panchagavya, jeevamrit, amritpani, bramashtra, biodynamic compost etc)

Role of microorganism and beneficial insects in organic farming system

Techniques of soil health management in organic farming

Technique of insect's pest and disease management in organic farming system

Organic standards and certification systems (NOPO, NOP, EU, JAS, IFOAM, DEMETER, Third party certification, Participatory guarantee system, Good agricultural practices and other quality parameters)

National Programme For Organic Production (Structure, National standard for organic production, Accreditation of Inspection and certification agencies, certification of grower groups and organic certification mark)

Accredited certification agencies and inspection and certification procedures and trading formalities of certified organic commodity

Organic worldwide movements and Development

(Dedicated organizations, organic development, organic trade, promotional activities, present status etc)