

**SYLLABUS FOR DIRECT RECRUITMENT OF JUNIOR GRADE OF  
MIZORAM AGRICULTURE SERVICE (MAS) AT LEVEL-10 IN THE PAY MATRIX**

<b>PAPER</b>	<b>SUBJECT</b>	<b>MARKS</b>	<b>DURATION</b>	
<b>Paper-I</b>	a) Current events of national and international importance b) History of India and Indian National Movement c) Indian and World Geography - Physical, Social, Economic Geography of India and the World d) Indian Polity and Governance - Constitution, Political System, Panchayati Raj, Public Policy, Rights Issues, etc. e) Economic and Social Development, Sustainable Development, Poverty, Inclusion, Demographics, Social Sector initiatives, etc. f) General issues on Environmental Ecology, Bio-diversity and Climate Change - that do not require subject specialization g) General Science h) General awareness on Mizo culture, its heritage and society	200	3 hrs	
<b>Paper-II</b>	a) Comprehension b) Interpersonal skills including communication skills c) Logical reasoning and analytical ability d) Decision-making and problem solving e) General mental ability f) Basic computer knowledge g) Basic numeracy (numbers and their relations, orders of magnitude, etc.), Data interpretation (charts, graphs, tables, data sufficiency, etc.) (Class X level) h) English Language Comprehension skills (Class XII level)	200	3 hrs	
<b>Paper-III</b>	Agronomy	50	200	3 hrs
	Soil Science	40		
	Horticulture	30		
	Plant Protection	40		
	Plant Physiology/ Crop Physiology	40		
<b>Paper-IV</b>	Seeds & Seed Production Technology	50	200	3 hrs
	Plant Breeding and Genetics	30		
	Farm Power and Machineries	30		
	Agricultural Extension	50		
	Agricultural Economics, Marketing and Post Harvest Technology	40		

**Note:** All questions in Paper I, II, III & IV shall be set in Multiple Choice Questions (MCQ), each question carrying 2 (two) marks.

**DETAILED TOPICS FOR PAPER-III & PAPER-IV  
FOR JUNIOR GRADE OF MIZORAM AGRICULTURE SERVICE [LEVEL-10 IN THE PAY  
MATRIX (56100 - 124500)] UNDER AGRICULTURE DEPARTMENT**

**PAPER-III (AGRICULTURE-I) (200 marks)**

**a) Agronomy (50 marks)**

National policy on Agriculture, importance of Agriculture in national economy, principles of Agronomy, crop ecology, geography and Agricultural Meteorology. Agronomy - meaning and scope, National & International Agricultural Research Institutes in India, Agro climatic zones of India, Tillage and intercultural operations, implements for ploughing, nursery management, Organic farming, Precision farming, Integrated farming systems, Principles of crop ecology and crop adaptation, climate shift and its ecological implications, Agro-ecological regions in India, Geographical distribution of crop plants, Greenhouse effect, Climatic factors and their effect on plant processes and crop productivity, Role of GIS and GPS in agriculture. Weather & Climate, Atmospheric temperature and global warming, Weather forecasting.

Origin, distribution, economic importance, soil and climatic requirement, varieties, cultural practices and yield of cereals, pulses, oilseeds, fiber crops, fodder & forage crops and commercial crops.

Weed management : Principles of weed management, classification, biology and ecology of weeds, crop weed competition and allelopathy, concepts and methods of weed control, Integrated weed management, classification, formulations, selectivity and resistance of herbicides, herbicide persistence in soil and plants, application methods and equipments.

**b) Soil Science (40 marks)**

Soil as a medium for plant growth, composition of earth's crust, weathering of rocks and minerals, components of soil - their importance, soil profile. Soil physical properties - density, porosity, texture, soil structure and their brief descriptions. Factors affecting soil temperature, its importance in plant growth. Cation exchange capacity, anion exchange capacity, buffering of soils. Problem soils - acid, saline and sodic soils - their characteristics, formation, problems and management.

Soil fertility and fertilizers : Essential plant nutrients and their deficiency symptoms, concept of essentiality of plant nutrients, indicators of soil fertility and productivity, fertilizer materials and their availability to plants, slow release fertilizers, principles and methods of fertilizer application, Integrated Nutrient Management, methods of soil sample collection, soil testing and fertilizer recommendations. Soil classifications - major soils of India, soil micro-organisms, classification and their roles. Organic matter decomposition, C:N ratios, mineralization and immobilization process, humus, role of organic matter in soil quality. Soil erosion, types and control measures. Fertilizers and manures - classifications, NPK fertilizers, their reactions in soils, green manuring, recycling of organic waste, composting. Characteristic features of Biofertilizers.

### **c) Horticulture (30 marks)**

Meaning & definition of horticulture, branches of Horticulture, classification of fruits, vegetables. Major fruit crops and their culture, major vegetable crops and their culture, Spices and condiments, floriculture, medicinal and aromatic plants, plantation crops, fruits and vegetables preservation, kitchen gardening. Methods of plant propagation. Harvesting, storage, processing, value addition and marketing of fruits and vegetables. Major pests and diseases and their control of Horticulture crops.

### **d) Plant Protection (40 marks)**

Classification of Animals, classification of insect-pests, principles of pest management, pesticides and their formulation, fungicides and bactericides, plant protection equipments and spraying techniques, Bio-pesticides, Integrated Pest Management (IPM), Integrated disease management. Major insect pests and diseases of agricultural crops like cereals, pulses, oilseeds, commercial crops and their management, Biological control of crop pests.

### **e) Plant Physiology/Crop Physiology (40 marks)**

Plant physiology - importance in agriculture. Seed germination, viability and vigour. Photosynthesis - significance of C-3, C-4 and CAM pathway; photorespiration and its implications. Translocation of assimilates; dry matter partitioning; Harvest index of crops. Growth and development; growth analysis; crop-water relationship. Plant nutrients and their functions. Phytohormones and their physiological role. Photoperiodism, vernalisation; pollination/fertilization in flowering plants. Post-harvest physiology and its significance.

## **PAPER-IV (AGRICULTURE-II) (200 marks)**

### **a) Seeds & Seed Production Technology (50 marks)**

Definition of seeds, seed certification techniques and processing, Seed testing laboratories, ISTA standards for seed testing, Seed village concept and Seed Act, production techniques of quality seeds, seed hybridization, principles of plant breeding and genetics, GM seeds, HYV, Hybrid seeds. Seed sampling : principles and procedures, Seed storage and packaging. Intellectual Property Rights – Protection of Plant Varieties and Farmers Act (PPVFRA) and Geographical Indications.

### **b) Plant Breeding and Genetics (30 marks)**

Plant breeding as a dynamic science, genetic basis of Plant Breeding - classical, quantitative and molecular, plant breeding in India-limitation, major achievement, sexual reproduction (cross and self pollination), asexual reproduction, pollination control mechanism (incompatibility, sterility and implications of reproductive systems on population structure). Hybridization and selection, breeding techniques. Heterosis-concepts, estimation and its genetic basis.

### **c) Farm Power and Machineries (30 marks)**

Equipments for Tillage and seed bed preparation, seeding and planting machineries, Intercultural and Plant protection equipments, Harvesting and threshing machineries, Weeders, Power Tillers and Tractors.

#### **d) Agricultural Extension (50 marks)**

Extension Education - concept, meaning, principles, philosophy, scope and importance; Extension programme planning. Principles of teaching and learning, teaching and learning process, Steps in Extension teaching, Extension Teaching methods and its classification, Participatory Rural Appraisal (PRA), Monitoring and evaluation process. Diffusion and adoption, Role of women in Agriculture. Communication, principles, concepts, process, elements and barriers in teaching methods. Communication - Key elements and models of Communication, Communication through written forms, different kinds of communication methods, media and Audio Visual aids/materials. Kisan Call Centers, teleconferencing, agriculture journalism, diffusion and adoption of innovations-adopter categories, capacity building of extension personnel and farmers - training to farmers, women and rural youth.

#### **e) Agricultural Economics, Marketing and Post harvest Technology (40 marks)**

Basic principles of farm management, concept of farming system and economics of farming systems, agricultural production economics-scope and analysis, factor-product relationship, marginal cost and marginal revenue, farm planning and budgeting, Agricultural finance : nature and scope. Time value of money, compounding and discounting. Agricultural credit: meaning, definition, need and classification. Credit analysis : 4R's, 5C's and 7 P's of credit, repayment plans. History of financing agriculture in India. Commercial banks, nationalization of commercial banks. Lead bank scheme, regional rural banks, scale of finance. Higher financing agencies, RBI, NABARD, AFC, Asian Development Bank, World Bank, role of capital and credit in agriculture; credit institutions, co- operatives and agrarian reforms in India.

Agricultural marketing - role, practice, institutions, problems and reforms, role of capital and credit in agriculture, crop insurance, credit institutions, cooperatives, capital formation in agriculture, agrarian reforms, globalization, WTO & its impact on Indian agriculture.

Post harvest losses, post harvest operations and value addition, post harvest technology of cereals, coarse cereals, pulses, oilseeds, tuber crops and spices.

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