

प्रदेश लोक सेवा आयोग

सुदूरपश्चिम प्रदेश

प्रदेश निजामती सेवा र स्थानीय सरकारी सेवा अन्तरगत कृषि सेवा (एगृ एक्सटेन्सन, हर्टिकल्चर, एग्रोनोमी, प्लान्ट प्रोटेक्सन, एगृ.इको. एण्ड मार्केटिङ र स्वाइल साइन्स समुह), अधिकृत सातौं तह वा सो सरह पदको आन्तरिक, अन्तर सेवा र खुला प्रतियोगितात्मक परीक्षाको पाठ्यक्रम

यस पाठ्यक्रम योजनालाई निम्न अनुसार दुई चरणमा विभाजन गरिएको छ :

प्रथम चरण : लिखित परीक्षा (Written Examination)

पूर्णांक : २००

द्वितीय चरण : (क) सामूहिक परीक्षण(Group Test)

पूर्णांक : १०

(ख) अन्तरवार्ता(Interview)

पूर्णांक : २५

**परीक्षा योजना (Examination Scheme)**

प्रथम चरण : लिखित परीक्षा (Written Examination)

पूर्णांक : २००

पत्र	विषय	खण्ड	पूर्णांक	उतीर्णांक	परीक्षा प्रणाली		प्रश्न संख्या × अंक	समय
प्रथम	सामान्य विषयवस्तु (General Subject)	<b>Part I :</b> General Awareness and General Ability Test	१००	४०	वस्तुगत (Objective)	बहुवैकल्पिक प्रश्नहरू (MCQs)	५० प्रश्न x १ अंक	१ घण्टा ३० मिनेट
		<b>Part II :</b> General Technical Subject					५० प्रश्न x १ अंक	
द्वितीय	प्राविधिक विषयवस्तु (Technical Subject)		१००	४०	विषयगत (Subjective)	छोटो उत्तर लामो उत्तर	४ प्रश्न x ५ अंक ८ प्रश्न x १० अंक	३ घण्टा

द्वितीय चरण : सामूहिक परीक्षण (Group Test) र अन्तरवार्ता(Interview)

पूर्णांक : ३५

पत्र/विषय	पूर्णांक	उतीर्णांक	परीक्षा प्रणाली	समय
सामूहिक परीक्षण (Group Test)	१०	-	सामूहिक छलफल(Group Discussion)	३० मिनेट
अन्तरवार्ता(Interview)	२५	-	बोर्ड अन्तरवार्ता(Board Interview)	-

द्रष्टव्य :

- लिखित परीक्षाको माध्यम भाषा नेपाली वा अंग्रेजी अथवा नेपाली र अंग्रेजी दुबै हुनेछ ।
- प्रथम र द्वितीय पत्रको लिखित परीक्षा छुट्टाछुट्टै हुनेछ ।
- वस्तुगत बहुवैकल्पिक प्रश्नहरू (Multiple Choice Questions) को गलत उत्तर दिएमा बापत २० प्रतिशत अंक कट्टा गरिनेछ । तर उत्तर नदिएमा त्यस बापत अंक दिइने छैन र अंक कट्टा पनि गरिने छैन ।
- बहुवैकल्पिक प्रश्नहरू हुने परीक्षामा कुनै प्रकारको क्याल्कुलेटर (Calculator) प्रयोग गर्न पाइने छैन ।
- बिषयगत प्रश्नहरूको हकमा तोकिएको अंकको एउटा लामो प्रश्न वा एउटै प्रश्नका दुई वा दुई भन्दा बढी भागहरू (Two or more parts of a single question) वा एउटा प्रश्न अन्तर्गत दुई वा बढी टिप्पणीहरू (Short notes) सोध्न सकिने छ ।
- द्वितीय पत्रमा प्रत्येक खण्डका लागि छुट्टाछुट्टै उत्तर पुस्तिकाहरू हुनेछन । परीक्षार्थीले प्रत्येक खण्डका प्रश्नहरूको उत्तर सोही खण्डको उत्तर पुस्तिकामा लेख्नु पर्नेछ ।
- यस पाठ्यक्रम योजना अन्तर्गतका पत्र/विषयका विषयवस्तुमा जेसुकै लेखिएको भए तापनि पाठ्यक्रममा परेका कानून (एन, नियम) तथा नीतिहरू परीक्षाको मिति भन्दा ३ महिना अगाडि संशोधन भएका वा संशोधन भई हटाईएका व थप गरी संशोधन भई कायम रहेकालाई यस पाठ्यक्रममा परेको सम्झनु पर्दछ ।
- प्रथम चरणको परीक्षा बाट छनौट भएका उम्मेदवारहरूलाई मात्र द्वितीय चरणको परीक्षामा सम्मिलित गराइनेछ ।
- पाठ्यक्रम लागु मिति : २०८०।१०।०८ गते देखि

प्रदेश लोक सेवा आयोग

सुदूरपश्चिम प्रदेश

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प्रथम चरण : लिखित परीक्षा (Written Examination)

प्रथम पत्र (First Paper): सामान्य विषयवस्तु (General Subject)

**Part (I): General Awareness and General Ability Test**

1. नेपालको संविधान तथा सान्दर्भिक कानूनहरू

[15 Marks]

- 1.1 नेपालको संविधान, २०७२ (भाग १ देखि ५ सम्म र अनुसूचीहरू)
- 1.2 कर्मचारी समायोजन ऐन, २०७५
- 1.3 सार्वजनिक खरिद ऐन, २०६३ र नियमावली, २०६४
- 1.4 सुदूरपश्चिम प्रदेशको कृषि तथा पशुपन्छी व्यवसाय प्रवर्द्धन ऐन, २०७६ र नियमावली, २०७९
- 1.5 सुदूरपश्चिम प्रदेश सार्वजनिक खरिद नियमावली, २०७८
- 1.6 सुदूरपश्चिम प्रदेशको आर्थिक कार्यविधि तथा वित्तीय उत्तरदायित्व ऐन, २०७९ र नियमावली, २०८०
- 1.7 सुदूरपश्चिम प्रदेशको सहकारी ऐन, २०७५ र नियमावली, २०७६
- 1.8 जीवनासक विषादी व्यवस्थापन ऐन, २०७६
- 1.9 सूचनाको हक सम्बन्धि ऐन, २०६४ र नियमावली, २०६५
- 1.10 सुदूरपश्चिम प्रदेश सुशासन ऐन, २०७५
- 1.11 सुदूरपश्चिम प्रदेश निजामती सेवा ऐन, २०७९
- 1.12 स्थानीय सरकार संचालन ऐन, २०७४
- 1.13 खाद्य अधिकार तथा खाद्य सम्प्रभुता सम्बन्धी ऐन, २०७५
- 1.14 मल नियन्त्रण आदेश, २०५५
- 1.15 बीउ बिजन ऐन, २०४५ र नियमावली २०६९
- 1.16 बिरुवा क्वारेन्टाईन तथा संरक्षण ऐन, २०६४ र नियमावली २०६६
- 1.17 सुदूरपश्चिम प्रदेश वातावरण संरक्षण ऐन, २०७७

2. General Awareness and Contemporary Issues

[15 Marks]

- 2.1 Physical, socio-cultural and economic geography and demography of Nepal
- 2.2 Major natural resources of Nepal
- 2.3 Geographical diversity, climatic condition and livelihood and lifestyle of people
- 2.4 Current periodical plan of Nepal and Sudurpashchim Province
- 2.5 Information on sustainable development, environment, pollution, climate change, biodiversity, science and technology
- 2.6 Governance system and Governments (Federal, Provincial and Local)
- 2.7 Functional scope of public services
- 2.8 Public service charter
- 2.9 Concept, objective and importance of public policy
- 2.10 Fundamental of management: Planning, organizing, directing, controlling, coordinating, decision making, motivation and leadership
- 2.11 Government planning, budgeting and accounting system
- 2.12 Major events and current affairs of national and international importance

## प्रदेश लोक सेवा आयोग

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### 3. General Ability Test

[20 Marks]

#### 3.1 Verbal Ability Test

Jumble words, series, Analogy, Classification, Coding-Decoding, Matrix, Ranking Order Test, Direction and Distance sense Test, common sense Test, Logical Reasoning, Assertion and Reason, statement and conclusions

#### 3.2 Numerical Ability Test

Series, Analogy, Classification, Coding, Arithmetical reasoning, operation, Percentage Ratio, Average, Loss and Profit, Time and Work, Data interpretation and Data verification

#### 3.3 Nonverbal/ abstract ability Test

Figure series, figure analogy, figure classification, figure matrix, pattern completion/finding analytical reasoning test, figure formation and analysis rule detection, water images, mirror images, cubes and dice & Venn diagram

### Part (II): General Technical Subject

#### 1. History and Current Status of Agriculture Sector in Nepal

[5 Marks]

- 1.1 History of Agriculture research and development in Nepal
- 1.2 Overview of Nepalese agriculture, current status and scope
- 1.3 Institutional arrangement of agriculture research, extension and education in Nepal
- 1.4 Agriculture Perspective Plan (APP) and its impact in Nepalese agriculture
- 1.5 Devolution of agriculture extension system and its impact in agriculture development
- 1.6 National Agriculture Census, 2078

#### 2. Agriculture Research, Extension and Education

[5 Marks]

- 2.1 Role of agriculture research in contemporary agriculture
- 2.2 Nepal Agriculture Research Council (NARC)
- 2.3 Agriculture education system in Nepal (Universities, Academic, Non-academic institutions)
- 2.4 Linkage and coordination among research, extension and education in Nepal
- 2.5 Public, private, NGOs, CBOs, agriculture co-operatives and farmer groups Involvement in research, extension and education
- 2.6 Participatory technology development, participatory planning, monitoring, evaluation and feedback

#### 3. Natural Resource, Environment Conservation, Climate Change and Disaster Management

[10 Marks]

- 3.1 Importance of natural resources conservation, utilization and management; Food security; employment generation and livelihood improvement in Nepal
- 3.2 Bio-diversity and Agro-biodiversity: Conservation and utilization for sustainable agriculture development
- 3.3 Use of fertilizers and pesticides in agriculture and their implications to Environment
- 3.4 Integrated pest and integrated crop plant nutrient management system (IPM, ICM, IPNM) and Good Agriculture Practices (GAP)
- 3.5 Environmental issues and sustainability of Nepalese agriculture
- 3.6 Organic agriculture and organic products for export promotion and food safety

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- 3.7 Weather observation and instruments use in Nepal
- 3.8 Climate change and its impact in agriculture sector
- 3.9 Climate change adaptation and mitigation strategies of Nepal
- 3.10 Disaster (landslide, drought, flood, cold spell, hailstorm, earthquake, pest outbreak) management in agriculture
- 3.11 Rapid urbanization and change in land use pattern and their consequence in food security, environment conservation, employment generation and youth migration
- 3.12 Crop insurance and agriculture Credit/Loan in Nepal: Current policies and status
- 4. Plan, Policies, Strategies & Global/ Regional Trade Agreement's in Agriculture [10 Marks]**
  - 4.1 Concept, goals, target and strategies of current periodic plan
  - 4.2 Planning, implementation, monitoring and evaluation in agricultural projects
  - 4.3 Local governance and its role in agriculture development
  - 4.4 National Agriculture Policy, 2061
  - 4.5 Agro-Biodiversity Promotion Policy, 2063
  - 4.6 Agri-business Promotion Policy 2063
  - 4.7 Agriculture Development Strategy (ADS) 2015-035 AD : Vision, mission targets, components and its salient features
  - 4.8 Provincial Agriculture Development Strategy (PADS) of Sudurpaschim Province 2079/80-2093/94 BS : Vision, mission targets, components and its salient features
  - 4.9 National Seed Vision 2013-2025 and its implementation status
  - 4.10 National Trade Integration Strategy (NTIS), 2016 –Agriculture commodities
  - 4.11 Agriculture Extension Strategy, 2061
  - 4.12 National Food Safety Policy, 2076
  - 4.13 National Agro-forestry Policy, 2076
  - 4.14 National Coffee Policy, 2060
  - 4.15 National Fertilizer Policy, 2058
  - 4.16 Land use Policy, 2072
  - 4.17 Agriculture Mechanization Promotion Policy, 2071
  - 4.18 Floriculture Promotion Policy, 2069
  - 4.19 Comparative advantage, agriculture commercialization and trading of Nepalese agricultural products
  - 4.20 Implications of Sanitary and Phyto-sanitary (SPS) measures in Nepalese Agriculture trade
- 5. Agriculture Technology and Management [20 Marks]**
  - 5.1 Importance of technology generation, verification and dissemination in crop production and management
  - 5.2 Seed quality assurance: Seed production, laboratory testing, processing, handling, marketing and storage
  - 5.3 Variety release and registration system in Nepal
  - 5.4 Food and nutrition security: Concepts, status and dimensions
  - 5.5 Importance of pest and pesticides management
  - 5.6 Integrated Pest Management (IPM) : Concepts and strategies
  - 5.7 Role of pollinators in crop production

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- 5.8 Importance of microbial agent (fungus, bacteria, virus ) in plant protection
- 5.9 Importance of crop diversification and commercialization in Nepal
- 5.10 Precision and protected agriculture: Concepts and technologies
- 5.11 Agricultural crop for agro-forestry and environmental protection
- 5.12 Strategies for commercialization and high value low volume commodities
- 5.13 Concept of soil fertility and productivity
- 5.14 Essential plant nutrients and their sources (manures and fertilizers)
- 5.15 Soil reaction (pH) and soil reaction improvement
- 5.16 Concept of Integrated Plant Nutrient System (IPNS) and its signification
- 5.17 Contemporary Agricultural extension practices in Nepal (plant clinic, mobile service, training and demonstration farm, farmer to farmer extension and pluralistic extension)
- 5.18 Role of Information and Communication Technology (ICT) in agriculture development
- 5.19 Agriculture markets and marketing in Nepal
- 5.20 Agricultural Management Information System (AMIS) in Nepal
- 5.21 linkage of agro industries with agriculture production and marketing
- 5.22 Role of cooperatives in agriculture development in Nepal
- 5.23 Research methodology in Agriculture (basic concepts, common designs and their application)
- 5.24 Trade liberalization and its implication in Nepalese agricultural product
- 5.25 Value chain development: Concepts and practices in agriculture
- 5.26 Postharvest management of agricultural commodities
- 5.27 Farming system and sustainable agriculture development
- 5.28 Gender Equity and Social Inclusion (GESI) and women's role in Nepalese agriculture
- 5.29 Conservation agriculture: Concept, principle and practice

ΩΩΩ

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प्रतियोगितात्मक परीक्षाको पाठ्यक्रम

द्वितीय पत्र (Paper Second) : प्राविधिक विषयवस्तु (Technical Subject)

Section (A) - 25 Marks

**1. Horticulture**

**1.1 Cultivation practices of major horticultural crops**

- 1.1.1 **Fruits (Tropical, Sub-tropical and Temperate):** Citrus (Citrus spp.), Banana (Musa acuminata), Papaya (Caricaa papaya), Mango (Mangifera indica), Litchi (Litchi chinensis), Apple (Malus pumila), Walnut (Juglans regia), Almond (Prunus dulcis), Pear (Pyrus communis), Pomegranate (Punica granatum), Pineapple (Ananas comosus), Kiwi (Actinida deliciosa), Dragon fruit (Selenicereus spp., Hylocereus spp.) Grape (Vitis vinifera) and Strawberry (Fragaria x ananassa)
- 1.1.2 **Vegetables including potato:** Root, tuber and bulb vegetables; Fruit vegetables; Cole crops; Cucurbits, Leguminous vegetables and leafy vegetables
- 1.1.3 **Spice crops :** Ginger (Zingiber officinale), Turmeric (Curcuma longa), Cardamom (Amomum sabulatum), Garlic (Allium sativum), Chilli/Hot pepper (Capsicum annuum var : annuum var and C: frutescens var. cerasiforme bailey)
- 1.1.4 **Flowers and ornamental plants :** Rose (Rosa spp.), Carnation (Dianthus caryophyllus), Gladiolus (Gladiolus spp.), Marigold ( Tagetes spp.) , Gerbera (Gerbera jamesonii) and Chrysanthemum (Chrysanthemum x morifolium)
- 1.1.5 Plantation crops : Arabica coffee (Coffea arabica)

**1.2 Variety development and Seed production technology**

- 1.2.1 Germplasm collection, variety development and maintenance breeding of major horticultural crops
- 1.2.2 Seed production zones of vegetable, potato and spices crops in Nepal
- 1.2.3 Classification and types of seeds focus on horticultural crops (breeder, foundation, certified and improved; Open pollinated, hybrids, True Potato Seed (TPS) and Pre-basic Seed (PBS)
- 1.2.4 Hybrid seed production and seed production practices of open pollinated horticultural crops varieties.
- 1.2.5 Seed quality control, seed certification procedures and seed standards of major horticultural crops in Nepal
- 1.2.6 Seed processing, packaging, labeling, storage and marketing of major horticultural crops in Nepal

**1.3 Nursery establishment and management of horticultural crops/plants**

- 1.3.1 Sexual and asexual propagation techniques of horticultural crops
- 1.3.2 Types of nurseries and their use in horticultural crops/plants production including hi-tech nurseries.
- 1.3.3 Use of root-stocks for horticultural crop propagation

## प्रदेश लोक सेवा आयोग

सुदूरपश्चिम प्रदेश

प्रदेश निजामती सेवा र स्थानीय सरकारी सेवा अन्तरगत कृषि सेवा (एग्ट एक्सटेन्सन, हर्टिकल्चर, एग्रोनोमी, प्लान्ट प्रोटेक्सन, एग्ट.इको. एण्ड मार्केटिङ र स्वाइल साइन्स समुह), अधिकृत सातौं तह वा सो सरह पदको आन्तरिक, अन्तर सेवा र खुला प्रतियोगितात्मक परीक्षाको पाठ्यक्रम

- 1.3.4 Care and management of nursery plants/saplings including mother plants (root-stock blocks)
- 1.4 **Plant growth and development of horticultural crops**
  - 1.4.1 Seed germination: mechanism and controlling factors
  - 1.4.2 Flowering, pollination, fruit set, fruit drop and fruit maturity
  - 1.4.3 Fruit ripening and senescence: mechanism and controlling factors
  - 1.4.4 Tuber and bulb formation: mechanism and controlling factors
- 1.5 **Modern technologies in horticulture**
  - 1.5.1 Organic farming, Soilless farming, Tissue culture technology, High Density Planting (HDP), Modern irrigation technologies and use of machineries in horticulture
  - 1.5.2 Precision and protected horticulture technology
  - 1.5.3 Urban farming technologies: roof top, vertical farming and home garden
  - 1.5.4 Use of Plant Growth Regulators (PGR) and hormones in horticulture
  - 1.5.5 Resource Conservation Technologies (RCT) in horticulture crop production
- 1.6 **Post-harvest management of horticulture crops**
  - 1.6.1 Post-harvest physiology: Transpiration, Respiration and ripening of horticultural commodities
  - 1.6.2 Causes (Biotic and Abiotic) of post-harvest loss and their management
  - 1.6.3 Storage of horticultural commodities: Principles, Importance and different storage structures
  - 1.6.4 Preservation of fruits and vegetables
- 1.7 **Processing, storage and marketing of horticultural crops**
- 1.8 **Importance and status of use of neglected and under-utilized horticultural crops/varieties**

### Section (B) – 25 Mark

## 2. Plant protection

### 2.1 General Plant Protection

- 2.1.1 Importance of crop pests & diseases
- 2.1.2 Climate change and its implications on crop pest & disease
- 2.1.3 Plant protection principle and approaches
- 2.1.4 Importance and issues of pest survey and surveillance in disease/pest forecasting
- 2.1.5 Types of sprayers, duster and seed treatment equipments
- 2.1.6 Use of equipments, calibration and dose calculation
- 2.1.7 Biological control of pests and diseases (Insect predator, pathogens & parasitoids)
- 2.1.8 Tools used for pest monitoring
- 2.1.9 Botanical formulations for pest & disease control
- 2.1.10 Type of Pesticide formulation
- 2.1.11 WHO classification of pesticide by hazard
- 2.1.12 Banned pesticides in Nepal
- 2.1.13 Safe use of pesticides

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- 2.1.14 Status of pesticide use in Nepal
- 2.1.15 Symptoms and treatment of pesticide poisoning
- 2.1.16 Different methods of pesticide residue monitoring
- 2.1.17 Weed management
- 2.1.18 Rodents and their management

### 3. Entomology

#### 3.1 Industrial Entomology

- 3.1.1 Importance of industrial entomology
- 3.1.2 Biology of silkworm and honey bee
- 3.1.3 Rearing of silk worm, and mulberry cultivation, and Bee farming (Honey production)

#### 3.2 Agricultural Insect Pests of National Importance and their Management

- 3.2.1 **Cereals:** Yellow rice stem borers (*Scirpophaga incertula*), Spotted stalk borer (*Chilo partellus*), Brown plant hopper (*Nilaparvata lugens*); Gandhi bug /Rice stink bug (*Leptocorisa oratorius*); Fall Armyworm (*Spodoptera frugiperda*), Soybean hairy caterpillar (*Spilarctia casignata*)
- 3.2.2 **Vegetables:** Black cut worm (*Agrotis ipsilon*), Pumpkin fruit fly (*Bactrocera cucurbitae*); Aphids (*Myzus persicae*; *Aphis fabae*; *A. gossypii*; *A. craccivora*; *Brevicoryne brassicae*); Red ant (*Dorylus orientalis*); White grubs (*Melolontha* spp., *Onthofagus* spp., *Holotrichia* spp.), Brinjal shoot and fruit borer (*Leucinodes orbonalis*); Large white cabbage butterfly (*Pieris brassicae*); Fruit borer (*Helicoverpa armigera*); Tobacco caterpillar (*Spodoptera litura*); Potato tuber moth (*Phthorimaea operculella*); White fly (*Bemisia tabaci*); South american leaf miner (*Tuta absoluta*), Okra shoot and fruit borer (*Earias vitella*)
- 3.2.3 **Cash Crops**
  - 3.2.3.1 White stem borer of coffee (*Xylotrechus quadripes*)
  - 3.2.3.2 Sugarcane plassey borer (*Chilo tumidicostalis*)
  - 3.2.3.3 Pink boll worm (*Pectinophora gossypiella*)
- 3.2.4 **Fruits**
  - 3.2.4.1 **Sub-tropical fruits:** Citrus Leaf minor (*Phyllocnistis citrella*), Citrus fruit fly (*Bactrocera dorsalis* and *B. minax*); Scale insects (*Saissetia aleae*, *Aonidiella aurantii*); Citrus green stinkbug (*Rhynchocoris humeralis*) and Citrus aphid (*Taxoptera* spp.), Pomegranate butterfly (*Virachola isocrates*), Citrus psylla (*Diaphorina citri*), Oriental fruit fly (*Bactrocera dorsalis*), Chinese citrus fly (*Batrocera minax*) and Litchi leaf curl mite (*Aceria litchii*)
  - 3.2.4.2 **Tropical fruits:** Mango hoppers (*Idioscopus clypealis*, *I. nitidulus* and *Amritodus atkinsoni*); Banana stem weevil (*Odoiporus longicollis*) and Banana rhizome weevil (*Cosmopolites sordidus*)
  - 3.2.4.3 **Temperate fruits:** Apple woolly aphid (*Eriosoma lanigerum*); San Jose scale (*Quadraspidiotus perniciosus*), plum leaf curl aphid (*Brachycaudus helicyssi*)
  - 3.2.4.4 **Ornamental and Flowers:** Red Spider Mite (*Tetranychus urticae*)



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### 4. Plant pathology :

- 4.1 Introduction and importance of plant diseases
- 4.2 Mechanism of infection by plant pathogen, Host Plant Resistance
- 4.3 Defense mechanisms of host plants
- 4.4 Genetics and disease resistance in plants
- 4.5 Plant disease epidemiology and forecasting
- 4.6 Agricultural Crop Diseases of National Importance and Their Management
  - 4.6.1 **Cereals :** Rice blast (*Pyricularia oryzae*), Bacterial blight (*Xanthomonas oryzae* pv. *oryzae*), Stalk rot (*Erwinia carotovora*), Leaf blight (*Helminthosporium turcicum*), Rusts (*Puccinia graminis tritici*, *P. triticina*, *P. striiformis* sp. *tritici*) and Loose smut (*Ustilago tritici*)
  - 4.6.2 **Vegetables and spices:** Late blight (*Phytophthora infestans*); Bacterial wilt /Brown rot (*Ralstonia solanacearum*); *Alternaria* leaf spot (*Alternaria brassicicola*, *A. brassicae*); Damping off of seedlings (*Pythium* spp., *Fusarium* spp.); Club root (*Plasmodiophora brassicae*); Root knot nematode (*Meloidogyne* spp.); Anthracnose (*Colletotrichum* spp.); Tomato yellow leaf curl virus; Rhizomes rot of ginger and cardamom (*Pythium* spp., *Fusarium* spp.), Potato leaf roll virus.
  - 4.6.3 **Fruits and others:** Foot and root rot (*Phytophthora citrophthora*, *P. nicotianae*); Citrus greening/Huanglungbing– (*Liberibacter asiaticus*); Pink disease (*Erythricium salmonicolor*), Citrus canker (*Xanthomonas citri*), Green/Blue fungal disease (*Penicillium digitatum*), Collar rot of citrus/Gummosis (*Phytophthora parasitica*/*P. citrophthora*), Tristeza disease (*Tristeza virus*), Scab (*Venturia inaequalis*); Powdery mildew (*Levullela taurica*); Panama wilt of banana (*Fusarium oxysporum*); Coffee rust (*Hemialeia vastatrix*); *Septoria* blight/leaf spot of marigold (*Septoria apicola*), Powdery mildew (*Acrosporium tingitanium*, *Oidium tingitaninum*), Anthracnose disease (*Colletotrichum gloeosporioides*)
- 4.7 **Other Problems And their Management**
  - 4.7.1 Alternate and irregular bearing in fruit crops and their management
  - 4.7.2 Fruit drop and splitting and their management
- 4.8 **Mushroom cultivation**
  - 4.8.1 Cultivated species of mushroom in Nepal
  - 4.8.2 Cultivation techniques of *Pleurotus* spp. and *Agaricus* spp.
- 4.9 **Laboratory Techniques & production**
  - 4.9.1 Isolation
  - 4.9.2 Culture and preservation
  - 4.9.3 Mounting & culturing
  - 3.9.4 Sterilization
  - 3.9.5 Different media used
  - 3.9.6 Production technique of *Metarhizium anisopliae*, *Beauveria bassiana* & *Trichoderma harzianum* T. *viridae*

प्रदेश लोक सेवा आयोग

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**Section (C) – 25 Marks**

**5. Soils, Soil Fertility and Plant Nutrition**

**[20 Marks]**

**5.1 General Information**

- 5.1.1 Physical Properties of soils (texture, structure, density, porosity, consistency)
- 5.1.2 Chemical Properties of soils (soil reaction, electric conductivity, cation exchange capacity, percentage base saturation, fertilizers and reclamation of problematic soil: Acidic & alkaline)
- 5.1.3 Biological Properties of soils (algae, fungi, actinomycetes, soil bacteria)
- 5.1.4 Role of Soil micro-organisms in ammonification, nitrification, denitrification and biological nitrogen fixation (Symbiotic and non-symbiotic relationship)
- 5.1.5 Soil organic matter and carbon nitrogen ratio
- 5.1.6 Soil forming process

**5.2 Plant Nutrition**

- 5.2.1 Essential plant nutrients and their functions
- 5.2.2 Visual symptoms of nutrient deficiencies and disorders
- 5.2.3 Nutrient cycle (C, N, P, and S) and its components
- 5.2.4 Improved soil fertility management
- 5.2.5 Integrated Plant Nutrient System (IPNS) and its significance in sustainable soil management in the Nepalese context.
- 5.2.6 Nutrient requirements, uptake mechanism
- 5.2.7 Symptoms of nutrient deficiency in various crops and their management
- 5.2.8 General soil fertility status of Nepal and major causes of declining soil fertility
- 5.2.9 Soil testing, plant analysis and diagnostic techniques

**5.3 Manures and Fertilizers**

- 5.3.1 Different types of chemical fertilizers and their application
- 5.3.2 Sources and types of organic manures
- 5.3.3 Bio-fertilizers, inoculants and their use in Nepalese agriculture
- 5.3.4 Fertilizers and manures available in Nepalese market and their use
- 5.3.5 Fertilizer regulation, marketing and quality control mechanism in Nepal

**5.4 Soil, Water and Plant Relationship**

- 5.4.1 Crop water requirements, evapo-transpiration, irrigation requirements and water balance
- 5.4.2 Hydrological cycle
- 5.4.3 Water infiltration and percolation
- 5.4.4 Soil permeability and Hydraulic conductivity
- 5.4.5 Saturation percentage, permanent wilting point, field capacity and plant available soil water
- 5.4.6 Soil moisture retention curve
- 5.4.7 Soil water management, water stress (drought, water logging)
- 5.4.8 Soil Erosion, Slopping Agriculture Land Technology (SALT) and terracing

## प्रदेश लोक सेवा आयोग

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### 5.5 soil survey

- 5.5.1 Importance of soil survey and types
- 5.5.2 General soil classification
- 5.5.3 Major soils of Nepal and their characteristics (suborder/great group levels of USDA taxonomy).
- 5.5.4 Soil fertility mapping and tools used

## 6. Agronomy

### 6.1 Basics of crop production

#### 6.1.1 Farming system

- 6.1.1.1 Introduction, system approach in agriculture, component/determinants of farming system
- 6.1.1.2 Farming System Research Methodology (FSR)
- 6.1.1.3 Framework of FSR methodology

#### 6.1.2 Resource Conservation Technologies (RCT) in crop production

#### 6.1.3 Tillage

- 6.1.3.1 Objective, significance and importance of tillage in crop production
- 6.1.3.2 Zero tillage, minimum tillage and optimum tillage
- 6.1.3.3 Condition of soil suitable for cultivation

#### 6.1.4 Seed Technology

- 6.1.4.1 Seed formation, development and physiology of seed
- 6.1.4.2 Seed quality and seed classes
- 6.1.4.3 Principles and practices of seed production
- 6.1.4.4 Seed processing, handling and storage
- 6.1.4.5 Seed testing principles
- 6.1.4.6 Seed certification procedures and seed standards of major crops in Nepal
- 6.1.4.7 Importance of Varietal Replacement and Seed Replacement Rate (SRR)
- 6.1.4.8 Seed self-sufficiency and seed production programs in Nepal

### 6.2 Crop production technology

- 6.2.1 Production practices of rice, maize, wheat, finger millet, lentil, soybean, chickpea, black gram, Mung bean/green gram, rapeseed, groundnut, sugarcane with respect to:
  - 6.2.1.1 Importance, distribution, origin and classification
  - 6.2.1.2 Morphology and growth stages
  - 6.2.1.3 Recommended varieties
  - 6.2.1.4 Climate and soil
  - 6.2.1.5 Cultural practices and post-harvest technology (with latest technologies and innovations )
- 6.2.2 Underutilized crops/varieties and their importance in food and nutritional security (finger millet, buckwheat, amaranthus, foxtail millet, beans and horse gram)

### 6.3 Plant breeding and research design

- 6.3.1 Definition, importance, history and achievement of plant breeding
- 6.3.2 Methods of crop improvement and breeding methods in field crops

## प्रदेश लोक सेवा आयोग

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- 6.3.3 Classification of crops according to mode of pollination
- 6.3.4 Germplasm collection, characterization, evaluation and utilization
- 6.3.5 Variety development procedure in Nepal
- 6.3.6 Maintenance breeding of varieties/germplasms.
- 6.3.7 Hybrid variety development and hybrid seed production.
- 6.3.8 Use of biotechnology in plant breeding
- 6.3.9 Research design and application

### Section (D) – 25 Marks

## 7. Agricultural Extension

### 7.1 Extension Education, Training and Leadership Development

- 7.1.1 Concepts, definition, principles, philosophy and objectives of extension education
- 7.1.2 Role and scope of extension education in Nepalese agricultural development
- 7.1.3 History of agricultural extension in Nepal
- 7.1.4 New direction of agricultural extension (subject matter specialist/SMS, privatization, pluralistic, collaboration, gender mainstreaming in agriculture, pocket package strategy/PPS, public private partnership/PPP), Farmer to farmer extension, Climate smart agriculture
- 7.1.5 Extension teaching methods and factors to be considered for selection of methods
- 7.1.6 Training need assessment, designing training module and training management
- 7.1.7 Leadership development and role of local leaders in Agricultural Extension

### 7.2 Communication, Innovation, Diffusion and Technology Transfer

- 7.2.1 Role of communication in agricultural extension
- 7.2.2 Communication models and Communication channels (mass media, inter personal, indigenous)
- 7.2.3 Information and Communication technologies (ICTs) and Agricultural Extension
- 7.1.3 Designing effective communication process
- 7.2.5 Barriers of effective communication
- 7.2.6 Innovation diffusion process
- 7.2.7 Adopter's categories and factors affecting rate of adoption
- 7.2.8 Development and transfer of technology and selection of appropriate technology
- 7.2.9 Models of transfer of technology (e.g. Conventional, Feedback Model, Farming System Research and Extension, Farmers' Field School/FFS)

### 7.3 Agricultural Extension System & Extension Program Planning

- 7.3.1 Agriculture extension Systems of Nepal in changing context
- 7.3.2 Role, responsibility and coordination among stakeholders involved in agricultural extension in Nepal
- 7.3.3 Effective extension program planning: Principles, importance and process in Nepalese context
- 7.3.4 Factors to be considered in executing extension program

## 8. Agricultural Economics

### 8.1 Principles of Economics

- 8.1.1 Basic concepts on demand and supply

## प्रदेश लोक सेवा आयोग

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- 8.1.2 Price and income elasticity of demand, cross elasticity of demand
- 8.1.3 Consumer's preference and indifference curve
- 8.1.4 Market classification and price determination under different market condition
- 8.1.5 Principles of production (production function, the law of diminishing return, isoquant, product curves, production possibility curves)
- 8.1.6 Cost of production (explicit and implicit costs, total, average, marginal, variable and fixed costs, economies and diseconomies of size and scale)
- 8.1.7 Comparative and competitive advantage

### 8.2 Agricultural Economics

- 8.2.1 Farm Management
  - 8.2.1.1 Scope and importance of farm management
  - 8.2.1.2 Farm budgets (total and partial budgeting).
  - 8.2.1.3 Cost and return analysis (Major food grains, cash crops and horticultural crops)
  - 8.2.1.4 Farm plan (Resources, constraints and optimization).
  - 8.2.1.5 Efficiency measure; farm inventory management and valuation
  - 8.2.1.6 Time value of money, compounding and discounting techniques
  - 8.2.1.7 Income and net-worth statement
- 8.2.2 Agricultural Marketing and Agri-business
  - 8.2.2.1 Concept, scope and role
  - 8.2.2.2 Characteristics of agricultural market and problems of marketing in Nepal
  - 8.2.2.3 Grading, standardization, quality control and related problems of agricultural commodities
  - 8.2.2.4 Value chain development in agriculture, Supply chain management in agriculture
  - 8.2.2.5 Business plan preparation
  - 8.2.2.6 Marketing of agricultural inputs (fertilizer, seeds, saplings, chemicals) and outputs (cereals, cash crops, fruits and vegetables) and other fresh as well as processed products
  - 8.2.2.7 Global and regional context of agricultural marketing and trade (WTO, SAFTA, Indo-Nepal trade)
  - 8.2.2.8 Commodity markets in agriculture

### 8.3 Agricultural Program Planning, Monitoring, Evaluation and Data Management

- 8.3.1 Concepts of agricultural planning, preparation of programs/projects, budgeting and project cycle
- 8.3.2 Feasibility studies of agricultural projects and use of B/C Ratio, IRR, Economic and Financial Rate of Return, Net Present Value
- 8.3.3 Risk and uncertainty
- 8.3.4 Monitoring and evaluation of agricultural programs/ projects
- 8.3.5 Logical framework in project planning and monitoring
- 8.3.6 Statistics and Survey Techniques
  - 8.3.6.1 Frequency distribution and measures of central tendency, bar and pie charts

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- 8.3.6.2 Computation of mean and standard deviation from grouped and ungrouped sets of Data.
- 8.3.6.3 Hypothesis testing and confidence interval
- 8.3.6.4 Regression and correlation analysis
- 8.3.6.5 Estimate of errors, control of error
- 8.3.6.6 Agriculture Census: Sample survey and its advantage over census survey
- 8.3.6.7 Source of sampling and non-sampling error and measures to minimize such errors, Sample design for collecting current agricultural statistics in Nepal
- 8.3.6.8 Rapid and Participatory Rural Appraisal (RRA and PRA) and crop cutting surveys

ΩΩΩ

**द्वितीय चरण (Second Phase) : सामूहिक परीक्षण (Group Test) र अन्तरवार्ता (Interview)**

**सामूहिक परीक्षण (Group Test)**

**(10 Marks)**

**सामूहिक छलफल (Group Discussion)**

यस प्रयोजनको लागि गरिने परीक्षण १० पूर्णाङ्क र ३० मिनेट अबधिको हुनेछ, जुन नेता बिहिन सामूहिक छलफल (Leaderless Group Discussion) को रूपमा अवलम्बन गरिने छ | दिइएको प्रश्न वा Topic का बिषयमा पालैपालोसंग निर्दिष्ट समय भित्र समुह बीच छलफल गर्दै प्रत्येक उम्मेदवारले व्यक्तिगत प्रस्तुति (Individual Presentation) गर्नु पर्नेछ

**सामूहिक छलफलमा दिइने नमुना प्रश्न वा Topic**

उदाहरणको लागि - उर्जा संकट, गरिबी निवारण, बाली बिमा, खाद्य सुरक्ष, प्रतिभा पलायन जस्ता समसामयिक विषयबस्तुहरुबाट कुनै एक Topic दिइनेछ |

**अन्तरवार्ता (Interview)**

**(25 Marks)**

बोर्ड अन्तरवार्ता (Board Interview)

ΩΩ THE END ΩΩ