

नेपाल सरकार  
नेपाल कृषि अनुसन्धान परिषद्  
पदपूर्ति समिति

**मुख्यवैज्ञानिक, एस-५, (Principal Scientist, S-5), सबै उपसमूहको आन्तरिक प्रतियोगितात्मक लिखितपरीक्षाको लागि पाठ्यक्रम**

यस पाठ्यक्रम योजनालाई दुई चरणमा विभाजन गरिएको छ ।

प्रथम चरण: लिखित परीक्षा (Written Examination)

पूर्णाङ्क: २००

द्वितीय चरण: अन्तरवार्ता (Interview)

पूर्णाङ्क: ३०

**१. प्रथम चरण (First Phase): लिखित परीक्षा (Written Examination)**

पूर्णाङ्क: २००

Paper	Subject	Mark	Full Mark	Pass Mark	No. Questions (Q)xMark (M) = Total Marks	Time Allowed
I	Part I: Management	20	100	40	2Q x 10M = 20 (Long Answer)	3.00 Hours
	Part-II: Agriculture Research and development Issues	80			6Q x 10M = 60 (Short Answer) 1Q x 20M = 20 (Long Answer)	
II	Technical Subject		100	40	5Q x 10M = 50 (Critical Analysis) 2Q x 25M = 50 (Problem Solving)	3.00 Hours

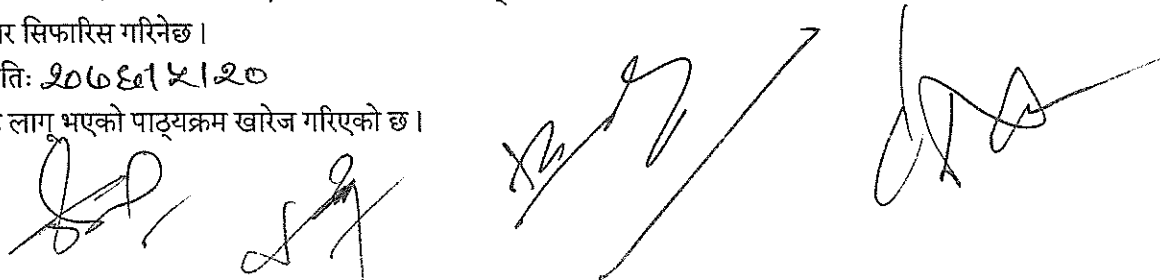
**२. द्वितीय चरण(Second Phase): Interview**

पूर्णाङ्क: ३०

Subject	Full Marks	System
Interview	30	Oral

**द्रष्टव्य:**

- यो पाठ्यक्रम योजनालाई प्रथम चरणमा लिखित परीक्षा र द्वितीय चरणमा अन्तरवार्ता परीक्षा गरी दुई चरणमा विभाजन गरिएको छ ।
- लिखित परीक्षाको माध्यम भाषा नेपाली वा अंग्रेजी अथवा नेपाली र अंग्रेजी दुबै हुन सक्ने छ ।
- समान पद/तहको प्रथम पत्र सबै उपसमूहको लागि पाठ्यक्रम एउटै भएको कारण एकिकृत परीक्षा सञ्चालन हुनेछ । तर द्वितीय पत्र Technical Subject को पाठ्यक्रम उपसमूह अनुरूप फरक फरक हुनेछ ।
- प्रथम र द्वितीय पत्रको लिखित परीक्षा छुट्टाछुट्टै हुनेछ ।
- प्रथम पत्रको Part-I र Part-II का लागि छुट्टाछुट्टै एक एक वटा उत्तर पुस्तिका हुनेछन् ।
- परीक्षामा कुनै प्रकारको विद्युतीय उपकरण तथा क्याल्कुलेटर (Calculator) प्रयोग गर्न पाइने छैन ।
- यस पाठ्यक्रम योजना अन्तर्गतका पत्र/विषयका विषयबस्तुमा जेसुकै लेखिएको भएतापनि पाठ्यक्रममा परेका कानून, ऐन, नियम, विनियम तथा नीतिहरू परीक्षाको मिति भन्दा ३ महिना अगाडि (संशोधन भएका वा संशोधन भई हटाइएका वा थप गरी संशोधन भई) कायम रहेकालाई यस पाठ्यक्रममा परेको सम्झनु पर्दछ ।
- पाठ्यक्रममा भएका यथासम्भव सबै पाठ्याशंहरूबाट प्रश्नहरू सोधिने छ । प्रथम चरणको लिखित परीक्षाबाट छनौट भएका उम्मेदवारहरूलाई मात्र द्वितीय चरणको अन्तरवार्तामा सम्मिलित गराइने छ ।
- प्रथम चरणको लिखित परीक्षाबाट छनौट भएका उम्मेदवारको प्राप्ताङ्क र द्वितीय चरणको अन्तरवार्तामा प्राप्त गरेको अंक जोडी योग्यताक्रम अनुसार सिफारिस गरिनेछ ।
- पाठ्यक्रम लागू मिति: २०७६।२।२०
- यस भन्दा अगाडि लागू भएको पाठ्यक्रम खारेज गरिएको छ ।



मुख्यवैज्ञानिक, एस-५, (Principal Scientist, S-5), सबै उपसमूहको आन्तरिक प्रतियोगितात्मक  
लिखितपरीक्षाको लागि पाठ्यक्रम

**Paper: I**

**Management and Agricultural Research and Development  
(Common For all Sub-groups)**

**Part-I: Management**

**A. Management:**

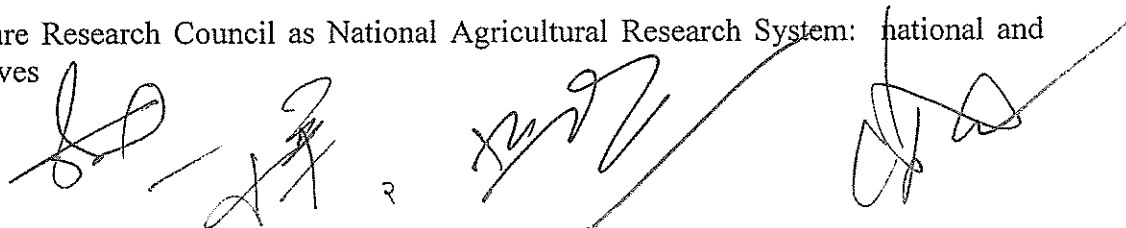
1. Concept, principles, functions, scope, challenge, leadership style
2. Participative Management: concept, opportunity, techniques of participation
3. Conflict management: concept, approaches to conflict, levels of conflict, causes of conflict and strategies for conflict management
4. Stress management: Concept, causes and sources of stress, techniques of stress management

**B. Finance and Human Resource:**

1. Human resources management: concepts, approaches and functions
2. Leadership: concept, opportunity and functions
3. Coordination: concept, need, types, techniques and approaches for effective coordination
4. Motivation: Concept, theories of motivation, reasons for low productivity, techniques of employ motivation
5. Decision making: importance, types, rational process of decision process
6. Financial management: concept, approaches, budget formulation, and implantation, auditing and reporting

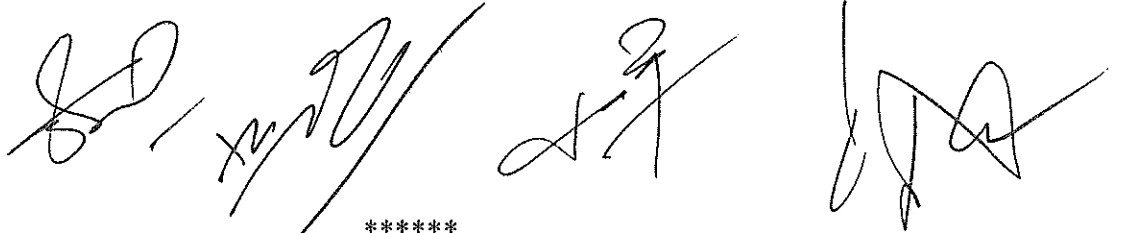
**Part-II: Agriculture Research and Development Issues**

1. Constitution of Nepal: Food, agriculture and natural resources related issues
2. Current national agricultural policies, strategies and plans: National Agriculture Policy, Agricultural Biodiversity Policy, Climate Change Policy, Agriculture Development Strategy (ADS), Seed Vision, Poultry Policy, Pasture Policy and Floriculture Promotion Policy and agriculture related issues in periodic plan
3. Nepal Agriculture Research Council as National Agricultural Research System: national and global perspectives



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4. International Agricultural Research Organizations: CGIAR and IARCS - CIAT, CIMMYT, CIP, ICRISAT, ICARDA, World Fish, ICRAP, IFPRI, IITA, ILRI, Bioversity international, IRRI, IWMI, AVRDC, ICIMOD, ICRAF, IFDC, IFAD and FAO
5. Agricultural Innovation System: concept, actors, relationship between actors and accountability to stakeholders
6. Agricultural research farm management
7. Agricultural research project management: Problem and objective tree analysis, logframe development, effect and impact assessment and its linkage with technology users
8. Public private partnership in agriculture research
9. Entrepreneurs and agri-business development through agricultural research
10. Approaches of agricultural research in the context of federalism



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मुख्य वैज्ञानिक, एस-५, (Principal Scientist, S-5), स्वायत्त साइन्स उपसमूहको आन्तरिक  
प्रतियोगितात्मक लिखित परीक्षाको लागि पाठ्यक्रम

**Paper: II**

**Technical Subject**  
**Sub-Group: Soil Science**

**1. Scientific and Technical Knowledge related to Soil Science**

- 1.1 Surface soil and sub-soil as a natural body
- 1.2 Morphology, colour, constituents, profile, horizons, texture, structure, consistency, concretions of soil in agriculture
- 1.3 Classification of Soil and land use planning
- 1.4 Soil genesis, weathering, factors and process of soil formation
- 1.5 Dynamic properties of soil
- 1.6 Soil pollution and its control
- 1.7 Soil erosion and Soil conservation
- 1.8 Soils of Nepal and their classification
- 1.9 Problem soils of Nepal
- 1.10 Soil management for sustainable farming in Nepal

**2. Soil and Water Relation**

- 2.1 Water in soils - where and how the water is held, suction and pF curves for soils, movement of water in soils, permeability, field capacity, evaporation, the transfer of water from soil to plant, amount of water used by different crops
- 2.2 Plant-foods and their sources
- 2.3 Amount of nutrients removed by plants
- 2.4 Response of major and trace elements in major crops in Nepalese soils
- 2.5 Nitrogen cycle in the soil - mineralization and nitrification
- 2.6 Phosphorus fixation
- 2.7 Role of potassium in plant nutrition
- 2.8 Different tillage systems
- 2.9 Cation Exchange Capacity and factors affecting them
- 2.10 Principles underlying the control of soil erosion, wind erosion and soil drifting, erosion by run-off water

**3. Soil Fertility Management**

- 3.1 Recommended doses of nutrients, method and timing of application
- 3.2 Effect of imbalanced fertilizer use on soil health and environmental pollution.
- 3.3 Methods of soil chemical analysis for different elements
- 3.4 Recommendation of nutrients on the basis of soil chemical analysis
- 3.5 Soil reaction (soil pH), its measurement, liming material their response when applied in soil, reclamation of acidic, saline, alkaline and sodic soil
- 3.6 Nature of Cation and Anion Exchange, Cation Exchange Capacity versus Soil pH
- 3.7 Classification of elements on the basis of their functions
- 3.8 Deficiency symptoms of elements on the crops
- 3.9 Forms of element utilized by plants

- 3.10 Inorganic fertilizer, composition, formula and their transformation from fertilizer to available form of element
- 3.11 Absorption process of nutrients by plant roots
- 3.12 Plant nutrients - losses from soil
- 3.13 Determination of nutrients requirement of crops

**4. Soil Ecology**

- 4.1 Microbial population of the soil, their function, their role on ammonification, nitrification, denitrification
- 4.2 Function and importance of rhizobium, azotobacter, clostridium, algae, phosphor-bacterium, worms, nematodes, fungi, virus, rodents, ants
- 4.3 Decomposition of plant material, composting, micro-organisms responsible for the decomposition of plant remains, green manuring, desirable characteristics of green manure, plants suitable for green manure, green manuring and the maintenance of soil fertility, constraints of green manuring
- 4.4 Bio-fertilizers, their types and commercially available bio-fertilizers
- 4.5 Nitrogen fixing microbes and their plant association
- 4.5 Azolla and biogas, and their economic importance
- 4.6 Plant nutrition management in organic farming and its importance in Nepalese context
- 4.7 Composition of soil organic matter, nutrient content of different animal dung, humus, composition of humus colloids, carbon - nitrogen (C/N) ratio, its importance in nutrient uptake, properties of soil humus, the clay - humus complex, decomposability of soil humus
- 4.8 Moisture conservation and weed management in rainfed agriculture

**5. National and International Research on Soil Science**

- 5.1 Major issues and achievements of soil science research in Nepal
- 5.2 Major issues and achievements of soil science research in neighboring countries and international institutions

**6. Statistics**

- 6.1 Probability
- 6.2 Estimate of error: replication and randomization
- 6.3 Control of error, field plot technique and data analysis
- 6.4 Different statistical design for field crops (RCBD, Latin Square, Split Plot Design and other factorial experiment)
- 6.5 Comparison: Least significant difference (LSD) and Duncan's Multiple Range Test (DMRT), group comparison between groups and within group, trend comparison, factorial comparison and interpretation of results
- 6.6 Regression and correlation and their use in agronomical researches
- 6.7 Data transformation and missing plot techniques