लोक सेवा आयोग

नेपाल वन सेवा, बोटानी समूह, राजपत्रांकित तृतीय श्रेणीका पदको खुला प्रतियोगितात्मक परीक्षाको पाठ्यक्रम

यस पाठ्यक्रम योजनालाई दुई चरणमा विभाजन गरिएको छ :

प्रथम चरण :–	लिखित परीक्षा (Written Examination)	पूर्णाङ्क :– २००
द्वितीय चरण :-	(क) सामूहिक परीक्षण (Group Test)	पूर्णाङ्क :– १०
	(ख) अन्तर्वार्ता(Interview)	पूर्णाङ्क :– ३०

परीक्षा योजना (Examination Scheme)

प्रथम चरण : लिखित परीक्षा(Written Examination) **पूर्णाङ्क :– २००**

पत्र	विषय	खण्ड	पूर्णाङ्क	उर्तीर्णाङ्क	परीक्षा प्रणाली		प्रश्नसंख्या ×अङ्क	समय
प्रथम	General Subject	Part I: General Awareness & General Reasoning Test	१००	४०	वस्तुगत (Objective)	बहुवैकल्पिक प्रश्न (MCQs)	५० प्रश्न ×१ अङ्क	१ घण्टा ३० मिनेट
		Part II: General Technical Subject					५०प्रश्न ×१ अङ्क	
द्वितीय	Technical Subject		१००	४०	विषयगत (Subjective)	छोटो उत्तर लामो उत्तर	४ प्रश्न × ५ अङ्क ८ प्रश्न ×१०अङ्क	३ घण्टा

द्वितीय चरण : सामूहिक परीक्षण (Group Test) र अन्तर्वार्ता (Interview) **पूर्णाङ्क :– ४०**

पत्र /विषय	पूर्णाङ्क	उर्तीर्णाङ्क	परीक्षा प्रणाली	समय
सामूहिक परीक्षण (Group Test)	१०		सामूहिक छलफल (Group Discussion)	३० मिनेट
अन्तर्वार्ता (Interview)	३०		बोर्ड अन्तर्वार्ता(Board Interview)	-

द्रष्टव्य :

१. लिखित परीक्षाको माध्यम भाषा नेपाली वा अंग्रेजी अथवा नेपाली र अंग्रेजी दुवै हुनेछ ।

२. प्रथमपत्र र द्वितीय पत्रको लिखित परीक्षा छुट्टाछुट्टै हुनेछ ।

३. वस्तुगत बहुवैकल्पिक (Multiple Choice) प्रश्नहरुको गलत उत्तर दिएमा प्रत्येक गलत उत्तर बापत २० प्रतिशत अङ्क कट्टा गरिनेछ । तर उत्तर नदिएमा त्यस बापत अङ्क दिइने छैन र अङ्क कट्टा पनि गरिने छैन ।

४. बहुवैकल्पिक प्रश्नहरु हुने परीक्षामा कुनै प्रकारको क्याल्कुलेटर (Calculator) प्रयोग गर्न पाइने छैन ।

५. विषयगत प्रश्नहरुको हकमा तोकिएको अंकको एउटा लामो प्रश्न वा एउटै प्रश्नका दुई वा दुई भन्दा बढी भाग (Two or more parts of a single question) वा एउटा प्रश्न अन्तर्गत दुई वा बढी टिप्पणीहरु (Short notes) सोध्न सकिने छ ।

६. द्वितीय पत्रमा(विषयगत प्रश्न हुनेका हकमा) प्रत्येक खण्डका लागि छुट्टाछुट्टै उत्तरपुस्तिकाहरु हुनेछन् । परिक्षार्थीले प्रत्येक खण्डका प्रश्नहरुको उत्तर सोहीखण्डको उत्तरपुस्तिकामा लेख्नुपर्नेछ ।

७. यस पाठ्यक्रम योजना अन्तर्गतका पत्र/विषयका विषयवस्तुमा जेसुकै लेखिएको भए तापनि पाठ्यक्रममा परेका कानून, ऐन, नियम तथा नीतिहरु परीक्षाको मिति भन्दा ३ महिना अगाडि (संशोधन भएका वा संशोधन भई हटाईएका वा थप गरी संशोधन भई) कायम रहेकालाई यस पाठ्क्रममा परेको सम्झनु पर्दछ ।

८. प्रथमचरणको परीक्षाबाट छनौट भएका उम्मेदवारहरुलाई मात्र द्वितीयचरणको परीक्षामा सम्मिलित गराइनेछ ।

९. यस भन्दा अगाडि लागु भएका माथि उल्लेखित सेवा, समूहको पाठ्यक्रम खारेज गरिएको छ ।

१०. पाठ्यक्रम लागू मिति : **२०८०/०७/२०**

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प्रथम पत्र (Paper I): General Subject

Part (I) : - General Awareness & General Ability Test (50 Marks)

1. **General Awareness and Contemporary Issues (25 ×1 Mark = 25 Marks)**
   - 1.1 Physical, socio-cultural and economic geography and demography of Nepal
   - 1.2 Major natural resources of Nepal
   - 1.3 Geographical diversity, climatic conditions, and livelihood & lifestyle of people
   - 1.4 Notable events and personalities, social, cultural and economic conditions in modern history of Nepal
   - 1.5 Current periodical plan of Nepal
   - 1.6 Information on sustainable development, environment, pollution, climate change, biodiversity, science and technology
   - 1.7 Nepal's international affairs and general information on the UNO, SAARC & BIMSTEC
   - 1.8 The Constitution of Nepal (From Part 1 to 5 and Schedules)
   - 1.9 Governance system and Government (Federal, Provincial and Local)
   - 1.10 Provisions of civil service act and regulation relating to constitution of civil service, organisational structure, posts of service, fulfillment of vacancy and code of conduct
   - 1.11 Functional scope of public services
   - 1.12 Public Service Charter
   - 1.13 Concept, objective and importance of public policy
   - 1.14 Fundamentals of management : planning, organizing, directing, controlling, coordinating, decision making, motivation and leadership
   - 1.15 Government planning, budgeting and accounting system
   - 1.16 Major events and current affairs of national and international importance

2. **General Reasoning Test (25 ×1 Mark = 25 Marks)**

   2.1 **Logical Reasoning** (9×1 Mark = 9 Marks)

   Verbal Ability, Alphanumeric Series, Reasoning Analogies, Classification, Coding-Decoding, Order & Ranking, Distance & Directions, Analytical and Logical Reasoning, Assertion and Reason, Statement and Conclusion, Input-Output, Venn- diagram

   2.2 **Numerical Reasoning** (8×1 Mark = 8 Marks)

   Arithmetic Series, Analogy, Classification, Arithmetical Reasoning, Fraction. Percentage, Ratio, Average, Profit & Loss, Time & Work, Date & Calender, Data Sufficiency, Data Interpretation & Data Verification

   2.3 **Spatial Reasoning** (8×1 Mark = 8 Marks)

   Figure Series, Figure Analogy, Figure Classification, Figure Matrix, Pattern Completion, Embedded Images, Image Formation & Analysis, Mirror and Water Images, Cubes and Dices, Paper Folding & Cutting

Part (II) : - General Technical Subject (50 Marks)

1. Algae and Lichens 10%

1.1 Algae

1.1.1 General account, classification and economic importance of algae with reference to Nepal.

1.1.2 Structure and life cycle of the following genera:

1. *Oscillatoria*
2. *Anabaena*
3. *Chlamydomonas*
4. *Ulothrix*
5. *Spirogyra*
6. *Volvox*
7. *Oedogonium*
8. *Vaucheria*
9. *Chara*
10. *Batrachospermum*

1.2 Lichens

1.2.1 Structure and different forms.

1.2.2 Economic importance of lichens with reference to Nepal.

1.2.3 Lichens as a bio-indicator of the air pollution and a pioneer in the plant succession.

2. Fungi, Bacteria, Virus and Plant Pathology 10%

2.1 Fungi

2.1.1 General account, classification and economic importance of fungi with reference to Nepal.

2.1.2 Structure and life cycle of the following taxa:

1. *Plasmodiophora*
2. *Saprolegnia*
3. *Albugo*
4. *Rhizopus*
5. Yeast
6. *Eurotium*
7. *Puccinia*
8. *Agaricus*
9. *Alternaria*

2.2 Bacteria : Structure, nutrition, reproduction and economic importance

2.3 Virus : General concept of virus.

2.4. Plant pathology

2.4.1 Introduction and scope of plant pathology.

2.4.2 Symptoms and plant diseases caused by fungi, bacteria and virus.

2.4.3 Study of causal organism, symptom, etiology and control measure of the following diseases in plants:

1. Damping off disease
2. Late blight disease on potato
3. Downy mildew disease on spinach
4. Rust disease on wheat
5. Fusarium wilt disease
6. Ring rot disease on potato
7. Bean mosaic disease

3. Bryophytes, Pteridophytes, Gymnosperms and Palaeobotany 10%

3.1 Bryophytes

3.1.1 General introduction, classification and economic importance of bryophytes with reference to Nepal.

3.1.2 A detailed study of the following genera:

1. Marchantia
2. Anthoceros
3. Polytrichum

3.2 Pteridophytes

3.2.1 General introduction, classification and economic importance of pteridophytes with reference to Nepal.

3.2.2 A detailed study of the following genera:

1. Lycopodium
2. Selaginella
3. Equisetum
4. Pteris
5. Marsilea

3.3 Gymnosperms

3.3.1 General introduction, classification and economic importance of Gymnosperms with reference to Nepal.

3.3.2 A detailed study of the following genera:

1. Cycas
2. Pinus

3.4 Palaeobotany

3.4.1 General account and geological eras and periods
3.4.2 Types of fossils and its formation
3.4.3 Morphology and anatomy of Rhynia fossil

4. Taxonomy and Economic Botany 20%

4.1 Taxonomy

4.1.1 Classification system of Bentham and Hooker in higher plants
4.1.2 International system in botanical nomenclatures
4.1.3 History of botanical exploration in Nepal
4.1.4 Role of National Herbarium and its significance
4.1.5 Systematic study, economic importance and affinity of the following families:

Dicotyledon;

1. Ranunculaceae
2. Cruciferae
3. Rutaceae
4. Rosaceae
5. Solanaceae
6. Malvaceae
7. Leguminosae
8. Labiatae
9. Scrophulariaceae
10. Polygonaceae

Monocotolyden;

1. Gramineae
2. Orchidaceae

4.2 Economic Botany

4.2.1 General account and distribution of the following medicinal plants with reference to Nepal:

4.2.2 Tropical and sub-tropical plants:

1. *Piper longum* Linn., Piperaceae (Pipla/Murjhang)
2. *Rauwolfia serpentina* Benth. ex Kurz, Apocynaceae (Chad Maruwa/ Sarpaganda)
3. *Terminalia chebula* Retz., Combretaceae (Harro)
4. *Phallanthus emblica* Linn. Euphorbiaceae (Amala)

4.2.3 Temperate plants:

1. *Acorus calamus* Linn., Araceae (Bojho)
2. *Cinnamomum tamala* Nees., Lauraceae (Tej Pat)
3. *Swertia chirata* Ham., Gentianaceae (Chiraito)
4. *Valeriana wallichii* DC., Velerianaceae (Sugandhwala)
5. *Zanthoxylum armatum* DC., Rutaceae (Timur)
6. *Taxus baccata* Linn. Taxaceae (Lothe Sallo)

4.2.4 Sub-Alpine and Alpine plants:

1. *Cordyceps sinensis* (Berk) Sacc. Clavicipitaceae, fungus (Yarsa Gumba)
2. *Ephedra gerardiana* Wall., Gnetaceae (Bhutu Kesh/ Somalata)
3. *Nardostachys jatamansi* DC., Valerianaceae (Jatamonsi)
4. *Dactylorhiza hategira* (D.Don) Soo. Var. incarnate, Orchidaceae (Panch Aunla)
5. *Neopicrorhiza kurroa* Royle ex Benth., Scrophulariaceae (Kutki)

5. Cytology and Genetics, Plant Breeding, Evolution, Anatomy and Embryology 20%

5.1 Cytology and Genetics

5.1.1 Structural organization of prokaryotic and eukaryotic cells

5.1.2 Ultra-structure and function of cell wall, cell membrane, endoplasmic reticulum, golgi bodies, vacuoles, microbodies, mitochondria, plastids, microtubules, centrosome, flagella, nucleus and nucleolus

5.1.3 Structure and function of Nucleic acids referring double helix, and circular DNA & RNA

5.1.4 Physical and chemical nature of chromosomes

5.1.5 Chromosomal behaviour during mitotic and meiotic divisions

5.1.6 Cell cycle and its different phases and significance

5.1.7 Significance of linkage, chiasma formation and crossing over

5.1.8 Elementary idea of different types of mutation in chromosome;

1. Chromosomal aberration
2. Chromosomal number variation (polyploidy)
3. Gene mutation

5.1.9 Mendel's laws of inheritance, post-Mendelian expression and interaction of genes, and multiple alleles

5.2 Plant Breeding

5.2.1 Nature and scope of plant breeding

5.2.2 Selection, Hybridization and Mutation breeding process as tools of crop improvement

5.3 Evolution

5.3.1 Natural variation and Darwinian evolution

5.4 Anatomy

5.4.1 Structure and classification of meristem
5.4.2 Apical cell and Histogen theories in the differentiation of root and shoot apices
5.4.3 Secondary growth in root and stem, and occurrence of anomalous secondary structure in some plants
5.4.4 Anatomical modification and ecological adaptation

5.5 Embryology
5.5.1 General account of microsporogenesis and megasporogenesis
5.5.2 Development of male and female gametophytes
5.5.3 Fertilization and endosperm formation
5.5.4 Embryogenesis in a typical dicotyledonous & monocotyledonous plants

6. Ecology 10%

6.1 General concept and scopes of ecology
6.2 Biotic and abiotic ecological factors
6.3 Biogeochemical cycles of Carbon, Water, Phosphorous, Nitrogen and Sulphur
6.4 Plant community and succession
6.5 Concept of ecosystem (forest, grassland and fresh water)
6.6 Environmental pollution with reference to air and water
6.7 Vegetation (phytogeography) in Nepal and major natural resources
6.8 National parks and wildlife reserves of Nepal as tools of Nature conservation

7. Plant physiology 10%

7.1 Macro- and Micro-nutrients in plants and their roles
7.2 Absorption, translocation and transpiration
7.3 Growth regulating substances (auxins, cytokinins, gibberellins, ethylene, and abscissic acid)
7.4 Tropism- Phototropism,
7.5 Photoperiodism and Vernalization
7.6 An overview of respiration and factors affecting respiration
7.7 An overview of photosynthesis and factors affecting photosynthesis
7.8 Concept of C3 and C4 plants
7.9 Relationship between biochemistry and Plant physiology

8. Applied technology and Convention and Treaties 10%

8.1 Applied technology
8.1.1 Introduction, scope and importance of biotechnology
8.1.2 Grafting, budding and cutting methods in plant propagation
8.1.3 General account of *In vitro* culture techniques and principles
8.1.4 Application of *In vitro* cultures
8.1.5 Cloning and its significance
8.1.6 Genetically modified (GM) crops or Living modified organism (LMO)
8.1.7 Production of medicine by using genetic engineering

8.2 Convention, Treaties, Acts and Regulation
8.2.1 Convention on Biodiversity (CBD)
8.2 2 Convention on International Trade in Endangered species of Wild Fauna and Flora (CITES)
8.2 3 Forest Act and Forest Rules
8.2 4 Nepal Environmental Policy and Action Plan (NEPAP) (Environment Protection Act and Rules