

**लोक सेवा आयोग**  
नेपाल विविध सेवा, राजपत्राङ्कित तृतीय श्रेणी, वातावरण निरीक्षक/ वातावरणविद् वा सो सरह पदको खुला  
प्रतियोगितात्मक लिखित परीक्षाको पाठ्यक्रम

पाठ्यक्रमको रूपरेखा :- यस पाठ्यक्रमको आधारमा निम्नानुसार तीन चरणमा परीक्षा लिइने छ :

प्रथम चरण :- लिखित परीक्षा

पूर्णाङ्क :- २००

द्वितीय चरण :- सामूहिक परीक्षण र अन्तर्वार्ता

पूर्णाङ्क :- ४०

प्रथम चरण – लिखित परीक्षा योजना (Examination Scheme)

पत्र	विषय	पूर्णाङ्क	उत्तीर्णाङ्क	परीक्षा प्रणाली	प्रश्न संख्या X अङ्कभार	समय
प्रथम	सेवा सम्बन्धी विषय	१००	४०	वस्तुगत बहुवैकल्पिक (MCQs)	१००X१ = १००	१ घण्टा १५ मिनेट
द्वितीय		१००	४०	विषयगत (Subjective)	१०X१० = १००	३ घण्टा

द्वितीय चरण

विषय	पूर्णाङ्क	परीक्षा प्रणाली	समय
सामूहिक परीक्षण (Group Test)	१०	सामूहिक छलफल (Group Discussion)	३० मिनेट
व्यक्तिगत अन्तर्वार्ता	३०	मौखिक	-

- लिखित परीक्षाको माध्यम भाषा अंग्रेजी वा नेपाली अथवा अंग्रेजी र नेपाली दुवै हुन सक्नेछ ।
- माथि उल्लिखित पदको पाठ्यक्रमको प्रथम र द्वितीय पत्रको विषयवस्तु एउटै हुनेछ ।
- प्रथम र द्वितीय पत्रको लिखित परीक्षा छुट्टाछुट्टै हुनेछ ।
- प्रथम तथा द्वितीय पत्रका एकाईहरूको प्रश्नसंख्या निम्नानुसार हुनेछ :

खण्ड	A		B	C	D	
प्रथम पत्रका एकाई	1	2	3	4	5	6
प्रश्न संख्या	10	10	30	20	15	15
द्वितीय पत्रका एकाई	1	2	3	4	5	6
प्रश्न संख्या	1	1	3	2	3	

- वस्तुगत बहुवैकल्पिक (Multiple Choice) प्रश्नहरूको 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 ।
- बहुवैकल्पिक प्रश्नहरू हुने परीक्षामा कुनै प्रकारको क्याल्कुलेटर (Calculator) प्रयोग गर्न पाइने छैन ।
- विषयगत प्रश्नका लागि तोकिएका १० अङ्कका प्रश्नहरूको हकमा १० अङ्कको 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 टिप्पणीहरू (Short notes) सोध्न सकिने छ ।
- द्वितीय पत्रमा प्रत्येक खण्डका लागि छुट्टाछुट्टै उत्तरपुस्तिकाहरू हुनेछन् । परीक्षार्थीले प्रत्येक खण्डका प्रश्नहरूको उत्तर सोही खण्डको उत्तरपुस्तिकामा लेख्नुपर्नेछ ।
- यस पाठ्यक्रम योजना अन्तर्गतका पत्र/विषयका विषयवस्तुमा जेसुकै लेखिएको भए तापनि पाठ्यक्रममा परेका कानून, ऐन, नियम तथा नीतिहरू परीक्षाको मिति भन्दा ३ महिना अगाडि (संशोधन भएका वा संशोधन भई हटाईएका वा थप गरी संशोधन भई) कायम रहेकालाई यस पाठ्यक्रममा परेको सम्झनु पर्दछ ।
- यस भन्दा अगाडि लागू भएको माथि उल्लिखित समूहको पाठ्यक्रम खारेज गरिएको छ ।
- पाठ्यक्रम लागू मिति :- २०७०/०७/१५ गते देखि (२०७२/०७/२४ को निर्णय अनुसार सामूहिक परीक्षण समावेश)

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प्रथम र द्वितीय पत्र :- सेवा सम्बन्धी विषय

## Section A- 20 Marks

### 1. ENVIRONMENTAL FACETS

#### 1.1 Environment: Concept, Scope and Practices

- 1.1.1 Development of human society and environment
- 1.1.2 Physical, biological and socio-economic aspects of environment and their interrelationships
- 1.1.3 Environmental degradation and manifestations (land, water and air)
- 1.1.4 Environmental movements and environmental ethics

#### 1.2 Ecology

- 1.2.1 Population characteristics and regulations
- 1.2.2 Community characteristics, regulation and succession
- 1.2.3 Ecosystem dynamics: energy flow, biogeochemical cycles
- 1.2.4 Terrestrial biomes and characteristics

#### 1.3 Environmental Geology

- 1.3.1 Geological materials and structures
- 1.3.2 Weathering and erosion: types, cycle and control
- 1.3.3 Mass movement: causes and mechanisms
- 1.3.4 Fluvial, glacial and aeolian environmental processes

#### 1.4 Climatology and Hydrometeorology

- 1.4.1 Horizontal and vertical temperature distribution
- 1.4.2 Mechanisms of wind development, air masses dynamics
- 1.4.3 Climatic systems, distribution and classifications
- 1.4.4 Floods: classification, causes, triggering factors

#### 1.5 Global Environmental Issues

- 1.5.1 Global warming
- 1.5.2 Green economy
- 1.5.3 Payment for ecosystem services
- 1.5.4 Ozone layer depletion and acid rain

### 2. ENVIRONMENTAL RESOURCES

#### 2.1 Water Resources

- 2.1.1 Water resources: sources, extent and assessment
- 2.1.2 Integrated Water Resource Management (IWRM)
- 2.1.3 Water resources of Nepal
- 2.1.4 Problems of water resource management in Nepal

#### 2.2 Food Resources

- 2.2.1 Major food resources and production
- 2.2.2 Human nutrition and health
- 2.2.4 Food resources of Nepal

#### 2.3 Energy Resources

- 2.3.1 Energy resources: sources and classification
- 2.3.2 Alternative energy resources
- 2.3.3 Environmental issues of energy use
- 2.3.4 Energy resource conservation practices

2.3.5 Energy resources of Nepal

## **2.4 Forest and Biodiversity**

2.4.1 Forest types and biodiversity status of Nepal

2.4.2 Ex-situ and in-situ conservation

2.4.3 Biodiversity conservation approaches

2.4.4 Carbon sequestration

## **2.5 Resource Economics**

2.5.1 Micro-economic analysis for accounting environmental resources

2.5.2 Environmental Kuznets curve, cost benefit analysis and resource accounting

2.5.3 Economic and regulatory instruments to control pollution

## **Section B- 30 Marks**

### **3. ENVIRONMENTAL POLLUTION AND ENGINEERING**

#### **3.1 Water Pollution**

3.1.1 Point and non-point sources and categories of water pollutants

3.1.2 Water pollutants effect on human health and ecosystems

3.1.3 Standard methods of water analysis

3.1.4 Water and wastewater treatment technologies

#### **3.2 Air Pollution**

3.2.1 Sources and categories of air pollutants

3.2.2 Emission, transport, receptors of air pollutants, criteria air pollutants

3.2.3 Air pollutants effects on human health, property and visibility

3.2.4 Air pollution measurement and emission estimates

3.2.5 Air pollution control technologies

#### **3.3 Noise Pollution**

3.3.1 Noise sources and criteria

3.3.2 Health effects of noise and control mechanisms

#### **3.4 Waste Management**

3.4.1 Sources, types and composition of solid wastes

3.4.2 Solid waste management systems

3.4.3 Issue, generation and management of e-waste, hazardous and hospital waste

3.4.4 Management of industrial and agricultural chemical pesticides

#### **3.5 Toxicology and Eco-toxicology**

3.5.1 Acute, sub-acute and chronic toxicity

3.5.2 Dose and frequency response relationships

3.5.3 Bioassays and attributes for predicting species response to pollution stress

#### **3.6 Climate Change**

3.6.1 Climate variability and theories of climate change

3.6.2 Climate models and model based projections of greenhouse effect

3.6.3 Climate change impacts: agriculture and food security, water resources, energy, human health, biodiversity, settlement and infrastructure and livelihood

3.6.4 Vulnerability assessment of climate change and mitigation and adaptation approaches (NAPA, LAPA)

## Section C- 20 Marks

### 4. ENVIRONMENTAL MANAGEMENT SYSTEMS

#### 4.1 Environmental Assessment

- 4.1.1 Environmental assessment: evolution in global and national perspectives
- 4.1.2 Environmental assessment: process, practices, methods and tools
- 4.1.3 Strategic environmental assessment for decision making and integrated planning

#### 4.2 Environmental Management Systems (EMS) & Modeling

- 4.2.1 Concept, components and stages of EMS
- 4.2.2 ISO 14000 series, standards and certification systems
- 4.2.3 Life cycle assessment and environmental labeling
- 4.2.4 Types and importance of environmental models

#### 4.3 Remote Sensing & GIS

- 4.3.1 Concept, scope and stages in remote sensing and GIS
- 4.3.2 Remote sensing image: acquisition, resolution, analysis and interpretation
- 4.3.4 GIS applications in assessing environmental studies

#### 4.4 Environmental Statistics

- 4.4.1 Sampling, data analysis and interpretation
- 4.4.2 Central tendency, measures of dispersion
- 4.4.3 Correlation and regression
- 4.4.4 Parametric and non-parametric tests

#### 4.5 Environmental Governance

- 4.5.1 Institutional arrangement (organogram) and environmental governance; concerned stakeholders and networks
- 4.5.2 Governance tools and strategies
- 4.5.3 Adaptive management and sustainability

## Section D- 30 Marks

### 5. LEGAL FRAMEWORKS

#### 5.1 Guidelines and Standards

Guidelines and Standards Relating to Air (Ambient, Indoor and Stack) and Water (Tolerance Limits for Industrial Effluents to be Discharged into Public Sewers and Inland Surface Waters); Specific Industrial Effluent Standards

#### 5.2 National Legislations

Interim Constitution of Nepal, 2007; Environmental Protection Act (EPA), 1996; Environment Protection Rules (EPR) in 1997; National EIA Guidelines, 1993; EIA Guidelines for Forestry Sector, 1995; EIA Guidelines for Industry Sector, 1995; Plant Protection Act, 2007; National Parks and Wildlife Conservation Act, 1973; Water Resources Act, 1992; Forest Act, 1993; Local Self-Governance Act, 1999, Soil and Watershed Management Act, 1982; Solid Waste Management Act, 2011; Pesticides Act, 1991; The Pesticide Regulation, 1994; Hydropower Development Policy, 2001; Climate Change Policy, 2011

#### 5.3 International Treaties, Protocols & Conventions

Convention on Wetland of International Importance Especially as Waterfowl Habitat, 1971; Convention on the International Trade in Endangered Species of Wild Fauna and Flora, 1973; Convention on Biological Diversity, 1992; United Nations

Framework Convention on Climate Change, 1992; United National Convention to Combat Desertification, 1994; Kyoto Protocol to the United Nations Framework Convention on Climate Change, 1997; Vienna Convention for the Protection of the Ozone Layer, 1985; Montreal Protocol on Substances that Deplete Ozone Layer, 1987; Basel Convention on the Control of Transboundary Movements of Hazardous Waste and Their Disposal, 1989; Stockholm Convention on Persistent Organic Pollutants, 2004; Rotterdam Convention on the Prior Informed Consent Procedures for Certain Hazardous Chemicals and Pesticides in International Trade, 2004

## **6. CURRENT ENVIRONMENTAL ISSUES**

### **6.1 Urban Environment**

- 6.1.1 Urbanization and its implications on environment (sanitation, solid and hazardous waste, air pollution, water pollution, groundwater depletion, food security)
- 6.1.2 Urbanization infrastructures and environment (housing, water supply and sanitation, waste management, transportation, electricity, markets and commercial areas, religious and heritage sites, open spaces and recreational areas)
- 6.1.3 Concept of urban planning and sustainable cities

### **6.2 Land use and Watershed Management**

- 6.2.1 Land use and environment (land use pattern and zoning; Guided Land Development (GLD) and land pooling)
- 6.2.2 Principles of land use and land reclamation
- 6.2.3. Factors governing land utilization and land use pattern
- 6.2.4 Scenario of watershed management in Nepal
- 6.2.5 Development and conservation challenges in watershed management
- 6.2.6 Watershed as ecosystems; Upstream-downstream linkages; Measures for watershed conservation

### **6.3 Agriculture and Food Security**

- 6.3.1 Farming systems
- 6.3.2 Modern agriculture and its impacts on environment, green revolution
- 6.3.3 Sustainable agriculture and food aid policies
- 6.3.4 Food security in Nepal

### **6.4 Disaster Risks & Vulnerability Assessment**

- 6.4.1 Hazard, disaster, risk, exposure and vulnerability analysis
- 6.4.2 Disasters due to earthquake, landslide and river bank erosion, flood, GLOF, drought, epidemics, fire and industrial accidents
- 6.4.3 Disaster risk management and practices

The end

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प्रथम पत्र

**Objective Sample Questions**

1. The Pyrheliometers are used for the determination of:  
A) Insolation                      B) River discharge      C) Wind velocity      D) Sound level
2. Which of the following laws states the solubility of gases with water?  
A) Wien's Displacement Rule                      B) Stefan-Boltzmann Law  
C) Henry's Law    D) Gaussian Model
3. Which one of the following EPA classified categories is used to describe the most severity of likelihood that a chemical substance is carcinogen?  
A) Group A: Human Carcinogen                      B) Group B: Probable Human Carcinogen (B1)  
C) Group B: Probable Human Carcinogen (B2)  
D) Group C: Possible Human Carcinogen
4. Trihalomethanes (THMs) are the by-products of  
A) Ozonolysis      B) Flocculation      C) Radioactive decay                      D) Water chlorination
5. What one of the following is not included in the list of criteria air pollutants?  
A) Carbon monoxide      B) Lead                      C) Benzene                      D) Nitrogen dioxide
6. The WHO guideline value for Lead in drinking water is:  
A) 0.01 mg/L                      B) 0.3 mg/L                      C) 0.001 mg/L                      D) 0.005 mg/L
7. As per EPR, 1997; which one of the followings is not mandatory for IEE process:  
A) Environmental monitoring    B) Identification of harmful impacts  
C) Identification of mitigation measures    D) Environmental auditing
8. The chemical composition of CFC-12 is:  
A) CF<sub>3</sub>Cl                      B) CF<sub>2</sub>Cl<sub>2</sub>                      C) CFCl<sub>3</sub>                      D) CCl<sub>4</sub>
9. Which one of the following animal belongs to appendix I of CITES list:  
A) *Platanista gangetica*    B) *Vulpes bengalensis*  
C) *Antilope cervicapra*    D) *Bubalus bubalis*
10. When an speciation occurs through isolation in geographical barrier, it is known as:  
A) Primary succession    B) Secondary succession  
C) Sympatric speciation    D) Allopatric speciation

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द्वितीय पत्र

**SUBJECTIVE SAMPLE QUESTIONS**

1. What is the root causes for environmental degradation? Illustrate your statement relating to land, water and air pollution. (2+8)
2. What are the environmental issues of energy use? Describe various approaches and strategies that can be adopted for the sustainability of energy resource use in Nepal? (4+6)
3. Explain briefly about the different treatment technologies of hazardous wastes. (10)
4. What is bioassay? Explain the procedures for carrying out carcinogenic bioassay. (2+8)
5. Write short notes on the followings: (2.5×4)
  - a. Impacts of climate change on Nepalese agricultural sector
  - b. Auditory effects of noise
  - c. Tertiary treatment of water
  - d. Suspended Particulate Matter (SPM) control technologies
6. Mention various stages of EIA in Nepal and describe the role of various organizations in this process. (10)
7. What is life cycle assessment (LCA)? Explain how LCA can be helpful for the conservation of the environment. (2+8)
8. Solid Waste Management (SWM) is becoming a burning issue in urban areas of Nepal. Critically analyze the current legislations and enforcement mechanisms relating to the SWM and provide your suggestions for making them more practicable. (10)
9. What is disaster risk management? Explain the different approaches for the management of water induced disasters. (2+8)
10. Write short notes on the followings: (5×2)
  - a. Kyoto Protocol
  - b. Sustainable cities

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नेपाल आर्थिक योजना तथा तथ्याङ्क, इन्जिनियरिङ्ग, कृषि, वन, विविध र शिक्षा सेवाका सबै समूह/उपसमूह,  
राजपत्राङ्कित तृतीय श्रेणी र एवं स्वास्थ्य सेवाको सातौं र आठौं तहका पदहरूमा  
प्रथम चरणको लिखित परीक्षाबाट छनौट भएका उम्मेदवारहरूलाई मात्र  
लिइने **सामूहिक परीक्षण (Group Test)** को लागि

**सामूहिक छलफल (Group Discussion)**

यस प्रयोजनको लागि गरिने परीक्षण १० पूर्णाङ्क र ३० मिनेट अवधिको हुनेछ जुन नेताविहिन सामूहिक छलफल (Leaderless Group Discussion) को रूपमा अवलम्बन गरिने छ। दिइएको प्रश्न वा Topic का विषयमा पालैपालोसँग निर्दिष्ट समयभित्र समूहबीच छलफल गर्दै प्रत्येक उम्मेदवारले व्यक्तिगत प्रस्तुति (Individual Presentation) गर्नु पर्नेछ। यस परीक्षणमा मूल्याङ्कनको लागि देहाय अनुसारको ३ जना भन्दा बढीको समिति रहनेछ।

आयोगका सदस्य	-	अध्यक्ष
आयोगका सदस्य	-	सदस्य
मनोविज्ञ	-	सदस्य
दक्ष/विज्ञ (१ जना)	-	सदस्य

**सामूहिक छलफलमा दिइने नमूना प्रश्न वा Topic**

उदाहरणको लागि - उर्जा संकट, गरीबी निवारण, स्वास्थ्य बीमा, खाद्य सुरक्षा, प्रतिभा पलायन जस्ता Topics मध्ये कुनै एक Topic मात्र दिइनेछ।