



## पोखरा महानगरपालिका

बन तथा वातावरण अधिकृत (अधिकृतस्तर सातौं तह) को सूचीकृत भएका उमेदवारहरुको खुला प्रतियोगितात्मक परीक्षाको पाठ्यक्रम

यस पाठ्यक्रम योजना लाई दुई चरणमा विभाजन गरिएको छ।

प्रथम चरण: लिखित परीक्षा

पूर्णाङ्क: १००

द्वितीय चरण: (क) सामूहिक परीक्षण

पूर्णाङ्क: १०

(ख) अन्तर्वार्ता

पूर्णाङ्क: १५

परीक्षा योजना:

प्रथम चरण: लिखित परीक्षा

पूर्णाङ्क: १००

विषय	खण्ड	पूर्णाङ्क	उत्तीर्णाङ्क	परीक्षा प्रणाली	प्रश्न संख्या X अंक	समय
General and Technical Subject	Part I	५०	२०	वस्तुगत बहुवैकल्पिक	२० प्रश्न X १ अंक	४५ मिनेट
	Part II				३० प्रश्न X १ अंक	
General and Technical Subject	Part I	५०	२०	विषयगत छोटो उत्तर	२ प्रश्न X ५ अंक	१ घण्टा
	Part II				८ प्रश्न X ५ अंक	

द्वितीय चरण: समूहिक परीक्षण र अन्तर्वार्ता

पत्र/विषय	पूर्णाङ्क	उत्तीर्णाङ्क	परीक्षण प्रणाली	समय
सामूहिक परीक्षण	१०		सामूहिक छलफल	३० मिनेट
अन्तर्वार्ता	१५		बोर्ड अन्तर्वार्ता	-

### Part I

- नेपालको संविधान
- स्थानीय प्रशासन ऐन, २०२८
- स्थानीय सरकार सञ्चालन ऐन, २०७४
- चालु आवधिक योजना
- स्थानीय तहको योजना तर्जुमा प्रकृया
- सामान्य ज्ञान तथा समसामयिक विषय
- नेपाल सरकार, गण्डकी प्रदेश सरकार र पोखरा महानगरपालिकाबाट जारी भएका विषयसँग सम्बन्धित ऐन, नियम, निर्देशिका, कार्यविधि र मापदण्ड



## **Part II**

### **1. Forest Resource Survey, Inventory and Research**

- 1.1 Basic principles of statistics: measure of central tendency, coefficient of variation, standard error of mean, measure of skewness, continuous and discrete variables
- 1.2 Forest statistics of Nepal
- 1.3 Basic knowledge on computer based statistical packages, data processing and analysis
- 1.4 Basic principles, practices and techniques used in Remote Sensing (RS) and GIS in forest management planning including land use and land cover changes detection
- 1.5 Principles and practices of forest resource surveys, inventory and mapping
- 1.6 Principles and applications of experimental design in forestry research
- 1.7 Importance of forest genetics and tree improvement in natural and artificial forest resource management
- 1.8 Research, extension and development linkages in forestry
- 1.9 Measuring trees and forest in the natural stand and plantations
- 1.10 Inventory techniques of Non-timber forest Products
- 1.11 Principles and practices of parametric and non-parametric statistical tests used in forestry research
- 1.12 Principles and practices of forest surveying
- 1.13 Principles of forest biometrics, tree and forest growth models and preparation of volume tables, yield table and biomass tables
- 1.14 National forest inventory, procedures used in planning, management, field data collection, data compilation and presentation in forest surveying
- 1.15 Importance of forestry research and associated issues in forest management and silviculture, biodiversity conservation, tree improvement and agroforestry, soil and water conservation, protected areas and wildlife management, NTFPs and other forestry related areas
- 1.16 Types of research (basic research, adaptive research, action research), and advantages/ disadvantages and their limitations Basics of Forestry research planning, design and field implementation
- 1.17 Research on socio-economic and policy aspects of forests, wildlife and watershed management, wildlife census, monitoring and camera trapping

### **2. Soil Conservation and Watershed Management**

- 2.1 Concept of soil conservation and watershed management
- 2.2 Understanding the concept of soil and water conservation in different ecological zones of Nepal
- 2.3 Natural and manmade erosion, mass movement, landslides, slope failure and factors responsible for water induced erosion
- 2.4 Preventive and rehabilitative measures for soil conservation methods and tools
  - 2.4.1 Contour trenching, bunding, diversion channels, gully plugging, shelter belt, green belt, contour planting, wattling, fascining, grass planting, reseedling, maintenance of forest





biomass.

- 2.4.2 Conservation farming, cover cropping, zero tillage, crop rotation, mulching. Green manuring, contour strip cropping, terracing, runoff harvesting and gully plugging
- 2.5 Understanding and use of universal soil loss equation
- 2.6 Bio-engineering techniques and their importance to stabilize slope failure, stream/riverbank cutting, control of erosion along small streams and rivers, improvement of irrigation canals
- 2.7 Principles and practices of sustainable soil management to land productivity conservation in Nepal
- 2.8 Basic concepts of hydrological cycle and its relationships to watershed management
- 2.9 Importance and relationship of watershed management to water harvesting development activities such as irrigation, hydropower and drinking water supply scheme.
- 2.10 Understanding of Soil formation process and its parent materials, geological process, soil profile, soil particles and size classes, soil texture and textural classification, soil structure and classification
- 2.11 Maintenance of soil fertility and effect of vegetation on physical, chemical and biological properties of soil and its organic matter, decomposition of plant residues and development of humus, importance of macroscopic and microscopic organisms in soil
- 2.12 Empirical estimation of stream flow, estimation of runoff volume and yield, water flow regulating structures, catchments ponds, stream gauging for measuring discharge,, weirs and flumes, retaining walls, different kinds of check dams, embankments, spurs, spillways, chutes
- 2.13 Understanding hydrology and its processes, precipitation, rainfall intensity, interception, evapotranspiration, runoff, movement of water into and through the soil, water yield.
- 2.14 General characteristics and principles of watershed prioritization, integrated approach of watershed management
- 2.15 Upstream and downstream linkages, payment for environmental services, equitable benefits sharing
- 2.16 Coordination mechanism and integration of agriculture, forestry, livestock and water resource interventions in integrated sub-watershed management plan.
- 2.17 Participatory approach of watershed management and decision making, participatory monitoring and evaluation of watershed management activities
- 2.18 Emerging problems of Churia watershed and strategies to mitigate the watershed degradation problems of Churia, Bhawar, Terai
- 2.19 Theory and practices of agro-forestry in Nepal, and criteria and indicators for selection of agro-forestry species with respect to ecological zone of Nepal



### **3. Biodiversity Conservation and Protected Area Management**

- 3.1 History, development and status of protected areas in Nepal
- 3.2 Principles and practices of protected area management
- 3.3 Protected area types and management modalities: national parks, wildlife reserve, hunting reserve, conservation area, buffer zone
- 3.4 Concept of ex-situ and in-situ biodiversity conservation at different levels (species, genetic and ecosystems)
- 3.5 Conservation biology, wildlife biology, forest ecology, mammalogy, ornithology and herpetology,
- 3.6 Wildlife farming, and market opportunities for sustainable management and trade of wildlife products;
- 3.7 Wildlife population dynamics, species status, abundance, distribution and classification (IUCN Red Data Book and CITES Appendix)
- 3.8 Engagement of local communities in protected area management system
- 3.9 Ecotourism in biodiversity conservation and protected area management
- 3.10 Wildlife habitat management including grassland and wetland management
- 3.11 Economic valuation of biodiversity conservation and environmental services
- 3.12 Landscape level conservation planning, integrated protected area management, and species conservation action plan
- 3.13 Trans-boundary coordination and cooperation
- 3.14 Major threats and challenges of biodiversity conservation
- 3.15 Human wildlife conflicts : Pattern, remedies and existing policy mechanism
- 3.16 Management of endemic, endangered, rare and vulnerable species, introduction and reintroduction, translocation and meta population of the species,
- 3.17 Protected area management planning, implementation, monitoring and evaluation process
- 3.18 Zoological and botanical garden, rescue centers and wildlife hospitals

### **4. Crosscutting issues in forestry sector of Nepal**

- 4.1 Initial Environment Examination, Environment Impact Assessment and Strategic Environment Assessment, conservation and development related projects
- 4.2 Research and extension in forestry sector
- 4.3 Forest and wildlife crime and law enforcement, legal procedures and provisions
- 4.4 Climate change, mitigation and adaptation measures
- 4.5 Monitoring and evaluation based on outcomes and impacts
- 4.6 Bottom-up planning process, project cycle and logical framework approach
- 4.7 International conventions, agreements, treaties and protocols related to forests, biodiversity conservation, climate change, land degradation such as UNFCCC, UNCCD, CBD, CITES, RAMSAR
- 4.8 Roles and scopes of national and international conservation partners
- 4.9 Role of conservation education, extension and awareness, outreach and communication, and media roles in conservation
- 4.10 Gender and social inclusion





- 4.11 Forestry sector governance
- 4.12 Organizational structures of government and its roles in forest conservation and management
- 4.13 Disaster risk reduction: earth quake, forest fire, landslides and floods,
- 4.14 Sustainable Development Goals (SDGs)/ Global Forest Goals
- 4.15 Quasi judicial body and functions in forestry sector

## **6. Environmental Facets**

### **6.1 Environment: Concept, Scope and Practices**

- 6.1.1 Development of human society and environment
- 6.1.2 Physical, biological and socio-economic aspects of environment and their interrelationships
- 6.1.3 Environmental degradation and manifestations (land, water and air)
- 6.1.4 Environmental movements and environmental ethics

### **6.2 Ecology**

- 6.2.1 Population characteristics and regulations
- 6.2.2 Community characteristics, regulation and succession
- 6.2.3 Ecosystem dynamics: energy flow, biogeochemical cycles
- 6.2.4 Terrestrial biomes and characteristics

### **6.3 Environmental Geology**

- 6.3.1 Geological materials and structures
- 6.3.2 Weathering and erosion: types, cycle and control
- 6.3.3 Mass movement: causes and mechanisms
- 6.3.4 Fluvial, glacial and aeolian environmental processes

### **6.4 Climatology and Hydrometeorology**

- 6.4.1 Horizontal and vertical temperature distribution
- 6.4.2 Mechanisms of wind development, air masses dynamics
- 6.4.3 Climatic systems, distribution and classifications
- 6.4.4 Floods: classification, causes, triggering factors

### **6.5 Global Environmental Issues**

- 6.5.1 Global warming
- 6.5.2 Green economy
- 6.5.3 Payment for ecosystem services
- 6.5.4 Ozone layer depletion and acid rain

## **7. Environmental Management Systems/Legal Frameworks**

### **7.1 Environmental Assessment**

- 7.1.1 Environmental assessment: evolution in global and national perspectives
- 7.1.2 Environmental assessment: process, practices, methods and tools
- 7.1.3 Strategic environmental assessment for decision making and integrated planning

### **7.2 Environmental Management Systems (EMS) & Modeling**

- 7.2.1 Concept, components and stages of EMS
- 7.2.2 ISO 14000 series, standards and certification systems
- 7.2.3 Life cycle assessment and environmental labeling
- 7.2.4 Types and importance of environmental models

### **7.3 Remote Sensing & GIS**

- 7.3.1 Concept, scope and stages in remote sensing and GIS



- 7.3.2 Remote sensing image: acquisition, resolution, analysis and interpretation
- 4.3.4 GIS applications in assessing environmental studies
- 7.4 Environmental Statistics**
  - 7.4.1 Sampling, data analysis and interpretation
  - 7.4.2 Central tendency, measures of dispersion
  - 7.4.3 Correlation and regression
  - 7.4.4 Parametric and non-parametric tests
- 7.5 Environmental Governance**
  - 7.5.1 Institutional arrangement (organogram) and environmental governance; concerned stakeholders and networks
  - 7.5.2 Governance tools and strategies
  - 7.5.3 Adaptive management and sustainability
- 7.6 Existing Legislations**

Constitution of Nepal; Environmental Protection Act; Environment Protection Rules; National EIA Guidelines; EIA Guidelines for Forestry Sector; EIA Guidelines for Industry Sector; Plant Protection Act; National Parks and Wildlife Conservation Act; Water Resources Act; Forest Act; Soil and Watershed Management Act; Solid Waste Management Act; Pesticides Act; Pesticide Regulation; Hydropower Development Policy; Climate Change Policy
- 7.7 International Treaties, Protocols & Conventions**

Convention on Biological Diversity, 1992; United Nations Framework Convention on Climate Change, 1992; United National Convention to Combat Desertification, 1994; Kyoto Protocol, 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
- 8. Current Environmental Issues**
  - 8.1 Urban Environment**
    - 8.1.1 Urbanization and its implications on environment (sanitation, solid and hazardous waste, air pollution, water pollution, groundwater depletion, food security)
    - 8.1.2 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)
    - 8.1.3 Concept of urban planning and sustainable cities
  - 8.2 Land use and Watershed Management**
    - 8.2.1 Land use and environment (land use pattern and zoning; Guided Land Development (GLD) and land pooling)
    - 8.2.2 Principles of land use and land reclamation
    - 8.2.3. 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





### 8.3 Agriculture and Food Security

- 8.3.1 Farming systems
- 8.3.2 Modern agriculture and its impacts on environment, green revolution
- 8.3.3 Sustainable agriculture and food aid policies
- 8.3.4 Food security in Nepal

### 8.4 Disaster Risks & Vulnerability Assessment

- 8.4.1 Hazard, disaster, risk, exposure and vulnerability analysis
- 8.4.2 Disasters due to earthquake, landslide and river bank erosion, flood, GLOF, drought, epidemics, fire and industrial accidents
- 8.4.3 Disaster risk management and practice

### 9. Urban Forestry

- 9.1 Concept and scope of urban forestry
- 9.2 Importance of urban forestry
- 9.3 Choice of species
- 9.4 Urban forest management (pruning, harvesting, replacement planting)
- 9.5 Urban forestry in the context of environment friendly local governance
- 9.6 Inventory of street tree, green space, urban canopy cover
- 9.7 Green space management
- 9.8 Tools for assessing and managing urban and community forests
- Arboriculture
- 9.9 Street tree inventory and neighborhoods case study projects (teams)
- 9.10 Tree Inventory in the park and avenue
- 9.11 Replacement mechanism of the 4D tree in the urban forestry
- 9.12 Thinning and pruning activities in the urban forestry
- 9.13 Policy, rule and regulation for the management of urban forestry