काठमाण्डौ उपत्यका खानेपानी लिमिटेड

प्राविधिक सेवा, सिभिल समुह तह ९ उपप्रबन्धक पदको

खुल्ला समावेशी तथा आन्तरिक प्रतियोगितात्मक लिखित परीक्षाको पाठयक्रम

१. लिखित परीक्षाको बिषय पुर्णाङ्क परीक्षा प्रश्नसंख्या अंकभार र समय निम्नानुसार हुनेछ ।

पत्र	बिषय	पुर्णाङ्क	उतिर्णाङ्क	खण्ड	परीक्षा प्रणाली	प्रश्न संख्या	प्रति प्रश्न अंकभार	समय
प्रथम पत्र	शासकीय प्रबन्ध, व्यवसायीकता र सेवा सम्बन्धी सामान्य बिषय	१००	४०	(क) शासकीय प्रबन्ध, व्यवस्थापन र व्यवसायीकता	छोटो उत्तर दिने प्रश्न	१०	५	३ घण्टा
				(ख) सेवा सम्बन्धी सामान्य बिषय	लामो उत्तर दिने प्रश्न	५	१०	
द्वितीय पत्र	सेवा सम्बन्धी (विस्तृत विवरण)	१००	४०	विश्लेषणात्मक समीक्षा		४	१५	३ घण्टा
				विश्लेषणात्मक र समाधान मुलक उत्तर		२	२०	

२. **द्वितिय चरणः अन्तर्वार्ताको योजना**

बिषय	पूर्णाङ्क	परीक्षा प्रणाली
व्यक्तिगत अन्तर्वार्ता	३०	मौखिक

३. प्राविधिक सेवा अन्तर्गतका सबै समुहहरुको प्रथम पत्रको पाठयक्रम एउटै हुनेछ । प्रथम पत्रको लिखित परीक्षा सबै समुहहरुका लागि संयुक्त रुपमा एउटै प्रश्नपत्रबाट एकैदिन वा छुट्टाछुट्टै प्रश्नपत्रबाट छुट्टाछुट्टै लिन सक्नेछ ।

४. प्रथम पत्र र द्वितीय पत्रको परीक्षा फरक फरक हुनेछ ।

५. दुवै पत्रको प्रत्येक खण्डको लागि फरक फरक उत्तरपुस्तिका प्रयोग गर्नुपर्नेछ ।

६. लिखित परीक्षाको माध्यम भाषा नेपाली वा अंग्रेजी वा दुवै हुन सक्नेछ ।

७. प्रश्नहरु यथासम्भव सबै इकाईबाट पर्नेगरी र नेपालको सन्दर्भमा सोधिने छन । लामो उत्तर दिनुपर्ने प्रश्न एकै वा खण्ड खण्ड गरी (दुई वा सो भन्दा बढी) सोध्न सकिनेछ । यस्तो प्रश्न एक भन्दा बढी इकाईबाट पर्ने गरी सोध्न सकिनेछ ।

८. यस पाठयक्रममा जेसुकै लेखिएको भएता पनि पाठयक्रममा परेका ऐन, नियमहरु परीक्षाको मिति भन्दा ३ महिना अगाडी (संशोधन भएका वा संशोधन भई हटाइएका वा थप गरी संशोधन भई) कायम रहेकालाई यस पाठयक्रममा परेको सम्झनु पर्दछ ।

९. परीक्षामा कालो मसी भएको कलम वा डटपेन मात्र प्रयोग गर्नुपर्नेछ ।

१०. पाठ्यक्रम लागु मिति २०७८ श्रावण १ गते देखि ।

प्रथम पत्र

खण्ड (क) (१०० अंक)

शासकीय प्रबन्ध, व्यवस्थापन र व्यवसायीकता

(Governance, Management and professionalism)

1. **Governance**
   - 1.1 Meaning, features and dimension of governance
   - 1.2 Corporate governance system
   - 1.3 Existing Constitution of Nepal
   - 1.4 The federal, provincial and Local governance
2. **Public Administration**
   - 2.1 Emerging Concept of Public Administration
   - 2.2 Basic elements of personnel Administration
   - 2.3 Financial Administration : Budget preparation, Implementation, Monitoring and Evaluation
   - 2.4 Financial Internal control
   - 2.5 Public Policy: Formulation, Implementation, Monitoring and Evaluation
3. **Management and Financial Analysis**
   - 3.1 Contemporary issues and Emerging Concept of management
   - 3.2 Role and Importance of Leadership. Motivation, Team works, Decision making, Control and coordination in Management
   - 3.3 Corporate planning and Strategic management
   - 3.4 Corporate social responsibility
   - 3.5 Project management: Project Planning and Scheduling: Network models, CPM/PERT, Manpower planning and resource scheduling, Project preparation for implementation and justification, Project monitoring and control: System of control, Project control cycle, Feedback control system, Cash control, Capital planning and Budgeting: Capital planning procedures, preparation of operating budgets, fixed and flexible budget, budgetary control
   - 3.6 Management Information System
   - 3.7 Issues and Challenges of Human Resource Management in Public Enterprises of Nepal
   - 3.8 Financial analysis: Methods of financial analysis such as benefit cost ratio, internal rate of return, net present value, payback period, minimum attractive rate of return and their application; Concept of EIRRR and FIRR; tariff structu**re**
4. **Development**
   - 4.1 Concept of Development administration
   - 4.2 Globalization
   - 4.3 Planning in Nepal: effort, achievement and challenges
   - 4.4 People’s participation in development
   - 4.5 Sustainable development

4.6 Diversity Management

4.7 Public Private Partnership

4.8 Development partners in development processes and foreign aid mobilization

4.9 Kathmandu Upatyaka Khanepani Limited (KUKL) Objective, efforts, achievement and challenges

5. **Ethics, Integrity, Morality and Accountability**

5.1 Essence, determinants, consequences and dimensions of ethics

5.2 Human Values

5.3 Ethical issues in service delivery and utilization of public funds

5.4 Challenges of corruption and corruption control strategies

5.5 Accountability, responsibility and authority

5.6 Compliance mechanism of public auditing

6. Professionalism

6.1 The foundational values for public service- integrity, impartiality. Dedication, empathy, tolerance and compassion

6.2 Time management, Resource management, Change management, Technology management, Information management, performance management, Grievance management, Team management, Conflict management, Crisis management, Stress management, Risk management, Participative management, Disaster management and Work culture Talent management, Negotiation skills and Dispute management

खण्ड (ख) सेवा सम्बन्धी सामान्य बिषय

(Service Related General Issues)

(१) संविधान र ऐन, नियमहरु

१.१ नेपालको संविधान, २०७२

१.२ कर्मचारी प्रशासन विनियमावली, २०६४ (संशोधन सहित)

१.३ आर्थिक प्रशासन विनियमावली, २०६४

१.४ कम्पनी ऐन, २०६३

१.५ खानेपानी व्यवस्थापन बोर्ड ऐन, २०६३

१.६ खानेपानी महशुल निर्धारण आयोग ऐन, २०६३

१.७ खानेपानी तथा सरसफाई नीति २०७१

१.८ सार्वजनिक खरिद ऐन, २०६३

१.९ सार्वजनिक खरिद नियमावली, २०६४

१.१० भ्रष्टाचार निवारण ऐन, २०५९

१.११ खानेपानी सेवा संचालन सम्बन्धी निर्देशिका, २०६९

(२) काठमाण्डौ उपत्यका खानेपानी लिमिटेड सम्बन्धी

२.१ काठमाण्डौ उपत्यका खानेपानी लिमिटेडको ऐतिहासिक पृष्ठभुमी तथा विद्यमान सांगठनिक संरचना

२.२ सार्वजनिक नीजि साझेदारी (Public Private Partnership) को अवधारणा तथा सार्वजनिक नीजि साझेदारी (Public Private Partnership) मा खानेपानी व्यवस्थापन भएका केही मुलुकहरुको संक्षिप्त जानकारी

२.३ खानेपानी महशुल निर्धारण आयोग तथा काठमाण्डौ उपत्यका खानेपानी व्यवस्थापन बोर्ड

२.४ आयोजना कार्यान्वयन निर्देशनालय

२.५ काठमाण्डौ उपत्यका खानेपानी लिमिटेडको प्रबन्धपत्र

२.६ काठमाण्डौ उपत्यका खानेपानी लिमिटेडको नियमावली

२.७ काठमाण्डौ उपत्यका खानेपानी लिमिटेडका शेयरधनीहरु बिचको सम्झौता तथा काठमाण्डौ उपत्यका खानेपानी लिमिटेड र काठमाण्डौ उपत्यका खानेपानी व्यवस्थापन बोर्ड बीचको Lease Agreement र अनुमति पत्र

२.८ काठमाण्डौ उपत्यका भित्रको खानेपानी व्यवस्थापन र चुनौती

(३) खानेपानी तथा सरसफाई सम्बन्धी

३.१ नेपालमा खानेपानी तथा सरसफाईको अवस्था

३.२ दिगो विकास लक्ष्य (Sustainable Development Goal)

३.४ सहरी सुविधा व्यवस्थापन

३.५ खानेपानी गुणस्तर नियन्त्रण सम्बन्धी विद्यमान ऐन तथा नियमहरु

३.६ खानेपानी चुहावट तथा नियन्त्रणका उपायहरु

३.७ खानेपानी गुणस्तर (WHO & NS Standard) प्रयोगशाला सम्बन्धी

३.८ खानेपानी गुणस्तर सम्बन्धी विभिन्न राष्ट्रिय तथा अन्तराष्ट्रिय संघ संस्थाहरु

३.९ खानेपानी गुणस्तर सम्बन्धी नविनतम प्रविधि र सो को प्रयोग

३.१० Existing Drinking Water Tap Connection Policy of KUKL

प्राविधिक सेवा, सिभिल समुह तह-९ उप-प्रबन्धक पदको

द्वितिय पत्रः सेवा सम्बन्धी (१०० अंक)

Section A:

1. <u>Concept and Principles.</u>

1.1. Drinking Water.

1.1.1. Present status of Water Supply and Sanitation

1.1.2. Current issues and problems of Water Supply in rural and urban

1.1.3. Design norms and principles

1.1.4. Principles related to unit operation:-

a) Aeration.
b) Flocculation and coagulation.
c) Sedimentation process including course material removal.
d) Filtration process/Slow sand filtration /Rapid filtration.
e) Disinfection process.
f) Sludge handling and disposal.

1.2. Municipal Wastewater.

1.2.1 Principles related to unit operation: -

1.2.1.1. Physical treatment: Screen /Grit chamber /Gas chamber /Mixing /Sedimentation /Flocculation /Floatation etc.

1.2.1.2. Chemical treatment: Chemical precipitation, Absorption, Ion exchange, Electrolysis etc.

1.2.1.3. Biological treatment: Aerobic and Anaerobic process- Aerated lagoons, Activated sludge, Trickling filters, Oxidation ditches.

1.2.1.4. Sludge treatment: Drying, Dewatering, Filtration, Centrifugation, Chemical conditioning (immobilization), and Incineration

1.3. Industrial Wastewater.

1.3.1 Introduction to nature and origin of industrial wastewater and their impacts on aquatic environment, flow characteristic, effluent and stream standards, Waste water treatment processes.

1.3.2 Pre and primary treatment: Equalization, Neutralization, Sedimentation oil separation, Filtration etc.

1.3.3 Wastewater treatment techniques: Coagulation and precipitation, Biological treatment (aerated lagoons, conventional activated sludge, trickling filters), Absorption, Ion exchange, Chemical oxidation.

1.3.4 Tertiary treatment for major polluting industries (tannery, textile, pulp and paper, sugar etc).

1.3.5 Sludge treatment, handling and disposal.

Section B:

2. Design and Treatment:-

2.1 Design of Drinking Water & WasteWater System

2.1.1 Drinking Water supply system

a) Introduction to pollutants (sources, types and effects), sources and characteristics of water, water demand and quantity, estimation of future population, design period.
b) Water sources and intakes.
c) Design of intake structures for rural and urban water supply system.
d) Pipeline design: design criteria, design of transmission and distribution system (including pipe networks).
e) Reservoirs: types, size determination.

2.1.2 Municipal Wastewater system.

a) Sources and nature of wastewater, effluent characteristics.
b) Estimation of quantity of sanitary sewage and storm water sewage collection systems, sewers design criteria.
c) Design of sanitary and storm water sewers and combined sewer systems.
d) Sewer Appurtenances: Manholes, Inverted siphons, House connections, Storm water inlets and etc.

2.1.2 Industrial Wastewater system

2.1.1.1. Industrial wastewater characteristics.
2.1.1.2. Concept of Central effluent treatment plant – Advantages and disadvantages.
2.1.1.3. Design criteria for Industrial Waste water system.
2.1.1.4. Design of Pre and primary treatment facilities: Equalization tank, Neutralization, Sedimentation oil separation, Filtration etc.

2.2 Design of Treatment Facility:-

2.2.1 Drinking Water treatment facility

a) Design of pre-treatment facility: Intake screen, aeration and etc.
b) Design of treatment facilities: Sedimentation, Flocculation, Filtration systems and Disinfection.
c) Advanced treatment: Absorption by activated carbon, ion exchange, multimedia filtration, ultra filtration and reverse osmosis, ozonation, ultra violet disinfection, demineralization, new development in water treatment operation.

2.2.2 Municipal wastewater treatment facility

a) Design of primary treatment: Screen, grit chamber, primary sedimentation, flow measurement facilities.
b) Design of secondary treatment: BOD removal, design criteria, activated sludge oxidation ponds /ditches, lagoons, trickling filters, and secondary clarifier.
c) Need for Tertiary treatment.

2.2.3 Industrial Wastewater treatment facility

a) Design of Industrial Wastewater treatment facilities: Coagulation and precipitation, Biological treatment (aerated lagoons, conventional activated sludge, trickling filters), Absorption, Ion exchange, Chemical oxidation.

b) Concept of Central effluent treatment plant – Advantages and disadvantages.

2.3 Management and other related aspects:-

2.3.1 Drinking Water system and treatment facility

a) Pipe materials and related aspects.
b) Sludge management, handling and disposal.
c) Operation and Maintenance of Water system.
d) Legal and Management aspects of Water system.
e) Financial aspects: Tariff structure, tariff rates and affordability, System cost recovery. Education and training.

2.3.2 Municipal Wastewater system and treatment facility

a) Sludge management, handling and disposal.
b) Operation and Maintenance
c) Legal and Management aspects
d) Financial aspects: Tariff structure, tariff rates and affordability, System cost recovery.
e) Education and training.

2.3.3 Industrial Wastewater system and treatment facility

a) Sludge treatment, handling and disposal
b) Operation and Maintenance
c) Legal and Management aspects
d) Financial aspects
e) Education and training.

Section C:

3. Ground Water Development.

3.1 Ground water flow.

a) Ground water occurrences and prospecting, chemical characteristics and properties of ground water.
b) Ground water exploration and Methods of ground water withdrawal.

3.2 Ground water recovery and tubewell design

3.2.1 Ground water recovery.
3.2.2 Tube well design.

3.3 Ground water quality

3.3.1 Ground water treatment (aerator, iron removal plant) requirement based on ground water quality
3.3.2 Disinfecting wells and piping
3.3.3 Maintaining well yield
3.3.4 Sanitary protection for ground water supplies
3.3.5 Conservation and utility of ground water

4 <u>Water and Wastewater Quality Issues</u>

4.1 **Introduction:** Water resources and ecosystem, water cycle, fresh water and competitive use of water.

4.2 **Water pollution**: Types and sources of water pollution, point and non- point pollution sources, effects of pollution (river, lake and reservoir), pollution of ground water.

4.3 Water quality and standards for various uses of water.

4.4 Sources and nature of Municipal and Industrial Wastewater, required effluent quality and standards.

4.5 Municipal and Industrial wastewater quality and standards and its impact on aquatic environment, effluent and stream standards.

4.6 **Management:** Strategies for water pollution control, water quality monitoring and surveillance.

5 <u>Environmental Issues.</u>

5.1 Environmental health and sanitation.

5.1.1 Introduction: Fundamentals of epidemiology, infectious and non- infectious diseases, infectious disease transmission routes, organic and inorganic contaminants, and health and water quality.

5.1.2 Human excreta and its characteristics, pollution caused by excreta, health aspects of water supply and sanitation.

5.1.3 Pathogens: Excreted bacteria, helminthes and their control, diseases transmitted by arthropod vectors (mosquito, flies, cockroaches, bugs, lice, etc).

5.1.4 Excreta treatment and disposal: Options, On site sanitation system (pit latrines, composting toilets and septic tank), Off site sanitation (septage collection, lagoon, waste stabilization ponds, anaerobic digestion).

5.1.5 Engineering and infectious diseases: Water related, excreta related, refuse related, housing related, diseases; reuse of wastes, watershed reservoir sanitation; engineering control of infectious diseases.

5.2 Environmental impact assessment.

5.2.1 Introduction: Concept of environmental assessment, Initial environmental examination (IEE), Environmental impact assessment (EIA), role of EIA, types of environmental impacts, and EIA principles.