

नेपाल आयल निगम लिमिटेड

खुला तथा आन्तरिक प्रतियोगितात्मक परीक्षाको लागि पाठ्यक्रम एवं परीक्षा योजना

स्तर : अधिकृत, सेवा : प्राविधिक, समूह : इञ्जिनियरिङ्ग, तह : ६, पद : सहायक प्रबन्धक (सिभिल)

यस पाठ्यक्रम योजनालाई दुई चरणमा विभाजन गरिएको छ :

प्रथम चरण :- लिखित परीक्षा, पूर्णाङ्क : २००

द्वितीय चरण :- अन्तर्वार्ता, पूर्णाङ्क : ३०

प्रथम चरण - लिखित परीक्षा

पत्र	विषय	परीक्षा प्रणाली	प्रश्न संख्या	अंक भार	समय	पूर्णाङ्क	उत्तीर्णाङ्क
प्रथम	शासकीय व्यवस्था र विकास	विषयगत	१०	१०	३ घण्टा	१००	४०
द्वितीय	सेवा सम्बन्धी	विषयगत	१०	१०	३ घण्टा	१००	४०

द्वितीय चरण - अन्तर्वार्ता

विषय	पूर्णाङ्क	परीक्षा प्रणाली
अन्तर्वार्ता	३०	मौखिक

द्रष्टव्य :

- लिखित परीक्षाको माध्यम भाषा नेपाली वा अंग्रेजी अथवा नेपाली र अंग्रेजी दुवै हुनेछ ।
- प्रथम पत्र र द्वितीय पत्रको लिखित परीक्षा छुट्टाछुट्टै हुनेछ ।
- परिक्षार्थीले प्रथम पत्रको प्रत्येक खण्डको उत्तर छुट्टाछुट्टै उत्तरपुस्तिकामा र दोस्रो पत्रको लागि सबै प्रश्नको उत्तर एउटै 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 ।
- प्रथम चरणको परीक्षाबाट छनौट भएका उम्मेदवारहरूलाई मात्र द्वितीय चरणको अन्तर्वार्तामा सम्मिलित गराइनेछ ।
- पाठ्यक्रम लागू मिति : २०७४ असोज २२ गते देखि

प्रथम पत्र - शासकीय व्यवस्था र विकास

खण्ड क : शासकीय व्यवस्थाका आधारभूत पक्ष - अंक ३० (३ प्रश्न × १० अंक)

१. नेपालको वर्तमान संविधान र नेपालको संवैधानिक विकासक्रम ।
२. नेपालमा संघीय शासन प्रणाली ।
३. सरकारको कार्यक्षेत्र, काम, कर्तव्य र अधिकार ।
४. कार्यपालिका, व्यवस्थापिका र न्यायपालिका बिचको अन्तरसम्बन्ध ।
५. सुशासन, पारदर्शिता, उत्तरदायित्व, निष्पक्षता र व्यावसायिकता ।
६. राजनीति र सार्वजनिक प्रशासन बीचको सम्बन्ध र सीमा ।
७. नागरिक वडापत्रको अवधारणा ।
८. कानूनी राज्य, मानव अधिकार ।
९. सामाजिक न्याय र सामाजिक सुरक्षा ।
१०. उपभोक्ताको हक हित संरक्षण सम्बन्धी अवधारणा

खण्ड ख : संस्थान व्यवस्थापन तथा संस्थागत सुशासन - अंक ३० (३ प्रश्न × १० अंक)

१. सार्वजनिक संस्थानको आवश्यकता, उद्देश्य
२. सार्वजनिक संस्थानको स्वायत्तता र उत्तरदायित्व
३. सार्वजनिक संस्थानका कार्य सम्पादन सुधारका पक्षहरू
४. नेपालमा सार्वजनिक संस्थान निजीकरणको अवस्था
५. नेपालमा सार्वजनिक संस्थान संचालनमा रहेका समस्या र चुनौतीहरू
६. नेपाल सरकारको निजीकरण सम्बन्धी कार्यक्रम
७. उदारीकरणको सन्दर्भमा सार्वजनिक संस्थानको सान्दर्भिकता
८. संस्थागत सुशासनको अवधारणा र सिद्धान्तहरू
९. नेपालमा संस्थागत सुशासनका सम्बन्धमा रहेका कानूनी, नीतिगत र संस्थागत व्यवस्था
१०. नेपाल आयल निगमबाट संस्थागत सुशासनका लागि गरिएका प्रयासहरू

खण्ड ग : नेपाल आयल निगम र उपभोक्ताको अधिकार - अंक ४० (४ प्रश्न × १० अंक)

१. नेपाल आयल निगमको उद्देश्य, काम, कर्तव्य र अधिकार
२. निगम संचालक समितिको भूमिका तथा उत्तरदायित्व
३. नेपाल आयल निगमको कर्मचारी प्रशासन र कर्मचारीका आचारण
४. नेपाल आयल निगमको खरिद कार्यविधि सम्बन्धी व्यवस्था
५. नेपालमा पेट्रोलियम पदार्थ आयात, ढुवानी तथा बिक्री वितरण सम्बन्धी व्यवस्था
६. पेट्रोलियम पदार्थ गुणस्तर नियन्त्रण सम्बन्धी व्यवस्था
७. पेट्रोलियम पदार्थको स्वचालित मूल्य निर्धारण सम्बन्धी व्यवस्था
८. पेट्रोलियम पदार्थ र यसबाट वातावरणमा पर्ने असर, प्रभाव, समस्या र समाधानका उपायहरू
९. अन्तर्राष्ट्रिय तेल बजार : उत्पादन, बिक्री वितरण तथा मूल्य निर्धारण प्रणाली
१०. कम्पनीको स्थापना तथा खारेजी प्रक्रिया सम्बन्धी कानूनी व्यवस्था
११. करार तथा सम्झौताका आधारभूत पक्षहरू ।

द्वितीय पत्र - सेवा सम्बन्धी

1. Structure Analysis and Design

- 1.1 Stresses and strains; theory of torsion and flexure; moment of inertia
- 1.2 Analysis of beams and frames: Bending moment, shear force and deflection of beams and frames: determinate structure - Energy methods; three hinged systems, indeterminate structures- slope deflection method and moment distribution method; use of influence line diagrams for simple beams, unit load method
- 1.3 Reinforced concrete structures: Difference between working stress and limit state philosophy, analysis of RC beams and slabs in bending, shear, deflection, bond and end anchorage, Design of axially loaded columns; isolated and combined footings, introduction to pre-stressed concrete
- 1.4 Steel and timber structures: Standard and built-up sections: Design of riveted, bolted and welded connections, design of simple elements such as ties, struts, axially loaded and eccentric columns, column bases, Design principles on timber beams and columns

2. Construction Materials and Concrete Technology

- 2.1 Properties of building materials: physical, chemical, constituents, thermal etc.
- 2.2 Stones-characteristics and requirements of stones as a building materials
- 2.3 Ceramic materials: ceramic tiles, Mosaic Tile, brick types and testing etc.
- 2.4 Cementing materials: types and properties of lime and cement; cement mortar tests
- 2.5 Metals: Steel; types and properties; Alloys
- 2.6 Timber and wood: timber trees in Nepal, types and properties of wood
- 2.7 Miscellaneous materials: Asphaltic materials (Asphalt, Bitumen and Tar); paints and varnishes; polymers
- 2.8 Indigenous Technology in Building Design and Construction
- 2.9 Constituents and properties of concrete (physical and chemical)
- 2.10 Water cement ratio
- 2.11 Grade and strength of concrete, concrete mix design, testing of concrete
- 2.12 Mixing, transportation pouring and curing of concrete
- 2.13 Admixtures
- 2.14 High strength concrete
- 2.15 Pre-stressed concrete technology

3. Construction Management

- 3.1 Construction scheduling and planning: network techniques (CPM, PERT) and bar charts
- 3.2 Contractual procedure and management: types of contract, tender and tender notice, preparation of bidding (tender) document, contractors pre-qualification, evaluation of tenders and selection of contractor, contract acceptance, condition of contract; quotation and direct order, classifications of contractors; dispute resolution; muster roll
- 3.3 Material management: procurement procedures and materials handling
- 3.4 Cost control and quality control
- 3.5 Project maintenance
- 3.6 Occupational health and safety
- 3.7 Project monitoring and evaluation
- 3.8 Quality assurance plan
- 3.9 Variation, alteration and omissions

4. Estimating and Costing Valuation and Specification

- 4.1 Types of estimates and their specific uses
- 4.2 Methods of calculating quantities
- 4.3 Key components of estimating norms and rate analysis
- 4.4 Preparation of bill of quantities
- 4.5 Purpose, types and importance of specification
- 4.6 Purpose, principles and methods of valuation

5. Drawing Techniques

- 5.1 Drawing sheet composition and its essential components
- 5.2 Suitable scales, site plans, preliminary drawings, working drawings etc
- 5.3 Theory of projection drawing: perspective, orthographic and axonometric projection; first and third angle projection
- 5.4 Drafting tools and equipments
- 5.5 Drafting conventions and symbols
- 5.6 Topographic, electrical, plumbing and structural drawings
- 5.7 Techniques of free hand drawing

6. Engineering Survey

- 6.1 Introduction and basic principles
- 6.2 Linear measurements: techniques; chain, tape, ranging rods and arrows; representation of measurement and common scales; sources of errors; effect of slope and slope correction; correction for chain and tape measurements; Abney level and clinometers
- 6.3 Compass and plane table surveying: bearings; types of compass; problems and sources of errors of compass survey; principles and methods of plane tabling
- 6.4 Leveling and contouring: Principle of leveling; temporary and permanent adjustment of level; bench marks; booking methods and their reductions; longitudinal and cross sectioning; reciprocal leveling; trigonometric leveling; contour interval and characteristics of contours; methods of contouring
- 6.5 Theodolite traversing: need of traverse and its significance; computation of coordinates; adjustment of closed traverse; closing errors
- 7.6 Uses of Total Station and Electronic Distance Measuring Instruments

7. Engineering Economics

Benefit cost analysis, cost classification, sensitivity analysis, internal rate of return, time value of money; economic equilibrium, demand, supply and production, net present value, financial and economic evaluation

8. Technology and Environment

- 8.1 Public procurement practices for works, goods and services and its importance
- 8.2 Technological development in Nepal.
- 8.3 Promotion of local technology and its adaptation
- 8.4 Environmental Impact Assessment, Initial Environmental Examination, Global-warming phenomena.
- 8.5 Types of sources of pollution: point / non-point (for air and water)
- 8.6 Social mobilization in local infrastructure development and utilization in Nepal.
- 8.7 Participatory approach in planning, implementation, maintenance and operation of local infrastructure

9 Transportation

- 9.1 Highway Drainage; Importance of drainage: surface drainage and estimation of water quantity, design of drainage structures, erosion control and dissipating structures, subsurface drains, cross drainage structures and types
- 9.2 Road Pavement: Types of road pavements, flexible and rigid pavement, loads and other factors controlling pavement, design methods for flexible pavements, design methods for rigid pavements, stress due to load, temperature and sub-grade friction, function of pavement structure, axle load, damaging factor of axle loads, different types of pavement surface
- 9.3 Road Maintenance, Repair and Rehabilitation: Classification of maintenance activities for road pavement and road facilities, inspection, prioritization and planning of maintenance operations, evaluation of pavement distress and pavement condition, types and methods of pavement repair, types of overlay and strengthening of existing pavements.

10. Soil Mechanics

- 10.1 Properties of soils, Soil as a three phase diagram, Basic definitions of phase relationships, Index properties of soil, Determination of various index properties
- 10.2 Consolidation and settlements; Behavior of soil under compressive loads, Settlement of structures resting on soil: its nature, causes and remedial Measures, Primary and secondary consolidation, Compressibility of soil, Stability of slopes; Causes of slope movements and failures, Types of slope and slope failures, Critical surfaces and factor of safety, Method of stability analysis and stability number
- 10.3 Bearing capacity of soils; Types of bearing capacity and factors influencing bearing capacity, Effects of various factors on bearing capacity, Modes of foundation failure, Terzaghi's general bearing capacity theory, Ultimate bearing capacity of cohesionless and cohesive soil

11. Professional Practice

- 11.1 Ethics and Professionalism: Perspective on morals, codes of ethics and guidelines of professional engineering practice
- 11.2 Legal aspects of Professional Engineering in Nepal. Provision for private practice and employee engineers
- 11.3 Nepal Engineering Council Act, 2055 and regulations, 2056
- 11.4 Relation with clients, contractor and fellow professionals.
- 11.5 Public procurement practices for works, goods and services and its importance

12. Computer and Information System

- 12.1 Computer Structure (I/O devices, Storage devices, Memories) and typical processor architecture, CPU and memory organization, buses , Characteristics of I/O and storage devices, Processing Unit, memory systems (main, auxiliary, virtual, cache).
- 12.2 Digital Networks (LAN, WAN)
- 12.3 Data types, Concept of Management Information System, concept of Operating Systems, Application software, Basic Concept on internet, e-mail and webpage (such as DNS, IP, URL, http, ftp, IRQ, Routers). Server (Web, email, printer), General concept of Cyber security (digital signature, SPAM, VIRUS, WORM, hiking, cracking), Unicode
