



ललितपुर महानगरपालिका
नगर कार्यपालिकाको कार्यालय
पुल्चोक, ललितपुर, ३ नं प्रदेश, नेपाल

इन्जिनियरिङ्ग सेवा, विल्डिङ्ग एण्ड आर्किटेक्ट समूह / उपसमूह, छैठौं तह, आर्किटेक्ट पदको प्रतियोगितात्मक परीक्षाको लागि पाठ्यक्रम

पाठ्यक्रमको रूपरेखालाई निम्न अनुसार विभाजन गरिएको छ :

भाग १

लिखित परीक्षा (Written Examination) :- वस्तुगत (बहुवैकल्पिक)

पूर्णाङ्क :- १००

भाग २

अन्तिम चरण (Final Examination):- अन्तर्वार्ता

पूर्णाङ्क :- ५०

परीक्षा योजना (Examination Scheme)

पत्र	विषय	पूर्णाङ्क	उतीर्णाङ्क	परीक्षा प्रणाली	प्रश्नसंख्या X अङ्क	समय
प्रथम	सेवा सम्बन्धी	१००	४०	वस्तुगत : बहुवैकल्पिक प्रश्न (MCQs)	१०० प्रश्न X १अङ्क	१ घण्टा १५मिनेट

विषय	पूर्णाङ्क	परीक्षा प्रणाली
अन्तर्वार्ता (Interview)	५०	मौखिक (Oral)

द्रष्टव्य :

- यो पाठ्यक्रम योजनालाई लिखित परीक्षा (प्रथम चरण) तथा अन्तिम चरण (अन्तर्वार्ता) गरी दुई भागमा विभाजन गरिएको छ ।
- प्रश्नपत्र अंग्रेजी भाषामा हुनेछ ।
- लिखित परीक्षाको माध्यम भाषा नेपाली वा अंग्रेजी अथवा नेपाली र अंग्रेजी दुवै हुनेछ ।
- 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 ।

इञ्जिनियरिङ्ग सेवा, विल्डिङ्ग एण्ड आर्किटेक्ट समूह /उपसमूह, छैठौं तह, आर्किटेक्ट पदको प्रतियोगितात्मक परीक्षाको लागि पाठ्यक्रम

५. परीक्षामा कुनै प्रकारको क्याल्कुलेटर (Calculator) प्रयोग गर्न पाइने छैन ।
६. कार्यालय बाट संचालन हुने परीक्षामा परीक्षार्थीले मोबाइल वा यस्तै प्रकारका विद्युतीय उपकरण परीक्षा हलमा लैजान पाइने छैन ।
७. लिखित परीक्षामा छनौट भएका उम्मेदवारहरूलाई मात्र अन्तिम चरणको अन्तर्वार्तामा सम्मिलित गराइनेछ ।
८. 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 ।
९. पाठ्यक्रम लागू मिति : २०७६/०८/१२

इञ्जिनियरिङ्ग सेवा, विल्डिङ्ग एण्ड आर्किटेक्ट समूह /उपसमूह, छैठौं तह, आर्किटेक्ट पदको प्रतियोगितात्मक परीक्षाको लागि पाठ्यक्रम

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

- 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; Aluminium
- 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 Soil properties and its parameters
- 2.9 Alternative materials / technology

3. Concrete Technology

- 3.1 Constituents and properties of concrete (physical and chemical)
- 3.2 Water cement ratio
- 3.3 Grade and strength of concrete, concrete mix design, testing of concrete
- 3.4 Mixing, transportation pouring and curing of concrete
- 3.5 Admixtures
- 3.6 High strength concrete
- 3.7 Pre-stressed concrete technology

4. Construction Management

- 4.1 Construction scheduling and planning: network techniques, bar charts and computer aided construction management

4.2 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 negotiation, contract acceptance, condition of contract; quotation and direct order, classifications of contractors; dispute resolution

4.3 Material management: procurement procedures and materials handling

4.4 Cost control, quality control and time control

4.5 Utility maintenance

4.6 Health, safety and insurance

4.7 Project monitoring and evaluation

4.8 Quality assurance plan

4.9 Variation and changes

4.10 Use of construction equipments

5. Estimating and Costing, Valuation and Specification

5.1 Types of estimates and their specific uses

5.2 Methods of calculating quantities

5.3 Key components of estimating norms and rate analysis

5.4 Preparation of bill of quantities

5.5 Purpose and importance of specification

5.6 Purpose, principles and methods of valuation

6. Drawing Techniques

6.1 Drawing sheet composition and its essential components

6.2 Suitable scales, site plans and location plans, preliminary drawings, conceptual and working drawings

6.3 Theory of projection drawing: perspective, orthographic and axonometric projection; first and third angle projection

6.4 Drafting tools and equipments; conventions and symbols

6.5 Topographic, electrical, plumbing and structural drawings

6.6 Techniques of free sketches drawing

7. Engineering Survey

7.1 Introduction and basic principles

7.2 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

7.3 Compass and plane table surveying: bearings; types of compass; problems and sources of errors of compass survey; principles and methods of plane tabling

7.4 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

7.5 Theodolite traversing: need of traverse and its significance; computation of coordinates; adjustment of closed traverse; closing errors

7.6 Uses of Total Station, Electronic Distance Measuring Instruments & GPS

8. Engineering Economics

8.1 Benefit cost analysis, cost classification, sensitivity analysis, internal rate of return, time value of money

8.2 Economic equilibrium, demand, supply and production, net present value, financial and economic evaluation

9. Professional Practices and Legislations

9.1 Ethics and professionalism: code of conduct and guidelines for professional engineering practices

9.2 Nepal Engineering Council Act, 2055; and regulations, 2056

9.3 Relation with clients, contractor and professionals 9.4 Public procurement concept and practices for works, goods and services and its importance

9.5 The Constitution of Nepal (From Part 1 to 5, 13, 14, 15, 16, 17, 18, 19 & 20; and Schedules)

9.6 Local Government Operation Act, 2074

10. Building Materials and Construction

10.1 Stone masonry: Types of stone used in stone masonry; specifications

10.2 Brick masonry: Classification of bricks, specifications of different types of bricks, testing of bricks, different shapes of bricks

10.3 Hollow concrete blocks: Various types of concrete blocks, use of concrete blocks in buildings.

10.4 Sand: Requirement of good quality sand, sieve analysis, fineness modulus

10.5 Lime: Different types of lime and their uses test of freshness

10.6 Mortar: Types of mortar, specifications, proportion of mortar for various types of masonry works

10.7 Paintings: Types of paints, specification for various types of painting works

10.8 Water proofing: Water proofing at basement, ground floor and roofs, common water proofing problems in Nepal

10.9 Roofing Systems: Different types of roofing system

10.10 Doors and windows: Different types of doors and windows, door and window details, merits and demerits of metal door and windows

10.11 Walls: Different types of wall system, load bearing walls, partition walls and curtain walls

10.12 Pre-fabrication: Principles of pre-fabrication, advantages and disadvantages of a pre-fabricated building

10.13 Flooring: Different types of flooring, specification of floorings

10.14 Plastering: Different types of plasters and coating materials

10.15 Formworks: Shoring, underpinning, scaffolding and formworks

10.16 Building Elements: Foundation, super structure, lintel, floors, roofs, sun control devices, parapet, staircase, emergency stairs, elevators and escalators

- 10.17 Building services: water supply and sanitation, electrification, heating and ventilation and air-conditioning
- 10.18 National Nepal Building Code: Hierarchy of building codes and its application, problem and procedure for implementation of building code
- 10.19 Development Control System in municipalities in Nepal
- 10.20 Maintenance and repair of buildings 1.21 Principles & concept of cost effective & affordable construction techniques
- 10.22 Current building norms and role of municipalities

11. Structural Design and Analysis

- 11.1 Design of RCC footings, columns, slabs, beams
- 11.2 Analysis of structural system in a building
- 11.3 Design of steel structure
- 11.4 Design of timber structure
- 11.5 Design of masonry structure
- 11.6 Common structural problems in RCC buildings in Nepal
- 11.7 Requirements of earthquake resistant building construction
- 11.8 Computer Aided Design (CAD) of building structure
- 11.9 Mandatory Rule of Thumb in building design
- 11.10 Non-engineered earthquake resistant building design
- 11.11 Low strength masonry building code

12. Housing and Urban Planning

- 12.1 Hierarchy of urban settlements
- 12.2 Types of urban settlements in Nepal
- 12.3 Base maps and urban maps
- 12.4 Hierarchy of plans and hierarchy of cities
- 12.5 Principles of land use planning
- 12.6 Building byelaws and its implementation challenges
- 12.7 Periodic plans for local authorities
- 12.8 Planning legislation of Nepal
- 12.9 Environmental issues in urban development
- 12.10 Institutions involved in urban planning and development in Nepal
- 12.11 Conservation of heritage sites
- 12.12 Settlement planning for disaster mitigation and urban planning
- 12.13 Municipalities of Nepal and their role in urban development
- 12.14 Town Development Committees and their role in urban development.
- 12.15 Different types of housing
- 12.16 Principles of housing design
- 12.17 Different models of land development and roles of municipalities

- 12.18 Squatter and slums
- 12.19 Private and public housing development
- 12.20 Rural housing, housing development programmes in Nepal
- 12.21 Prospects of apartments and group housing in Nepal
- 12.22 Ecological adaptation
- 12.23 Matrix addressing system
- 12.24 Impact of provincial government and state planning institutions in municipalities

13. Architecture

- 13.1 History of architecture
- 13.2 Contemporary world architecture
- 13.3 Contemporary Nepalese architecture
- 13.4 Traditional architecture of Nepal
- 13.5 Architecture of the Kathmandu Valley
- 13.6 Principles of architectural design
- 13.7 Factors to be considered while designing buildings
- 13.8 Code and standards to be followed while designing buildings in Nepal
- 13.9 Contemporary world architects and their works
- 13.10 Architectural landmarks in Nepal
- 13.11 Conservation of historic buildings
- 13.12 Ethics of architects in professional practice
- 13.13 Contemporary role of architects in municipalities and their works