

गण्डकी विश्वविद्यालय
जनशक्ति व्यवस्थापन समिति,
प्राविधिक अधिकृतस्तरका कर्मचारीहरूको पाठ्यक्रम- २०७७

खुल्ला प्रतियोगिता अन्तर्गत प्राविधिक अधिकृत वा सो सरह (अधिकृतस्तर ६/ ७/ ८) का प्राविधिक सेवासमूहका पदहरूको लिखित परीक्षा तोकिएको पाठ्यक्रम भित्र रही देहाय अनुसार संचालन गरिने छ ।

क्र.सं.	पत्र	विषय	कुल पुर्णाङ्क
१	प्रथम पत्र	सम्बन्धित विषयगत ज्ञान(वस्तुगत प्रश्न)	३०
२	द्वितीय पत्र	क) संविधान, ऐन,नियम र विश्वविद्यालय सम्बन्धी ज्ञान (विषयगत प्रश्न) (१५ अङ्क)	४५
		ख) समुहपदसँग सम्बन्धित विषयको ज्ञान(विषयगत प्रश्न)(३० अङ्क)	
		जम्मा	७५

नोट:-

(१) परीक्षाको पुरा समय ३ घण्टाको हुनेछ । जसमध्ये वस्तुगत ३० मिनेटको हुनेछ । वस्तुगत पत्रको उत्तर पुस्तिका बुझाएपछि विषयगत प्रश्नपत्र उपलब्ध गराइने छ ।

(२) लिखित परीक्षाको माध्यम भाषा नेपाली वा अंग्रेजी अथवा नेपाली र अंग्रेजी दुवै हुन सक्नेछ ।

(३) यस पाठ्यक्रममा जेसुकै लेखिएको भए तापनि पाठ्यक्रममा परेका ऐन, नियमहरू परीक्षाको मिति भन्दा ३ महिना अगाडी (संशोधन भएका वा संशोधन भई हटाईएका वा थप संशोधन भई) कायम रहेकालाई यस पाठ्यक्रममा परेको सम्झनु पर्दछ ।

क) प्राविधिक अधिकृत (अधिकृतस्तर छैटौँ, सातौँ र आठौँ तह) सिभिल ईन्जिनियर पदको पाठ्यक्रम:

१. संविधान, ऐन, नियम र शिक्षा प्रणालीको व्यवस्थापन सम्बन्धी विभिन्न ऐन नियमहरू

नेपालको संविधान २०७२, शिक्षा ऐन २०२८ र शिक्षा नियमावली, २०५९, विश्वविद्यालय अनुदान आयोग ऐन, २०५०, चालु र सो भन्दा अघिल्लो पञ्चवर्षीय योजनामा शिक्षा सम्बन्धी व्यवस्था, विश्वविद्यालय अनुदान आयोग र विश्वविद्यालयहरू बीचको सम्बन्धका विविध आयामहरू, , गण्डकी प्रदेशस्तरीय नीति तथा योजना, गण्डकी विश्वविद्यालयको ऐन २०७६को जानकारी, गण्डकी विश्वविद्यालयको संगठन तथा शैक्षिक प्रशासन सम्बन्धी नियमावली २०७७को जानकारी, गण्डकी विश्वविद्यालयको शिक्षक तथा कर्मचारी सम्बन्धी नियममवली २०७७ को जानकारी, गण्डकी विश्वविद्यालयको आर्थिक व्यवस्थापन सम्बन्धी नियमावली २०७७को जानकारी

२. सम्बन्धित सेवा सम्बन्धी विषय ज्ञान

Part: A

1. Structural Engineering

1.1 Center of gravity, moment of inertia, radius of gyration

1.2 Stresses and strains, theory of torsion and flexure

1.3 Analysis of beams and frames: bending moment, shear force and deflection of beams and frames

1.4 Determinate structures (energy methods), three hinged systems, suspension cable system
1.5 Indeterminate structures: - slope deflection method and moment distribution method, use of influence line diagrams for simple beams, unit load method, two hinged arches

1.6 Plastic analysis of beam and frame

2. Engineering Survey

2.1 Introduction and basic principles, classification of surveys

2.2 Linear measurement techniques:- chain and tape method, 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

2.3 Compass: - types of compass, problems and sources of errors in compass survey

2.4 Plane table surveying: principles and methods of plane tabling

2.5 Leveling: principle of leveling, temporary and permanent adjustment of level, bench marks, booking methods and their recording, longitudinal and cross sectioning, reciprocal leveling, trigonometric leveling

2.6 Contouring: contour interval and characteristics of contours, methods of contouring, interpolation, use of contour map

2.7 Theodolite traversing: need of traverse and its significance, principle of traverse, computation of coordinates; adjustment of closed traverse and linked traverse, closing errors

2.8 Tacheometry: principle, tacheometric formula, relation of distance and elevation

2.9 Uses of total station and electronic distance measuring instruments

2.10 Curves: types and suitability, elements, geometry and setting out of curves (simple circular curve, vertical curve, transition curve)

2.11 Calculation of area and volume: methods of area calculation of land, methods of area and volume calculation of cut and fill, mass haul diagram

3. Construction Materials

3.1 Properties of building materials: physical, chemical, constituents, thermal

3.2 Stones: characteristics and requirements of stones as a building material

3.3 Ceramic materials: ceramic tiles, mosaic tile, brick types and testing

3.4 Cementing materials: types and properties of lime and cement; cement mortar tests

3.5 Metals: types and properties of steel, alloys

3.6 Timber and wood: timber trees in Nepal, types and properties of wood

3.7 Miscellaneous materials: asphaltic materials (asphalt, bitumen and tar), paints and varnishes, polymers

3.8 Soil properties and its parameters

3.9 Local and modern building construction material in Nepal

4. Concrete Technology

4.1 Constituents and properties of concrete (physical and chemical)

4.2 Water cement ratio

4.3 Grade and strength of concrete, concrete mix design, testing of concrete

4.4 Mixing, transportation pouring and curing of concrete

4.5 Admixtures

4.6 High strength concrete

4.7 Pre-stressed concrete

5. Geotechnical Engineering

5.1 Formation of soil, general classification of soil depending on transporting agent and deposit media

5.2 Three phases of soil: basic terms, relation between basic terms, volumetric relationship: mass and volume, weight and volume, specific gravity of soil and lab test, field density and determination methods

5.3 Types of water in soil, moisture content and relationship, organic content in soil

5.4 Index properties of soil: grain size distribution and types of soil depending on grain size distribution, consistency limit, relative density, lab test of index properties

5.5 Types of rock, dip, strike, fold, fault, cleavage, geographical divisions of Nepal, earthquake: causes of earthquake, types of wave, grading of earthquake, seismic fault line in Nepal

5.6 Tunneling: types of tunnels, component parts of a tunnel and tunnel cross section, survey for tunnel alignment, drainage, lighting and ventilation requirements for tunnels, method of tunneling in soft soils and rock

6. Construction Management

6.1 Construction scheduling and planning: network techniques (CPM, PERT) and bar charts

6.2 Contractual procedure and management: types of contract, bid and bid notice, preparation of bidding document, contractors pre-qualification, evaluation of tenders and selection of contractor, contract acceptance, condition of contract, quotation and direct purchase, classifications of contractors, dispute resolution, muster roll

6.3 Material management: procurement procedures and materials handling

6.4 Cost, quality and time control

6.5 Project management

6.6 Occupational health and safety

6.7 Project monitoring and evaluation

6.8 Quality assurance plan

6.9 Variation, alteration and omissions

7. Estimating, Costing, Specification and Valuation

7.1 Types of estimates and their specific uses

7.2 Methods of calculating quantities

7.3 Key components of estimating norms and rate analysis

7.4 Preparation of bill of quantities 7.5 Purpose, types and importance of specification

7.6 Purpose, principles and methods of valuation

8. Engineering Drawing

8.1 Drawing sheet composition and its essential components

8.2 Suitable scales, site plans, preliminary drawings, working drawings

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

8.4 Drafting tools and equipments

8.5 Drafting conventions and symbols

8.6 Topographic, electrical, plumbing and structural drawings

8.7 Techniques of free hand drawing

8.8 Community buildings: School and hospital buildings and their design considerations

9. Engineering Economics

9.1 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

10. Professional Practices

10.1 Ethics, integrity and professionalism: code of conduct and guidelines for professional engineering practices

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

10.3 Relation with clients, contractor and fellow professionals

10.4 Public procurement practices for works, goods and services and its importance

10.5 National Building Code: Hierarchy of building codes and its application, procedure for implementation of building code in Nepal

10.6 Building Bylaws

Part: B

1. Building Materials and Construction

1.1 Stone masonry: Types of stone used in stone masonry, specifications of stone masonry.

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

1.3 Hollow Concrete Blocks: Various types of concrete blocks, use of concrete blocks in buildings.

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

1.5 Lime: Different types of lime and their uses test of freshness.

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

1.7 Paintings: Types of paints, specification for various types of painting Works.

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

1.9 Roofing Systems: Different types of roofing system.

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

1.11 Walls: Different types of wall system, Load bearing walls, partition walls and curtain walls.

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

1.13 Flooring: Different types of flooring, specification of floorings.

1.14 Plastering: Different types of plasters and coating materials.

1.15 Formworks: Shoring, underpinning, scaffolding and formworks.

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

1.17 Building services: water supply and sanitation, electrification, heating and ventilation and air-conditioning.

1.18 National Building Code: Hierarchy of building codes and its application, procedure for implementation of building code in Nepal.

1.19 Development Control System in municipalities in Nepal

1.20 Maintenance and repair of buildings.

1.21 Principles of low cost construction techniques.

1.22 Current building norms for estimating and costing.

2. Structural Design and Analysis

2.1 Design of RCC footings, columns, slabs, beams.

2.2 Analysis of structural system in a building.

2.3 Design of steel structure.

2.4 Design of timber structure.

2.5 Design of masonry structure.

2.6 Common structural problems in RCC buildings in Nepal.

2.7 Requirements of earthquake resistant building construction.

2.8 Computer Aided Design (CAD) of building structure.

2.9 Mandatory Rule of Thumb in building design.

2.10 Non-engineered earthquake resistant building design

3. Housing and Urban Planning

3.1 Hierarchy of urban settlements,

3.2 Types of urban settlements in Nepal.

- 3.3 Base Maps:
- 3.4 Hierarchy of plans
- 3.5 Principles of land use planning
- 3.6 Building byelaws
- 3.7 Periodic plans for local authorities
- 3.8 Planning legislation of Nepal
- 3.9 Environmental issues in urban development.
- 3.10 Institutions involved in urban planning and development in Nepal.
- 3.11 Types of urban development programs in Nepal.
- 3.12 Conservation of heritage sites,
- 3.13 Settlement planning for disaster mitigation.
- 3.14 Municipalities of Nepal and their role in urban development.
- 3.15 Town Development Committees and their role in urban development.
- 3.16 Different types of housing,
- 3.17 Principles of housing design,
- 3.18 Different models of land development,
- 3.19 Squatter and slums, 3.20 Private housing development,
- 3.21 Rural housing, housing development programs in Nepal,
- 3.22 Prospects of apartments and group housing in Nepal.
- 4. Architecture
 - 4.1 History of architecture
 - 4.2 Contemporary world architecture
 - 4.3 Contemporary Nepalese architecture
 - 4.4 Traditional architecture of Nepal
 - 4.5 Architecture of Kathmandu Valley
 - 4.6 Principles of architectural design.
 - 4.7 Factors to be considered while designing buildings.
 - 4.8 Standards to be followed while designing buildings in Nepal
 - 4.9 Contemporary world architects and their works
 - 4.10 Architectural landmarks in Nepal
 - 4.11 Conservation of historic buildings.
 - 4.12 Ethics of architects in professional practice

३. लिखित परीक्षामा उर्तिणहरुलाई आवश्यकता अनुसार कम्प्युटरको प्रयोगात्मक परीक्षा लिईने छ ।

प्राविधिक पदहरू सबै पदहरूको कम्प्युटरप्रयोग सम्बन्धी ज्ञानको तथा प्रयोगात्मक परीक्षाको पाठ्यक्रम(आवश्यकता अनुसार)

कम्प्युटर प्रयोग सम्बन्धी ज्ञानको परीक्षणमा लिखित परीक्षामा पास भएका साथै योग्य भएका उम्मेदवारहरूलाई मात्र आवश्यकता अनुसार प्रयोगात्मक परीक्षामा सम्मिलित गराइने छ । कम्प्युटरको प्रयोगात्मक परीक्षामा प्राप्त गरेको अङ्क गणना गरिनेछैन । कम्प्युटर प्रयोग सम्बन्धी आधारभूत ज्ञानको परीक्षाको पूर्णाङ्क सबै पदहरूका लागि ५० र उत्तिर्णाङ्क २५ हुनेछ ।

क) प्राविधिक अधिकृत सेवालागि

1. Knowledge of operating systems: Microsoft Windows & their version
2. Knowledge to backup data and store them for further use.
3. Knowledge of essential application programs:
 - a) Microsoft office package (MS word, MS excel, MS power point & MS Access)
 - b) Data base Programs (Dbase)
 - c) Photo editing programs (Paintbrush, Adobe Photoshop, Macromedia, freehand package)
4. Printing & Scanning knowledge
5. Preparation of the estimate and progress sheet Using Computer
6. Statistical Analysis package such as tally
7. Check any technical data
8. Prepare small program packages using: MS Access, MS excel Dbase, etc.
9. Knowledge of internet & e-mail.
10. Knowledge of Printing and Scanning. Evaluation Method - Typing letters using MS word in Nepali & English - Preparation of a any DPR of GU (one physical structure).