

# प्रदेश लोक सेवा आयोग

## गण्डकी प्रदेश

इञ्जिनियरिङ्ग सेवा, सिभिल समूह, बिल्डिङ्ग एण्ड आर्किटेक्ट उपसमूह, अधिकृत सातौं तहका पदको खुला र अन्तरतह प्रतियोगितात्मक परीक्षाको पाठ्यक्रम

यस पाठ्यक्रम योजनालाई दुई चरणमा विभाजन गरिएको छ :

प्रथम चरण :-	लिखित परीक्षा (Written Examination)	पूर्णाङ्क :- २००
द्वितीय चरण :-	(क) सामूहिक परीक्षण (Group Test)	पूर्णाङ्क :- १०
	(ख) अन्तर्वार्ता (Interview)	पूर्णाङ्क :- ३०

### परीक्षा योजना (Examination Scheme)

प्रथम चरण : लिखित परीक्षा (Written Examination)

पूर्णाङ्क :- २००

पत्र	विषय	खण्ड	पूर्णाङ्क	उर्तीर्णाङ्क	परीक्षा प्रणाली		प्रश्नसंख्या × अङ्क	समय
प्रथम	General Subject	Part I: General Awareness & General Ability Test	१००	४०	वस्तुगत (Objective)	बहुवैकल्पिक प्रश्न (MCQs)	५० प्रश्न × १ अङ्क	१ घण्टा ३० मिनेट
		Part II: General Technical Subject					५० प्रश्न × १ अङ्क	
द्वितीय	Technical Subject		१००	४०	विषयगत (Subjective)	छोटो उत्तर लामो उत्तर	४ प्रश्न × ५ अङ्क ८ प्रश्न × १० अङ्क	३ घण्टा

द्वितीय चरण : सामूहिक परीक्षण (Group Test) र अन्तर्वार्ता (Interview)

पूर्णाङ्क :- ४०

पत्र / विषय	पूर्णाङ्क	उर्तीर्णाङ्क	परीक्षा प्रणाली	समय
सामूहिक परीक्षण (Group Test)	१०		सामूहिक छलफल (Group Discussion)	३० मिनेट
अन्तर्वार्ता (Interview)	३०		बोर्ड अन्तर्वार्ता (Board Interview)	-

द्रष्टव्य :

- लिखित परीक्षाको माध्यम भाषा नेपाली वा अंग्रेजी अथवा नेपाली र अंग्रेजी दुवै हुनेछ ।
- प्रथमपत्र र द्वितीयपत्रको लिखित परीक्षा छुट्टाछुट्टै 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 ।
- बहुवैकल्पिक प्रश्नहरू हुने परीक्षामा कुनै प्रकारको क्याल्कुलेटर (Calculator) प्रयोग गर्न पाइने छैन ।
- विषयगत प्रश्नहरूको हकमा तोकिएको अंकको एउटा लामो प्रश्न वा एउटा प्रश्नका दुई वा दुई भन्दा बढी भाग (Two or more parts of a single question) वा एउटा प्रश्न अन्तर्गत दुई वा बढी टिप्पणीहरू (Short notes) सोध्न सकिने छ ।
- द्वितीय पत्रमा (विषयगत प्रश्न हुनेका हकमा) प्रत्येक खण्डका लागि छुट्टाछुट्टै उत्तरपुस्तिकाहरू हुनेछन् । परीक्षार्थीले प्रत्येक खण्डका प्रश्नहरूको उत्तर सोही खण्डको 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 परीक्षामा सम्मिलित गराइनेछ ।
- पाठ्यक्रम लागू मिति :- २०८०।०४।०९

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### प्रथम पत्र (Paper I): General Subject

#### **Part (I) : - General Awareness & General Ability Test (50 Marks)**

1. **General Awareness and Contemporary Issues (25 ×1 Mark = 25 Marks)**
  - 1.1 Physical, socio-cultural and economic geography and demography of Nepal
  - 1.2 Major natural resources of Nepal
  - 1.3 Geographical diversity, climatic conditions, and livelihood & lifestyle of people
  - 1.4 Notable events and personalities, social, cultural and economic conditions in the modern history of Nepal
  - 1.5 Current periodical plan of both Nepal and Gandaki Province
  - 1.6 Information on sustainable development, environment, pollution, climate change, biodiversity, science and technology
  - 1.7 Nepal's international affairs and general information on the UNO, SAARC & BIMSTEC
  - 1.8 The Constitution of Nepal (From Part 1 to 5 and Schedules)
  - 1.9 Governance system and Government (Federal, Provincial and Local)
  - 1.10 Provisions of civil service act and regulation relating to constitution of civil service, organizational structure, posts of service, fulfillment of vacancy and code of conduct
  - 1.11 Functional scope of public services
  - 1.12 Public Service Charter
  - 1.13 Concept, objective and importance of public policy
  - 1.14 Fundamentals of management : planning, organizing, directing, controlling, coordinating, decision making, motivation and leadership
  - 1.15 Government planning, budgeting and accounting system
  - 1.16 Major events and current affairs of national and international importance
2. **General Ability Test (25 ×1 Mark = 25 Marks)**
  - 2.1 **Verbal Ability Test (8×1 Mark = 8 Marks)**

Jumble words, Series, Analogy, Classification, Coding-Decoding, Matrix, Ranking Order Test, Direction and Distance Sense Test, Common Sense Test, Logical Reasoning, Assertion and Reason, Statement and Conclusions
  - 2.2 **Numerical Ability Test (9×1 Mark = 9Marks)**

Series, Analogy, Classification, Coding, Arithmetical reasoning/operation, Percentage, Ratio, Average, Loss & Profit, Time & Work, Data interpretation & Data verification
  - 2.3 **Non-verbal/Abstract Ability Test (8×1 Mark = 8 Marks)**

Figure Series, Figure Analogy, Figure Classification, Figure Matrix, Pattern Completion/Finding, Analytical Reasoning Test, Figure Formation and Analysis, Rule Detection, Water images, Mirror images, Cubes and Dice & Venn-diagram

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### **Part (II) : - General Technical Subject (50 Marks)**

1. **Structural Engineering** (5 marks)
  - 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 diagram for simple beams, unit load method, two hinged arch
  - 1.6 Plastic analysis of beam and frame
2. **Engineering Survey** (7 marks)
  - 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 error, effect of slope and slope correction, correction for chain and tape measurement, abney level and clinometers
  - 2.3 Compass:- types of compass, problems and sources of error 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 contour, methods of contouring, interpolation, use of contour map
  - 2.7 Theodolite traversing: need of traverse and its significance, principles 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 and mass haul diagram
3. **Construction Materials** (6 marks)
  - 3.1 Properties of building materials: physical, chemical, constituents, thermal
  - 3.2 Stones: characteristics and requirements of stones as a building materials
  - 3.3 Ceramic materials: ceramic tile, 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

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- 3.7 Miscellaneous materials: asphaltic materials (asphalt, bitumen and tar), paints and varnishes, polymers
- 3.8 Soil properties and their parameters
- 3.9 Local and modern building construction materials in Nepal
- 4. **Concrete Technology** (5 marks)
  - 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** (6 marks)
  - 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 tunnel, component parts of a tunnel and tunnel cross section, survey for tunnel alignment, drainage, lighting and ventilation requirements for tunnels, methods of tunneling in soft soil and rock
- 6. **Construction Management** (6 marks)
  - 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

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7. **Estimating, Costing, Specification and Valuation** (5 marks)
- 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** (4 marks)
- 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 equipment
  - 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** (3 marks)
- 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** (3 marks)
- 10.1 Ethics, integrity and professionalism: codes of conduct and guidelines for professional engineering practices
  - 10.2 Nepal Engineering Council Act, 2055; and regulations, 2056
  - 10.3 Relation with clients, contractors and fellow professionals
  - 10.4 Public procurement practices for works, goods and services and their importance
  - 10.5 National Building Code: Hierarchy of building codes and its application, procedures for implementation of building code in Nepal
  - 10.6 Building Bylaws
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