

**प्रदेश लोक सेवा आयोग, बागमती प्रदेश**  
स्थानीय तह अन्तर्गतको इञ्जिनियरिङ सेवा, सिभिल समूह, अधिकृत छैटौँ तह, इञ्जिनियर पदको खुला प्रतियोगितात्मक परीक्षाको  
पाठ्यक्रम

पाठ्यक्रमको रूपरेखालाई निम्न अनुसार विभाजन गरिएको छ

भाग १

लिखित परीक्षा (Written Examination) :- प्रथम चरण पूर्णाङ्क :- १००  
द्वितीय चरण पूर्णाङ्क :- १००

भाग २

अन्तिम चरण (Final Examination) :- सामूहिक परीक्षण र अन्तर्वार्ता पूर्णाङ्क :- ४०  
परीक्षा योजना (Examination Scheme)

१. लिखित परीक्षा :- प्रथम चरण (First Phase)

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

२. लिखित परीक्षा :- द्वितीय चरण (Second Phase)

पत्र	विषय	पूर्णाङ्क	उतीर्णाङ्क	परीक्षा प्रणाली	प्रश्नसंख्या X अङ्क	समय
द्वितीय	जनरल इञ्जिनियरिङ्ग	१००	४०	विषयगत (Subjective)	१०प्रश्न X १०अङ्क	३ घण्टा

अन्तिम चरण: - सामूहिक परीक्षण र अन्तर्वार्ता (Group Test & Interview)

विषय	पूर्णाङ्क	परीक्षा प्रणाली	समय
सामूहिक परीक्षण (Group Test)	१०	समूहमा व्यक्तिगत प्रस्तुति (Individual Presentation in Group)	३०मिनेट
अन्तर्वार्ता (Interview)	३०	मौखिक (Oral)	

- यो पाठ्यक्रम योजनालाई लिखित परीक्षा (प्रथम चरण र द्वितीय चरण) तथा अन्तिम चरण (सामूहिक परीक्षण र अन्तर्वार्ता) गरी दुई भागमा विभाजन गरिएको छ ।
- प्रश्नपत्र अङ्ग्रेजी भाषामा हुनेछ ।
- लिखित परीक्षाको माध्यम भाषा नेपाली वा अङ्ग्रेजी अथवा नेपाली वा अङ्ग्रेजी 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 ।
- परीक्षामा कुनै प्रकारको क्याल्कुलेटर (calculator) प्रयोग गर्न पाइने छैन ।
- विषयगत प्रश्नका लागि तोकिएका अङ्कका हकमा एउटा लामो प्रश्न वा एउटै प्रश्नका दुई वा दुईभन्दा बढी भाग (

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Two or more parts of a single question) वा एउटा प्रश्न अन्तर्गत दुई वा बढी टिप्पणीहरू (Short notes) सोध्न सकिने छ ।

७. विषयगत प्रश्न हुने पत्रका हकमा प्रत्येक खण्डका लागि छुट्टाछुट्टै उत्तरपुस्तिकाहरू हुनेछन् । परीक्षार्थीले प्रत्येक खण्डका प्रश्नहरूको उत्तर सोही खण्डको उत्तरपुस्तिकामा लेख्नुपर्नेछ ।
८. आयोगबाट संचालन हुने परीक्षामा परीक्षार्थीले मोबाइल वा यस्तै प्रकारका विद्युतीय उपकरण परीक्षा हलमा लैजान पाइने छैन ।
९. लिखित परीक्षाको प्रथम पत्र र द्वितीय पत्रका पाठ्यक्रमका विषयवस्तु फरक-फरक हुनेछ ।
११. प्रथम चरण (First Phase) लिखित परीक्षाबाट छनौट भएका उम्मेदवारहरूलाई मात्र द्वितीय चरण (Second Phase) को लिखित परीक्षामा सम्मिलित गराइनेछ ।
१२. लिखित परीक्षामा सोधिने प्रश्न सङ्ख्या द्वितीय पत्रको लागि यथासम्भव देहाय बमोजिम हुनेछ ।
१३. लिखित परीक्षाको प्रथम चरण (First Phase) मा प्राप्त गरेको प्रासाङ्कको शत प्रतिशत अङ्क तथा द्वितीय चरण (Second Phase) को प्रासाङ्कहरू जोडि कुल अङ्कको आधारमा लिखित परीक्षाको नतिजा प्रकाशित गरिनेछ ।
१४. लिखित परीक्षामा छनौट भएका उम्मेदवारहरूलाई मात्र अन्तिम चरणको सामूहिक परीक्षण र अन्तर्वार्तामा सम्मिलित गराइनेछ ।
१५. लिखित परीक्षा र अन्तिम चरणको सामूहिक परीक्षण र अन्तर्वार्ताको कुल अङ्क योगका आधारमा अन्तिम परीक्षाफल प्रकाशित गरिनेछ ।
१६. 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 ।
१७. पाठ्यक्रम लागू मिति:- २०७७।१०।०७

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प्रथम पत्र :- सिभिल इञ्जिनियरिङ

**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
- 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,

**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

**4. Construction Management**

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- 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

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- 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. भाषा - नेपाली र अङ्ग्रेजी

### 10.1 नेपाली शुद्धाशुद्धि सम्बन्धी ज्ञान

सरकारी कामकाजको नेपाली भाषाको लेखाइ विशेष गरी टिप्पणी र आदेश, पत्राचार, परिपत्र, निर्देशन, आदेश, विज्ञप्ति, सूचना, विज्ञापन, राजपत्र, प्रतिवेदन, वार्षिक प्रतिवेदन, ऐन-नियमावली तथा कार्यविधि, बैठकको माइन्ट तथा निर्णय, प्रशंसा पत्र, निमन्त्रणा पत्र, करारनामा, सम्झौता, कबुलियतनामा, बयान, वेवसाइट लेख लगायत सबै प्रकारका मस्यौदा वा अन्तिम लिखत तयारी गर्दा शुद्धाशुद्धि लेखाइको परीक्षण (विशेष गरी वर्णविन्यास, पदसङ्गति, नाम, सर्वनाम, विशेषण, क्रिया, अव्यय [नामयोगी, क्रियायोगी (क्रियाविशेषण), संयोजक, विस्मयादिबोधक, निपात], काल, वाच्य, पदवर्ग, अनुकरणात्मक शब्द, कारक

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र विभक्ति, लिङ्ग, वचन, पुरुष, उल्टो अर्थ आउने शब्द, पर्यायवाची शब्द, मौलिक शब्द:तत्सम शब्द, तद्भव शब्द, स्वदेशी आगन्तुक शब्द, विदेशी आगन्तुक शब्द, उपसर्ग लागेर निर्मित शब्द, प्रत्यय लागेर निर्मित शब्द, समास भएर निर्मित शब्द, द्वित्व भएर निर्मित शब्द, ह्रस्व दीर्घ, श, ष, स तथा ब र व, शिरबिन्दु र चन्द्रबिन्दुको प्रयोग गर्ने क्षमताको परीक्षण)।

## 11. English proficiency

- 11.1 Comprehension: questions will be asked on the passage given. The questions will try to accommodate the following areas: Fact finding, Inferential, core theme, true/false identification, issues raised, and language based.
- 11.2 Vocabulary: Questions will be asked to assess their grasp on the English language vocabulary. The questions will be of the following nature, -Meaning of the words (literal/figurative/contextual), single word for expressions, Synonyms/antonyms, Derivatives and Homonyms/ homophones.
- 11.3 Syntactic ability: Questions will be asked to assess the syntactic ability of the candidates. The questions will be based on the following categories: Agreement, tense, parallel structures, clauses, modifier, conditionals, phrasal expressions, shifts (tense, number, person), transformations, varieties, prepositions/conjunctions, and parts of speech.

Note: this above English Language Competence Test syllabus is devised for assessing the proficiency of the English language of candidates. With the view to assess the candidates' language competence, the syllabus aims:

- To test the understanding of their language though reading comprehension,
- To map the range of their vocabulary,
- To examine their syntactic ability.

The nature and standard of questions in English Language Competence Test will be such that and educated class XII level person will be able to answer them without any specialized study.

प्रथम पत्रको इकाइ	1	2	3	4	5	6	7	8	9	10	11
प्रश्न सङ्ख्या	16	12	12	12	10	10	8	4	8	4	4

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द्वितीय पत्र :- जनरल इञ्जिनियरिङ्ग सम्बन्धी

**Section (A) – 30 Marks**

**1. Transportation and Trail Bridge**

- 1.1. Transportation system and its classification.
- 1.2. Transportation planning: rationale, types and its philosophy.
- 1.3. Road transport and road construction in Nepal.
- 1.4. Classification of roads in Nepal (NRS and IRC)
- 1.5. General principles of road network planning.
- 1.6. Feasibility study of road projects.
- 1.7. Alignment, engineering survey and its stages.
- 1.8. Geometric design of roads: map study, element of cross-section and highway alignment, design of horizontal curve, super elevation, transition curve, vertical curves, and right of way.
- 1.9. Drainage consideration in roads:
  - 1.9.1. Introduction and design of culverts and minor bridges, cross drainage structures, subsurface drainage system.
- 1.10. Special consideration in Hill roads design:
  - 1.10.1. Problems associated with hill roads construction
  - 1.10.2. Route location, hairpin bends and special structures.
- 1.11. Road Pavement: Types of pavement and their applicability in hill roads, Design of pavement,
- 1.12. Bioengineering practices along hill side
- 1.13. Activities and techniques in road construction in rural roads
- 1.14. Maintenance, repair and rehabilitation of roads.
- 1.15. Basic knowledge on design, construction and maintenance of suspended and suspension bridge in Nepal.
- 1.16. Role of social mobilization in rural road development.
- 1.17. Low-cost road construction

**Section (B) – 20 Marks**

**2. Water Supply and Sanitation**

- 2.1 Rural and community based water supply system.
- 2.2 Water supply sources and their management.
  - 2.2.1 Surface water
  - 2.2.2 Ground water
- 2.3 Selection of source.
- 2.4 Water quality and treatment, water demand and supply, source protection
- 2.5 Intakes, collection chamber and break pressure tanks.
- 2.6 Reservoir and distribution system.
- 2.7 Intakes, Pipeline design, design of transmission and distribution system, reservoir design.
- 2.8 Pipe and fittings: Pipe materials, pipe laying and fittings.
- 2.9 Operation and maintenance of water supply systems
- 2.10 Sanitation, wastewater and solid waste management:
  - 2.10.1 On-site sanitation system
  - 2.10.2 Types of sewerage system, design and construction of sewers.
  - 2.10.3 Types, characteristics, sources, quantity, generation, collection, transportation and disposal of solid wastes.
  - 2.10.4 Sanitary landfill, incineration, composting etc.

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- 2.11 Environmental health engineering- Epidemiology, pathogens (Bacteria, Virus, Helminthes, Protozoa)

**Section C – 30 Marks**

- 3. Energy System 10%**
- 3.1 Hydrological study, planning and design of small hydropower projects.  
3.2 Head works, dams, spillways, surge tanks, stilling basin etc.  
3.3 River diversion works.  
3.4 Biogas- Introduction.  
3.5 Alternative energy systems in Nepal
- 4. Irrigation and River training works 20%**
- 4.1 Status of irrigation development in Nepal.  
4.2 Methods of irrigation and their suitability.  
4.3 Design of irrigation canals.  
4.4 Operation and maintenance of irrigation systems  
4.5 Management of Farmers managed irrigation system.  
4.6 Preventive and remedial measures of water logging.  
4.7 Flood control, its necessity and flood mitigation measures.  
4.8 River training works.  
4.9 Specific considerations in design, operation and management of hill irrigation systems

**Section D – 20 Marks**

- 5. Housing, building and urban planning 10%**
- 5.1 Present status and practices of building construction in Nepal  
5.2 Specific considerations in design and construction of buildings in Nepal  
5.3 Indigenous technology in building design and construction  
5.4 Local and Modern building construction material in Nepal  
5.5 Community buildings: School and hospital buildings and their design considerations  
5.6 Urban planning needs and challenges in Nepal
- 6. Technology, Environment and civil society 10%**
- 6.1 Technological development in Nepal  
6.2 Promotion of local technology and its adaptation  
6.3 Environmental Impact Assessment, Initial Environmental Examination, Global-warming phenomena  
6.4 Types of sources of pollution: point / non-point (for air and water)  
6.5 Social mobilization in local infrastructure development and utilization in Nepal  
6.6 Participatory approach in planning, implementation, maintenance and operation of local infrastructure

प्रदेश लोक सेवा आयोग, बागमती प्रदेश  
स्थानीय तह अन्तर्गतको इञ्जिनियरिङ सेवा, सिभिल समूह, अधिकृत छैटौँ तह, इञ्जिनियर पदको खुला प्रतियोगितात्मक  
परीक्षाको पाठ्यक्रम

प्रथम चरणको लिखित परीक्षाबाट छनौट भएका उम्मेदवारहरूलाई मात्र  
लिइने सामूहिक परीक्षण (Group Test) को लागि

सामूहिक छलफल (Group Discussion)

यस प्रयोजनको लागि गरिने परीक्षण १० पूर्णाङ्क र ३० मिनेट अवधिको हुनेछ जुन नेताविहिन सामूहिक छलफल  
(**Leaderless Group Discussion**)को रूपमा अवलम्बन गरिने छ । दिइएको प्रश्न वा **Topic** का विषयमा  
पालैपालोसँग निर्दिष्ट समयभित्र समूहबीच छलफल गर्दै प्रत्येक उम्मेदवारले व्यक्तिगत प्रस्तुती  
(**Individual Presentation**) गर्नु पर्नेछ । यस परीक्षणमा मूल्याङ्कनको लागि देहाय अनुसारको समिति रहनेछ ।

आयोगका अध्यक्ष/सदस्य — अध्यक्ष

मनोविज्ञ — सदस्य

दक्ष/विज्ञ (१ जना) — सदस्य

सामूहिक छलफलमा दिइने नमुना प्रश्न वा **Topic**

उदाहरणको लागि — दिगो विकास, सडक दुर्घटना, रोजगारी जस्ता Topics मध्ये कुनै एक Topic मात्र दिइनेछ ।