

प्रदेश लोक सेवा आयोग

लुम्बिनी प्रदेश

प्रदेश निजामती सेवा तथा स्थानीय सरकारी सेवा अन्तर्गत इञ्जिनियरिङ्ग सेवा, सिभिल समूह, चौथो तह असिस्टेन्ट सव-इन्जिनियर पदको खुला प्रतियोगितात्मक परीक्षाको पाठ्यक्रम

पाठ्यक्रमको रूपरेखा:— यस पाठ्यक्रमको आधारमा निम्नानुसार चरणमा परीक्षा लिइनेछ ।

प्रथम चरण:- लिखित परीक्षा पूर्णाङ्क:- १००
द्वितीय चरण:- अन्तर्वार्ता पूर्णाङ्क:- २०

प्रथम चरण:- लिखित परीक्षा योजना (Written Examination)

| विषय | पूर्णाङ्क | उत्तीर्णाङ्क | परीक्षा प्रणाली | प्रश्न संख्या × अङ्कभार | समय |
|---------------|-----------|--------------|------------------------|-----------------------------|----------|
| सेवा सम्बन्धी | १०० | ४० | वस्तुगत बहुवैकल्पिक | ५० प्रश्न × २ अङ्क = १०० | ४५ मिनेट |

द्वितीय चरण:-

| विषय | पूर्णाङ्क | परीक्षा प्रणाली |
|--------------|-----------|--------------------------------------|
| अन्तर्वार्ता | २० | बोर्ड अन्तर्वार्ता (Board Interview) |

द्रष्टव्य:-

- लिखित परीक्षाको माध्यम भाषा नेपाली वा अंग्रेजी अथवा नेपाली र अंग्रेजी दुवै हुन सक्नेछ ।
- लिखित परीक्षामा यथासम्भव निम्नानुसार प्रश्नहरू सोधिनेछ ।

| | | | | | | | | | | |
|---------------|---|---|---|---|---|---|---|---|---|----|
| एकाइ | १ | २ | ३ | ४ | ५ | ६ | ७ | ८ | ९ | १० |
| प्रश्न संख्या | ५ | ६ | ५ | २ | ५ | ४ | ४ | ८ | ८ | ३ |

- 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 ।
- यस पाठ्यक्रम योजना अन्तर्गतका पत्र/विषयका विषयवस्तुमा जेसुकै लेखिएको भएता पनि पाठ्यक्रममा परेका कानून, ऐन, नियम तथा नीतिहरू परीक्षाको विज्ञापन हुदाँका वखत (संशोधन भएका वा संशोधन भई हटाईएका वा थप गरी संशोधन भई) कायम रहेकालाई यस पाठ्यक्रममा परेको सम्झनु पर्दछ ।
- प्रथम चरणको लिखित परीक्षाबाट छनौट भएका उम्मेदवारहरूलाई मात्र द्वितीय चरणको अन्तर्वार्तामा सम्मिलित गराइनेछ ।
- बहुवैकल्पिक प्रश्नहरू हुने परीक्षामा कुनै प्रकारको क्याल्कुलेटर (Calculator) प्रयोग गर्न पाइने छैन ।
- परीक्षार्थीले मोबाइल वा यस्तै प्रकारका विद्युतीय उपकरण परीक्षा हलमा लैजान पाइने छैन ।
- पाठ्यक्रम लागू मिति:- २०७९।०८।२०

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असिस्टेन्ट सब-इन्जिनियर पदको खुला प्रतियोगितात्मक परीक्षाको पाठ्यक्रम

(५० प्रश्न × २ अङ्क = १०० अङ्क)

1. Surveying

- 1.1. General
 - 1.1.1. Classifications
 - 1.1.2. Principle of surveying
 - 1.1.3. Selection of suitable method
 - 1.1.4. Scales, plans and maps
 - 1.1.5. Entry into survey field books and level books
- 1.2. Levelling
 - 1.2.1. Methods of leveling
 - 1.2.2. Levelling instruments and accessories
 - 1.2.3. Principles of leveling
- 1.3. Plane Tabling
 - 1.3.1. Equipment's required
 - 1.3.2. Methods of plane tabling
 - 1.3.3. Two- and three-point problems
- 1.4. Contouring
 - 1.4.1. Characteristics of contour lines
 - 1.4.2. Method of locating contours
 - 1.4.3. Contour plotting
- 1.5. Fundamentals of Setting Out
 - 1.5.1. Small buildings
 - 1.5.2. Simple curves

2. Construction Materials

- 2.1. Stone
 - 2.1.1. Availability of stones in Nepal
 - 2.1.2. Methods of laying and construction with various stones
- 2.2. Cement
 - 2.2.1. Different cement: - ingredients, Properties and manufacture
 - 2.2.2. Storage and transport
 - 2.2.3. Admixtures
- 2.3. Clay and Clay Products
 - 2.3.1. Brick: type, manufacture, laying, bonds
- 2.4. Paints and Varnishes
 - 2.4.1. Type and selection
 - 2.4.2. Preparation techniques
 - 2.4.3. Use
- 2.5. Bitumen
 - 2.5.1. Type
 - 2.5.2. Selection
 - 2.5.3. Use

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3. Engineering Drawing

- 3.1. Unit, dimension and their conversion with special reference to SI system
- 3.2. Elementary idea of drawing, building drawings
- 3.3. Drafting techniques and methods in common practice
 - 3.3.1. Different types of lines and effects
 - 3.3.2. Vertical line, horizontal line and inclined line (Thick, Thin, Dark, Light)
 - 3.3.3. Representation of different materials: Stone, Timber, Glass, Metal, Brick, Concrete, Sand, Earth, Tile, Plaster.
 - 3.3.4. Dimensioning: element to element, center to center and overall dimensioning
- 3.4. Measured drawing
 - 3.4.1. Methods of measurement of horizontal and vertical dimensions
 - 3.4.2. Sectional measurements
 - 3.4.3. Scales: Choice, Use and conversion
- 3.5. Working drawing
 - 3.5.1. Significance of detailing in terms of accuracy of estimation, bill of quantities and construction supervision
 - 3.5.2. Structural working drawings and structural detail: column, beam, slab, foundation and other structural elements.

4. Soil Mechanics

- 4.1. General
 - 4.1.1. Soil types and classification
 - 4.1.2. Three phase system of soil
 - 4.1.3. Unit Weight of soil mass: bulk density, saturated density, submerged density and dry density
- 4.2. Compaction of soil
 - 4.2.1. Factors affecting soil compaction
 - 4.2.2. Optimum moisture content
 - 4.2.3. Relation between dry density and moisture content
- 4.3. Earth Pressures
 - 4.3.1. Active and passive earth pressures
 - 4.3.2. Lateral earth pressure theory
- 4.4. Foundation
 - 4.4.1. Basic concepts of bearing capacity
 - 4.4.2. Selection of different types of foundations

5. Building Construction Technology

- 5.1. Foundations
 - 5.1.1. Subsoil exploration
 - 5.1.2. Type and suitability of different foundations: Shallow, deep
 - 5.1.3. Shoring and dewatering
 - 5.1.4. Design of simple brick or stone masonry foundations
- 5.2. Walls
 - 5.2.1. Type of walls and their functions

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- 5.2.2. Choosing wall thickness, Height to length relation
- 5.2.3. Use of scaffolding
- 5.3. Damp Proofing
 - 5.3.1. Source of Dampness
 - 5.3.2. Remedial measures for damp proofing
- 5.4. Concrete Technology
 - 5.4.1. Constituents of cement concrete
 - 5.4.2. Grading of aggregates
 - 5.4.3. Concrete mixes
 - 5.4.4. Water cement ratio
 - 5.4.5. Factors affecting strength of concrete
 - 5.4.6. Form work
 - 5.4.7. Curing
- 5.5. Wood work
 - 5.5.1. Frame and shutters of door and window
 - 5.5.2. Timber work for upper floors
 - 5.5.3. Design and construction of stairs
- 5.6. Flooring and Finishing
 - 5.6.1. Floor finishes: brick, concrete, flagstone
 - 5.6.2. Modern construction materials for floor finishing
 - 5.6.3. Plastering and punning
- 6. Water Supply and Sanitation Engineering**
 - 6.1. General
 - 6.1.1. Objectives of water supply system
 - 6.1.2. Source of water and its selection: gravity and artesian springs, shallow and deep wells; infiltration galleries.
 - 6.2. Gravity Water Supply System
 - 6.2.1. Design period
 - 6.2.2. Determination of daily water demand
 - 6.2.3. Determination of storage tank capacity
 - 6.2.4. Selection of pipe and fittings
 - 6.2.5. Pipe line design and hydraulic grade line
 - 6.3. Design of Sewer
 - 6.3.1. Quantity of sanitary sewage
 - 6.3.2. Maximum, Minimum and self-cleaning velocity
 - 6.4. Excreta Disposal in an Unsewered Area
 - 6.4.1. Pit latrine
 - 6.4.2. Design of septic tank
- 7. Irrigation Engineering**
 - 7.1. General
 - 7.1.1. Advantages need for irrigation
 - 7.2. Irrigation Water Requirement
 - 7.2.1. Crop season, Principal crops and crop water requirements

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7.2.2. Duty delta and base period

7.3. Irrigation Canals

7.3.1. Canal losses and their minimization

7.3.2. Maximum and minimum velocities

7.3.3. Design of irrigation canal section using Manning's and Lacey's formula

7.3.4. Need and location of escapes

7.3.5. Components of distribution system

7.3.6. Head works for small canals

8. Highway Engineering

8.1. General

8.1.1. Introduction to transportation systems

8.1.2. Historic development of roads in Nepal

8.1.3. Classification of road in Nepal

8.1.4. Basic requirements of road alignment

8.2. Geometric Design

8.2.1. Basic design control and criteria for design

8.2.2. Elements of cross section, typical cross-section for all roads in filling and cutting

8.2.3. Camber

8.2.4. Determination of radius of horizontal curves

8.2.5. Super elevation

8.2.6. Sight distances

8.2.7. Gradient

8.2.8. Nepal Road Standard 2070, Nepal Rural Road Standards, 2071, Nepal Urban Road Standard, 2076

8.3. Drainage System

8.3.1. Importance of drainage system and requirements of a good drainage system

8.4. Road Pavement

8.4.1. Pavement structure and its components: subgrade, sub-base, base and surface courses

8.5. Road Machineries

8.5.1. Earth moving and compacting machines

8.6. Road Construction Technology

8.7. Motorable and Trail Bridges

8.7.1. T-beam bridge

8.7.2. Timber bridges

8.7.3. Types of Trail Bridges

8.7.4. Basic components of Trail Bridges

8.8. Road Maintenance and Repair

8.8.1. Type of maintenance Works

8.9. Tracks and Trails

9. Estimating and Costing

9.1. General

9.1.1. Main items of work

9.1.2. Units of measurement and payment of various items of work and material

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- 9.1.3. Standard estimate formats of government offices
- 9.2. Rate Analysis
 - 9.2.1. Basic general knowledge on the use of rate analysis norms of Government of Nepal and approved district rates
- 9.3. Specifications
 - 9.3.1. Interpretation of specifications
- 9.4. Drawing and Bill of Quantities (BoQ)
- 9.5. Valuation
 - 9.5.1. Methods of valuation
- 10. **Construction Management**
 - 10.1. Organization
 - 10.1.1. Need for organization
 - 10.1.2. Responsibilities of an assistant sub-engineer
 - 10.2. Site Management
 - 10.2.1. Preparation of site plan
 - 10.2.2. Organizing labor
 - 10.2.3. Measures to improve labor efficiency
 - 10.2.4. Accident prevention
 - 10.3. Basics of Bidding documents and it's procedure
 - 10.3.1. Contracts and it's types
 - 10.3.2. Departmental works and day-works
 - 10.3.3. Contract agreement
 - 10.3.4. Condition of contract
 - 10.3.5. Construction supervision
 - 10.3.6. Defect Liability Period (DLP)
 - 10.4. Record keeping and reports preparation
 - 10.4.1. Muster roll
 - 10.4.2. Work Acceptance and Completion report
 - 10.4.3. Measurement Book
 - 10.5. Planning and Control
 - 10.5.1. Construction schedule
 - 10.5.2. Equipment and materials schedule
 - 10.5.3. Construction stages and operations
 - 10.5.4. Bar chart
