

प्रदेश लोक सेवा आयोग

लुम्बिनी प्रदेश

प्रदेश निजामती सेवा तथा स्थानीय सरकारी सेवा अन्तर्गत इञ्जिनियरिङ्ग सेवा, सिभिल समूह, बिल्डिङ्ग एण्ड आर्किटेक्ट उप-समूह, पाँचौं तहको 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×२अङ्क= १००	४५ मिनेट

द्वितीय चरण:-

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

द्रष्टव्य:-

1. लिखित परीक्षामा यथासम्भव निम्नानुसार प्रश्नहरू सोधिनेछ ।

एकाइ	१	२	३	४	५	६	७	८	९	१०	११	१२
प्रश्न संख्या	५	५	५	४	६	३	३	४	४	६	२	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 भएतापनि 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।०४।२९

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(५० प्रश्न × २ अङ्क = १०० अङ्क)

1. सार्वजनिक व्यवस्थापन (Public Management)

1.1 कार्यालय व्यवस्थापन (Office Management)

1.1.1 कार्यालय: परिचय, महत्व, कार्य र प्रकार

1.1.2 सहायक कर्मचारीका कार्य र गुणहरू

1.1.3 कार्यालय स्रोत साधन (Office Resources):- परिचय र प्रकार

1.1.4 कार्यालयमा सञ्चारको महत्व, किसिम र साधन

1.1.5 कार्यालय कार्यविधि (Office Procedure) पत्र व्यवहार (Correspondence), दर्ता र चलानी (Registration & Dispatch), परिपत्र (Circular), तोक आदेश (Order), टिप्पणी लेखन र टिप्पणी तयार गर्दा ध्यान दिनुपर्ने कुराहरू

1.1.6 अभिलेख व्यवस्थापन (Record Management)

1.2 निजामती सेवा ऐन र नियमावलीमा भएका देहायका व्यवस्थाहरू

1.2.1 निजामती सेवा, प्रदेश निजामती सेवा र स्थानीय सरकारी सेवाको गठन, संगठन संरचना, पदपूर्ति गर्ने तरिका र प्रक्रियाहरू

1.2.2 कर्मचारीको नियुक्ति, सरुवा, बढुवा, बिदा, विभागीय सजाय र अवकाश

1.2.3 कर्मचारीले पालन गर्नुपर्ने आचरण र कर्तव्यहरू

1.3 सरकारी बजेट, लेखा र लेखापरीक्षण प्रणाली सम्बन्धी सामान्य जानकारी

1.4 सार्वजनिक सेवा प्रवाहको अर्थ, सेवा प्रवाह गर्ने निकाय, तरिका र माध्यमहरू

1.5 सार्वजनिक बडापत्र (Public Charter) महत्व र आवश्यकता

1.6 व्यवस्थापनको अवधारणा तथा सार्वजनिक व्यवस्थापनमा निर्देशन, नियन्त्रण, समन्वय, निर्णय प्रक्रिया, उत्प्रेरणा र नेतृत्व सम्बन्धी जानकारी

1.7 मानवीय मूल्य मान्यता (Human Values), नागरिक कर्तव्य र दायित्व तथा अनुशासन

1.8 Basics of Computer Science (MS Word, Excel, Power Point)

1.9 सार्वजनिक खरिद ऐन, २०६३ र नियमावली, २०६४ तथा सार्वजनिक खरिद सम्बन्धी प्रदेश नियमावली, २०७६

2 Drawing

2.1 General

2.1.1 Importance, aims and objectives of drawing

2.1.2 Drawing equipments

2.1.3 Architectural discipline

2.1.4 Standard drawing sheets sizes

2.1.5 Drafting techniques and methods in common practice

2.1.6 Scales Choice, use and conversion

2.2 Measured Drawing

2.2.1 Methods of measurement of horizontal and vertical dimensions

2.2.2 Sectional measurements

2.2.3 Dimensioning of sketches

2.2.4 Checking for missing details in field

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2.3 Working Drawing

2.3.1 Role of working drawing

2.3.2 Interrelationship with estimate and specification

2.3.3 Construction detailing in plan and section

2.3.4 Significance of detailing in terms of accuracy of estimation, bill of quantities and construction supervision

2.3.5 Working drawing for private and public buildings, sanitary installation electrification

2.3.6 Structural working drawings

3 Estimating and Costing

3.1 General

3.1.1 Purpose of estimating

3.1.2 Main items of work

3.1.3 Units of measurement and payment of various items of work and materials

3.1.4 Degree of accuracy

3.1.5 Standard estimate formats of Government of Nepal

3.1.6 Data for estimate

3.1.7 Preliminary estimate

3.1.8 Approximate quantity estimate

3.1.9 Detailed estimate

3.1.10 Revised estimate

3.2 Rate Analysis

3.2.1 Manufactures' cost

3.2.2 Transportation cost

3.2.3 Overheads

3.2.4 Need for contingencies

3.2.5 Use of Government Rate Analysis Norms

3.3 Specifications

3.3.1 Purpose

3.3.2 Types

3.3.3 Necessity

3.3.4 Interpretation of Specifications

3.4 Estimating

3.4.1 Earthwork

3.4.2 Estimate of different components building

3.4.3 Estimate of sanitary installations

3.4.4 Estimate of electrical wiring and sanitary works

3.4.5 Annual maintenance

3.5 Valuation

3.5.1 Purpose of valuation

3.5.2 Methods of valuation

3.5.3 Standard formats used for property valuation in Nepal

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4 Management

4.1 Organization

4.1.1 Need for Organization

4.1.2 Building agencies

4.1.3 Structure of the Provincial Ministry of Urban Development

4.1.4 Responsibilities of a building sub- engineer

4.1.5 Relation between owner, contractor and consultants

4.2 Accounts

4.2.1 Familiarity with related Nepalese accounting system

4.2.2 Administrative approval and technical sanction

4.3 Planning and Control

4.3.1 List of activities

4.3.2 Construction schedule

4.3.3 Equipment and materials schedule

4.3.4 Construction stages and operations

4.3.5 Bar Chart,

4.4 Municipal Building By – laws

4.4.1 Sheet sizes

4.4.2 Scales

4.4.3 Setback

4.4.4 Height Controls

4.4.5 Other requirements specified by the Municipalities

4.4.6 Floor Area Ratio (FAR)

5 Building Service

5.1 Water Supply

5.1.1 General Principle of water supply

5.1.2 Water requirement standard for different buildings

5.1.3 Storage and distribution of water

5.1.4 Heating of water, storage and distribution requirements

5.2 Disposal system

5.2.1 Septic tank, soak pit, vent and manhole

5.2.2 Pipes for different sewage

5.2.3 Incinerators

5.3 Electricity

5.3.1 General principles of electrical installation and distribution

5.3.2 Wiring systems in private and public building

5.3.3 Ducts for electrical distribution

5.3.4 Safety precautions

5.4 Lighting

5.4.1 General principles of lighting

5.4.2 Illumination requirements and standards

5.4.3 Combination of artificial and natural light

5.4.4 Lighting fixtures

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6 Surveying

6.1 General

- 6.1.1 Primary divisions of survey
- 6.1.2 Classification based on instruments and methods
- 6.1.3 Basic principle of surveying
- 6.1.4 Scales, plans and maps
- 6.1.5 System of field booking of surveying and levelling data
- 6.1.6 Theodolite survey
- 6.1.7 Total station survey

6.2 Levelling

- 6.2.1 Classification of levelling work
- 6.2.2 Methods of leveling
- 6.2.3 Levelling instruments and accessories
- 6.2.4 Principles of levelling
- 6.2.5 Temporary and permanent adjustments of a level
- 6.2.6 Profile leveling
- 6.2.7 Booking and reducing levels

6.3 Errors and their effects

- 6.3.1 Kinds of errors
- 6.3.2 Source of errors in chaining, levelling, plane tabling and compass surveying
- 6.3.3 Effects of errors
- 6.3.4 Precision and accuracy

6.4 Plane Tabling

- 6.4.1 Equipment's used
- 6.4.2 Working operations
- 6.4.3 Methods of plane tabling
- 6.4.4 Merits and demerits of plane tabling

6.5 Contouring

- 6.5.1 Definitions of terms
- 6.5.2 Properties of contour
- 6.5.3 Use of contour maps

6.6 Setting out

- 6.6.1 Small buildings
- 6.6.2 Simple curves
- 6.6.3 Locating the boundaries of farm lands

7 Construction Materials

7.1 Stone

- 7.1.1 Rocks and their characteristics
- 7.1.2 Formation and availability of stones in Nepal
- 7.1.3 Quarrying excavation, Wedging and blasting
- 7.1.4 Methods of laying and construction with various stones

7.2 Aggregates

- 7.2.1 Fine aggregates
- 7.2.2 Coarse aggregates
- 7.2.3 Availability and practice in Nepal

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7.3 Cement

7.3.1 Ingredients, properties and manufacture of cement

7.3.2 Types of cement

7.3.3 Storage and transport

7.3.4 Admixtures

7.4 Metals and Alloys.

7.4.1 Wrought iron: Properties, use

7.4.2 Steel: - composition, properties, appearance, strength, constructional forms and manufacture

7.4.3 Corrosion and its prevention

7.4.4 Brass: uses

7.5 Brick

7.5.1 Type

7.5.2 Manufacture

7.5.3 Laying

7.5.4 Availability and practice in Nepal

7.6 Lime

7.6.1 Manufacture

7.6.2 Types and properties

7.6.3 Uses

7.7 Paints and Varnishes

7.7.1 Type and selection

7.7.2 Preparation techniques

7.7.3 Uses

7.8 Floor Finishes

7.8.1 Punning

7.8.2 Tiles: mosaic, clay, concrete, vinyl

7.8.3 Marble and flagstones

7.8.4 Wooden boarding and parqueting

7.9 Wall Finishes

7.9.1 Plasters: cement, lime, mud

7.9.2 Punning: cement, lime

7.9.3 Cladding: wood, stone, tiles

7.10 Roofing Materials

7.10.1 Clay tile, ceramic tile and slate

7.10.2 CGI and UPVC

7.11 Miscellaneous Materials

7.11.1 Glass

7.11.2 Plastics

7.11.3 Asphalt and Bitumen

7.11.4 Surkhi

8 Structural Design

8.1 Timber Structures

8.1.1 Allowable stresses

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- 8.1.2 Design of compression members
- 8.1.3 Design of solid rectangular beams
- 8.1.4 Types of joints and their connections
- 8.2 Steel Structures
 - 8.2.1 Design of simple steel beams
 - 8.2.2 Rivetted and welded connections: types, uses and detailing
 - 8.2.3 Detailing of simple roof trusses
 - 8.2.4 Detailing of rolled steel beams
 - 8.2.5 Detailing of column bases
- 8.3 R.C. Sections in Bending
 - 8.3.1 Basis assumptions
 - 8.3.2 Position of neutral axis
 - 8.3.3 Moment of resistance
 - 8.3.4 Under reinforced, over reinforced and balanced sections
 - 8.3.5 Analysis of singly and doubly reinforced rectangular sections
 - 8.3.6 Analysis of singly reinforced flanged sections
- 8.4 Shear and Bond for Reinforced Concrete (RC) Sections
 - 8.4.1 Behaviour of R.C. section in shear
 - 8.4.2 Shear resistance of R. C. section
 - 8.4.3 Types of shear reinforcement and their design
 - 8.4.4 Local and anchorage bond
 - 8.4.5 Determination of anchorage length
 - 8.4.6 Bar curtailment
- 8.5 Axially Loaded R.C. columns
 - 8.5.1 Short and long columns
 - 8.5.2 Design of a rectangular column section
 - 8.5.3 Reinforcement detailing
- 8.6 Design and Detailing of R.C Structures
 - 8.6.1 IS code requirements
 - 8.6.2 Methods of design
 - 8.6.3 Singly reinforced T and L. beams,
 - 8.6.4 Simple one-way and two-way slabs.
 - 8.6.5 Simple pad footings for columns
 - 8.6.6 Preparation of bar bending for RC design
- 8.7 Earthquake Resistant Design of Non-engineered Structures
 - 8.7.1 History of Earthquake in Nepal and damages
 - 8.7.2 Weakness of existing building
 - 8.7.3 Site consideration
 - 8.7.4 Building form, shape and size
 - 8.7.5 Size and location of openings
 - 8.7.6 Selection of materials
 - 8.7.7 Construction technology
 - 8.7.8 Seismic resistant components: through stone, vertical and horizontal reinforcement, diaphragm, boxing of building, lateral restrainers, unsupported length of wall, corner and junction of wall/connection of building components

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9 Building Construction Technology

9.1 Foundations

9.1.1 Function and necessity

9.1.2 Subsoil exploration: test pit

9.1.3 Safe bearing capacity of soils and its improvement

9.1.4 Type and suitability of different foundations: shallow, deep (pile and well)

9.1.5 Methods of excavating

9.1.6 Shoring and dewatering

9.1.7 Elements of simple spread foundation

9.1.8 Stone masonry foundations

9.1.9 Raft foundation

9.1.10 Combined footing foundation

9.2 Walls

9.2.1 Types of walls: solid wall, partition wall, cavity wall, curtain wall

9.2.2 Features and their functions

9.2.3 Types of stone masonry: rubble, hammer dressed and ashlar masonry

9.2.4 Brick Masonry: English, Flemish, garden rat trap, monk

9.2.5 Types of concrete blocks

9.2.6 Choosing wall thickness, height to length relation

9.2.7 Use of scaffolding

9.2.8 Procedure of constructing various masonry walls

9.3 Damp Proofing

9.3.1 Source of dampness

9.3.2 Remedial measures to prevent dampness

9.3.3 Vertical and horizontal damp proofing

9.3.4 Damp proofing materials

9.4 Concrete Technology

9.4.1 Constituents, mixing and use of lime concrete

9.4.2 Constituents of cement concrete

9.4.3 Grading of aggregates

9.4.4 Concrete mixes

9.4.5 Water cement ratio

9.4.6 Workability

9.4.7 Concrete laying

9.4.8 Factors affecting strength of concrete

9.4.9 Form work

9.4.10 Vibrators

9.4.11 Curing

9.4.12 General introduction to Precast RC units

9.4.13 Hydration and segregation

9.5 Wood Work

9.5.1 Frame and shutters of doors and windows

9.5.2 Timber construction of upper floors

9.5.3 Design and construction of stairs

9.5.4 Double timber roofs

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9.5.5 False ceiling

9.5.6 Sky-light elements, functions and construction details

9.6 Steel Work

9.6.1 Steel work in windows: Standards, elements and functions

9.6.2 Tubular and angle steel roofs

9.6.3 Iron grill and lattice work

Architecture - Maintenance of building

10 Building Design

10.1 Analysis of Building Elements

10.1.1 Bed

10.1.2 Kitchen/Dining

10.1.3 Living Hall

10.1.4 Class Room

10.1.5 Working Office Space

10.1.6 Library

10.2 Design Consideration

10.2.1 Specific program: space requirements

10.2.2 Site: topography, orientation, environment

10.2.3 Functional relationship between activities

10.2.4 Culture: tradition, values, taste

10.2.5 Economics: efficient use of space and materials

10.2.6 Availability to technology and material

10.2.7 Structure type and efficiency

10.2.8 Optimum use of natural light and ventilation

10.2.9 Aesthetics

10.2.10 Building Bye Laws

10.3 Climatology

10.3.1 Climate: sun, wind, rain, humidity

10.3.2 Orientation of the building with respect to the sun and wind: best optimum, bad

10.3.3 Determination of length of roof projection to act as sunshade

11 Architectural Modelling

11.1 Modelling Materials and Practices

11.1.1 Use of models

11.1.2 Choice of materials

11.1.3 Modelling techniques

11.1.4 Accuracy of models

11.1.5 Determination of degree of detailing

11.1.6 Model construction of multi-storey buildings

11.1.7 Contour models of sites

11.2 Equipment's Required

11.2.1 Choice of cutting tools

11.2.2 Choice of adhesives

11.2.3 Choice of colour and tone

11.2.4 Choice of paint and brushes

11.2.5 Miscellaneous tools

प्रदेश लोक सेवा आयोग

लुम्बिनी प्रदेश

प्रदेश निजामती सेवा तथा स्थानीय सरकारी सेवा अन्तर्गत इञ्जिनियरिङ्ग सेवा, सिभिल समूह, बिल्डिङ्ग एण्ड आर्किटेक्ट उप-समूह, पाँचौ तहको खुला प्रतियोगितात्मक परीक्षाको पाठ्यक्रम

12 Graphics and presentation

12.1 Principles of Composition

12.1.1 Balance

12.1.2 Scale

12.1.3 Rhythm

12.1.4 Monotony

12.1.5 Contrast

12.1.6 Unity

12.1.7 Focal point

12.2 Tone

12.2.1 Light

12.2.2 Medium

12.2.3 Dark

12.2.4 Flat

12.2.5 Graded

12.3 Free Hand Works

12.3.1 Drawing lines

12.3.2 Drawing letters

12.3.3 Three dimensional objects

12.4 Presentation

12.4.1 Textures

12.4.2 Exterior and interior objects

12.4.3 Human figures

12.4.4 Shadows

12.5 Medium for Presentation

12.5.1 Pencil techniques

12.5.2 Colour history and type: pencil colour, water colour, Poster colour

12.5.3 Primary, secondary and tertiary colours

12.5.4 Warm and cool Colours

12.5.5 Properties of colour

12.5.6 Colour circle

12.5.7 Colour scheme: monochromatic, analogous, complementary and triad

12.6 Data Presentation in Graphical Forms

12.6.1 Translation of numerical data into diagrams and vice versa

12.6.2 Pie chart, bar chart and XY graphs

12.7 Cartography

12.7.1 Tracing of land-use maps

12.7.2 Presentation of land-use maps
