प्रदेश लोक सेवा आयोग, कर्णाली प्रदेश

प्रदेश निजामती सेवा र स्थानीय सेवाको इन्जिनियरिङ्ग सेवा, सिभिल समूह, विल्डिङ्ग एण्ड आर्किटेक्ट उपसमूह, सहायकस्तर पाँचौ तह, सव-इन्जिनियर वा सो सरह पदको खुला प्रतियोगितात्मक लिखित परीक्षाको पाठ्यक्रम र परीक्षा योजना

पाठ्यक्रमको रुपरेखाः यस पाठ्यक्रम योजनालाई दुई चरणमा विभाजन गरिएको छ।

परीक्षाको चरण	परीक्षाको किसिम	पूर्णाङ्क
प्रथम चरण	लिखित परीक्षा (Written Examination)	२००
अन्तिम चरण	कम्प्युटर सीप परीक्षण (Computer Skill Test)	१०
	अन्तर्वार्ता (Interview)	३०

परीक्षा योजना (Examination Scheme)

१. प्रथम चरणः लिखित परीक्षा (Written Examination) पूर्णाङ्कः २००

पत्र	विषय	पूर्णाङ्क	उत्तीर्णाङ्क	परीक्षा प्रणाली		प्रश्नसंख्याxअङ्क	समय
प्रथम	सामान्य ज्ञान र सार्वजनिक व्यवस्थापन (General awareness & Public management)	१००	४०	वस्तुगत (Objective)	बहुवैकल्पिक प्रश्न (MCQs)	२०x२=४०	४५ मिनेट
	सेवा सम्बन्धी ज्ञान (Service Based knowledge)					३०x२=६०	
द्वितीय	प्राविधिक विषय (Technical Subject)	१००	४०	विषयगत (Subjective)	छोटो उत्तर लामो उत्तर	१२x५=६० ४x१०=४०	२ घण्टा १५ मिनेट

२. अन्तिम चरणः कम्प्युटर सीप परीक्षण र अन्तर्वार्ता पूर्णाङ्कः ४०

पत्र/विषय	पूर्णाङ्क	परीक्षा प्रणाली
कम्प्युटर सीप परीक्षण (Computer Skill test)	१०	प्रयोगात्मक (Practical)
अन्तर्वार्ता (Interview)	३०	मौखिक (Oral)

द्रष्टव्यः

१. यस पाठ्यक्रम योजनालाई प्रथम चरण र अन्तिम चरण गरी दुई चरणमा विभाजन गरिएको छ।

२. प्रश्नपत्रको भाषा नेपाली वा अङ्ग्रेजी वा नेपाली र अङ्ग्रेजी दुवै हुन सक्नेछ।

३. परीक्षाको भाषा नेपाली वा अङ्ग्रेजी अथवा नेपाली र अङ्ग्रेजी दुवै हुन सक्नेछ।

४. खुला र समावेशी समूहको एउटै प्रश्नपत्रबाट परीक्षा सञ्चालन हुनेछ।

५. प्रथम पत्र र द्वितीय पत्रको लिखित परीक्षा छुट्टाछुट्टै हुनेछ। दुवैपत्रको परीक्षा एकैदिनमा वा छुट्टाछुट्टै दिनमा लिन सकिनेछ।

६. वस्तुगत बहुवैकल्पिक (Multiple Choice) प्रश्नहरुको 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।

७. बहुवैकल्पिक प्रश्नहरु हुने परीक्षामा मोवाईल फोन, स्मार्ट वाच, क्याल्कुलेटर जस्ता सामग्रीहरु प्रयोग गर्न पाइने छैन।

८. विषयगत प्रश्नहरुको हकमा तोकिएको अङ्कमा एउटा लामो प्रश्न वा एउटै प्रश्नका दुई वा दुई भन्दा बढी भाग (Two or more parts of a single question) वा एउटा प्रश्न अन्तर्गत दुई वा बढी टिप्पणीहरु (Short notes) सोध्न सकिनेछ।

९. परीक्षामा सोधिने प्रश्नसंख्या, अङ्क र अङ्कभार यथासम्भव सम्बन्धित पत्र/विषयमा दिईए अनुसार हुनेछ।

१०. विषयगत प्रश्न हुने पत्र/विषयका प्रत्येक भाग/खण्डका लागि छुट्टाछुट्टै उत्तरपुस्तिकाहरु हुनेछन्। परीक्षार्थीले प्रत्येक भाग/खण्डका प्रश्नहरुको उत्तर सोही भाग/खण्डको उत्तरपुस्तिकामा लेख्नुपर्नेछ।

११. यस पाठ्यक्रम अनुसारका पत्र/विषयका विषयवस्तुमा जुनसुकै कुरा लेखिएको भएतापनि पाठ्यक्रममा परेका कानून, ऐन, नियम तथा नीतिहरु परीक्षाको मिति भन्दा ३ महिना अगावै संशोधन भई कायम रहेका विषयवस्तुलाई यस पाठ्यक्रममा परेको सम्झनु पर्दछ।

१२. प्रथम चरणको लिखित परीक्षाबाट छनौट भएका उम्मेदवारहरुलाई मात्र अन्तिम चरणको कम्प्युटर सीप परीक्षण र अन्तर्वार्तामा सम्मिलित गराइनेछ।

१३. प्रथम चरणको लिखित परीक्षाको प्राप्ताङ्क, अन्तिम चरणको कम्प्युटर सीप परीक्षण र अन्तर्वार्ताको प्राप्ताङ्कको आधारमा अन्तिम परीक्षाफल प्रकाशित गरिनेछ।

१४. यस भन्दा अगाडि लागू गरिएको माथि उल्लेखित सेवा, समूहको पाठ्यक्रम खारेज गरिएको छ।

१५. पाठ्यक्रम लागू हुने मितिः २०८१।०९।२३

प्रदेश लोक सेवा आयोग, कर्णाली प्रदेश

प्रदेश निजामती सेवा र स्थानीय सेवाको इन्जिनियरिङ्ग सेवा, सिभिल समूह, विल्डिङ्ग एण्ड आर्किटेक्ट उपसमूह, सहायकस्तर पाँचौ तह, सव-इन्जिनियर वा सो सरह पदको खुला प्रतियोगितात्मक लिखित परीक्षाको पाठ्यक्रम

प्रथम पत्र (Paper I): सामान्य ज्ञान र सार्वजनिक व्यवस्थापन तथा सेवा सम्बन्धी ज्ञान

भाग (Part I):

सामान्य ज्ञान र सार्वजनिक व्यवस्थापन

(General awareness & Public management)

(Section-A) (१०प्रश्न×२ अङ्क= २०अङ्क)

१. सामान्य ज्ञान (General Awareness)

१.१. नेपालको भौगोलिक अवस्था, प्राकृतिक स्रोत र साधनहरु

१.२. कर्णाली प्रदेशको ऐतिहासिक, सांस्कृतिक र सामाजिक अवस्था सम्बन्धी जानकारी

१.३. कर्णाली प्रदेशको आर्थिक अवस्था र चालु आवधिक योजना सम्बन्धी जानकारी

१.४. मानव जीवनमा प्रत्यक्ष प्रभाव पार्ने विज्ञान र प्रविधिका महत्त्वपूर्ण उपलव्धिहरु

१.५. जैविक विविधता, दिगो विकास, वातावरण प्रदुषण, जलवायु परिवर्तन र जनसङ्ख्या व्यवस्थापन

१.६. नेपालको संविधान (भाग १ देखि भाग ५ सम्म र अनुसूचीहरु)

१.७. संघ, प्रदेश र स्थानीय तहको शासन व्यवस्था सम्बन्धी जानकारी

१.८. संयुक्त राष्ट्र संघ, सार्क, बिमस्टेक सम्बन्धी जानकारी

१.९. राष्ट्रिय तथा अन्तर्राष्ट्रिय महत्त्वका समसामयिक गतिविधिहरु

(Section-B) (१०प्रश्न×२ अङ्क= २०अङ्क)

२. सार्वजनिक व्यवस्थापन (Public management)

२.१. कार्यालय व्यवस्थापन

२.१.१ कार्यालयः परिचय, महत्त्व, कार्य र प्रकार

२.१.२ सहायक कर्मचारीका कार्य र गुणहरु

२.१.३ कार्यालय स्रोत साधनः परिचय र प्रकार

२.१.४ कार्यालयमा सञ्चारको महत्त्व, किसिम र साधन

२.१.५ कार्यालय कार्यविधिः पत्र व्यवहार, दर्ता र चलानी, फाइलिङ, परिपत्र, तोक आदेश, टिप्पणी लेखन

२.१.६ अभिलेख व्यवस्थापन

२.२. प्रदेश निजामती सेवा ऐन र स्थानीय सेवा ऐनमा भएका व्यवस्थाहरु

२.२.१ निजामती सेवाको गठन, संगठन संरचना, पदपूर्ति गर्ने तरिका र प्रक्रियाहरु

२.२.२ कर्मचारीको नियुक्ति, सरुवा, वढुवा, विदा, विभागीय सजाय र अवकाश

२.२.३ कर्मचारीले पालना गर्नुपर्ने आचरण, नैतिक दायित्त्व र कर्तव्यहरु

२.३. सार्वजनिक सेवा प्रवाहको अर्थ, सेवा प्रवाह गर्ने निकाय, तरिका र माध्यमहरु

२.४. मानव अधिकार, सुशासन र सूचनाको हक सम्बन्धी सामान्य जानकारी

२.५. सार्वजनिक वडापत्र

२.६. कानूनी शासन र कर्मचारीतन्त्र

भाग (Part II):

सेवा सम्बन्धी ज्ञान (Service Based Knowledge) (३०×२= ६०)

1. Drawing
   - 1.1. General
     - 1.1.1. Importance, aims and objectives of drawing
     - 1.1.2. Drawing equipment
     - 1.1.3. Architectural discipline
     - 1.1.4. Standard drawing sheets size
     - 1.1.5. Drafting techniques and methods in common practice
     - 1.1.6. Scales: Choice, use and conversion
   - 1.2. Measured drawing
     - 1.2.1. Methods of measurement of horizontal and vertical dimensions
     - 1.2.2. Sectional measurements
     - 1.2.3. Dimensioning of sketches
     - 1.2.4. Checking for missing details in field
   - 1.3. Working drawing
     - 1.3.1. Role of working drawing
     - 1.3.2. Interrelationship with estimate and specification
     - 1.3.3. Construction detailing in plan and section
     - 1.3.4. Significanceofdetailingintermsofaccuracyofestimation,billofquantities and construction supervision
     - 1.3.5. Working drawing for buildings, sanitary and electrical
     - 1.3.6. Structural working drawings
   - 1.4. Presentation drawing
     - 1.4.1. Choices for presentation works in color and black and white modes
     - 1.4.2. Presentation techniques for plans, elevations, sections and perspectives
     - 1.4.3. Presentation techniques for housing, urban planning, landscape works, construction materials, furniture and vehicle
     - 1.4.4. Materials and equipment required for presentations works
     - 1.4.5. Shades and shadows
2. Estimating and Costing
   - 2.1. General
     - 2.1.1. Purpose of estimating
     - 2.1.2. Main items of work
     - 2.1.3. Units of measurement and payment of various items of work and materials
     - 2.1.4. Degree of accuracy
     - 2.1.5. Standard estimate formats of government of Nepal
     - 2.1.6. Data for estimate
     - 2.1.7. Preliminary estimate
     - 2.1.8. Approximate quantity estimate
     - 2.1.9. Detailed estimate
     - 2.1.10. Revised estimate
   - 2.2. Rate Analysis
     - 2.2.1. Manufacturers' cost
     - 2.2.2. Transportation cost
     - 2.2.3. Overheads
     - 2.2.4. Need of contingencies
     - 2.2.5. Use of government Rate Analysis and Norms

2.3. Specifications
    2.3.1. Purpose
    2.3.2. Types
    2.3.3. Necessity
    2.3.4. Interpretation of Specifications
2.4. Estimating
    2.4.1. Earthwork
    2.4.2. Estimate of building
    2.4.3. Estimate of sanitary works
    2.4.4. Estimate of electrical works
    2.4.5. Estimation of site development and landscaping works
    2.4.6. Annual maintenance
2.5. Valuation
    2.5.1. Purpose of valuation
    2.5.2. Methods of valuation
    2.5.3. Standard formats used for Property Valuation in Nepal

3. Management

3.1. Organization
    3.1.1. Need for organization
    3.1.2. Various agencies in Housing, Building and Urban Development under Federal, Provincial and Local level of governments
    3.1.3. Responsibilities of a sub engineer
    3.1.4. Relation between client, contractor and consultants
3.2. Accounts
    3.2.1. Familiarity with related Nepalese accounting system
    3.2.2. Administrative approval and technical sanction
3.3. Planning and Control
    3.3.1. List of activities
    3.3.2. Construction schedule
    3.3.3. Equipment and materials schedule
    3.3.4. Construction stages and operations
    3.3.5. Bar Chart
3.4. Municipal Building By-laws
    3.4.1. Drawing sheet sizes
    3.4.2. Scales
    3.4.3. Setback
    3.4.4. Height controls
    3.4.5. Other requirements specified by the municipalities
    3.4.6. Floor Area Ratio (FAR)

4. Building Service

4.1. Water Supply
    4.1.1. General principle of water supply
    4.1.2. Water requirement standard for different buildings
    4.1.3. Storage and distribution of water
    4.1.4. Heating of water, storage and distribution requirements
4.2. Disposal system
    4.2.1. Septic tank, soak pit, vent pipe and manhole
    4.2.2. Pipes for different waste water
    4.2.3. Incinerators

4.3. Electricity
    4.3.1. General principles of electrical installation and distribution
    4.3.2. Wiring systems in building
    4.3.3. Ducts for electrical distribution
    4.3.4. Safety precautions
4.4. 4.4 Lighting
    4.4.1. General principles of lighting
    4.4.2. Illumination requirements and standards
    4.4.3. Combination of artificial and natural light
    4.4.4. Lighting fixtures

5. Surveying
5.1. General
    5.1.1. Primary divisions of survey
    5.1.2. Classification based on instruments and on methods
    5.1.3. Basic principle of surveying
    5.1.4. Scales, plans and maps
    5.1.5. System of field booking of surveying and levelling data
    5.1.6. Theodolite survey
5.2. Levelling
    5.2.1. Classification of levelling work
    5.2.2. Methods of levelling
    5.2.3. Levelling instruments and accessories
    5.2.4. Principles of levelling
    5.2.5. Temporary and permanent adjustments of a level
    5.2.6. Profile levelling
    5.2.7. Booking and reducing levels
5.3. Errors and their effects
    5.3.1. Kinds of errors
    5.3.2. Source of errors in chaining, levelling, plane tabling and compass surveying
    5.3.3. Effects of errors
5.4. Contouring
    5.4.1. Definitions of terms
    5.4.2. Use of contour maps
5.5. Setting out
    5.5.1. Small buildings
    5.5.2. Simple curves
    5.5.3. Locating the boundaries

6. Construction Materials
6.1. Stone
    6.1.1. Rocks and their characteristics
    6.1.2. Formation and availability of stones in Nepal
    6.1.3. Quarrying: excavation, Wedging and blasting
    6.1.4. Methods of laying and construction with various stones
6.2. Aggregates
    6.2.1. Fine aggregates
    6.2.2. Coarse aggregates
    6.2.3. Availability and practices in Nepal
6.3. Cement
    6.3.1. Different cements: Ingredients, properties and manufacture

6.3.2. Storage and transport
6.3.3. Admixtures
6.4. Metals and Alloys
6.4.1. Wrought iron: Properties, use
6.4.2. Steel: composition, properties, appearance, strength, constructional forms and manufacture
6.4.3. Corrosion and its prevention
6.4.4. Uses of brass
6.5. Brick
6.5.1. Type and properties
6.5.2. Manufacture
6.5.3. Laying
6.5.4. Availability in Nepal
6.6. Lime
6.6.1. Manufacture
6.6.2. Types and properties
6.6.3. Uses
6.7. Paints and Varnishes
6.7.1. Type and selection
6.7.2. Preparation techniques
6.7.3. Uses
6.8. Floor Finishes
6.8.1. Punning
6.8.2. Tiles: mosaic, clay, concrete, vinyl
6.8.3. Marble and flagstones
6.8.4. Wooden boarding and parqueting
6.9. Wall Finishes
6.9.1. Plasters: cement, lime, mud
6.9.2. Punning: cement, lime
6.9.3. Cladding: wood, stone, tiles
6.10. Roofing Materials
6.10.1. Clay tiles, ceramic tiles and slates
6.10.2. CGI and UPVC roofing
6.11. Miscellaneous Materials
6.11.1. Glass
6.11.2. Plastics
6.11.3. Bitumen
6.11.4. Surkhi

7. Structural Design
7.1. Timber Structures
7.1.1. Allowable stresses
7.1.2. Design of compression members
7.1.3. Design of solid rectangular beams
7.1.4. Types of joints and their connections
7.2. Steel Structures
7.2.1. Riveted and welded connections: types, uses, detailing
7.2.2. Detailing of simple roof trusses
7.2.3. Detailing of rolled steel beams
7.2.4. Detailing of column bases
7.3. R.C. Sections in Bending

7.3.1. Basis assumptions
7.3.2. Position of neutral axis
7.3.3. Moment of resistance
7.3.4. Under reinforced, over reinforced and balanced sections
7.3.5. Analysis of singly and doubly reinforced rectangular sections
7.3.6. Analysis of singly reinforced flanged sections

7.4. Shear and Bond for Reinforced Concrete (RC) Sections
7.4.1. Behaviour of R.C. section in shear
7.4.2. Shear resistance of R.C. section
7.4.3. Types of shear reinforcement and their design
7.4.4. Local and anchorage bond
7.4.5. Determination of anchorage length
7.4.6. Bar curtailment

7.5. Axially Loaded R.C
7.5.1. Short and long columns
7.5.2. Design of a rectangular column section
7.5.3. Reinforcement detailing

7.6. Design and Detailing of R.C Structures
7.6.1. IS code requirements
7.6.2. Methods of design
7.6.3. Singly reinforced T beams
7.6.4. Simple one-way and two-way slabs
7.6.5. Simple pad footings for columns
7.6.6. Preparation of bar bending for RC design

7.7. Earthquake Resistant Design of Non-engineered Structures
7.7.1. History of Earthquake in Nepal and damages
7.7.2. Weakness of existing building
7.7.3. Site consideration
7.7.4. Building form, shape and size
7.7.5. Size and location of openings
7.7.6. Selection of materials
7.7.7. Construction technology
7.7.8. 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

8. Building Construction Technology

8.1. Foundations
8.1.1. Function and necessity
8.1.2. Subsoil exploration: test pit
8.1.3. Safe bearing capacity of soils and its improvement
8.1.4. Type and suitability of different foundations: shallow, deep (pile and well)
8.1.5. Methods of excavating
8.1.6. Shoring and dewatering
8.1.7. Elements of simple spread foundation
8.1.8. Stone masonry foundations
8.1.9. Raft foundation

8.2. Walls
8.2.1. Types of walls: solid wall, partition wall, cavity wall, curtain wall
8.2.2. Features and their functions
8.2.3. Types of stone masonry: rubble, hammer dressed and ashlars masonry

8.2.4. Brick Masonry: English, Flemish, Garden rat trap, Monk
8.2.5. Types of concrete blocks
8.2.6. Choosing wall thickness, height to length relation
8.2.7. Use of scaffolding
8.2.8. Procedure of constructing various masonry walls

8.3. Damp Proofing
8.3.1. Source of dampness
8.3.2. Remedial measures to prevent dampness
8.3.3. Vertical and horizontal damp proofing
8.3.4. Damp proofing materials

8.4. Concrete Technology
8.4.1. Constituents, mixing and use of lime concrete
8.4.2. Constituents, of cement concrete
8.4.3. Grading of aggregates
8.4.4. Concrete mixes
8.4.5. Water cement ratio
8.4.6. Workability
8.4.7. Concrete laying
8.4.8. Factors affecting strength of concrete
8.4.9. Form work
8.4.10. Vibrators
8.4.11. Curing
8.4.12. General introduction to Precast RC units
8.4.13. Hydration and segregation

8.5. Wood Work
8.5.1. Frame and shutters of doors and windows
8.5.2. Timber construction of upper floors
8.5.3. Design and construction of stairs
8.5.4. Double timber roofs
8.5.5. False ceiling
8.5.6. Sky-light: elements, functions and construction details

8.6. Steel Work
8.6.1. Steel work in door and windows: Standards, elements and functions
8.6.2. Tubular and angle steel roofs
8.6.3. Iron grill and lattice work

9. Architecture

9.1. Analysis of Building Elements
9.1.1. Bed
9.1.2. Kitchen/Dining
9.1.3. Living Hall
9.1.4. Class Room
9.1.5. Working Office Space
9.1.6. Library

9.2. Design Consideration
9.2.1. Specific program: space requirements
9.2.2. Site: topography, orientation, environment
9.2.3. Functional relationship between activities
9.2.4. Culture: tradition, values, taste
9.2.5. Economics: efficient use of space and materials
9.2.6. Availability to technology and material

9.2.7. Structure type and efficiency
9.2.8. Optimum use of natural light and ventilation
9.2.9. Aesthetics
9.2.10. Color codes of government office building

9.3. Climatology
9.3.1. Climate: sun, wind, rain, humidity
9.3.2. Orientation of the building with respect to the sun and wind: best, optimum, bad
9.3.3. Determination of length of roof projection to act as sunshade

9.4. Basic understanding of housing and land development
9.4.1. Site and services, Guided land development, Land pooling, Core housing, Estate housing, Row housing, Compact settlements and Plotting.

9.5. Basic understanding of urban planning
9.5.1. Cadastral map, Topographic map, Base map, structure plan, Master plan, Land use plan and Physical development plan

10. Architectural Modelling

10.1. Modelling Materials and Practices
10.1.1. Use of models
10.1.2. Choice of materials
10.1.3. Modelling techniques
10.1.4. Accuracy of models
10.1.5. Determination of degree of detailing
10.1.6. Model construction of multi-storied buildings
10.1.7. Contour models of sites

10.2. Equipment Required
10.2.1. Choice of cutting tools, adhesives, colour and tone, paint and brushes
10.2.2. Miscellaneous tools

11. Graphics and Composition

11.1. Principles of Composition
11.1.1. Balance
11.1.2. Scale
11.1.3. Rhythm
11.1.4. Monotony
11.1.5. Contrast
11.1.6. Unity
11.1.7. Focal point

11.2. Tone
11.2.1. Light
11.2.2. Medium
11.2.3. Dark
11.2.4. Flat
11.2.5. Graded

11.3. Free Hand Works
11.3.1. Drawing lines
11.3.2. Drawing letters
11.3.3. Three dimensional objects

11.4. Medium for presentation
11.4.1. Pencil, ink and charcoal techniques
11.4.2. Colour history and type: pencil colour, water colour, Poster colour
11.4.3. Primary, secondary and tertiary colours

11.4.4. Warm and cool colours
11.4.5. Properties of colour
11.4.6. Colour circle
11.4.7. Colour scheme: monochromatic, analogous, complementary and triad

11.5. Data Presentation in Graphical Forms
11.5.1. Translation of numerical data into diagrams and vice versa
11.5.2. Pie chart, bar chart and XY graphs

11.6. Cartography
11.6.1. Tracing of land-use maps
11.6.2. Presentation of land-use maps

प्रथम पत्रको Part II का एकाईवाट यथासम्भव निम्नानुसार प्रश्नहरु सोधिनेछ।

एकाई	१	२	३	४	५	६	७	८	९	१०	११
वस्तुगत	२	३	२	३	३	३	३	३	३	३	२

प्रदेश लोक सेवा आयोग, कर्णाली प्रदेश

प्रदेश निजामती सेवा र स्थानीय सेवाको इन्जिनियरिङ्ग सेवा, सिभिल समूह, विल्डिङ्ग एण्ड आर्किटेक्ट उपसमूह, सहायकस्तर पाँचौ तह, सव-इन्जिनियर वा सो सरह पदको खुला प्रतियोगितात्मक लिखित परीक्षाको पाठ्यक्रम

द्वितीय पत्र (Paper II): प्राविधिक विषय (Technical Subject)

(Section-A) 40 Marks

1. Drawing
   - 1.1. General
     - 1.1.1. Importance, aims and objectives of drawing
     - 1.1.2. Drawing equipment
     - 1.1.3. Architectural discipline
     - 1.1.4. Standard drawing sheets size
     - 1.1.5. Drafting techniques and methods in common practice
     - 1.1.6. Scales: Choice, use and conversion
   - 1.2. Measured drawing
     - 1.2.1. Methods of measurement of horizontal and vertical dimensions
     - 1.2.2. Sectional measurements
     - 1.2.3. Dimensioning of sketches
     - 1.2.4. Checking for missing details in field
   - 1.3. Working drawing
     - 1.3.1. Role of working drawing
     - 1.3.2. Interrelationship with estimate and specification
     - 1.3.3. Construction detailing in plan and section
     - 1.3.4. Significanceofdetailingintermsofaccuracyofestimation,billofquantities and construction supervision
     - 1.3.5. Working drawing for buildings, sanitary and electrical
     - 1.3.6. Structural working drawings
   - 1.4. Presentation drawing
     - 1.4.1. Choices for presentation works in color and black and white modes
     - 1.4.2. Presentation techniques for plans, elevations, sections and perspectives
     - 1.4.3. Presentation techniques for housing, urban planning, landscape works, construction materials, furniture and vehicle
     - 1.4.4. Materials and equipment required for presentations works
     - 1.4.5. Shades and shadows
2. Estimating and Costing
   - 2.1. General
     - 2.1.1. Purpose of estimating
     - 2.1.2. Main items of work
     - 2.1.3. Units of measurement and payment of various items of work and materials
     - 2.1.4. Degree of accuracy
     - 2.1.5. Standard estimate formats of government of Nepal
     - 2.1.6. Data for estimate
     - 2.1.7. Preliminary estimate
     - 2.1.8. Approximate quantity estimate
     - 2.1.9. Detailed estimate
     - 2.1.10. Revised estimate
   - 2.2. Rate Analysis
     - 2.2.1. Manufacturers' cost
     - 2.2.2. Transportation cost

2.2.3. Overheads
2.2.4. Need of contingencies
2.2.5. Use of government Rate Analysis and Norms

2.3. Specifications
2.3.1. Purpose
2.3.2. Types
2.3.3. Necessity
2.3.4. Interpretation of Specifications

2.4. Estimating
2.4.1. Earthwork
2.4.2. Estimate of building
2.4.3. Estimate of sanitary works
2.4.4. Estimate of electrical works
2.4.5. Estimation of site development and landscaping works
2.4.6. Annual maintenance

2.5. Valuation
2.5.1. Purpose of valuation
2.5.2. Methods of valuation
2.5.3. Standard formats used for Property Valuation in Nepal

3. Management

3.1. Organization
3.1.1. Need for organization
3.1.2. Various agencies in Housing, Building and Urban Development under Federal, Provincial and Local level of governments
3.1.3. Responsibilities of a sub engineer
3.1.4. Relation between client, contractor and consultants

3.2. Accounts
3.2.1. Familiarity with related Nepalese accounting system
3.2.2. Administrative approval and technical sanction

3.3. Planning and Control
3.3.1. List of activities
3.3.2. Construction schedule
3.3.3. Equipment and materials schedule
3.3.4. Construction stages and operations
3.3.5. Bar Chart

3.4. Municipal Building By-laws
3.4.1. Drawing sheet sizes
3.4.2. Scales
3.4.3. Setback
3.4.4. Height controls
3.4.5. Other requirements specified by the municipalities
3.4.6. Floor Area Ratio (FAR)

4. Building Service

4.1. Water Supply
4.1.1. General principle of water supply
4.1.2. Water requirement standard for different buildings
4.1.3. Storage and distribution of water
4.1.4. Heating of water, storage and distribution requirements

4.2. Disposal system

4.2.1. Septic tank, soak pit, vent pipe and manhole
4.2.2. Pipes for different waste water
4.2.3. Incinerators

4.3. Electricity
4.3.1. General principles of electrical installation and distribution
4.3.2. Wiring systems in building
4.3.3. Ducts for electrical distribution
4.3.4. Safety precautions

4.4. 4.4 Lighting
4.4.1. General principles of lighting
4.4.2. Illumination requirements and standards
4.4.3. Combination of artificial and natural light
4.4.4. Lighting fixtures

5. Surveying

5.1. General
5.1.1. Primary divisions of survey
5.1.2. Classification based on instruments and on methods
5.1.3. Basic principle of surveying
5.1.4. Scales, plans and maps
5.1.5. System of field booking of surveying and levelling data
5.1.6. Theodolite survey

5.2. Levelling
5.2.1. Classification of levelling work
5.2.2. Methods of levelling
5.2.3. Levelling instruments and accessories
5.2.4. Principles of levelling
5.2.5. Temporary and permanent adjustments of a level
5.2.6. Profile levelling
5.2.7. Booking and reducing levels

5.3. Errors and their effects
5.3.1. Kinds of errors
5.3.2. Source of errors in chaining, levelling, plane tabling and compass surveying
5.3.3. Effects of errors

5.4. Contouring
5.4.1. Definitions of terms
5.4.2. Use of contour maps

5.5. Setting out
5.5.1. Small buildings
5.5.2. Simple curves
5.5.3. Locating the boundaries

(Section-B) 30 Marks

6. Construction Materials

6.1. Stone
6.1.1. Rocks and their characteristics
6.1.2. Formation and availability of stones in Nepal
6.1.3. Quarrying: excavation, Wedging and blasting
6.1.4. Methods of laying and construction with various stones

6.2. Aggregates
6.2.1. Fine aggregates

6.2.2. Coarse aggregates
6.2.3. Availability and practices in Nepal

6.3. Cement
6.3.1. Different cements: Ingredients, properties and manufacture
6.3.2. Storage and transport
6.3.3. Admixtures

6.4. Metals and Alloys
6.4.1. Wrought iron: Properties, use
6.4.2. Steel: composition, properties, appearance, strength, constructional forms and manufacture
6.4.3. Corrosion and its prevention
6.4.4. Uses of brass

6.5. Brick
6.5.1. Type and properties
6.5.2. Manufacture
6.5.3. Laying
6.5.4. Availability in Nepal

6.6. Lime
6.6.1. Manufacture
6.6.2. Types and properties
6.6.3. Uses

6.7. Paints and Varnishes
6.7.1. Type and selection
6.7.2. Preparation techniques
6.7.3. Uses

6.8. Floor Finishes
6.8.1. Punning
6.8.2. Tiles: mosaic, clay, concrete, vinyl
6.8.3. Marble and flagstones
6.8.4. Wooden boarding and parqueting

6.9. Wall Finishes
6.9.1. Plasters: cement, lime, mud
6.9.2. Punning: cement, lime
6.9.3. Cladding: wood, stone, tiles

6.10. Roofing Materials
6.10.1. Clay tiles, ceramic tiles and slates
6.10.2. CGI and UPVC roofing

6.11. Miscellaneous Materials
6.11.1. Glass
6.11.2. Plastics
6.11.3. Bitumen
6.11.4. Surkhi

7. Structural Design

7.1. Timber Structures
7.1.1. Allowable stresses
7.1.2. Design of compression members
7.1.3. Design of solid rectangular beams
7.1.4. Types of joints and their connections

7.2. Steel Structures
7.2.1. Riveted and welded connections: types, uses, detailing

7.2.2. Detailing of simple roof trusses
7.2.3. Detailing of rolled steel beams
7.2.4. Detailing of column bases

7.3. R.C. Sections in Bending
7.3.1. Basis assumptions
7.3.2. Position of neutral axis
7.3.3. Moment of resistance
7.3.4. Under reinforced, over reinforced and balanced sections
7.3.5. Analysis of singly and doubly reinforced rectangular sections
7.3.6. Analysis of singly reinforced flanged sections

7.4. Shear and Bond for Reinforced Concrete (RC) Sections
7.4.1. Behaviour of R.C. section in shear
7.4.2. Shear resistance of R.C. section
7.4.3. Types of shear reinforcement and their design
7.4.4. Local and anchorage bond
7.4.5. Determination of anchorage length
7.4.6. Bar curtailment

7.5. Axially Loaded R.C
7.5.1. Short and long columns
7.5.2. Design of a rectangular column section
7.5.3. Reinforcement detailing

7.6. Design and Detailing of R.C Structures
7.6.1. IS code requirements
7.6.2. Methods of design
7.6.3. Singly reinforced T beams
7.6.4. Simple one-way and two-way slabs
7.6.5. Simple pad footings for columns
7.6.6. Preparation of bar bending for RC design

7.7. Earthquake Resistant Design of Non-engineered Structures
7.7.1. History of Earthquake in Nepal and damages
7.7.2. Weakness of existing building
7.7.3. Site consideration
7.7.4. Building form, shape and size
7.7.5. Size and location of openings
7.7.6. Selection of materials
7.7.7. Construction technology
7.7.8. 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

8. Building Construction Technology

8.1. Foundations
8.1.1. Function and necessity
8.1.2. Subsoil exploration: test pit
8.1.3. Safe bearing capacity of soils and its improvement
8.1.4. Type and suitability of different foundations: shallow, deep (pile and well)
8.1.5. Methods of excavating
8.1.6. Shoring and dewatering
8.1.7. Elements of simple spread foundation
8.1.8. Stone masonry foundations
8.1.9. Raft foundation

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- 8.2.1. Types of walls: solid wall, partition wall, cavity wall, curtain wall
- 8.2.2. Features and their functions
- 8.2.3. Types of stone masonry: rubble, hammer dressed and ashlars masonry
- 8.2.4. Brick Masonry: English, Flemish, Garden rat trap, Monk
- 8.2.5. Types of concrete blocks
- 8.2.6. Choosing wall thickness, height to length relation
- 8.2.7. Use of scaffolding
- 8.2.8. Procedure of constructing various masonry walls

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- 8.3.1. Source of dampness
- 8.3.2. Remedial measures to prevent dampness
- 8.3.3. Vertical and horizontal damp proofing
- 8.3.4. Damp proofing materials

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- 8.4.1. Constituents, mixing and use of lime concrete
- 8.4.2. Constituents, of cement concrete
- 8.4.3. Grading of aggregates
- 8.4.4. Concrete mixes
- 8.4.5. Water cement ratio
- 8.4.6. Workability
- 8.4.7. Concrete laying
- 8.4.8. Factors affecting strength of concrete
- 8.4.9. Form work
- 8.4.10. Vibrators
- 8.4.11. Curing
- 8.4.12. General introduction to Precast RC units
- 8.4.13. Hydration and segregation

8.5. Wood Work
- 8.5.1. Frame and shutters of doors and windows
- 8.5.2. Timber construction of upper floors
- 8.5.3. Design and construction of stairs
- 8.5.4. Double timber roofs
- 8.5.5. False ceiling
- 8.5.6. Sky-light: elements, functions and construction details

8.6. Steel Work
- 8.6.1. Steel work in door and windows: Standards, elements and functions
- 8.6.2. Tubular and angle steel roofs
- 8.6.3. Iron grill and lattice work

(Section-C) 30 Marks

9. Architecture

9.1. Analysis of Building Elements
- 9.1.1. Bed
- 9.1.2. Kitchen/Dining
- 9.1.3. Living Hall
- 9.1.4. Class Room
- 9.1.5. Working Office Space
- 9.1.6. Library

9.2. Design Consideration

9.2.1. Specific program: space requirements
9.2.2. Site: topography, orientation, environment
9.2.3. Functional relationship between activities
9.2.4. Culture: tradition, values, taste
9.2.5. Economics: efficient use of space and materials
9.2.6. Availability to technology and material
9.2.7. Structure type and efficiency
9.2.8. Optimum use of natural light and ventilation
9.2.9. Aesthetics
9.2.10. Color codes of government office building

9.3. Climatology
9.3.1. Climate: sun, wind, rain, humidity
9.3.2. Orientation of the building with respect to the sun and wind: best, optimum, bad
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9.4. Basic understanding of housing and land development
9.4.1. Site and services, Guided land development, Land pooling, Core housing, Estate housing, Row housing, Compact settlements and Plotting.

9.5. Basic understanding of urban planning
9.5.1. Cadastral map, Topographic map, Base map, structure plan, Master plan, Land use plan and Physical development plan

10. Architectural Modelling

10.1. Modelling Materials and Practices
10.1.1. Use of models
10.1.2. Choice of materials
10.1.3. Modelling techniques
10.1.4. Accuracy of models
10.1.5. Determination of degree of detailing
10.1.6. Model construction of multi-storied buildings
10.1.7. Contour models of sites

10.2. Equipment Required
10.2.1. Choice of cutting tools, adhesives, colour and tone, paint and brushes
10.2.2. Miscellaneous tools

11. Graphics and Composition

11.1. Principles of Composition
11.1.1. Balance
11.1.2. Scale
11.1.3. Rhythm
11.1.4. Monotony
11.1.5. Contrast
11.1.6. Unity
11.1.7. Focal point

11.2. Tone
11.2.1. Light
11.2.2. Medium
11.2.3. Dark
11.2.4. Flat
11.2.5. Graded

11.3. Free Hand Works
11.3.1. Drawing lines

11.3.2. Drawing letters
11.3.3. Three dimensional objects
11.4. Medium for presentation
11.4.1. Pencil, ink and charcoal techniques
11.4.2. Colour history and type: pencil colour, water colour, Poster colour
11.4.3. Primary, secondary and tertiary colours
11.4.4. Warm and cool colours
11.4.5. Properties of colour
11.4.6. Colour circle
11.4.7. Colour scheme: monochromatic, analogous, complementary and triad
11.5. Data Presentation in Graphical Forms
11.5.1. Translation of numerical data into diagrams and vice versa
11.5.2. Pie chart, bar chart and XY graphs
11.6. Cartography
11.6.1. Tracing of land-use maps
11.6.2. Presentation of land-use maps

12. General
12.1. Current Periodic Plan of Karnali province
12.2. Challenges in infrastructure development in Karnali province
12.3. Karnali Province Civil Service Act, 2080 and Regulations, 2080 (conduct, leave and punishment)
12.4. Local Level (Formulation and Operation) Act, 2081and Regulations, 2081 (conduct, leave and punishment)
12.5. Local Government Operation Act, 2074 (service related)
12.6. Prevention of Corruption Act, 2059 (Chapter 2)

द्वितीय पत्रको एकाईवाट यथासम्भव निम्नानुसार प्रश्नहरु सोधिनेछ।

Section	**(Section –A)**					**(Section-B)**			**(Section-C)**			
Unit	1	2	3	4	5	6	7	8	9	10	11	12
Short Question	1	1	1	1	-	2	1	1	-	2	1	1
Long Question	-	1	-	-	1	-	1	-	1	-	-	-

२. कम्प्युटर सीप परीक्षण(Computer Skill Test)

विषयः कम्प्युटर सीप परीक्षण (Computer Skill Test)

विषय	पूर्णाङ्क	विषयवस्तु शीर्षक	अङ्क	समय
कम्प्युटर सीप परीक्षण (Computer Skill Test)	१०	Nepali Typing	२ अङ्क	५ मिनेट
		MS Word	१ अङ्क	१५ मिनेट
		Electronic Spreadsheet	२ अङ्क	
		Presentation system	१ अङ्क	
		System Administration and Project Management	२ अङ्क	
		CAD	२ अङ्क	
जम्मा			१० अङ्क	२० मिनेट

Contents

1. MS Word (0.5×2=1 Marks)
   a. paragraph formatting (alignment, indentation, spacing)
   b. Inserting Header, Footer, Page Number, Table, Pictures, Shapes, Hyperlink, Bookmark, Text Box, Symbol and Equation.
   c. Mail merge (basic understanding and application), Track Changes, basic macro concepts
   d. Security Techniques of Document (Password Protection, Read-only, Track Changes)
   e. Drawings & Diagrams: Basic drawings, equations, symbols.
   f. Insertion of Engineering Symbols and Special Characters
2. Electronic Spreadsheet (0.5×2=1 Marks and 1×1=1 Mark)
   a. Use of formulas, functions, and data formatting
   b. Freezing Formatting
   c. Sorting and Filtering data, Data Import and Export (CSV, TXT)
   d. Creating charts and graphs (bar charts, line graphs, pie charts, scatter plots)
   e. Data visualization: Charts (Bar, Line, Scatter), Conditional Formatting for Visual Data Representation
   f. Data Security and Auditing: Cell Locking, Workbook Protection, Formula Auditing, Document Inspector
3. Presentation System (0.5×2=1 Marks)
   a. Slide Design and Formatting : (Use of Templates, Themes, and Consistent Formatting, Adding Animations, Transitions, and Visual Effects, Use of Tables, Charts, and SmartArt
   b. Importing Data and Visuals: (Importing Charts and Tables from Excel, Embedding PDFs, Different Files, and Images)
   c. Interactive and Engaging Presentations: (Hyperlinking to Specific Slides or Documents, Interactive Maps and Clickable Diagrams)
   d. Protecting and Finalizing the Presentation
4. System Administration and Project Management : (0.5×2=1 Marks and 1×1=1 Mark)
   a. User interface and Navigation: file Explorer, Control Panel, Device Manager
   b. Application Management, Basic email etiquette and security practices (avoiding phishing, spam filters), Setting Up Signatures and Out-of-Office Replies,
   c. Project Planning and Scheduling (Gantt Charts, Timelines), Budget Estimation and Cost Tracking
   d. Remote Desktop Connection and VPN Setup
5. CAD (0.5×2=1 Marks and 1×1=1 Mark)
   a. Introduction to AutoCAD – Interface, Tools, and Commands

b. Basic 2D Drafting (Line, Circle, Trim, Offset)
c. Dimensioning, Layers, and Plotting
d. Editing and Modifying Drawings (Extend, Fillet, Mirror)
e. Importing and Exporting Drawings
f. Converting Drawings to PDF for Reports

नेपाली Typing skill test को लागि निर्देशन

१. नेपाली typing skill test को लागि १५० शब्दको एउटा text दिइनेछ र देहाय अनुसार अङ्क प्रदान गरिनेछ।

शुद्ध शब्द प्रतिमिनेट (correct words/minute)	पाउने अङ्क
४ भन्दा कम शुद्ध शब्द प्रतिमिनेट वापत	० अङ्क
४ वा सो भन्दा बढी र ७ भन्दा कम शुद्ध शब्द प्रतिमिनेट वापत	०.२५ अङ्क
७ वा सो भन्दा बढी र १० भन्दा कम शुद्ध शब्द प्रतिमिनेट वापत	०.५० अङ्क
१० वा सो भन्दा बढी र १३ भन्दा कम शुद्ध शब्द प्रतिमिनेट वापत	०.७५ अङ्क
१३ वा सो भन्दा बढी र १६ भन्दा कम शुद्ध शब्द प्रतिमिनेट वापत	१.०० अङ्क
१६ वा सो भन्दा बढी र १९ भन्दा कम शुद्ध शब्द प्रतिमिनेट वापत	१.२५ अङ्क
१९ वा सो भन्दा बढी र २२ भन्दा कम शुद्ध शब्द प्रतिमिनेट वापत	१.५० अङ्क
२२ वा सो भन्दा बढी र २५ भन्दा कम शुद्धशब्द प्रतिमिनेट वापत	१.७५ अङ्क
२५ वा सो भन्दा बढी शुद्ध शब्द प्रतिमिनेट वापत	२.०० अङ्क

२. नेपालीमा दिइएको text लाई अनिवार्य रुपमा युनिकोड (रोमानाइज्ड वा ट्रेडिसनल) मा टाइप गर्नुपर्नेछ।
३. नेपाली typing मा दिइएको text लाई आधारमानी टाइप गरेको text सँग भिडाई परीक्षण गरिनेछ। दिइएको नेपाली text मा उल्लेखित स्थान बमोजिम परीक्षार्थीहरूले आफ्नो text मा punctuation टाइप नगरेको पाइएमा त्यसको शब्दमा गणना गरिनेछैन। तत्पश्चात, निम्न formula प्रयोग गरी शुद्ध शब्द प्रतिमिनेट (correct words/minute) निकालिनेछ।

Formula: शुद्ध शब्द प्रतिमिनेट (correct words/minute) $= \frac{(\text{Total words typed} - \text{Wrong words})}{5}$