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प्रदेश लोक सेवा आयोग, कर्णाली प्रदेश

प्रदेश निजामती सेवाको इञ्जिनियरिङ्ग सेवा, सिभिल समूह, (जनरल, हाईवे, स्यानीटरी, इरिगेशन र हाइड्रोपावर) उपसमूह तथा स्थानीय सेवाको इञ्जिनियरिङ्ग सेवा, सिभिल समूह, (जनरल र स्यानीटरी) उपसमूह, सहायकस्तर पाँचौ तह, सव-इन्जिनियर पदको खुला प्रतियोगितात्मक लिखित परीक्षाको पाठ्यक्रम र परीक्षा योजना

</div>

पाठ्यक्रमको रुपरेखाः संयुक्त र एकीकृत परीक्षा प्रणाली (Unified and Integrated Examination System) को आधारमा सञ्चालन हुने 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

<div align="center">

परीक्षा योजना (Examination Scheme)

</div>

१. प्रथम चरणः लिखित परीक्षा (Written Examination)   पूर्णाङ्क: 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   पूर्णाङ्क: 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 सेवाको इन्जिनियरिङ्ग सेवा, सिभिल समूह, (जनरल, हाईवे, स्यानीटरी, इरिगेशन र हाइड्रोपावर) उपसमूह तथा स्थानीय सेवाको इन्जिनियरिङ्ग सेवा, सिभिल समूह, (जनरल र स्यानीटरी) उपसमूह, सहायकस्तर पाँचौ तह, सव-इन्जिनियर पदको खुला प्रतियोगितात्मक लिखित परीक्षाको पाठ्यक्रम

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

भाग (Part I):

सामान्यज्ञान र सार्वजनिक व्यवस्थापन

(General awareness & Public management)

Section -A   (१० प्रश्न × २अङ्क= २० अङ्क)

१. सामान्यज्ञान (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   (१० प्रश्न×२ अङ्क= २० अङ्क)

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, बिदा, विभागीय सजाय र अवकाश

२.२.३ कर्मचारीले पालना गर्नुपर्ने आचरण, नैतिक दायित्व 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

सेवा सम्बन्धी ज्ञान (Service Based Knowledge)

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 levelling
       1.2.2. Levelling instruments and accessories
       1.2.3. Principles of levelling
   1.3. Theodolite, Total station and Traverse surveying
       1.3.1. Theodolites, Total station, Electronic Distance Measurement (EDM) and Drone Survey
       1.3.2. Temporary adjustments
       1.3.3. Fundamental lines and desired relations
       1.3.4. Tacheometry: stadia method
       1.3.5. Trigonometric levelling
       1.3.6. Checks in closed traverse
   1.4. Contouring
       1.4.1. Characteristics of contour lines
       1.4.2. Methods of contouring
       1.4.3. Contour plotting
   1.5. Setting Out
       1.5.1. Small buildings
       1.5.2. Simple curves
2. Construction Materials
   2.1. Stone
       2.1.1. Formation, types and availability of stones in Nepal
       2.1.2. Methods of laying and construction with various stones
   2.2. Cement
       2.2.1. Ingredients, properties, manufacture, types and tests
       2.2.2. Storage and transport
       2.2.3. Admixtures
   2.3. Clay and Clay Products
       2.3.1. Brick: type, manufacture, laying, bonds
       2.3.2. Tiles and ceramics
   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

2.5.4. Tests

3. Mechanics of Materials and Structures
    3.1. Mechanics of Materials
        3.1.1. Internal effects of loading
        3.1.2. Ultimate strength and working stress of materials
    3.2. Mechanics of Beams
        3.2.1. Shear force and bending moment
        3.2.2. Thrust, shear force and bending moment diagrams for statically determinate beams under various types of loading
    3.3. Simple Strut Theory

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
        4.1.4. Interrelationship between specific gravity, void ratio, porosity, degree of saturation, percentage of air voids, air content and density index
    4.2. Soil Water Relation
        4.2.1. Terzaghi's principle of effective stress
        4.2.2. Darcy's law
        4.2.3. Factors affecting permeability
    4.3. Compaction of soil
        4.3.1. Factors affecting soil compaction
        4.3.2. Optimum moisture content
        4.3.3. Relation between dry density and moisture content
    4.4. Shear Strength of Soils
        4.4.1. Mohr-Coulomb failure theory
        4.4.2. Cohesion and angle of internal friction
    4.5. Earth Pressures
        4.5.1. Active and passive earth pressures
        4.5.2. Lateral earth pressure theory
        4.5.3. Rankine's earth pressure theory
    4.6. Foundation Engineering
        4.6.1. Foundations and their types
        4.6.2. Terzaghi's general bearing capacity formulae and their application

5. Structural Design
    5.1. R.C. Sections in Bending
        5.1.1. Under reinforced, over reinforced and balanced sections
        5.1.2. Analysis of single and double reinforced rectangular sections
    5.2. Shear and Bond for R.C. Sections
        5.2.1. Shear resistance of a R.C. section
        5.2.2. Types of Shear reinforcement and their design
        5.2.3. Determination of anchorage length
    5.3. Axially Loaded R.C. Columns
        5.3.1. Short and long columns
        5.3.2. Design of a rectangular column section
    5.4. Design of slab

  5.4.1. Simple one-way and two-way slabs
 5.5. Steel structure
  5.5.1. Introduction of steel
  5.5.2. Properties and uses of steel as structural member
  5.5.3. Riveted and welded joints
  5.5.4. Advantage and disadvantage

6. Building Construction Technology
 6.1. Foundations
  6.1.1. Subsoil exploration
  6.1.2. Type and suitability of different foundations: Shallow, deep
  6.1.3. Shoring and dewatering
  6.1.4. Design of simple brick or stone masonry foundations
 6.2. Walls
  6.2.1. Type of walls and their functions
  6.2.2. Choosing wall thickness, Height to length relation
  6.2.3. Use of scaffolding
 6.3. Damp Proofing
  6.3.1. Source of Dampness
  6.3.2. Measures to prevent dampness
 6.4. Concrete Technology
  6.4.1. Constituents of cement concrete
  6.4.2. Grading of aggregates
  6.4.3. Concreting equipments
  6.4.4. Concrete mixes
  6.4.5. Water cement ratio
  6.4.6. Factors affecting strength of concrete
  6.4.7. Formwork
  6.4.8. Curing
 6.5. Wood work
  6.5.1. Frame and shutters of door and window
  6.5.2. Timber construction of upper floors
 6.6. Flooring and Finishing
  6.6.1. Floor finishes: brick, concrete, flagstone
  6.6.2. Plastering
 6.7. Modern construction technology
  6.7.1. Aluminum, PVC door and window, type and uses
  6.7.2. Prefabricated structure type and uses
  6.7.3. Autoclated Aerated Concrete (AAC) blocks and uses

7. Hydraulics
 7.1. General
  7.1.1. Properties of fluid: mass, weight, specific weight, density, specific volume, specific gravity, viscosity
  7.1.2. Pressure and Pascal's law
 7.2. Hydro-Kinematics and Hydro-Dynamics
  7.2.1. Energy of flowing fluid: elevation energy, Kinetic energy, potential energy, internal energy
 7.3. Measurement of Discharge
  7.3.1. Weirs and notches

       7.3.2. Discharge formulae
   7.4. Flows
       7.4.1. Characteristics of pressurized flow and open channel flow
       7.4.2. Head losses

8. Water Supply and Sanitation Engineering
   8.1. General
       8.1.1. Objectives of water supply system
       8.1.2. Source of water and its selection: gravity and artesian springs, shallow and deep wells; infiltration galleries
       8.1.3. Drinking water quality and it's parameters
   8.2. Gravity Water Supply System
       8.2.1. Design period
       8.2.2. Determination of daily water demand
       8.2.3. Determination of reservoir tank capacity
       8.2.4. Selection of pipe
       8.2.5. Pipeline design and hydraulic grade line
   8.3. Design of Sewerage system
       8.3.1. Quantity of sanitary sewage
       8.3.2. Maximum, Minimum and self-cleaning velocity
   8.4. Excreta Disposal and Unsewered Area
       8.4.1. Common latrine types
       8.4.2. Design of septic tank
       8.4.3. Fecal sludge management, collection, transportation, treatment and disposal

9. Irrigation Engineering
   9.1. General
       9.1.1. Advantages and Disadvantages of irrigation
   9.2. Crop water requirement
       9.2.1. Crop season and principal crops
       9.2.2. Base period
       9.2.3. Duty and delta
   9.3. Flow in irrigation canals
       9.3.1. Canal losses and their minimization
       9.3.2. Maximum and minimum velocities
       9.3.3. Design of irrigation canal section based on Manning's formula
       9.3.4. Need and location of spillways
       9.3.5. Head works for small canals
   9.4. Basic principle of integrated water resource management
   9.5. River training works

10. Highway Engineering
   10.1. General
       10.1.1. Introduction of transportation systems
       10.1.2. Historic development of roads
       10.1.3. Classification of roads in Nepal
       10.1.4. Basic requirements of road alignment
   10.2. Geometric Design
       10.2.1. Basic design control and criteria for design
       10.2.2. Elements of cross section, typical cross-section for all roads in filling and cutting
       10.2.3. Camber

10.2.4. Determination of radius of horizontal curves
10.2.5. Super elevation
10.2.6. Sight distances
10.2.7. Gradient
10.2.8. Nepal Road Standard
10.3. Drainage System
10.3.1. Importance of drainage system and requirements of a good drainage system
10.4. Road Pavement
10.4.1. Pavement structure and its components: subgrade, sub-base, base and surface courses
10.5. Road Machineries
10.5.1. Earth moving and compacting machines
10.6. Bridge: Trail bridge and motorable bridge
10.7. Road Maintenance
10.7.1. Type of maintenance works
10.8. Tracks and trails

11. Estimating and Costing
11.1. General
11.1.1. Main items of work
11.1.2. Units of measurement and payment of various items of work and material
11.1.3. Standard estimate formats of government offices
11.2. Norms and Rate Analysis
11.2.1. Basic general knowledge on the use of rate analysis norms and district rates
11.3. Specifications and it's uses
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          12.4.3. Muster roll

          12.4.4. Completion report

     12.5. Planning and Control

          12.5.1. Construction scheduling

          12.5.2. Equipment and materials schedule

          12.5.3. Construction stages and operations

प्रथम पत्रको Part II का एकाईवाट यथासम्भव निम्नानुसार प्रश्नहरु सोधिनेछ।

एकाई	१	२	३	४	५	६	७	८	९	१०	११	१२
वस्तुगत	३	२	२	३	३	३	२	२	२	३	२	३

प्रदेश निजामती सेवाको इञ्जिनियरिङ्ग सेवा, सिभिल समूह, (जनरल, हाईवे, स्यानीटरी, इरिगेशन र हाइड्रोपावर) उपसमूह तथा स्थानीय सेवाको इञ्जिनियरिङ्ग सेवा, सिभिल समूह, (जनरल र स्यानीटरी) उपसमूह, सहायकस्तर पाँचौ तह, सव-इन्जिनियर पदको खुला प्रतियोगितात्मक लिखित परीक्षाको पाठ्यक्रम

द्वितीय पत्र (Paper II): प्राविधिक विषय

<div align="center">

(Section –A)   45 Marks

</div>

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 levelling
        1.2.2. Levelling instruments and accessories
        1.2.3. Principles of levelling
    1.3. Theodolite, Total station and Traverse surveying
        1.3.1. Theodolites, Total station, Electronic Distance Measurement (EDM) and Drone Survey
        1.3.2. Temporary adjustments
        1.3.3. Fundamental lines and desired relations
        1.3.4. Tacheometry: stadia method
        1.3.5. Trigonometric levelling
        1.3.6. Checks in closed traverse
    1.4. Contouring
        1.4.1. Characteristics of contour lines
        1.4.2. Methods of contouring
        1.4.3. Contour plotting
    1.5. Setting Out
        1.5.1. Small buildings
        1.5.2. Simple curves
2. **Construction Materials**
    2.1. Stone
        2.1.1. Formation, types and availability of stones in Nepal
        2.1.2. Methods of laying and construction with various stones
    2.2. Cement
        2.2.1. Ingredients, properties, manufacture, types and tests
        2.2.2. Storage and transport
        2.2.3. Admixtures
    2.3. Clay and Clay Products
        2.3.1. Brick: type, manufacture, laying, bonds
        2.3.2. Tiles and ceramics
    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

2.5.4. Tests

3. Mechanics of Materials and Structures

3.1. Mechanics of Materials

3.1.1. Internal effects of loading

3.1.2. Ultimate strength and working stress of materials

3.2. Mechanics of Beams

3.2.1. Shear force and bending moment

3.2.2. Thrust, shear force and bending moment diagrams for statically determinate beams under various types of loading

3.3. Simple Strut Theory

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

4.1.4. Interrelationship between specific gravity, void ratio, porosity, degree of saturation, percentage of air voids, air content and density index

4.2. Soil Water Relation

4.2.1. Terzaghi's principle of effective stress

4.2.2. Darcy's law

4.2.3. Factors affecting permeability

4.3. Compaction of soil

4.3.1. Factors affecting soil compaction

4.3.2. Optimum moisture content

4.3.3. Relation between dry density and moisture content

4.4. Shear Strength of Soils

4.4.1. Mohr-Coulomb failure theory

4.4.2. Cohesion and angle of internal friction

4.5. Earth Pressures

4.5.1. Active and passive earth pressures

4.5.2. Lateral earth pressure theory

4.5.3. Rankine's earth pressure theory

4.6. Foundation Engineering

4.6.1. Foundations and their types

4.6.2. Terzaghi's general bearing capacity formulae and their application

5. Structural Design

5.1. R.C. Sections in Bending

5.1.1. Under reinforced, over reinforced and balanced sections

5.1.2. Analysis of single and double reinforced rectangular sections

5.2. Shear and Bond for R.C. Sections

5.2.1. Shear resistance of a R.C. section

      5.2.2.   Types of Shear reinforcement and their design

      5.2.3.   Determination of anchorage length

  5.3. Axially Loaded R.C. Columns

      5.3.1.   Short and long columns

      5.3.2.   Design of a rectangular column section

  5.4. Design of slab

      5.4.1.   Simple one-way and two-way slabs

  5.5. Steel structure

      5.5.1.   Introduction of steel

      5.5.2.   Properties and uses of steel as structural member

      5.5.3.   Riveted and welded joints

      5.5.4.   Advantage and disadvantage

6. Building Construction Technology

  6.1. Foundations

      6.1.1.   Subsoil exploration

      6.1.2.   Type and suitability of different foundations: Shallow, deep

      6.1.3.   Shoring and dewatering

      6.1.4.   Design of simple brick or stone masonry foundations

  6.2. Walls

      6.2.1.   Type of walls and their functions

      6.2.2.   Choosing wall thickness, Height to length relation

      6.2.3.   Use of scaffolding

  6.3. Damp Proofing

      6.3.1.   Source of Dampness

      6.3.2.   Measures to prevent dampness

  6.4. Concrete Technology

      6.4.1.   Constituents of cement concrete

      6.4.2.   Grading of aggregates

      6.4.3.   Concreting equipments

      6.4.4.   Concrete mixes

      6.4.5.   Water cement ratio

      6.4.6.   Factors affecting strength of concrete

      6.4.7.   Formwork

      6.4.8.   Curing

  6.5. Wood work

      6.5.1.   Frame and shutters of door and window

      6.5.2.   Timber construction of upper floors

  6.6. Flooring and Finishing

      6.6.1.   Floor finishes: brick, concrete, flagstone

      6.6.2.   Plastering

  6.7. Modern construction technology

      6.7.1.   Aluminum, PVC door and window, type and uses

      6.7.2.   Prefabricated structure type and uses

      6.7.3.   Autoclated Aerated Concrete (AAC) blocks and uses

                    (Section-B)   45 Marks

7. Hydraulics

  7.1. General

      7.1.1. Properties of fluid: mass, weight, specific weight, density, specific volume, specific gravity, viscosity

      7.1.2. Pressure and Pascal's law

  7.2. Hydro-Kinematics and Hydro-Dynamics

      7.2.1. Energy of flowing fluid: elevation energy, Kinetic energy, potential energy, internal energy

  7.3. Measurement of Discharge

      7.3.1. Weirs and notches

      7.3.2. Discharge formulae

  7.4. Flows

      7.4.1. Characteristics of pressurized flow and open channel flow

      7.4.2. Head losses

8. Water Supply and Sanitation Engineering

  8.1. General

      8.1.1. Objectives of water supply system

      8.1.2. Source of water and its selection: gravity and artesian springs, shallow and deep wells; infiltration galleries

      8.1.3. Drinking water quality and it's parameters

  8.2. Gravity Water Supply System

      8.2.1. Design period

      8.2.2. Determination of daily water demand

      8.2.3. Determination of reservoir tank capacity

      8.2.4. Selection of pipe

      8.2.5. Pipeline design and hydraulic grade line

  8.3. Design of Sewerage system

      8.3.1. Quantity of sanitary sewage

      8.3.2. Maximum, Minimum and self-cleaning velocity

  8.4. Excreta Disposal and Unsewered Area

      8.4.1. Common latrine types

      8.4.2. Design of septic tank

      8.4.3. Fecal sludge management, collection, transportation, treatment and disposal

9. Irrigation Engineering

  9.1. General

      9.1.1. Advantages and Disadvantages of irrigation

  9.2. Crop water requirement

      9.2.1. Crop season and principal crops

      9.2.2. Base period

      9.2.3. Duty and delta

  9.3. Flow in irrigation canals

      9.3.1. Canal losses and their minimization

      9.3.2. Maximum and minimum velocities

      9.3.3. Design of irrigation canal section based on Manning's formula

      9.3.4. Need and location of spillways

      9.3.5. Head works for small canals

  9.4. Basic principle of integrated water resource management

  9.5. River training works

10. Highway Engineering

  10.1. General

10.1.1. Introduction of transportation systems
10.1.2. Historic development of roads
10.1.3. Classification of roads in Nepal
10.1.4. Basic requirements of road alignment
10.2. Geometric Design
10.2.1. Basic design control and criteria for design
10.2.2. Elements of cross section, typical cross-section for all roads in filling and cutting
10.2.3. Camber
10.2.4. Determination of radius of horizontal curves
10.2.5. Super elevation
10.2.6. Sight distances
10.2.7. Gradient
10.2.8. Nepal Road Standard
10.3. Drainage System
10.3.1. Importance of drainage system and requirements of a good drainage system
10.4. Road Pavement
10.4.1. Pavement structure and its components: subgrade, sub-base, base and surface courses
10.5. Road Machineries
10.5.1. Earth moving and compacting machines
10.6. Bridge: Trail bridge and motorable bridge
10.7. Road Maintenance
10.7.1. Type of maintenance works
10.8. Tracks and trails

11. Estimating and Costing
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12.4.4. Completion report

12.5. Planning and Control

12.5.1. Construction scheduling

12.5.2. Equipment and materials schedule

12.5.3. Construction stages and operations

(Section-C)   10 Marks

13. General

13.1. Water resources in Karnali province

13.2. Hydro-power potential of Karnali province

13.3. Drinking water supply and sanitation status of Karnali province

13.4. Irrigation development in Karnali province

13.5. Challenges in infrastructure development in Karnali province

14. Laws and Policies

14.1. Karnali Province Civil Service Act, 2080 and Regulations, 2080 (conduct, leave and punishment)

14.2. Local Level (Formulation and Operation) Act, 2081 and Regulations, 2081 (conduct, leave and punishment)

14.3. Local Government Operation Act, 2074 (service related)

14.4. Prevention of Corruption Act, 2059 (Chapter 2)

14.5. Current Periodic Plan of Karnali province

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	13	14
Short Question	1	1	1	1	1	-	1	-	1	1	1	1	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

<u>नेपाली Typing skill test को लागि निर्देशन</u>

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) $= \dfrac{\text{(Total words typed} - \text{Wrong words)}}{5}$