प्रदेश लोक सेवा आयोग, कर्णाली प्रदेश

प्रदेश निजामती सेवाको ईन्जिनियरिङ सेवा, सर्भे समूह, अधिकृतस्तर सातौ तह, नापी अधिकृत वा सो सरह पदको खुला, अन्तर तह र आन्तरिक अन्तर सेवा प्रतियोगितात्मक लिखित परीक्षाको पाठ्यक्रम र परीक्षा योजना

पाठ्यक्रमको रूपरेखाः- यस पाठ्यक्रम योजनालाई दुई चरणमा विभाजन गरिएको छ।

परीक्षाको चरण	परीक्षाको किसिम	पूर्णाङ्क
प्रथम चरण	लिखित परीक्षा (Written Examination)	२००
अन्तिम चरण	सामुहिक परीक्षण र अन्तर्वार्ता (Group test and Interview)	४०

१. प्रथम चरणः लिखित परीक्षा योजना (Written Examination Schedule)

पत्र	विषय		पूर्णाङ्क	उत्तिर्णाङ्क	परीक्षा प्रणाली		प्रश्नसंख्या x अङ्क	समय
प्रथम	General Subject	Part I: General knowledge & General Ability Test	100	40	वस्तुगत (Objective)	बहुवैकल्पिक प्रश्न (MCQs)	५०प्रश्न x १ अङ्क	१ घन्टा ३० मिनेट
		Part II: General Technical Subject					५०प्रश्न x १ अङ्क	
द्वितीय	Technical Subject		100	40	विषयगत (Subjective)	छोटो उत्तर लामो उत्तर	८प्रश्न x ५ अङ्क ६प्रश्न x १० अङ्क	३ घन्टा

२.अन्तिम चरणः सामूहिक परीक्षण (Group Test) र अन्तर्वार्ता (Interview) **पूर्णाङ्कः ४०**

पत्र/विषय	पूर्णाङ्क	परीक्षा प्रणाली	समय
सामूहिक परीक्षण (Group Test)	१०	सामूहिक छलफल (Group Discussion)	३० मिनेट
अन्तर्वार्ता (Interview)	३०	बोर्ड अन्तर्वार्ता (Board Interview)	

द्रष्टव्यः

१. यस पाठ्यक्रम योजनालाई प्रथम चरण र अन्तिम चरण (सामूहिक परीक्षण र अन्तर्वार्ता) मा विभाजन गरिएको छ।
२. खुला र समावेशी समूहको एउटै प्रश्नपत्रको माध्यमबाट परीक्षा सञ्चालन हुनेछ।
३. लिखित परीक्षाको माध्यम भाषा नेपाली वा अंग्रेजी वा नेपाली र अंग्रेजी दुवै हुन सक्नेछ।

४. 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।

५. 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।

६. परीक्षा हलमा मोवाइल वा यस्तै प्रकारका विद्युतीय उपकरण, क्याल्कुलेटर, पुस्तक, नोटबुक, झोला लगायतका बस्तुहरु लैजान पाइने छैन।

७. परीक्षामा सोधिने प्रश्नसंख्या, अङ्क र अङ्कभार यथासम्भव सम्बन्धित पत्र/विषयमा दिईएअनुसार हुनेछ।

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

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

१०. प्रथम चरणको लिखित परीक्षाबाट छनौट भएका उम्मेदवारहरुलाई मात्र अन्तिम चरणको परीक्षामा सम्मिलित गराइनेछ।

११. प्रथम चरणको लिखित परीक्षामा प्राप्त गरेको प्राप्ताङ्क तथा अन्तिम चरणको सामुहिक परीक्षण र अन्तर्वार्ताको कुल प्राप्ताङ्कको आधारमा अन्तिम परीक्षाफल प्रकाशित गरिनेछ।

१२. पाठ्यक्रम लागू हुने मितिः २०८०।१२।१४

प्रदेश लोक सेवा आयोग, कर्णाली प्रदेश

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प्रथमपत्र (Paper I): General Subject

Part (I): - General Knowledge & General Ability Test (50 Marks)

1. General Knowledge and Contemporary Issues (25 ×1 Mark = 25 Marks)

1.1 Physical, socio-cultural and economic geography and demography of Nepal
1.2 Major natural resources of Nepal
1.3 Geographical diversity, climatic conditions, livelihood and lifestyle of the people of Nepal
1.4 Notable events and personalities, socio-economic and cultural conditions in modern history of Nepal
1.5 Current periodic plan of Karnali Province and Nepal.
1.6 Information on sustainable development, environment, pollution, climate change, biodiversity, science and technology
1.7 Nepal's international affairs and general information on the UNO, SAARC & BIMSTEC
1.8 The Constitution of Nepal
1.9 Governance system and Government (Federal, Provincial and Local)
1.10 Provisions of prevailing civil service act and regulation
1.11 Functional scope of public services
1.12 Public Service Charter
1.13 Concept, objective and importance of public policy
1.14 Fundamentals of management: planning, organizing, staffing, directing, controlling, coordinating, decision making, motivation and leadership
1.15 Government planning, budgeting, accounting and public assets management system
1.16 Major events and current affairs of national and international importance

2. General Ability Test (25 ×1 Mark = 25 Marks)

2.1 Verbal Ability Test (8×1 Mark = 8 Marks)

Jumble words, Series, Analogy, Classification, Coding-Decoding, Matrix, Ranking Order Test, Direction and Distance Sense Test, Common Sense Test, Logical Reasoning, Assertion and Reason, Statement and Conclusions

2.2 Numerical Ability Test(9×1 Mark = 9 Marks)

Series, Analogy, Classification, Coding, Arithmetical reasoning/operation, Percentage, Ratio, Average, Loss & Profit, Time & Work, Data interpretation & Data verification

2.3 Non-verbal/Abstract Ability Test (8×1 Mark = 8 Marks)

Figure Series, Figure Analogy, Figure Classification, Figure Matrix, Pattern Completion/Finding, Analytical Reasoning Test, Figure Formation and Analysis, Rule Detection, Water images, Mirror images, Cubes and Dice &Venn-diagram

Part (II) : - General Technical Subject (50 Marks)

Section A – 15 Marks

1. Fundamentals of Surveying (1×8=8 Marks)

1.1 Introduction

- 1.1.1 Historical Background
- 1.1.2 Objectives
- 1.1.3 Principles of surveying
- 1.1.4 Classification
- 1.1.5 Linear and Angular Measurements
- 1.1.6 Survey computations: Bearing, Coordinates, Reduced Level, Area & Volume
- 1.1.7 Units, Standardization and Conversion
- 1.1.8 Application of Surveying
- 1.1.9 Role of International Surveying and Mapping Communities

1.2 Surveying and Mapping Technology

- 1.2.1 Selection, Use, Feasibility, Sustainability, Transfer and Development
- 1.2.2 Instruments, Hardware, Software, Procuring, Maintaining and Upgrading

1.3 Survey Management

- 1.3.1 Surveying Need Assessment
- 1.3.2 Terms of Reference
- 1.3.3 Survey Design, Specification and Costing
- 1.3.4 Tasks, Identification and distribution
- 1.3.5 Tools, Equipment and accessories
- 1.3.6 Checking and Adjusting Instruments
- 1.3.7 Supervision
- 1.3.8 Production
- 1.3.9 Reports
- 1.3.10 Problems of Field Surveying in Nepal
- 1.3.11 Safety Management
- 1.3.12 Professional Ethics, Code and Conduct
- 1.3.13 Community Skill of Surveyor
- 1.3.14 Coordination of Institutional Resources
- 1.3.15 Governmental, Non-Governmental and International Non-Governmental Organization
- 1.3.16 Public Private Partnership
- 1.3.17 User Groups
- 1.3.18 Public Relations
- 1.3.19 Project cycle management

1.4 Statistical Concepts

- 1.4.1 Introduction and Application
- 1.4.2 Measure of Central Tendency: Mean, Median, Mode, Standard Deviation
- 1.4.3 Variance, Co-Variance
- 1.4.4 Correlation and Regression
- 1.4.5 Probability, Normal Distribution

1.5 Error and Adjustments

1.5.1 Introduction
1.5.2 Fundamentals of Theory of Measurement Errors
1.5.3 Accuracy and Precision
1.5.4 Least Square Adjustments
1.5.5 Propagation of Errors

2. Cadastre (1×7=7 Marks)

2.1 Land Registration
2.1.1 Land Rights and Land Records
2.1.2 Land Transfers
2.1.3 Registration of Deeds
2.1.4 Registration of Titles
2.1.5 Fragmentation and Consolidation
2.1.6 Systematic Adjudication
2.1.7 Land Tenure
2.1.8 Land Record in Nepal
2.1.9 Land Registries
2.2 Cadastral Surveying
2.2.1 Cadastral Concepts
2.2.2 Principles of cadastral Surveying
2.2.3 Boundaries
2.2.4 Parcel
2.2.5 Cadastral Survey Methods
2.2.6 Cadastral System
2.2.7 Maintenance of cadastre
2.2.8 Land Laws
2.2.9 Cadastral Surveys in Nepal
2.3 Land Management
2.3.1 Principles of Management
2.3.2 Cadastral Organization
2.3.3 Land Development Planning
2.3.4 Financial Aspects
2.3.5 Land Use
2.3.6 Land Management
2.3.7 GIS Applications
2.3.8 Land Administration
2.3.9 Overview of Land related Acts and Rules of Nepal
2.4 Land Information System (LIS)
2.4.1 Need for LIS
2.4.2 Concept of LIS
2.4.3 Need for coordination: Structure
2.4.4 Parcel based LIS: The Multipurpose Cadastre
2.4.5 The Economics of LIS
2.4.6 NeLIS and Mero Kitta (Nepal land information system)
2.4.7 LRIMS (Land Records Information Management System)

Section B – 10 Marks

3. Geodesy

3.1 Introduction to Control Surveying
- 3.1.1 Horizontal Controls
- 3.1.2 Vertical Controls

3.2 Methods of Control Surveying
- 3.2.1 Leveling: Geodetic and Ordinary Leveling
- 3.2.2 Triangulation and Trilateration: Principle, Figure and Strength, Procedures, Computation
- 3.2.3 Traversing: Principle, Procedures, Computation

3.3 Elementary Geodesy and Astronomy
- 3.3.1 Concepts
- 3.3.2 Geodetic Datum and Reference Ellipsoid, Deflection of Vertical, Laplace Equation
- 3.3.3 Coordinate Systems: Spherical, Geodetic and Astronomical Coordinates
- 3.3.4 Transformations of Coordinates and Datum Transformation
- 3.3.5 Celestial Sphere, Celestial Elements, Astronomical Triangle and Time Systems
- 3.3.6 Astronomical Positioning: Determination of Azimuth, Latitude and Longitude

3.4 Physical Geodesy
- 3.4.1 Concepts
- 3.4.2 Gravity Force, Gravity Potential, Measured and Normal Gravity, Gravity Anomaly
- 3.4.3 Equipotential Surface, Orthometric Height and Dynamic Height
- 3.4.4 Absolute and Relative Gravimeters

3.5 Global Positioning System
- 3.5.1 Introduction to Space Geodesy
- 3.5.2 Principle of Global Positioning System (GPS)
- 3.5.3 GPS Signals
- 3.5.4 Satellite Geometry and Accuracy
- 3.5.5 GPS Positioning
- 3.5.6 Static and Kinematic Observations
- 3.5.7 Geocentric Coordinates and WGS 84
- 3.5.8 GPS Data Processing
- 3.5.9 Global Navigation Satellite System (GNSS)
- 3.5.10 Continuing Operating Reference System (CORS)

Section C – 10 Marks

4. Photogrammetry and Remote Sensing (1×6=6 Marks)

4.1 Introduction
- 4.1.1 Basic Principles of Photogrammetry
- 4.1.2 Definitions of some terms used in Photogrammetry

4.2 Aerial Camera
- 4.2.1 Introduction
- 4.2.2 Parts of Aerial Camera
- 4.2.3 Types of Camera
- 4.2.4 Characteristics of Aerial Camera

4.3 Aerial Photography

4.11.1 Introduction
4.11.2 Brief History of Remote Sensing
4.11.3 Concepts of Satellite Remote Sensing
4.12 Image Processing and Interpretation
4.12.1 Geo-referencing
4.12.2 Processing: Geometric and Radiometric Processing
4.12.3 Image Interpretation and Analysis
4.12.4 Errors
4.13 LiDAR Survey in Nepal
4.14 UAV (Drone) Survey in Nepal

5. Engineering Survey (1×4=4 Marks)

5.1 Introduction
5.1.1 Control and Detail Surveys
5.1.2 Route Surveying-Plan and Profiles
5.1.3 Curves- Types, Geometry Setting out and Application
5.1.4 Area and Volume
5.2 Construction Surveys
5.2.1 Buildings
5.2.2 Pipelines
5.2.3 Roads and Highways
5.2.4 Tunnels
5.2.5 Hydropower-Intake, Reservoir, Dam, Powerhouse
5.2.6 Bridges
5.2.7 Canals
5.2.8 Transmission Lines
5.2.9 Setting out Surveys
5.2.10 Railway Surveys
5.3 Hydrographic Surveys
5.3.1 Discharge
5.3.2 Bathymetric Survey
5.3.3 Water Levels and Flow
5.3.4 Positioning
5.3.5 Hydrographic Data Management
5.3.6 Hydrography to support Port Management & Coastal Engineering

Section D – 15 Marks

6. Cartography (1×8=8 Marks)

6.1 Introduction
6.1.1 Historical Background
6.1.2 Scope of Cartography and Earth as a Cartographic Problem
6.1.3 Cartographic Concepts
6.1.4 Conventional and Digital Cartography
6.1.5 Map Production: Map Compilation and Map Reproduction
6.1.6 Topographic Cartography: Large Scale and Base Map
6.1.7 Small Scale mapping

6.1.8 Thematic Cartography

6.2 Geo Information

6.2.1 Data (Geometric and Attribute)

6.2.2 Information & Information System

6.2.3 Geographical Information System (GIS)

6.2.4 Database (Basic Concepts, Design and Principles)

6.3 Data Acquisition, Processing, Analysis, Visualization and Presentation (Conventional and Digital Environments)

6.3.1 Data Acquisition: Data Sources- Maps, Records (Tables, Texts), Digital Data, Ground Surveys, GPS, Aerial Photography, Satellite Imagery, Documents; Toponomy; Digitization

6.3.2 Data Processing: Geo-referencing; Map Projection (Introduction, Classification, Choice and Uses); Data Integration; Editing, Spatial Relationship and Topology; Spatial Analysis (Merge, Buffer Overly); Attribute Database (Topographic and Thematic)

6.3.3 Visualization and Presentation: Spatial and Attribute data; Statistical Surface; Classification of Data; Measurement Level of Data (Nominal, Ordinal, Interval and Ratio); Map design (Principles); Mapping Methods -Symbols; Generalization – conceptual and graphical; Graphic Variables; Typography Map in and for www (Web Cartography)

6.4 Map Reproduction

6.4.1 Map Reproduction in Conventional Environment - Photography, Copying and Printing

6.4.2 Map Reproduction in Digital Environment

6.5 Modern Cartography

7. Spatial Information System and Digital Terrain Model (SIS and DTM) (1×7=7 Marks)

7.1 Data Structure, Spatial-Non Spatial Data Source

7.1.1 Vector Data and Raster Data

7.1.2 Resolution of Raster Image

7.1.3 Object oriented Vector Data

7.1.4 Topological Vector Data

7.1.5 Data Integration

7.2 Spatial Database Management

7.2.1 Introduction

7.2.2 Data Modeling

7.2.3 Database Design and Maintenance

7.2.4 Storage and Archives, Data Security

7.3 Data Standards and Quality

7.3.1 Data/Metadata standards: Standardization Format and Accuracy

7.3.2 Data quality Administration

7.3.3 Copyright

7.4 Geographical Information System (GIS)

7.4.1 Introduction to GIS

7.4.2 GIS components

7.4.3 Data Model

7.4.4 GIS Operations and Spatial Analysis

7.5 National Spatial Database Infrastructure

7.5.1 Metadata
7.5.2 Data Sharing
7.5.3 Clearinghouse
7.5.4 Spatial Information Service

7.6 Digital Terrain Model (DTM)
7.6.1 Introduction
7.6.2 Data Collection, Processing and Creation of DTM
7.6.3 Storage and Presentation: Triangulated Irregular Network (TIN), Grid and Contours
7.6.4 Resolution, Error and Implications
7.6.5 Application: Flythrough, View shed, Overlay

7.7 Global Mapping

7.8 Information Communication Technology (ICT) Applications
7.8.1 Introduction to Web and Internet
7.8.2 Client server computing
7.8.3 Data dissemination through web
7.8.4 Web Maps: Static, Dynamic and Interactive

प्रदेश लोक सेवा आयोग, कर्णाली प्रदेश

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द्वितीयपत्र (Paper II): Technical Subject

Section A – 30 Marks (2×10=20, 2×5=10 Marks)

1. Fundamentals of Surveying

1.1 Introduction
- 1.1.1 Historical Background
- 1.1.2 Objectives
- 1.1.3 Principles of surveying
- 1.1.4 Classification
- 1.1.5 Linear and Angular Measurements
- 1.1.6 Survey computations: Bearing, Coordinates, Reduced Level, Area & Volume
- 1.1.7 Units, Standardization and Conversion
- 1.1.8 Application of Surveying
- 1.1.9 Role of International Surveying and Mapping Communities
- 1.1.10 Career path of Geomatics Engineering
- 1.1.11 Use of drone technology in surveying

1.2 Surveying and Mapping Technology
- 1.2.1 Selection, Use, Feasibility, Sustainability, Transfer and Development
- 1.2.2 Instruments, Hardware, Software, Procuring, Maintaining and Upgrading

1.3 Survey Management
- 1.3.1 Surveying Need Assessment
- 1.3.2 Terms of Reference
- 1.3.3 Survey Design, Specification and Costing
- 1.3.4 Tasks, Identification and distribution
- 1.3.5 Tools, Equipment and accessories
- 1.3.6 Checking and Adjusting Instruments
- 1.3.7 Supervision
- 1.3.8 Production
- 1.3.9 Reports
- 1.3.10 Problems of Field Surveying in Nepal
- 1.3.11 Safety Management
- 1.3.12 Professional Ethics, Code and Conduct
- 1.3.13 Community Skill of Surveyor
- 1.3.14 Coordination of Institutional Resources
- 1.3.15 Governmental, Non-Governmental and International Non-Governmental Organization
- 1.3.16 Public Private Partnership
- 1.3.17 User Groups
- 1.3.18 Public Relations

1.4 Statistical Concepts
- 1.4.1 Introduction and Application

1.4.2 Measure of Central Tendency: Mean, Median, Mode, Standard Deviation
1.4.3 Variance, Co-Variance
1.4.4 Correlation and Regression
1.4.5 Probability, Normal Distribution

1.5 Error and Adjustments
1.5.1 Introduction
1.5.2 Fundamentals of Theory of Measurement Errors
1.5.3 Accuracy and Precision
1.5.4 Least Square Adjustments
1.5.5 Propagation of Errors

2. Cadastre

2.1 Land Registration
2.1.1 Land Rights and Land Records
2.1.2 Land Transfers
2.1.3 Registration of Deeds
2.1.4 Registration of Titles
2.1.5 Fragmentation and Consolidation
2.1.6 Horizontal Sub division
2.1.7 Systematic Adjudication
2.1.8 Land Tenure
2.1.9 Land Record in Nepal
2.1.10 Land Registries

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2.2.1 Cadastral Concepts
2.2.2 Principles of cadastral Surveying
2.2.3 Boundaries
2.2.4 Parcel
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2.2.6 Cadastral System
2.2.7 Cadastral Interface
2.2.8 Maintenance of cadastre
2.2.9 Land Laws
2.2.10 Cadastral Surveys in Nepal

2.3 Land Management
2.3.1 Principles of Management
2.3.2 Cadastral Organization
2.3.3 Land Development Planning
2.3.4 Financial Aspects
2.3.5 Land Use
2.3.6 Land Management
2.3.7 GIS Applications
2.3.8 Land Administration
2.3.9 Land resource mapping
2.3.10 Urban and regional planning

2.3.11 Land valuation
2.3.12 Overview of Land related Acts and Rules of Nepal

2.4 Land Information System (LIS)
2.4.1 Need for LIS
2.4.2 Concept of LIS
2.4.3 Need for coordination: Structure
2.4.4 Cadastral information system: The Multipurpose Cadastre
2.4.5 The Economics of LIS

Section B – 20 Marks (1×10=10, 2×5=10 Marks)

3. Geodesy

3.1 Introduction to Control Surveying
3.1.1 Horizontal Controls
3.1.2 Vertical Controls

3.2 Methods of Control Surveying
3.2.1 Leveling: Geodetic and Ordinary Leveling
3.2.2 Triangulation and Trilateration: Principle, Figure and Strength, Procedures, Computation
3.2.3 Traversing: Principle, Procedures, Computation
3.2.4 Intersection and Resection: Importance, Procedures, Computation

3.3 Elementary Geodesy and Astronomy
3.3.1 Concepts
3.3.2 Geodetic Datum and Reference Ellipsoid, Deflection of Vertical, Laplace Equation
3.3.3 Coordinate Systems: Spherical, Geodetic and Astronomical Coordinates
3.3.4 Transformations of Coordinates and Datum Transformation
3.3.5 Celestial Sphere, Celestial Elements, Astronomical Triangle and Time Systems
3.3.6 Astronomical Positioning: Determination of Azimuth, Latitude and Longitude

3.4 Physical Geodesy
3.4.1 Concepts
3.4.2 Gravity Force, Gravity Potential, Measured and Normal Gravity, Gravity Anomaly
3.4.3 Equipotential Surface, Orthometric Height and Dynamic Height
3.4.4 Absolute and Relative Gravimeters

3.5 Global Positioning System
3.5.1 Introduction to Space Geodesy
3.5.2 Principle of Global Positioning System (GPS)
3.5.3 GPS Signals
3.5.4 Satellite Geometry and Accuracy
3.5.5 GPS Positioning
3.5.6 Static and Kinematic Observations
3.5.7 Geocentric Coordinates and WGS 84
3.5.8 GPS Data Processing

Section C – 20 Marks (1×10=10, 2×5=10 Marks)

4. Photogrammetry and Remote Sensing

4.1 Introduction
4.1.1 Basic Principles of Photogrammetry

4.9.3 Spatial Orientation and Measurements

4.10 Digital Photogrammetry

4.10.1 Introduction and Concepts

4.10.2 Image Acquisition

4.10.3 Processing

4.10.4 Feature Extraction

4.11 Remote Sensing

4.11.1 Introduction

4.11.2 Brief History of Remote Sensing

4.11.3 Concepts of Satellite Remote Sensing

4.12 Image Processing and Interpretation

4.12.1 Geo-referencing

4.12.2 Processing: Geometric and Radiometric Processing

4.12.3 Image Interpretation and Analysis

4.12.4 Errors

5. Engineering Survey

5.1 Introduction

5.1.1 Control and Detail Surveys

5.1.2 Route Surveying-Plan and Profiles

5.1.3 Curves- Types, Geometry Setting out and Application

5.1.4 Area and Volume

5.1.5 Disciplines of surveying and their significances

5.1.6 Sustainable and eco-friendly surveying

5.1.7 Need of quantity surveying and geologic survey

5.2 Construction Surveys

5.2.1 Buildings

5.2.2 Pipelines

5.2.3 Roads and Highways

5.2.4 Tunnels

5.2.5 Hydropower-Intake, Reservoir, Dam, Powerhouse

5.2.6 Bridges

5.2.7 Canals

5.2.8 Transmission Lines

5.2.9 Setting out Surveys

5.2.10 Railway Surveys

5.3 Hydrographic Surveys

5.3.1 Discharge

5.3.2 Bathymetric Survey

5.3.3 Water Levels and Flow

5.3.4 Positioning

5.3.5 Hydrographic Data Management

5.3.6 Hydrography to support Port Management & Coastal Engineering

Section D – 30 Marks ((2×10=20, 2×5=10 Marks)

6. Cartography

6.1 Introduction

- 6.1.1 Historical Background
- 6.1.2 Scope of Cartography and Earth as a Cartographic Problem
- 6.1.3 Cartographic Concepts
- 6.1.4 Conventional and Digital Cartography
- 6.1.5 Map Production: Map Compilation and Map Reproduction
- 6.1.6 Topographic Cartography: Large Scale and Base Map
- 6.1.7 Small Scale mapping
- 6.1.8 Thematic Cartography

6.2 Geo Information

- 6.2.1 Data (Geometric and Attribute)
- 6.2.2 Information & Information System
- 6.2.3 Geographical Information System (GIS)
- 6.2.4 Database (Basic Concepts, Design and Principles)
- 6.2.5 Spatial database management

6.3 Data Acquisition, Processing, Analysis, Visualization and Presentation (Conventional and Digital Environments)

- 6.3.1 Data Acquisition: Data Sources- Maps, Records (Tables, Texts), Digital Data, Ground Surveys, GPS, Aerial Photography, Satellite Imagery, Documents; Toponomy; Digitization
- 6.3.2 Data Processing: Geo-referencing; Map Projection (Introduction, Classification, Choice and Uses); Data Integration; Editing, Spatial Relationship and Topology; Spatial Analysis (Merge, Buffer Overly); Attribute Database (Topographic and Thematic)
- 6.3.3 Visualization and Presentation: Spatial and Attribute data; Statistical Surface; Classification of Data; Measurement Level of Data (Nominal, Ordinal, Interval and Ratio); Map design (Principles); Mapping Methods -Symbols; Generalization – conceptual and graphical; Graphic Variables; Typography Map in and for www (Web Cartography)

6.4 Map Reproduction

- 6.4.1 Map Reproduction in Conventional Environment - Photography, Copying and Printing
- 6.4.2 Map Reproduction in Digital Environment

7. Spatial Information System and Digital Terrain Model (SIS and DTM)

7.1 Data Structure, Spatial-Non Spatial Data Source

- 7.1.1 Vector Data and Raster Data
- 7.1.2 Resolution of Raster Image
- 7.1.3 Object oriented Vector Data
- 7.1.4 Topological Vector Data
- 7.1.5 Data Integration

7.2 Spatial Database Management

- 7.2.1 Introduction
- 7.2.2 Data Modeling
- 7.2.3 Database Design and Maintenance
- 7.2.4 Storage and Archives, Data Security

7.3 Data Standards and Quality
    7.3.1 Data/Metadata standards: Standardization Format and Accuracy
    7.3.2 Data quality Administration
    7.3.3 Copyright
7.4 Geographical Information System (GIS)
    7.4.1 Introduction to GIS
    7.4.2 GIS components
    7.4.3 Data Model
    7.4.4 GIS Operations and Spatial Analysis
7.5 National Spatial Database Infrastructure
    7.5.1 Metadata
    7.5.2 Data Sharing
    7.5.3 Clearinghouse
    7.5.4 Spatial Information Service
7.6 Digital Terrain Model (DTM)
    7.6.1 Introduction
    7.6.2 Data Collection, Processing and Creation of DTM
    7.6.3 Storage and Presentation: Triangulated Irregular Network (TIN), Grid and Contours
    7.6.4 Resolution, Error and Implications
    7.6.5 Application: Flythrough, View shed, Overlay
7.7 Global Mapping
7.8 Information Communication Technology (ICT) Applications
    7.8.1 Introduction to Web and Internet
    7.8.2 Client server computing
    7.8.3 Data dissemination through web
    7.8.4 Web Maps: Static, Dynamic and Interactive

--The End--

सामूहिक परीक्षण

सामुहिक परीक्षण व्यक्तित्व परीक्षणको एक अंश हो। प्रदेश निजामती सेवाको क्षेत्र विस्तार तथा कार्य पद्धति परिवर्तन समेत भैरहेको सन्दर्भमा नेपाल सरकारर प्रदेश सरकारका नीति, योजना, कार्यक्रम लगायत शासन व्यवस्था सम्वन्धी समसामयिक विषयमाथि विचार– विमर्श, छलफल गरी तिनको अझै बढी प्रभावकारी तथा कार्यान्वयन योग्य समाधान पहिल्याउने सम्बन्धमा उम्मेदवारहरुको क्षमता पहिचान गर्नु यस परीक्षणको मूलमर्म हो। यसको लागि छलफल, विचार– विमर्श गरी परिस्थिति बुझ्न सक्ने, निर्णय दिने, जनतालाई क्रियाशील बनाउने, चित्त बुझाउने, निर्धारित लक्ष्य अनुसार काम गर्ने/गराउने, जस्ता कामका लागि लेखन क्षमताका साथसाथै समस्यालाई यथार्थपरक ढंगले पहिचान गर्नसक्ने, वाकपटुता, शिष्टता, तर्कशक्तिको पनि आवश्यकता पर्दछ।

त्यसैले यस परीक्षणमा उम्मेदवारहरुको वौद्धिक क्षमता, संचार सीप, समूह गतिशिलता, व्यवहार, व्यक्तित्व, मनोवृति, क्रियाशीलता, निर्णयशक्ति, समस्या समाधान क्षमता, नेतृत्व क्षमता, समय व्यवस्थापन तथा व्यक्तित्वमा भएका अन्य गुणहरुको आकलन अर्थात परीक्षण र मूल्याङ्कन गर्नको लागि उम्मेदवारहरुलाई कुनै समसामयिक विषय/सवाल/समस्यामा सामूहिक छलफल गरीसमस्या समाधान केन्द्रीत प्रभावकारी र कार्यान्वयन योग्य समाधान निकाल्न दिइन्छ।

सामूहिक छलफल

यस प्रयोजनको लागि गरिने परीक्षण १० पूर्णाङ्क र ३० मिनेट अवधिको हुनेछ जुन नेताविहिन सामूहिक छलफलको रुपमा अवलम्वन गरिनेछ। दिइएको प्रश्न वा Topic का विषयमा पालैपालोसँग निर्दिष्ट समयभित्र समूहवीच छलफल गर्दै प्रत्येक उम्मेदवारले व्यक्तिगत प्रस्तुति गर्नुपर्नेछ। यस परीक्षणमा मूल्याङ्कनको लागि देहाय अनुसारको समिति रहनेछ।

आयोगका अध्यक्ष वा अध्यक्षले तोकेको सदस्य	– अध्यक्ष
आयोगका सदस्य	– सदस्य
मनोविज्ञानवेत्ता	– सदस्य
दक्ष/विज्ञ (१ जना)	– सदस्य