

# नेपाल विद्युत् प्राधिकरण

प्राविधिक सेवा, सिभिल समूह, सर्भे उपसमूह, तह-७ सर्भेक्षण अधिकृत पदको  
खुल्ला प्रतियोगितात्मक लिखित परीक्षाको पाठ्यक्रम

- शैक्षिक योग्यता: प्रचलित कर्मचारी सेवा विनियमावलीमा व्यवस्था भए अनुसार ।
- लिखित परीक्षाको विषय, पूर्णाङ्क, परीक्षा प्रणाली, प्रश्नसंख्या, अंकभार र समय निम्नानुसार हुनेछ ।

पत्र	विषय	पूर्णाङ्क	परीक्षा प्रणाली	प्रश्न संख्या	प्रति प्रश्न अंकभार	समय
प्रथम	जनरल सर्भे	३०	वस्तुगत बहुउत्तर	३०	१	३० मिनेट
द्वितीय	ईन्जिनियरिङ्ग सर्भे	७०	विषयगत	छोटो उत्तर	५	२ घण्टा ३० मिनेट
				लामो उत्तर	३	

- वस्तुगत बहुउत्तर परीक्षा प्रणालीमा प्रत्येक प्रश्नका चार वटा सम्भाव्य उत्तर दिइने छ । प्रश्नको उत्तर लेख्दा केरमेट गरेको, दोहोरो लेखेको, सच्याएको, निर्दिष्ट स्थानभन्दा अन्यत्र लेखेको वा उत्तर नै सारेकोलाई गल्ती मानिनेछ ।
- प्रत्येक गलत उत्तर वापत सो प्रश्न वापत पाउने अंकको ०.२ (बीस प्रतिशत २०%) का दरले सो विषयमा पाएको कुल प्राप्तांकबाट घटाईनेछ ।
- कालो/नीलो मसी मात्र भएको डटपेन/कलमले उत्तरको लागि निर्धारित कोठाका प्रश्नमा क,ख,ग,घ मध्ये एउटा मात्र सहि उत्तर स्पष्ट रूपले लेख्नुहोला । पेन्सिलले लेखेकोलाई मान्यता दिइने छैन ।
- प्रथम र द्वितीयपत्रको परीक्षा २ पटक गरेर हुनेछ । प्रथमपत्रको परीक्षा सकिएपछि द्वितीयपत्रको परीक्षा तत्काल हुनेछ ।
- द्वितीयपत्रको लिखित परीक्षाको माध्यम नेपाली वा अंग्रेजी भाषा हुनेछ ।

## प्रथमपत्र : जनरल सर्भे

### 1. Fundamental of Surveying :

- 1) General background of Surveying.
- 2) Application of Surveying in water resources development.
- 3) Role of Surveying and Mapping for economic development projects.

### 2. Survey Management :

- 1) Management of survey teams to dispatch in the field.
- 2) Supervision in the field.
- 3) Problems of field surveying in Nepal.
- 4) Skill of a Surveyor.
- 5) Professional ethics and code of conduct of a Surveyor.
- 6) Survey report preparation.
- 7) Public relation during field surveying.

### 3. Geodetic Surveying :

- 1) Trigonometrical Survey.
- 2) Concept of Trigonometrical Survey.
- 3) Monumentation and Signaling.
- 4) Establishment of horizontal and vertical controls.
- 5) Checking of 3rd and 4th order Triangulation control points.
- 6) Knowledge on co-ordinate systems : spherical and geodetic.
- 7) Transformation of co-ordinates.
- 8) Know-how on geodetic datum and reference ellipsoid.

### 4. Global Positioning System (GPS) :

- 1) Introduction to satellite geodesy.
- 2) Principle of GPS.
- 3) GPS signals and its positioning.
- 4) GPS observations : static and kinematic.
- 5) Geocentric co-ordinates and WGS- 84.
- 6) Knowledge on data processing.

**5. Leveling Survey :**

- 1) Definition of terms.
- 2) Principles of leveling.
- 3) Establishment of 3rd and 4th order leveling.
- 4) Field work and computation.
- 5) Sources of errors and adjustment.

**6. Topographical Surveying :**

- 1) General concept of photogrammetry :
- 2) Introduction and concepts of digital photogrammetry.
- 3) Function of aerial camera.
- 4) Aerial photographs and their types.
- 5) Scale of aerial photographs.
- 6) Flight planning and photo index.
- 7) Elements of photo interpretation, rectification, mosaicing.
- 8) Stereoscopic vision.
- 9) Use of aerial photographs for map revision.
- 10) Photo verifications.
- 11) Brief history of Remote Sensing.
- 12) Concepts of satellite images.
- 13) Use of various remote sensing images.
- 14) Comparison between aerial photographs and satellite imageries.

**7. Cartography :**

- 1) Introduction to general cartography.
- 2) Cartographic concepts.
- 3) Comparison between conventional and digital cartography.
- 4) Map compilation and production.
- 5) Elements of topographical maps.
- 6) Use of small and large scale topo maps.
- 7) Use of drawing equipments and tools.
- 8) Scribing and drafting.
- 9) Importance of map symbols.
- 10) Use of UTM modified projections in Nepal.
- 11) Numbering system for small and large scale maps used in Nepal.
- 12) Map design, compilation and generalization.
- 13) Collection of geographical names and relief presentation.
- 14) Map reproduction, enlargement and reduction.
- 15) General knowledge on geographic information system (GIS).
- 16) Basic concepts on data base.

**8. Cadastral Surveying :**

- 1) Importance of cadastral survey for land acquisition.
- 2) Process of cadastral surveying.
- 3) Elements of cadastral surveying.
- 4) Cadastral map reading.
- 5) Methods of area calculation.
- 6) Map edge matching error and adjustment.
- 7) Knowledge to acquire land and to provide compensation.
- 8) Land registries : Land record (Moth) and land ownership certificate (Lalpurja).

**9. Use of Survey Instruments :**

- 1) Total Station Theodolite, EDM, Level, Tacheometer, Plane-table Set, Microptic Telescopic Alidade, GPS Receiver.
- 2) Aerial Camera, Process Camera, Digital Camera, Scanner, Stereo-plotter,

Stereoscope, Printing Press, Scribing Tools, Drawing Equipments.

**10. Economic and Financial Analysis of Hydro-power Scheme :**

- 1) Methods of economic /financial analysis, such as cost-benefit ratio, internal rate of return, net present worth, payback period, minimum attractive rate of return and their application.
- 2) Risk analysis, tariff structure.
- 3) Investment decision, interest and time value of money.

**11. Power Sector Development :**

- 1) Hydro-power potential of Nepal and power sector development
- 2) Role of Nepal Electricity Authority and other related institutions- Ministry of Water Resources, Water & Energy Commission Secretariat, Electricity Development Centre, Electricity Tariff Fixation Commission.
- 3) Hydro-power Policy, 2058.
- 4) Water Resources Act, 2049.
- 5) Electricity Act, 2049.
- 6) Nepal Electricity Authority (NEA) Act, 2041 (with Amendment).
- 7) Land Acquisition Act, 2034.
- 8) Environment Protection Act, 2053. Environment Protection Regulations, 2054.
- 9) NEA Electricity theft Control Act. 2058.

**12. Institutional Know-How**

- 1) General knowledge of Nepal Electricity Authority, its organizational structure and function of various business groups.
- 2) General knowledge of various power plants of Nepal, their types, salient features and their geographical locations.
- 3) General knowledge on Nepalese Power Transmission System, Voltage levels and Lengths, export-import links for Power exchange with India.

**द्वितीयपत्र : इन्जिनियरिङ्ग सर्भे**

**1. Principle of Surveying :**

- 1) Objective of Surveying.
- 2) General principles of surveying.
- 3) Classification of Surveys based upon nature and object of Field Surveying.
- 4) Map and map planning.

**2. Methods of Survey and Measurements :**

1. Chain Survey.
2. Compass Survey.
3. Plane-table Survey.
4. Linear and angular measurements.
5. Triangulation, Trilateration, Traversing, Intersection, Resection.
6. Tacheometry: field procedure, preparation of sketch, numbering, observation, recording of details and contouring.
7. Field observations and checking.

**3. Computation, Adjustment and Volume Calculation :**

- 1) Methods of determining and calculation of areas and volumes.
- 2) Errors, Accuracy and Precision : Sources and kinds of errors, theory of probability, permissible error.
- 3) Adjustment of errors.
- 4) Concept of Bearing, Co-Ordinates, Reduced Level, Mean Sea Level.

**4. Engineering Survey :**

- 1) General concept of survey for the identification of Hydro-power scheme.
- 2) Introduction to the Horizontal and Vertical control points.
- 3) Concept of Hydrographic Survey : Sedimentation and bathymetric Survey.
- 4) Setting out Curves : types of curves, setting out of simple circular curves, geometry of vertical curves and its application.
- 5) Power transmission line Survey.
- 6) Route Surveying : location survey, plan and profile, cross-section and longitudinal-section.
- 7) Road alignment Survey : Gradient, curve, cutting, filling.

**5. Construction Survey of :**

- 1) Hydro-power Station : Intake, Reservoir, Dam Powerhouse.
- 2) Transmission line and distribution line.
- 3) Tunnel alignment

**6. Digital Mapping :**

- 1) Capture and handling of digital data.
- 2) Conversion of raster data to vector vice versa.
- 3) Knowledge of Auto-CAD, Arch-INFO, Arch-VIEW.

