

नेपाल विद्युत प्राधिकरण

प्राविधिक सेवा, सिभिल समूह, सिभिल उपसमूह, तह-५, सुपरभाइजर पदको खुल्ला प्रतियोगितात्मक लिखित परीक्षाको पाठ्यक्रम

१. लिखित परीक्षाको विषय, पूर्णाङ्क, परीक्षा प्रणाली, प्रश्नसंख्या, अंकभार र समय निम्नानुसार हुनेछ ।

पत्र	विषय	पूर्णाङ्क	उत्तिर्णाङ्क	परीक्षा प्रणाली		प्रश्न संख्या	प्रति प्रश्न अंकभार	समय
प्रथम	आधारभूत सामान्य ज्ञान र सेवा सम्बन्धी	१००	४०	वस्तुगत बहु वैकल्पिक प्रश्न	खण्ड (क) आधारभूत सामान्य ज्ञान	२०	२	४५ मिनेट
					खण्ड (ख) सेवा सम्बन्धी	३०	२	
द्वितीय	सेवा सम्बन्धी	१००	४०	विषयगत प्रश्न	छोटो उत्तर आउने प्रश्न	१०	५	२ घण्टा
					लामो उत्तर आउने प्रश्न	५	१०	३० मिनेट

- प्रथमपत्रको खण्ड क सबै समूहको लागि एउटै हुनेछ । प्रथमपत्रको खण्ड क समाप्त भएपछि एकै सिटिङ्ग खण्ड ख को परीक्षा हुनेछ । प्रथमपत्रको खण्ड ख र द्वितीयपत्रको पाठ्यक्रम एउटै हुनेछ ।
- वस्तुगत प्रश्नमा प्रत्येक प्रश्नका चार वटा सम्भाव्य उत्तर दिइने छ । जस मध्ये एउटा सही उत्तर लेख्नु पर्नेछ । गलत उत्तर बापत प्रति गलत उत्तर २० प्रतिशतका दरले अंक घटाइनेछ ।
- प्रथमपत्र र द्वितीयपत्रको परीक्षा फरक फरक हुनेछ ।
- परीक्षाको माध्यम नेपाली वा अंग्रेजी भाषा हुनेछ ।
- सामान्यतः प्रत्येक इकाईबाट प्रश्नहरू सोधिनेछन् । प्रत्येक इकाईको अंकभार तोकिए बमोजिम हुनेछ । लामो उत्तर दिनुपर्ने प्रश्न एकै वा खण्ड खण्ड गरी (दुई वा सो भन्दा बढी) सोध्न सकिनेछ ।

प्रथमपत्र:

खण्ड (क) आधारभूत सामान्य ज्ञान (प्राविधिक सेवा, तह-५ का सबै समूहका लागि):

- नेपालको भूगोल: धरातलीय स्वरूपको किसिम र विशेषता, नदीनाला, तालतलैया र खनिज पदार्थ, राजनैतिक विभाजन (संघ, प्रदेश तथा स्थानीय तह)
- नेपाल विद्युत प्राधिकरण सम्बन्धि जानकारी: स्थापना, नेपाल विद्युत प्राधिकरणका व्यवसाय/निर्देशनालयहरू, प्राधिकरणको काम, कर्तव्य र अधिकार, संचालक समिति
- दक्षिण एशियाली क्षेत्रीय सहयोग संगठन (SAARC) बारे सामान्य जानकारी
- राष्ट्रिय महत्वका समसामयिक घटना तथा नविनतम गतिविधिहरू ।
- सामान्य गणितिय अभ्यास: अनुपात, भिन्न, प्रतिशत, औषत, अंकगणितिय तर्क, नाफा-नोक्सान, श्रेणीक्रम ।
- विद्युत चोरी नियन्त्रण ऐन, २०५८ अनुसार विद्युत चोरी मानिने अवस्था, विद्युत चोरी नियन्त्रण नियमावली, २०५९ अनुसार विद्युत आपूर्ति बन्द गर्न सक्ने, पूनः जडान गर्ने अवस्था र पुरस्कार व्यवस्था ।
- विद्युत वितरण विनियमावली, २०६९ को विद्युत लाईन एवं मिटर जडान सम्बन्धी व्यवस्था र मिटर जाँच तथा मिटर रिडिङ्ग सम्बन्धी व्यवस्था ।

प्रथमपत्र खण्ड ख र द्वितीयपत्रको पाठ्यक्रम (सिभिल समूह)

1 DRAWING

(2x2=4)

- 1.1 Drafting techniques, development of plan and preparation of drawing. Section of Hydropower structures
- 1.2 Objectives and role of working drawing and its relationship with detail estimating and specifications
- 1.3 The comparative parameters of tender drawing and working drawing.
- 1.4 Preparation of large- scale construction details in plan and section. Importance of such details in terms of accuracy of estimation, Bill of Quantities and Construction supervision.
- 1.5 Tracing of topographical maps and drawings, of construction schedule and presentation of maps and drawings with required features, accuracy and standard.

2. SURVEYING

(2x2=4, 1x5 =5)

- 2.1. General: Classifications, Principle of surveying, Selection of suitable method, Scales, plans and maps, Entry into survey field books and level books
- 2.2. Accuracy, errors and the methods of adjustments in surveying.
- 2.3. Levelling : Methods of levelling, Levelling instruments and accessories, Principles of levelling
- 2.4. Theodolite and Traverse surveying: Basic difference between different theodolites, Temporary adjustments of theodolites, Fundamental lines and desired relations, Tacheometry: stadia method, Trigonometrical levelling, Checks in closed traverse
- 2.5. Contouring: Characteristics of contour lines, Method of locating contours, Contour plotting
- 2.6. Setting Out: Small buildings, Simple curve
- 2.7. General concept of survey for power house and tunneling.

3. CONSTRUCTION MATERIAL

(2x2=4, 1x5 =5)

- 3.1 Stone: Formation and availability of stones in Nepal, Methods of laying and construction with various stones
- 3.2 Cement: Different cements: Ingredients, properties and manufacture, Storage and transport, Admixtures
- 3.3 Clay and Clay Products: Brick: type, manufacture, laying, bonds
- 3.4 Paints and Varnishes: Type and selection, Preparation techniques, Uses
- 3.5 Bitumen: Type, Selection and Use.
- 3.6 General knowledge of types of conductors, fittings, insulators, insulator protective fittings and line insulator materials.

4. MECHANICS OF MATERIALS AND STRUCTURES

(2x2=4, 1x5 =5)

- 4.1. Mechanics of Materials: Internal effects of loading, Ultimate strength and working stress of materials
- 4.2. Mechanics of Beams: Relation between shear force and bending moment Thrust, shear and bending moment diagrams for statically determinate beams under various types of loading.
- 4.3. Simple Strut Theory

5. HYDRAULICS

(2x2=4, 1x5 =5)

- 5.1. General
 - 5.1.1. Properties of fluid: mass, weight, specific weight, density, specific volume, specific gravity, viscosity
 - 5.1.2. Pressure and Pascal's law
 - 5.1.3. Hydro-Kinematics and Hydro-Dynamics : Energy of flowing liquid: elevation energy, Kinetic energy, potential energy, internal energy
- 5.2. Measurement of Discharge: Weirs and notches and Discharge formulas
- 5.3. Flows: Characteristics of pipe flow and open channel flow

6. GEOTECHNICAL

(3x2=6, 1x10=10)

- 6.1. General concept of geology. Geological investigation.
- 6.2. Classification of rocks (soil) and their significance.
- 6.3. Classification of soil, soil-water relation and their significance.
- 6.4. General concept of consolidation and compaction, and their distinguishing characteristics.
- 6.5. Factors affecting soil compaction.

- 6.6. Methods of soil compaction for preparing foundation. Foundation treatments.
- 6.7. Concept of optimum moisture content, its significance and methods to control moisture content.
- 6.8. Active and passive earth pressures, their definition and general understanding. Concept of surcharge load.
- 6.9. Bearing capacity, safe bearing capacity and ultimate bearing capacity of foundation.
- 6.10. Types of foundation and their application.
- 6.11. Soil exploration, its need and procedure.
- 6.12. General concept of diversion structure.
- 6.13. General concept about stability of structure, the destabilizing and stabilizing factors.

7. STRUCTURAL DESIGN (2x2=4, 1x5=5, 1x10=10)

- 7.1. R.C. Sections in Bending: Under reinforced, over reinforced and balanced sections: Analysis of single and double reinforced rectangular sections
- 7.2. Shear and Bond for R.C. Sections: Shear resistance of a R.C. section, Types of Shear reinforcement and their design, Determination of anchorage length
- 7.3. Axially Loaded R.C. Columns: Short and long columns, Design of a rectangular column section
- 7.4. Design of R.C. Structures: Singly and doubly reinforced rectangular beams, Simple one-way and two-way slabs, Axially loaded short and long columns
- 7.5. Understanding of steel structures and their simple design with criteria and the procedure.
- 7.6. General mechanical features of the transmission lines.
- 7.7. General precautions to be taken during the design and construction process.
- 7.8. Span length of transmission line.
- 7.9. Concept of line supports- poles and towers and their basic design.
- 7.10. Construction and manufacture of poles and towers.
- 7.11. Live- metal clearance and effect of other materials in proximity.
- 7.12. General concept about stability of structure and the destabilizing and stabilizing factors.

8. BUILDING CONSTRUCTION AND TECHNOLOGY (2x2=4, 1x5=5, 1x10=10)

- 8.1. Foundations: Subsoil exploration, Type and suitability of different foundations: Shallow, deep, Shoring and dewatering, Design of simple brick or stone masonry foundations
- 8.2. Walls: Type of walls and their functions, Choosing wall thickness, Height to length relation, Use of scaffolding
- 8.3. Damp Proofing: Source of Dampness, Remedial measures to prevent dampness
- 8.4. Concrete Technology: Constituents of cement concrete, Grading of aggregates, Concrete mixes, Water cement ratio, Factors affecting strength of concrete, Form work, Curing
- 8.5. Wood work: Frame and shutters of door and window, Timber construction of upper floors, Design and construction of stairs
- 8.6. Flooring and Finishing: Floor finishes : brick, concrete, flagstone and Plastering

9. ESTIMATING AND COSTING (2x2=4, 1x5=5, 1x10=10)

- 9.1. Various methods of measurements and estimating quantities of civil works. Different units in, which the various quantities are expressed.
- 9.2. Bases and considerations in preparing analysis of rates for civil works.
- 9.3. Development of unit rates and factors affecting the unit rates.
- 9.4. Preparing analysis of rates for civil works with related to hydropower projects.
- 9.5. Methods of cost estimating. Preparation of project cost estimate.

- 9.6. Objectives and importance of specification for different types of work. Techniques of preparing specifications for different types of works.
- 9.7. Preparation of Bill of Quantities. Its functions and measurement techniques. Its significance.

10. CONSTRUCTION MANAGEMENT

(2x2=4, 1x5 =5)

- 10.1. Organization: Need for organization, Responsibilities of a civil overseer, Relation between Owner, Contractor and Engineer
- 10.2. Site Management: Preparation of site plan, Organizing labor, Measures to improve labor efficiency, Accident prevention
- 10.3. Contract Procedure: Contracts, Departmental works and day-work, Types of contracts, Tender and tender notice, Earnest money and security deposit, Preparation before inviting tender, Agreement, Conditions of contract and Construction supervision
- 10.4. Accounts: Administrative approval and technical sanction, Familiarity with standard account keeping formats used in governmental organizations, Muster roll, Measurement Book, Running Bill, Final Bill, and Project Completion report
- 10.5. Planning and Control: Construction schedule, Equipment and materials schedule, Construction stages and operations, Bar chart, CPM and PERT.
- 10.6. Safety measures and programs in excavation, drilling, blasting, tower erection, cable stringing and underground works.

11. HYDRAULIC STRUCTURES

(3x2=6, 1x10=10)

- 11.1. Headwork structures (Dams, Spillways), types and components.
- 11.2. General concept of design parameters of headwork structure. Computation of waterpower potential.
- 11.3. Hydropower plants, type and components.
- 11.4. General concept of design parameters of hydropower plants.
- 11.5. Understanding of power station, substation, penstocks, turbine, surge tank, the draft tube, the tail race and energy dissipaters.
- 11.6. Causes of failures of dams (general knowledge).
- 11.7. General understanding of surface hydrology.
- 11.8. General functions of hydraulic structures. (Dams, spillways, intake, canal, tunnel.
- 11.9. Design and layout of form works (scaffolding).
- 11.10. Protective structures, types and functions.
- 11.11. River training works, types, functions and layouts.

12. TRANSMISSION LINES AND TOWERS

(2x2=4, 1x5 =5)

- 12.1. Types of electrical towers and transmission lines.
- 12.2. Design parameters of transmission towers.
- 12.3. Design parameters of transmission lines.
- 12.4. General understanding of power station, substation,

13. DISTRIBUTION

(2x2=4, 1x5 =5)

- 13.1. General knowledge of types and categories of distribution (transmission) cables with reference to distribution.
- 13.2. General knowledge about technical problems, such as, power loss, leakage and cases of thefts.
- 13.3. Knowledge of general internal wiring and connections.
- 13.4. General acquaintance with the social problems and issues in reference with distribution system.
- 13.5. Techniques of connection of single circuits with single phase, 3- phase power supply system.
- 13.6. Installation of a rigid PVC conduit (pipe or holder pipe) on masonry surface.

- 13.7. Mounting of fixtures such as wall plugs, boxes and blocks on wall surfaces.
- 13.8. Safety precautions.

14. INSTITUTIONAL KNOW-HOW

(2x2=4)

- 14.1. General knowledge of Nepal Electricity Authority, its organizational structure and function of various business groups
- 14.2. General knowledge of various power plants of Nepal, their types, salient features, and their geographical locations
- 14.3. General knowledge on Nepalese power transmission system, voltage levels and line lengths, export-import links for power exchange with India.

टिप्पणी: पाठ्यक्रममा राखिएका संविधान, ऐन, नियम र विनियमहरू परीक्षा हुनु भन्दा ३ महिना अगाडी सम्म संशोधन वा खारेज भई त्यसको सट्टा हाल प्रचलनमा रहेकालाई सोही अनुरूप पाठ्यक्रममा समावेश भएको मानिने छ ।

