बुढीगण्डकीज लविद्युत कम्पनी लिमिटेड
नेपाल इञ्जिनियरिङ्ग सेवा सिभिल समूह पाँचौं तहका करार सेवाका पदहरुको परीक्षाको पाठ्यक्रम

परीक्षाको किसिमः- क) अन्तर्वार्ता (Interview) पूर्णाङ्कः- ४०

प्रथम खण्ड (Part I)

सामान्य ज्ञान [Part I: General Knowledge]

1. सामान्य ज्ञानः

1.1 नेपालको भूगोल, नेपालमा पाइने हावापानीको किसिम र विशेषता, नदीनाला, तालतलैया, पर्वत श्रृखला, हिमनदी, प्राकृतिक स्रोत साधन, विद्युत सम्बन्धी जानकारी

1.2 नेपालमा विद्युत विकास, उर्जाका श्रोत र सम्भावना, विद्युत व्यापार

1.3 नेपालको संघीय, प्रादेशिक र स्थानीय संरचना तथा शासन प्रणाली सम्वन्धी जानकारी

1.4 Policy, Act and Rules:

- Electricity Regulatory Commission Act, 2074
- Electricity Act, 2049 and Electricity Regulation, 2050
- Public Procurement Act, 2063 and Regulations, 2064
- Memorandum of Association , Article of Association of Budhigandaki Jalbidhyut Company Limited
- Good Governance (Management and Operation) Act, 2064
- Land Acquisition Act, 2034
- Environment Protection Act, 2076 and Environment Protection Regulation, 2077

1.5 Electricity Development in Nepal

- History of power development in Nepal; Electricity supply demand supply
- Hydropower potential of Nepal and prospects and challenges for its development
- Budhi Gandaki Jalbidhyut Company Ltd: objective, functions, corporate structure, achievement and challenges
- Reliable and Equality Electricity Services in Administration Development (Nepal: Prospects and Challenges)

दोस्रो खण्ड (Part II)

विषय वस्तुको ज्ञान [Part II: Subjective Knowledge]

1. Drawing

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 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

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 Total Station in Surveying, operation, uses, and advantages

2.5 Contouring: Characteristics of contour lines, Uses of Drone, Method of locating contours, Contour plotting

2.6 Setting Out: Small buildings, Simple curve

2.7 General concept of survey for powerhouse and tunneling

3. Construction Materials

3.1 Stone: Formation and availability of stones in Nepal, Methods of laying and construction with various stones, and testing procedure

3.2 Cement: Different types of cement: Ingredients, properties and manufacture, Storage and transport, Admixtures and their testing procedure

3.3 Clay and Clay Products: Brick: type, manufacture, laying, bonds and their testing procedure

3.4 Paints and Varnishes: Type and selection, Preparation techniques, Uses

3.5 Bitumen: Type, Selection, Use, and testing procedure/technique

3.6 General knowledge of types of conductors, fittings, insulators, insulator protective fittings and line insulator materials

4. Mechanics of Materials and Structures

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

5. Hydraulics

5.1 General: Properties of fluid: mass, weight, specific weight, density, specific volume, specifi gravity, viscosity, Pressure and Pascal's law

5.2 Measurement of Discharge: Weirs and notches and Discharge formulas

5.3 Flows: Characteristics of pipe flow and open channel flow

6. Geotechnical

6.1 General concept of Geotechnical Engineering, Geotechnical investigation

6.2 Classification of rocks 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
6.9 Concept of surcharge load, 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

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 Manufacturing concepts of poles and towers
7.11 Live- metal clearance and effect of other materials in proximity

8. Building Construction and Technology

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
8.7 Prefabricated Structure, uses and advantage

8.8 Testing techniques of Building Construction materials and concrete

9. Estimating and Costing

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, functions, measurement techniques and significance

10. Construction Management

10.1 Organization: Need for organization, Responsibilities of a Junior Engineer, 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, 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

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

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
11.12 Heavy equipment and their utilities for the construction of hydropower projects

12. Transmission Lines and Towers

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 and substation

13. Distribution

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 Techniques of connection of single circuits with single-phase, 3- phase power supply system
13.5 Installation of a rigid PVC conduit (pipe or holder pipe) on a masonry surface
13.6 Mounting of fixtures such as wall plugs, boxes, and blocks on wall surfaces
13.7 Safety precautions