राष्ट्रिय प्रसारण ग्रिड कम्पनी लिमिटेड

इन्जिनियरिङ्ग सेवा, सिभिल समूह, ७ तह, इन्जिनियर (सिभिल) पदको खुला र आन्तरिक प्रतियोगितात्मक परीक्षाको पाठ्यक्रम

पाठ्यक्रम योजनालाई निम्नानुसारका दुई चरणमा विभाजन गरिएको छः

प्रथम चरणः- लिखित परीक्षा पूर्णाङ्कः- २००

द्वितीय चरणः- अन्तरवार्ता पूर्णाङ्कः- ३०

परीक्षा योजना (Examination Scheme)

१. प्रथम चरणः- लिखित परीक्षा **पूर्णाङ्कः- २००**

पत्र	विषय	पूर्णाङ्क	उतीर्णाङ्क	परीक्षा प्रणाली		प्रश्नसंख्या × अङ्क	समय
प्रथम	संस्थागत र व्यवस्थापकीय ज्ञान तथा सेवा सम्बन्धी (प्राविधिक)	१००	४०	वस्तुगत	बहुवैकल्पिक प्रश्न (MCQ)	५० प्रश्न × २अङ्क	४५ मिनेट
द्वितीय		१००	४०	विषयगत	छोटो उत्तर लामो उत्तर	६ प्रश्न × ५अङ्क ७ प्रश्न × १०अङ्क	३ घण्टा

२. द्वितीय चरणः- अन्तरवार्ता **पूर्णाङ्कः- ३०**

विषय	पूर्णाङ्क	परीक्षा प्रणाली
अन्तरवार्ता	३०	मौखिक

द्रष्टव्यः

१. यो पाठ्यक्रमको योजनालाई प्रथम चरण र द्वितीय चरण गरी दुई भागमा विभाजन गरिएको छ।

२. प्रथम र द्वितीय पत्रको विषयवस्तु एउटै हुनेछ।

३. प्रथम र द्वितीय पत्रको लिखित परीक्षा छुट्टाछुट्टै हुनेछ।

४. लिखित परीक्षाको माध्यम भाषा नेपाली वा अंग्रेजी अथवा नेपाली र अंग्रेजी दुवै हुनेछ।

५. वस्तुगत बहुवैकल्पिक (Multiple Choice) प्रश्नको 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।

६. वस्तुगत बहुवैकल्पिक हुने परीक्षामा परीक्षार्थीले उत्तर लेख्दा अंग्रेजी ठूलो अक्षर (Capital letter) A,B,C,D मा लेख्नुपर्नेछ। सानो अक्षर (Small letter) a,b,c,d लेखेको वा अन्य कुनै सङ्केत गरेको भए सबै उत्तरपुस्तिका रद्द हुनेछ।

७. बहुवैकल्पिक प्रश्न हुने परीक्षामा कुनै प्रकारको क्यालकुलेटर (Calculator) प्रयोग गर्न पाइने छैन।

८. परीक्षामा सोधिने प्रश्नसंख्या, अङ्क र अङ्कभार सामान्यतया सम्बन्धित पत्र/विषयमा दिइए अनुसार हुनेछ।

९. विषयगत प्रश्न हुने पत्रका हकमा प्रत्येक खण्डका लागि छुट्टाछुट्टै उत्तरपुस्तिकाहरु हुनेछन्। परीक्षार्थीले प्रत्येक खण्डका प्रश्नहरुको उत्तर सोही खण्डको उत्तरपुस्तिकामा लेख्नुपर्ने छ।

१०. यस पाठ्यक्रम योजना अन्तर्गतका पत्र/विषयका विषयवस्तुमा जेसुकै लेखिएको भए तापनि पाठ्यक्रममा परेका कानून, ऐन, नियम तथा नीतिहरु परीक्षाको मिति भन्दा ३ महिना अगाडि (संशोधन भएका वा संशोधन भई हटाईएका वा थप गरी संशोधन भई) कायम रहेकालाई यस पाठ्यक्रममा परेको सम्झनु पर्दछ।

११. प्रथम चरणको परीक्षाबाट छनौट भएका उम्मेदवारहरुलाई मात्र द्वितीय चरणको परीक्षामा सम्मिलित गराइनेछ।

१२. पाठ्यक्रम स्वीकृत मितिः- २०८०/११/१७

राष्ट्रिय प्रसारण ग्रिड कम्पनी लिमिटेड

इन्जिनियरिङ्ग सेवा, सिभिल समूह, ७ तह, इन्जिनियर (सिभिल) पदको खुला र आन्तरिक प्रतियोगितात्मक परीक्षाको पाठ्यक्रम

प्रथम र द्वितीय पत्रः- संस्थागत, व्यवस्थापकीय ज्ञान र सेवा सम्बन्धी (प्राविधिक)

भाग (अ)- सेवा सम्बन्धी (प्राविधिक)

खण्ड (क)- (४०% अङ्क)

1. Engineering Survey

1.1 Introduction and basic principles

1.2 Linear measurements: techniques; chain, tape, ranging rods and arrows; representation of measurement and common scales; sources of errors; slope and slope correction; chain and tape measurements; Abney level and clinometers

1.3 Compass and plane table surveying: bearings; type of compass; problems and sources of errors of compass survey; principles and methods of plane tabling

1.4 Levelling and contouring: Principle of levelling; temporary and permanent adjustment of level; bench marks; booking methods and their reductions; longitudinal and cross sectioning; reciprocal levelling; trigonometric levelling; contour interval and characteristics of contours; methods of contouring

1.5 Theodolite traversing: need of traverse and its significance; computation of coordinates; adjustment of closed traverse; closing errors

1.6 Uses of Total Station and Electronic Distance Measuring Instruments, LiDAR Survey

2. Drawing Techniques

2.1 Drawing sheet: Types, composition and its essential component

2.2 Suitable scales, site plans, preliminary drawings, working drawings, as built drawing

2.3 Theory of projection drawing: perspective, orthographic and axonometric projection; first and third angle projection

2.4 Drafting tools, equipment and software

2.5 Drafting conventions and symbols

2.6 Topographic, electrical, plumbing and structural drawings

2.7 Techniques of free hand drawing

3. Construction Materials

3.1 Civil engineering materials: Properties and their use

3.2 Stones: characteristics and requirements of stones as a construction material

3.3 Brick: types and testing of bricks

3.4 Sand and aggregates

3.5 Ceramic materials: ceramic tiles, Mosaic tiles

3.6 Cementing materials: types and properties of lime and cement, cement mortar tests

3.7 Metals: Steel, Alloys of steel, Aluminium

3.8 Timber and wood: timber trees in Nepal, types and properties of wood.

3.9 Miscellaneous materials: Asphaltic materials (Asphalt, Bitumen and Tar), paints, varnishes, glass, insulating and plastic materials, soils, prefab materials

4. Concrete Technology

4.1 Constituents and properties of concrete (physical and chemical) Grade and strength of concrete

4.2 Water cement ratio and its effect on the quality and strength of concrete

4.3 Concrete mix design, testing of concrete

4.4 Mixing, transportation, pouring, placement and curing of concrete

4.5 Use of steel reinforced concrete and its applicability

4.6 Different chemical admixtures in concrete, high strength concrete, green concrete, pre-stressed concrete technology
4.7 Concrete durability and quality control

5. Hydraulics, Water supply and Sanitary Engineering

5.1 Fluid properties and flow of fluid
5.2 Quality and quantity of water
5.3 Reservoir and distribution system
5.4 Quantity and characteristic of waste water
5.5 Design and construction of sewer
5.6 Rainfall measurements and related analysis

6. Structural Analysis and Design

6.1 Types of Structures based on the material used
6.2 Concept of reinforced concrete structures, working stress and limit state
6.3 Analysis of reinforced concrete: beams and slabs in bending, shear, deflection, bond and end anchorage
6.4 Design of axially loaded columns with isolated and combined footings
6.5 Concept of pre-stressed reinforced concrete structures
6.6 Analysis of steel and timber structures for standard and built-up sections
6.7 Design principles of timber: beams and columns
6.8 Transmission Towers: Steel lattice structure (body and extension), stubs, truss etc.

खण्ड (ख)-(४०% अङ्क)

7. Soil Mechanics and foundation engineering

7.1 Properties of soils, Soil as a three-phase diagram, Basic definitions of phase relationships, Index properties of soil, Determination of various index properties
7.2 Consolidation and settlements; Behaviour of soil under compressive loads, Settlement of structures resting on soil: its nature, causes and remedial Measures, Primary and secondary consolidation, Compressibility of soil, Stability of slopes; Causes of slope movements and failures, Types of slope and slope failures, Critical surfaces and factor of safety, Method of stability analysis and stability number
7.3 Bearing capacity of soils; Types of bearing capacity and factors influencing bearing capacity, Effects of various factors on bearing capacity, Modes of foundation failure, Terzaghi's general bearing capacity theory, Ultimate bearing capacity of cohesionless and cohesive soil
7.4 Tower foundation:
  7.4.1 Types of foundation, factors affecting on selection of foundation, requirement and criteria of ideal foundation, types of load for design of foundation, criteria for selection of depth of foundation
  7.4.2 Design of foundation; Design of spread foundation, combined footing, strap footing, mat foundation, pile foundation, well foundation
  7.4.3 Retrofication and prevention of foundation Structures
  7.4.4 Earth pressure and retaining structures

8. Highway Engineering

8.1 Highway Planning and Survey and Geometric Design of Highway
8.2 Evaluation of subgrade soil, Highway Material and Hill Roads
8.3 Road Pavements

8.4 Highway Construction, Maintenance and Repair, Highway Drainage

9. Technology and Environment

9.1 Technological development in Nepal
9.2 Promotion of local technology and materials, and their adaptation
9.3 Types and sources of pollution: point and non-point (air, water, sound, soil)
9.4 Social mobilization in local infrastructure development and utilization in Nepal
9.5 Participatory approach in planning, implementation, maintenance and operation of local infrastructure
9.6 Environmental Impact and its assessment: Environmental impact of transmission infrastructure, BES (Brief Environmental Study), IEE (Initial Environmental Examination) and EIA (Environmental Impact Assessment)
9.7 Screening, scoping, initial impact identification, TOR preparation, EIA report writing
9.8 Management of BES/IEE/EIA process: public participation, EIA review, Mitigation measures, monitoring and Environmental Management Plan

10. Construction Management

10.1 Construction scheduling and planning: Concepts, techniques and tools (bar charts, CPM, PERT)
10.2 Contract management and administration: types of contracts, tender and tender notice, preparation of bidding (tender) document, contractors' pre-qualification, evaluation of tenders and selection of contractor, contract acceptance, condition of contract
10.3 Material management and handling
10.4 Cost control
10.5 Quality assurance and quality control mechanism
10.6 Variation, time extension, alteration, omissions
10.7 Claims and disputes, dispute resolution
10.8 Project closure and evaluation

11. Specification, Estimation and Costing

11.1 Purpose, types and importance of specification
11.2 Types of estimates and their specific uses
11.3 Methods of calculating quantities
11.4 Key components of estimating: norms and rate analysis
11.5 Preparation of price schedule
11.6 Purpose, principles and methods of valuation

भाग (आ)- संस्थागत र व्यवस्थापकीय ज्ञान

खण्ड (ग)- (२०% अङ्क)

1. Institutional Knowledge and Related Legislations

1.1 Rastriya Prasaran Grid Company Limited (RPGCL): Introduction, mission, vision, organisational structure, functions, present status, opportunities, challenges and possibilities
1.2 Corporate Development Plan (CDP) of RPGCL
1.3 The RPGCL Memorandum of Association and Article of association, 2072
1.4 The RPGCL Rules and bylaws
1.5 Constitution of Nepal, 2072 (part 1 to 5 and annexes)

1.6 Related Acts, Rules and Policies
- 1.6.1 Hydropower development policy, 2057
- 1.6.2 Electricity Act, 2049 and Electricity Regulation, 2050
- 1.6.3 Environment Protection Act, 2076 (Preamble, Chapter 1,2,4,6,7)
- 1.6.4 Environment Protection Regulation, 2077 (Preamble, Chapter 1,2,4,6,7,8; Annex-1, 2,3)
- 1.6.5 Forest Act, 2076 (Preamble, Chapter 2,3,12,13,14)
- 1.6.6 Forest Regulation, 2079 (Preamble, Chapter 12; Annexes-9,50,51,52)
- 1.6.7 Procurement Act, 2063 and Procurement Regulation, 2064

2. Management and Professional Practice
- 2.1 Management: Concept, Function and Scope
- 2.2 Motivation, Leadership, Coordination, Team work, Decision Making
- 2.3 Organizational Behaviour and Grievance Handling
- 2.4 Corporate planning and strategic management
- 2.5 Ethics and Professionalism: Perspective on morals, codes of ethics and guidelines of professional practice
- 2.6 Public procurement practices for works, goods and services and its importance; relationship among client, consultant and contractor

3. Occupational Safety
- 3.1 Effects of electric shock on human beings, first aid requirements, safety and precautions against electric shocks; safety rules and regulation
- 3.2 Safety rules and regulation in the project construction area, safety tools and devices, live line maintenance system
- 3.3 Storage and handling of explosives, hazard mitigation
- 3.4 Fire hazards; Types of fire and firefighting techniques

प्रथम पत्रको लागि सामान्यतया निम्नानुसार प्रश्नहरु सोधिने छ।

प्रथम पत्र (वस्तुगत)					
भाग	**विषय**	**खण्ड**	**परीक्षा प्रणाली**	**अङ्कभार**	**प्रश्न संख्या**
(अ)	सेवा सम्बन्धी	(क)	बहुवैकल्पिक प्रश्न (MCQS)	४०	२० प्रश्न × २अङ्क = ४०
		(ख)		४०	२० प्रश्न × २अङ्क = ४०
(आ)	संस्थागत र व्यवस्थापकीय ज्ञान	(ग)		२०	१० प्रश्न × २अङ्क = २०

द्वितीय पत्रको लागि सामान्यतया निम्नानुसार प्रश्नहरु सोधिने छ।

द्वितीय पत्र (विषयगत)					
भाग	**विषय**	**खण्ड**	**अङ्कभार**	**छोटो उत्तर**	**लामो उत्तर**
(अ)	सेवा सम्बन्धी	(क)	४०	२ प्रश्न × ५अङ्क = १०	३ प्रश्न × १०अङ्क = ३०
		(ख)	४०	२ प्रश्न × ५अङ्क = १०	३ प्रश्न × १०अङ्क = ३०
(आ)	संस्थागत र व्यवस्थापकीय ज्ञान	(ग)	२०	२ प्रश्न × ५अङ्क = १०	१ प्रश्न × १०अङ्क = १०