हनुमाननगर कंकालिनी नगरपालिका
पदपूर्ती समिति
नगर कार्यपालिकाको कार्यालय
हनुमाननगर, सप्तरी
मधेश प्रदेश, नेपाल

स्थानीय तह अन्तर्गतको इन्जिनियरिङ सेवा, सिभिल समूह, अधिकृत छैटौं तह, सिभिल इन्जिनियर पदको खुला प्रतियोगितात्मक परीक्षाको पाठ्यक्रम, २०८०

पाठ्यक्रमको रुपरेखा निम्न अनुसार विभाजन गरिएको

भाग १

लिखित परीक्षा (Written Examination) : प्रथम चरण पूर्णाङ्क: १००
द्वितिय चरण पूर्णाङ्क: १००

भाग २

अन्तिम चरण (Final Examination) : अन्तर्वार्ता पूर्णाङ्क: २०

परीक्षा योजना (Examination Scheme)

१. प्रथम चरण : लिखित परीक्षा (Written Examination) **पूर्णाङ्क: २००**

पत्र	विषय	खण्ड	पूर्णाङ्क	उत्तीर्णाङ्क	परीक्षा प्रणाली		प्रश्नसंख्याXअङ्क	समय
प्रथम	General Subject	Part I: General Awareness & General Reasoning Test	१००	४०	वस्तुगत (Objective)	बहुवैकल्पिक प्रश्न (MCQS)	५० प्रश्न X १ अङ्क	१ घण्टा ३० मिनेट
		Part II : General Technical Subject					५० प्रश्न X १ अङ्क	
द्वितीय	जनरल इन्जिनियरिङ्ग		१००	४०	विषयगत (Subjective)	छोटो उत्तर लामो उत्तर	४ प्रश्नX ५ अङ्क ८ प्रश्न X १० अङ्क	३ घण्टा

२. अन्तिम चरण : अन्तर्वार्ता (Interview)

विषय	पूर्णाङ्क	परीक्षा प्रणाली
अन्तर्वार्ता (Interview)	२०	मौखिक (Oral)

१. यो पाठ्यक्रम योजनालाई लिखित परीक्षा (प्रथम चरण र द्वितीय चरण) तथा अन्तिम चरण र अन्तर्वार्ता) गरी दुई भागमा विभाजन गरिएकाको छ ।

२. लिखित परीक्षाको माध्यम भाषा नेपाली वा अङ्ग्रेजी अथवा नेपाली वा अङ्ग्रेजी दुवै हुनेछ ।

३. वस्तुगत बहुवैकल्पिक (Multiple choice) प्रश्नको गलत उत्तर दिएमा प्रत्येक गलत उत्तरवापत २० प्रतिशत अङ्क कट्टा गरिनेछ । तर उत्तरु नदिएमा त्यस वापत अङ्क दिइने छैन र अङ्क कट्टा पनि गरिने छैन ।

४. परीक्षामा कुनै प्रकारको क्याल्कुलेटर (Calculator) प्रयोग गर्न पाइने छैन ।

५. विषयगत प्रश्नका लागि तोकिएका अङ्कका हकमा एउटा लामो प्रश्न वा एउटै प्रश्नका दुई वा दुईभन्दा बढी भाग (Two or more parts of a single questions) वा एउटा प्रश्न अन्तर्गत दुई वा बढी टिप्पणीहरु (Short notes) सोध्न सकिने छ ।

६. वियगत प्रश्न हुने पत्रका हकमा प्रत्यके खण्डका लागि छुट्टाछुट्टै उत्तरपुस्तिकाहरु हुनेछन् । परीक्षार्थीले प्रत्यके खण्डका प्रश्नहरुको उत्तर सोही खण्डको उत्तरपुस्तिकामा लेख्नुपर्नेछ ।

७. नगरपालिकाबाट संचालन हुने परीक्षामा परीक्षार्थीले मोबाइल वा यस्तै प्रकारका विद्युतीय उपकरण परीक्षा हलमा लैजान पाइने छैन ।

८. लिखित परीक्षाको प्रथम पत्र र द्वितीय पत्रका पाठ्यक्रमका विषयवस्तु फरक-फरक हुनेछ ।

९. प्रथम चरण (First Phase) लिखित परीक्षाबाट छनौट भएका उम्मेदवारहरुलाई मात्र द्वितीय चरण (Second Phase) को लिखित परीक्षामा सम्मिलित गराइनेछ ।

१०. लिखित परीक्षामा सोधिने प्रश्न संख्या द्वितीय पत्रको लागि यथासम्भव देहाय बमोजिम हुनेछ ।

११. लिखित परीक्षाको प्रथम चरण (First Phase) मा प्राप्त गरेकाके प्राप्ताङ्कको शत प्रतिशत अङ्क तथा द्वितीय चरण (Second Phase) को प्राप्ताङ्कहरु जोडि कुल अङ्कको आधारमा लिखित परीक्षाको नतिजा प्रकाशित गरिनेछ ।

१२. लिखित परीक्षामा छनौट भएका उम्मेदवारहरुलाई मात्र अन्तिम चरणको अन्तर्वार्तामा सम्मिलित गराइनेछ ।

१३. लिखित परीक्षा र अन्तिम चरणको अन्तर्वार्ताको कूल अङ्क योगका आधारमा अन्तिम परीक्षाफल प्रकाशित गरिनेछ ।

प्रथम पत्र (Paper I): General Subject

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

1. General Awareness 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, and livelihood & lifestyle of people

1.4 Notable events and personalities, social, cultural and economic conditions in modern history of Nepal

1.5 Current periodical plan of 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 (From Part 1 to 5 and Schedules)

1.9 Governance system and Government (Federal, Provincial and Local)

1.10 Provisions of civil service act and regulation relating to constitution of civil service, organisational structure, posts of service, fulfillment of vacancy and code of conduct

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, directing, controlling, coordinating, decision making, motivation and leadership

1.15 Government planning, budgeting and accounting system

1.16 Major events and current affairs of national and international importance

2. General Reasoning Test (25 x1 Mark=25 Marks)

2.1 Logical Reasoning (9×1 Mark = 9 Marks)

Verbal Ability, Alphanumeric Series, Reasoning Analogies, Classification, Coding-Decoding, Order & Ranking, Distance & Directions, Analytical and Logical Reasoning, Assertion and Reason, Statement and Conclusion, Input- Output, Venn- diagram

2.2 Numerical Reasoning (8×1 Mark = 8 Marks)

Arithmetic Series, Analogy, Classification, Arithmetical Reasoning, Fraction. Percentage, Ratio, Average, Profit & Loss, Time & Work, Date & Calender, Data Sufficiency, Data Interpretation & Data Verification

2.3 Spatial Reasoning (8×1 Mark = 8 Marks)

Figure Series, Figure Analogy, Figure Classification, Figure Matrix, Pattern Completion, Embedded Images, Image Formation & Analysis, Mirror and Water Images, Cubes and Dices, Paper Folding & Cutting

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

1. Structure Analysis and Design (5×1 Mark = 5 Marks)

1.1 Stresses and strains; theory of torsion and flexure; moment of inertia

1.2 Analysis of beams and frames: Bending moment, shear force and deflection of beams and frames: determinate structure

1.3 Reinforced concrete structures: Difference between working stress and limit state philosophy, analysis of RC beams and slabs in bending, shear, deflection, bond and end anchorage, Design of axially loaded columns; isolated and combined footings, introduction to pre-stressed concrete

1.4 Steel and timber structures: Standard and built-up sections: Design of riveted, bolted and welded connections, design of simple elements such as ties, struts, axially loaded and eccentric columns, column bases,

2. Construction Materials (6×1 Mark = 6 Marks)

2.1 Properties of building materials: physical, chemical, constituents, thermal etc.

2.2 Stones-characteristics and requirements of stones as a building materials

2.3 Ceramic materials: ceramic tiles, Mosaic Tile, brick types and testing etc.

2.4 Cementing materials: types and properties of lime and cement; cement mortar tests

2.5 Metals: Steel; types and properties; Alumunium

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

2.7 Miscellaneous materials: Asphaltic materials (Asphalt, Bitumen and Tar); paints and varnishes; polymers

2.8 Soil properties and its parameters

2.9 Alternative materials / technology

3. Concrete Technology (5×1 Mark = 5 Marks)

3.1 Constituents and properties of concrete (physical and chemical)

3.2 Water cement ratio

3.3 Grade and strength of concrete, concrete mix design, testing of concrete

3.4 Mixing, transportation pouring and curing of concrete

3.5 Admixtures

4. Construction Management (6×1 Mark =6 Marks)

4.1 Construction scheduling and planning: network techniques, bar charts and computer aided construction management

4.2 Contractual procedure and management: types of contract, tender and tender notice, preparation of bidding (tender) document, contractors pre-qualification, evaluation of tenders and selection of contractor, contract negociation, contract acceptance, condition of contract; quotation and direct order, classifications of contractors; dispute resolution

4.3 Material management: procurement procedures and materials handling

4.4 Cost control, quality control and time control
4.5 Utility maintenance
4.6 Health, safety and insurance
4.7 Project monitoring and evaluation
4.8 Quality assurance plan
4.9 Variation and changes
4.10 Use of construction equipments

5. Estimating and Costing, Valuation and Specification (5×1 Mark = 5 Marks)
5.1 Types of estimates and their specific uses
5.2 Methods of calculating quantities
5.3 Key components of estimating norms and rate analysis
5.4 Preparation of bill of quantities
5.5 Purpose and importance of specification
5.6 Purpose, principles and methods of valuation

6. Drawing Techniques (4×1 Mark =4 Marks)
6.1 Drawing sheet composition and its essential components
6.2 Suitable scales, site plans and location plans, preliminary drawings, conceptual and working drawings
6.3 Theory of projection drawing: perspective, orthographic and axonometric projection; first and third angle projection
6.4 Drafting tools and equipments; conventions and symbols
6.5 Topographic, electrical, plumbing and structural drawings
6.6 Techniques of free sketches drawing

7. Engineering Survey (7×1 Mark = 7 Marks)
7.1 Introduction and basic principles
7.2 Linear measurements: techniques; chain, tape, ranging rods and arrows; representation of measurement and common scales; sources of errors; effect of slope and slope correction; correction for chain and tape measurements; Abney level and clinometers
7.3 Compass and plane table surveying: bearings; types of compass; problems and sources of errors of compass survey; principles and methods of plane tabling
7.4 Leveling and contouring: Principle of leveling; temporary and permanent adjustment of level; bench marks; booking methods and their reductions; longitudinal and cross sectioning; reciprocal leveling; trigonometric leveling; contour interval and characteristics of contours; methods of contouring
7.5 Theodolite traversing: need of traverse and its significance; computation of coordinates; adjustment of closed traverse; closing errors
7.6 Uses of Total Station, Electronic Distance Measuring Instruments & GPS

8. Engineering Economics (3×1 Mark = 3 Marks)
8.1 Benefit cost analysis, cost classification, sensitivity analysis, internal rate of return, time value of money

8.2 Economic equilibrium, demand, supply and production, net present value, financial and economic evaluation

9. Professional Practices and Legislations (3×1 Mark = 3 Marks)

9.1 Ethics and professionalism: code of conduct and guidelines for professional engineering practices
9.2 Nepal Engineering Council Act, 2055; and regulations, 2056
9.3 Relation with clients, contractor and professionals
9.4 Public procurement concept and practices for works, goods and services and its importance
9.5 The Constitution of Nepal (From Part 1 to 5, 13, 14, 15, 16, 17, 18, 19 & 20; and Schedules)
9.6 Local Government Operation Act, 2074

10. Geotechnical Engineering (6×1 Mark = 6 Marks)

10.1 Formation of soil, general classification of soil depending on transporting agent and deposit media
10.2Three phases of soil: basic terms, relation between basic terms, volumetric relationship: mass and volume, weight and volume,specific gravity of soil and lab test, field density and determination methods
10.3Types of water in soil, moisture content and relationship, organic content in soil
10.4 Index properties of soil: grain size distribution and types of soil depending on grain size distribution, consistency limit, relative density,lab test of index properties
10.5 Types of rock, dip, strike, fold, fault, cleavage, geographical divisions of Nepal, earthquake: causes of earthquake, types of wave, grading of earthquake, seismic fault line in Nepal
10.6 Tunneling:types of tunnels, component parts of a tunnel and tunnel cross section, survey for tunnel alignment, drainage, lighting and ventilation requirements for tunnels, method of tunneling in soft soils and rock

द्वितीय पत्र :– जनरल इञ्जिनियरिङ्ग सम्वन्धी

Section (A) – 30 Marks

1. Transportation and Trail Bridge

1.1. Transportation system and its classification.

1.2. Transportation planning: rationale, types and its philosophy.

1.3. Road transport and road construction in Nepal.

1.4. Classification of roads in Nepal (NRS and IRC)

1.5. General principles of road network planning.

1.6. Feasibility study of road projects.

1.7. Alignment, engineering survey and its stages.

1.8. Geometric design of roads: map study, element of cross-section and highway alignment, design of horizontal curve, super elevation, transition curve, vertical curves, and right of way.

1.9. Drainage consideration in roads:

1.9.1. Introduction and design of culverts and minor bridges, cross drainage structures, subsurface drainage system.

1.10. Special consideration in Hill roads design:

1.10.1. Problems associated with hill roads construction

1.10.2. Route location, hairpin bends and special structures.

1.11. Road Pavement: Types of pavement and their applicability in hill roads, Design of pavement,

1.12. Bioengineering practices along hill side

1.13. Activities and techniques in road construction in rural roads

1.14. Maintenance, repair and rehabilitation of roads.

1.15. Basic knowledge on design, construction and maintenance of suspended and suspension bridge in Nepal.

1.16. Role of social mobilization in rural road development.

1.17. Low-cost road construction

Section (B) – 20 Marks

2. Water Supply and Sanitation

2.1 Rural and community based water supply system.

2.2 Water supply sources and their management.

2.2.1 Surface water

2.2.2 Ground water

2.3 Selection of source.

2.4 Water quality and treatment, water demand and supply, source protection

2.5 Intakes, collection chamber and break pressure tanks.

2.6 Reservoir and distribution system.

2.7 Intakes, Pipeline design, design of transmission and distribution system, reservoir design.

2.8 Pipe and fittings: Pipe materials, pipe laying and fittings.

2.9 Operation and maintenance of water supply systems

2.10 Sanitation, wastewater and solid waste management:

2.10.1 On-site sanitation system

2.10.2 Types of sewerage system, design and construction of sewers.

2.10.3 Types, characteristics, sources, quantity, generation, collection, transportation and disposal of solid wastes.

2.10.4 Sanitary landfill, incineration, composting etc.

2.11 Environmental health engineering- Epidemiology, pathogens (Bacteria, Virus, Helminthes, Protozoa)

Section C – 30 Marks

3. Energy System 10%

3.1 Hydrological study, planning and design of small hydropower projects.

3.2 Head works, dams, spillways, surge tanks, stilling basin etc.

3.3 River diversion works.

3.4 Biogas- Introduction.

3.5 Alternative energy systems in Nepal

4. Irrigation and River training works 20%

4.1 Status of irrigation development in Nepal.

4.2 Methods of irrigation and their suitability.

4.3 Design of irrigation canals.

4.4 Operation and maintenance of irrigation systems

4.5 Management of Farmers managed irrigation system.

4.6 Preventive and remedial measures of water logging.

4.7 Flood control, its necessity and flood mitigation measures.

4.8 River training works.

4.9 Specific considerations in design, operation and management of hill irrigation systems

Section D – 20 Marks

5. Housing, building and urban planning 10%

5.1 Present status and practices of building construction in Nepal

5.2 Specific considerations in design and construction of buildings in Nepal

5.3 Indigenous technology in building design and construction

5.4 Local and Modern building construction material in Nepal

5.5 Community buildings: School and hospital buildings and their design considerations

5.6 Urban planning needs and challenges in Nepal

6. Technology, Environment and civil society 10%

6.1 Technological development in Nepal

6.2 Promotion of local technology and its adaptation

6.3 Environmental Impact Assessment, Initial Environmental Examination, Global-warming phenomena

6.4 Types of sources of pollution: point / non-point (for air and water)

6.5 Social mobilization in local infrastructure development and utilization in Nepal

6.6 Participatory approach in planning, implementation, maintenance and operation of local infrastructure