पदपूर्ती समिति
चायाकोट नगरपालिकाको कार्यालय
स्थानका
सिमिल इनजिनियर, अधिकृत स्तर छैटी तहको खुला प्रतियोगितात्मक लिखित परीक्षाको
पद्यक्रमको स्पर्श

प्रथम चरण :- लिखित परीक्षा
पूर्णांक :- 200
पूर्णांक :- 10

प्रथम चरण – लिखित परीक्षा याजना

<table>
<thead>
<tr>
<th>पत्व</th>
<th>विषय</th>
<th>पूर्णांक</th>
<th>उत्तीर्णांक</th>
<th>परीक्षा प्रणाली</th>
<th>प्रश्न संख्या x अहिम्बार</th>
<th>समय</th>
</tr>
</thead>
<tbody>
<tr>
<td>प्रथम</td>
<td>सिमिल इनजिनियरिङ्ग सम्बन्धी विषय</td>
<td>900</td>
<td>40</td>
<td>व्याख्यात उत्तर (Multiple Choice)</td>
<td>100x1 = 100</td>
<td>1 घण्टा 15 मिनेट</td>
</tr>
<tr>
<td>द्वितीय</td>
<td>सेवा तथा स्थानीय शासन सम्बन्धी</td>
<td>900</td>
<td>40</td>
<td>व्याख्यात (Subjective)</td>
<td>Section A [25] 1 x 5=5, 2x10=20 Section B [25] 1 x 5=5, 2x10=20 Section C [30] 2x4=8, 2x10=20 Section D [20] 2x10=20</td>
<td>2 घण्टा</td>
</tr>
</tbody>
</table>

�्वितीय चरण

<table>
<thead>
<tr>
<th>विषय</th>
<th>पूर्णांक</th>
<th>परीक्षा प्रणाली</th>
</tr>
</thead>
<tbody>
<tr>
<td>व्यक्तिगत अन्तर्वार्ता</td>
<td>30</td>
<td>मौखिक</td>
</tr>
</tbody>
</table>
1. Structure Analysis and Design
   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 - Energy methods; three hinged systems, indeterminate structures-slope deflection method and moment distribution method; use of influence line diagrams for simple beams, unit load method
   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, Design principles on timber beams and columns

2. Construction Materials
   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; Alloys
   2.6 Timber and wood: timber trees in Nepal, types and properties of wood
   2.7 Miscellaneous materials: Asphalatic materials (Asphalt, Bitumen and Tar); paints and varnishes; polymers
   2.8 Soil properties and its parameters

3. Concrete Technology
   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
   3.6 High strength concrete
   3.7 Pre-stressed concrete technology

4. Construction Management
   4.1 Construction scheduling and planning: network techniques (CPM, PERT) and bar charts
   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 acceptance, condition of contract; quotation and direct order, classifications of contractors; dispute resolution; muster roll
   4.3 Material management: procurement procedures and materials handling
   4.4 Cost control and quality control
   4.5 Project maintenance
   4.6 Occupational health and safety
   4.7 Project monitoring and evaluation
   4.8 Quality assurance plan
5. **Estimating and Costing Valuation and Specification**

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, types and importance of specification

5.6 Purpose, principles and methods of valuation

6. **Drawing Techniques**

6.1 Drawing sheet composition and its essential components

6.2 Suitable scales, site plans, preliminary drawings, working drawings etc

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

6.4 Drafting tools and equipments

6.5 Drafting conventions and symbols

6.6 Topographic, electrical, plumbing and structural drawings

6.7 Techniques of free hand drawing

7. **Engineering Survey**

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 and Electronic Distance Measuring Instruments

8. **Engineering Economics**

8.1 Benefit cost analysis, cost classification, sensitivity analysis, internal rate of return, time value of money; economic equilibrium, demand, supply and production, net present value, financial and economic evaluation

9. **Professional Practices**

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 fellow professionals

9.4 Public procurement practices for works, goods and services and its importance
Section A – 25 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, right of way.
   1.9. Drainage consideration in roads.
   1.10. Special consideration in Hill roads design.
   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
   1.15. 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

   2.1 Rural and community based water supply system.
   2.2 Water supply sources and their management.
   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 B – 25 Marks

3. Energy System

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.

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

5. Housing, building and urban planning.

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.


6.1 Technological development in Nepal.
6.2 Promotion of local technology and its adaptation
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
Section C – 30 Marks

विकेन्द्रिकरण र स्थानीय शासन

(2 प्रश्न X 5 अंक = 10 र 2 प्रश्न X 10 अंक = 20)

- विकेन्द्रिकरण का अवधारणा, सिद्धांत, उद्देश्य र सार्वजनिकता
- विकेन्द्रिकरण का स्वरूप र तरीकाहरु
- नेपालमा विकेन्द्रिकरण र स्वायत्त शासनका लागि भएका प्रयासहरु, स्थानीय सरकारका अवकाशकता र महत्त्व
- स्थानीय स्वायत्त शासनका अवधारणा, सिद्धांत र आवश्यकता
- संघीय शासन प्रणाली
- वित्तीय विकेन्द्रिकरण र वित्तीय स्वायत्तता
- नेपालमा स्थानीय निकायका वित्तीय अधिकार अवस्था र समस्या
- स्थानीय स्वायत्त शासन ऐन २०५५ का विषेषता, व्यवस्था र स्थानीय निकायका कार्यहरु,
- नेपालमा विकेन्द्रिकरण र स्थानीय स्वायत्त शासनका सन्दर्भमा देखिएका समस्या र समाधानहरु
- नेपालमा विषयका मान्यता निक्षेपणका प्रयास र उपलब्धी
- स्थानीय विकासमा जिज्ञासा विकास समिति र नगरपालिकाको सम्बन्ध ।
- स्थानीय निकायका कर व्यवस्था

Section D – 20 Marks

प्रारम्भ तथा शाहीर विकास

(2 प्रश्न X 10 = 20)

- नेपालमा प्रारम्भ तथा शाहीर विकासका लागि २००४ साल देखि हालसम्म भएका प्रयास, समस्या र समाधानहरु
- प्रारम्भ तथा शाहीर विकास योजना तर्जना, कायांतर्यान, प्रामाण्य र मूल्याधार
- स्थानीय ओल परिवहन तथा व्यवस्थापन
- प्रारम्भ र शाहीर विकास योजना का सम्बन्ध र सामर्थ्य (Rural–urban Linkage/Partnership)
- शाहीरकरण र शाहीर सेवाका व्यवस्थापन
- जन सहभागिताका सैद्धांतिक अवधारणा र स्थानीय विकासमा जनसहभागिता
- शाहीर शासनसम्बन्ध संबंधहरु (सरकारी निकायहरु, स्थानीय निकायहरु, दलसम्बन्ध, गै.स.स., नगरिक समाज आदि) का भूमिका तथा जिम्मेदारी ।
- शाहीर शासनसम्बन्ध मूल्यहरु : पूर्वाधार सेवा, वित्तीय व्यवस्था, बातार्थ व्यवस्थापन ।
- शाहीर पूर्वाधार सेवा तथा शाहीर आधारभूत सेवामा सामंजस्य निर्माण साम्यहरु अवधारणा ।
- शाहीर सामंजस्य विशेष शासनमा सूचना प्रविधिका प्रयोग ।
- जनसंख्या व्यवस्थापन, वसाइ सराई, आवास, सुकृतमक्षी व्यवस्थापन ।
- वसाइ विकास, शाहीर मोजना तथा भवन निर्माण मापदंड, २०३२