नेपाल इन्टरमोडल यातायात विकास समिति
प्राविधिक सेवा, इञ्जिनियर समूह, ५ तह, सव इञ्जिनियर पदको खुला प्रतियोगितात्मक परीक्षाको पाठ्यक्रम

पाठ्यक्रमको रुपरेखा :– यस पाठ्यक्रमको आधारमा निम्नानुसारका चरणमा परीक्षा लिइने छ :

प्रथम चरण :– लिखित परीक्षा पूर्णाङ्क :– १००

द्वितीय चरण :– अन्तर्वार्ता पूर्णाङ्क :– २०

परीक्षा योजना (Examination Scheme)

१. प्रथम चरण : लिखित परीक्षा (Written Examination) **पूर्णाङ्क :- १००**

पत्र	विषय	पूर्णाङ्क	उत्तीर्णाङ्क	परीक्षा प्रणाली	प्रश्नसंख्या X अङ्क	समय
प्रथम	सेवा सम्बन्धी	१००	४०	वस्तुगत बहुवैकल्पिक प्रश्न (MCQs)	५० प्रश्न x १ अङ्क	२ घण्टा
				विषयगत	१० प्रश्न x ५ अङ्क	

२. द्वितीय चरण : अन्तर्वार्ता (Interview) **पूर्णाङ्क :- २०**

विषय	पूर्णाङ्क	परीक्षा प्रणाली
व्यक्तिगत अन्तर्वार्ता	२०	मौखिक

द्रष्टव्य :

१. लिखित परीक्षाको माध्यम भाषा नेपाली वा अंग्रेजी हुनेछ ।

२. लिखित परीक्षामा यथासम्भव पाठ्यक्रमका सबै एकाईबाट प्रश्नहरु सोधिनेछ ।

३. वस्तुगत बहुवैकल्पिक (Multiple Choice) प्रश्नहरुको 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 ।

४. 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 पाठ्क्रममा परेको सम्झनु पर्दछ ।

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

६. पाठ्यक्रम लागू मिति :–

नेपाल इन्टरमोडल यातायात विकास समिति
प्राविधिक सेवा, इञ्जिनियर समूह, ५ तह, सव इञ्जिनियर पदको खुला प्रतियोगितात्मक परीक्षाको पाठ्यक्रम

पत्र/विषय :– सेवा सम्बन्धी

खण्ड (क) – (९० % अङ्क)

1. **Surveying**
   - 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
   - 1.3 Compass and plane table surveying: bearings; types of compass; problems and sources of errors of compass survey; principles and methods of plane tabling
   - 1.4 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
   - 1.5 Theodolite traversing
   - 1.6 Uses of Total Station
2. **Construction Engineering**
   - 2.1 Properties of building materials: physical, chemical, constituents, thermal
   - 2.2 Construction materials found in Nepal; suitability of different building materials for different zones, strength and quality production
   - 2.3 Rocks/stone: types of rocks, their characteristics and properties of good stone
   - 2.4 Metal and alloys: Ferrous metals and non-ferrous, steel (composition and properties); alloys (properties and uses); corrosion and its prevention
   - 2.5 Brick: types of bricks and sizes of bricks available in Nepal
   - 2.6 Lime and Surkhi: types, properties and its uses
   - 2.7 Timber and wood products: Structural classification - Soft wood and hard wood-defects in timber- seasoning of timber - preservation of timber, timber trees in Nepal, types and properties of wood
   - 2.8 Miscellaneous materials: Asphaltic materials (Asphalt, Bitumen and Tar); paints and varnishes; polymers
   - 2.9 Masonry: Classification- Stone masonry - Brick masonry - Laterite masonry - composite masonry. Different types of stone masonry - General principles and specifications for stone masonry as per relevant codes
   - 2.10 Brick work: Brickwork preparation of trench plan methods of trench layout, different types of walls and their function, mortars for stone and brickwork, causes of dampness in building and remedies, terms used in brickwork (queen closer, king closer, meander, stretcher etc) different types of board, tools for laying bricks
   - 2.11 Cements: Composition, Compounds present, manufacturing methods-characteristics of cement, Types of cement- Properties of each-characteristics of cement-Tests on cement- Consistency test, fineness test. Sp. gravity test, setting time test, Soundness test, Grade of cement
   - 2.12 Aggregates: Sand: Sources of sand-River sand, Sea sand and pit sand-Limitations of mining of sand from rivers and sea shore- M-sand, alternatives of sand

2.13 Reinforced cement concrete- Qualities of materials-Types of reinforcement used characteristics of reinforcing material- waterproofing compounds

2.14 Concrete and reinforced concrete works: Constituents and properties of concrete, Water cement ratio, Grade and strength of concrete, concrete mix design, testing of concrete, preparation of mixing, placing compacting, curing and frameworks

2.15 Mortar: Preparation of lime and cement mortar-Proportions of mortar for various items of work-tests on cement mortar

2.16 Ornamental materials for finishing: Paints and Varnishes: Types – Constituents - Preparation characteristics and application

2.17 Plastics: types-characteristics and properties of PVC – uses and limitations

2.18 Rubber: Characteristics, properties and uses

2.19 Glass: Types, properties and uses / structural applications

2.20 Chimneys principle and construction of chimneys

2.21 Plastering work: function, preparation of mix, surface preparation, paints and white washes in walls and ceiling, stuff works

2.22 Flooring: introduction, types of flooring (mud, brick, cement, flagstone, mosaic, floor-boards)

3. **Soil Mechanics**

3.1 General : Soil types and classification; Three phase system of soil, Unit Weight of soil mass: bulk density, saturated density, submerged density and dry density; Interrelationship between specific gravity, void ratio, porosity, degree of saturation, percentage of air voids air content and density index

3.2 Compaction of soil: Factors affecting soil compaction; Optimum moisture content; Relation between dry density and moisture content

3.3 Earth Pressures: Active and passive earth pressures, Lateral earth pressure

4. **Structural Design**

4.1 R.C. Sections in Bending: Under reinforced, over reinforced and balanced sections; Analysis of single and double reinforced rectangular sections

4.2 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

4.3 Axially Loaded R.C. Columns: Short and long columns; Basic design of a rectangular column section

4.4 Design of R.C. Structures: Singly and doubly reinforced rectangular beams; Simple one-way and two-way slabs; Axially loaded short and long columns

4.5 Working stress vs Limit state method

4.6 Force, Couple, C.G., M.I., Support reaction in beam

4.7 Shear force, Bending moment and axial force analysis

4.8 Design of steel and timber structures (Beam, Column and Frame)

5. **Hydraulics and Fluid Mechanics**

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

5.2 Hydro-Kinematics and Hydro-dynamics

5.2.1 Energy of flowing liquid: elevation energy, kinetics energy, potential energy, internal energy

5.3 Measurements of Discharge

5.3.1 Weirs and Notches

5.3.2 Discharge formulae

5.4 Flows: Characteristics of pipe flow and open channel flow

6. **Estimating and Costing**

6.1 Units of measurement and payments for various items of building

6.2 Types of estimates and their specific uses

6.3 Methods of calculating quantities

6.4 Key components of estimating norms and rate analysis

6.5 Preparation of bill of quantities

6.6 Purpose, types and importance of specification

6.7 Purpose, principles and methods of valuation

6.8 Standard estimate formats of Government of Nepal

7. **Construction Management**

7.1 Construction scheduling and planning: network techniques (CPM and PERT)

7.2 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

7.3 Material management: procurement procedures and materials handling

8. **Engineering Drawing**

8.1 Drawing sheet composition and its essential components

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

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

8.4 Drafting tools and equipments

8.5 Drafting conventions and symbols

8.6 Topographic, electrical, plumbing and structural drawings

8.7 Techniques of free hand drawing

खण्ड (ख) – (१० % अङ्क)

9. **सामान्य ज्ञान**

9.1 नेपालको भौगोलिक, ऐतिहासिक, सामाजिक, राजनैतिक र आर्थिक अवस्था बारे जानकारी

9.2 राष्ट्रिय र अन्तर्राष्ट्रिय महत्वका समसामयिक घटना तथा नवीनतम गतिविधिहरु

9.3 नेपाल इन्टरमोडल यातायात विकास समिति सम्बन्धी जानकारी

9.4 नेपाल इन्टरमोडल यातायात विकास समितिको कर्मचारी सेवा (शर्त) नियमावली, २०५६

9.5 मालसामानको बहुविधिक ढुवानी ऐन, २०६३

9.6 सार्वजनिक खरिद ऐन, २०६३ र सार्वजनिक खरिद नियमावली, २०६४