

**कृषि सामग्री कम्पनी लिमिटेड**  
सहायक प्रबन्धक, अधिकृत तृतीय श्रेणी, प्राविधिक ईन्जिनियर पदको खुला प्रतियोगितात्मक परीक्षाको  
**परीक्षा योजना तथा पाठ्यक्रम**

यस पाठ्यक्रमलाई दुई चरणमा विभाजन गरिएको छ ।

प्रथम चरण - लिखित परीक्षा

पूर्णाङ्क : २००

द्वितीय चरण - अन्तर्वार्ता

पूर्णाङ्क : ३०

**लिखित परीक्षा योजना (Written examination Scheme)**

पत्र	विषय	प्रश्न संख्या × अङ्क भार	परीक्षा प्रणाली	समय	पूर्णाङ्क	उत्तीर्णाङ्क
प्रथम	सिभिल इन्जिनियरिङ्ग सम्बन्धी विषय	५० प्रश्न × २ अंक = १०० अंक	वस्तुगत बहुवैकल्पिक प्रश्न	४५ मिनेट	१००	४०
द्वितीय	विल्डिङ र आर्किटेक्ट सम्बन्धी विषय	१० प्रश्न × १० अंक = १०० अंक	विषयगत	३ घण्टा	१००	४०

**द्रष्टव्य :**

- द्वितीय पत्रका प्रत्येक खण्डका लागि छुट्टाछुट्टै उत्तर पुस्तिकाहरु हुनेछन् ।
- लिखित परीक्षाको माध्यम भाषा नेपाली वा अंग्रेजी अथवा नेपाली र अंग्रेजी दुवै हुन सक्नेछ ।
- वस्तुगत बहुउत्तर (Multiple Choice) प्रश्नहरुको उत्तर सही दिएमा प्रत्येक सही उत्तर बापत २ (दुई) अङ्क प्रदान गरिनेछ भने गलत उत्तर दिएमा प्रत्येक गलत उत्तर बापत २० प्रतिशत अर्थात् ०.४ अङ्क कट्टा गरिनेछ । तर उत्तर नदिएमा त्यस बापत अङ्क दिइने छैन र अङ्क कट्टा पनि गरिने छैन ।
- यस पाठ्यक्रममा जेसुकै लेखिएको भएता पनि पाठ्यक्रममा परेका ऐन, नियमहरु परीक्षाको मिति भन्दा ३ महिना अगाडि (संशोधन भएका वा संशोधन भई हटाइएका वा थप गरी संशोधन भई) कायम रहेकालाई यस पाठ्यक्रममा परेको सम्झनु पर्दछ
- पाठ्यक्रम लागु मिति :-

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**प्रथम पत्र**

**सिभिल इन्जिनियरिङ्ग सम्बन्धी विषय**

- 1. Structure Analysis and Design** **20**
  - 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** **15**
  - 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: Asphaltic materials (Asphalt, Bitumen and Tar); paints and varnishes; polymers
  - 2.8 Soil properties and its parameters
- 3. Concrete Technology** **12**
  - 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** **12**
  - 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

# कृषि सामग्री कम्पनी लिमिटेड

सहायक प्रबन्धक, अधिकृत तृतीय श्रेणी, प्राविधिक ईन्जिनियर पदको खुला प्रतियोगितात्मक परीक्षाको

## परीक्षा योजना तथा पाठ्यक्रम

- 4.5 Project maintenance
- 4.6 Occupational health and safety
- 4.7 Project monitoring and evaluation
- 4.8 Quality assurance plan
- 4.9 Variation, alteration and omissions
- 5. Estimating and Costing Valuation and Specification 10**
  - 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 10**
  - 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 8**
  - 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**
  - 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 5**
  - 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

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**द्वितीय पत्र**  
**बिल्डिङ एण्ड आर्किटेक्ट सम्बन्धी विषय**

**Section A- 30 Marks**

**1. Building Materials and Construction**

- 1.1 Stone masonry: Types of stone used in stone masonry, specifications of stone masonry.
- 1.2 Brick masonry: Classification of bricks, specifications of different types of bricks, testing of bricks, different shapes of bricks.
- 1.3 Hollow Concrete Blocks: Various types of concrete blocks, use of concrete blocks in buildings.
- 1.4 Sand: Requirement of good quality sand, sieve analysis, fineness modulus.
- 1.5 Lime: Different types of lime and their uses test of freshness.
- 1.6 Mortar: Types of mortar, specifications, proportion of mortar for various types of masonry works.
- 1.7 Paintings: Types of paints, specification for various types of painting Works.
- 1.8 Water proofing: Water proofing at basement, ground floor and roofs, common water proofing problems in Nepal.
- 1.9 Roofing Systems: Different types of roofing system.
- 1.10 Doors and windows: Different types of doors and windows, door and window details, merits and demerits of metal door and windows.
- 1.11 Walls: Different types of wall system, Load bearing walls, partition walls and curtain walls.
- 1.12 Pre-fabrication: Principles of pre-fabrication, advantages and disadvantages of a pre-fabricated building.
- 1.13 Flooring: Different types of flooring, specification of floorings.
- 1.14 Plastering: Different types of plasters and coating materials.
- 1.15 Formworks: Shoring, underpinning, scaffolding and formworks.
- 1.16 Building Elements: Foundation, super structure, lintel, floors, roofs, sun control devices, parapet, staircase, emergency stairs, elevators and escalators
- 1.17 Building services: water supply and sanitation, electrification, heating and ventilation and air-conditioning.
- 1.18 National Building Code: Hierarchy of building codes and its application, procedure for implementation of building code in Nepal.
- 1.19 Development Control System in municipalities in Nepal
- 1.20 Maintenance and repair of buildings.
- 1.21 Principles of low cost construction techniques.
- 1.22 Current building norms for estimating and costing.

**Section B- 20 Marks**

**2. Structural Design and Analysis**

- 2.1 Design of RCC footings, columns, slabs, beams..
- 2.2 Analysis of structural system in a building.
- 2.3 Design of steel structure.
- 2.4 Design of timber structure.
- 2.5 Design of masonry structure.

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- 2.6 Common structural problems in RCC buildings in Nepal.
- 2.7 Requirements of earthquake resistant building construction.
- 2.8 Computer Aided Design (CAD) of building structure.
- 2.9 Mandatory Rule of Thumb in building design.
- 2.10 Non-engineered earthquake resistant building design.

**Section C- 30 Marks**

**3. Housing and Urban Planning**

- 3.1 Hierarchy of urban settlements,
- 3.2 Types of urban settlements in Nepal.
- 3.3 Base Maps:
- 3.4 Hierarchy of plans
- 3.5 Principles of land use planning
- 3.6 Building byelaws
- 3.7 Periodic plans for local authorities
- 3.8 Planning legislation of Nepal
- 3.9 Environmental issues in urban development.
- 3.10 Institutions involved in urban planning and development in Nepal.
- 3.11 Types of urban development programmes in Nepal.
- 3.12 Conservation of heritage sites,
- 3.13 Settlement planning for disaster mitigation.
- 3.14 Municipalities of Nepal and their role in urban development.
- 3.15 Town Development Committees and their role in urban development.
- 3.16 Different types of housing,
- 3.17 Principles of housing design,
- 3.18 Different models of land development,
- 3.19 Squatter and slums,
- 3.20 Private housing development,
- 3.21 Rural housing, housing development programmes in Nepal,
- 3.22 Prospects of apartments and group housing in Nepal.

**Section D- 20 Marks**

**4. Architecture**

- 4.1 History of architecture
- 4.2 Contemporary world architecture
- 4.3 Contemporary Nepalese architecture
- 4.4 Traditional architecture of Nepal
- 4.5 Architecture of Kathmandu Valley and the rest of the Cities of Nepal
- 4.6 Principles of architectural design.
- 4.7 Factors to be considered while designing buildings.
- 4.8 Standards to be followed while designing buildings in Nepal
- 4.9 Contemporary world architects and their works
- 4.10 Architectural landmarks in Nepal
- 4.11 Ethics of architects in professional practice.

**End**