

कर्मचारी सञ्चय कोष
छैठौं तह सहायक प्रबन्धक (सिभिल इन्जिनियर) पदका लागि

सेवा : प्राविधिक
तह : छैठौं

समूह : इन्जिनियर
पद : सहायक प्रबन्धक (सिभिल इन्जिनियर)

उपसमूह :
किसिम : खुला प्रतियोगिता

पाठ्यक्रम योजनालाई निम्नानुसारका दुई चरणमा विभाजन गरिएको छ :

प्रथम चरण :- लिखित परीक्षा:

पूर्णाङ्क :- २००

द्वितीय चरण : - अन्तर्वार्ता

पूर्णाङ्क :- ३०

परीक्षा योजना (Examination Scheme)

प्रथम चरण : लिखित परीक्षा (Written Examination)

पूर्णाङ्क :- २००

पत्र	विषय	खण्ड	पूर्णाङ्क	उतीर्णाङ्क	परीक्षा प्रणाली	प्रश्नसंख्या × अङ्क	समय	
प्रथम	प्राविधिक विषय तथा व्यवस्थापन	प्राविधिक विषय	१००	४०	वस्तुगत	बहुवैकल्पिक प्रश्न	५० प्रश्न × १ अङ्क	४५ मिनेट
		व्यवस्थापन, सामाजिक सुरक्षा प्रणाली तथा विविध			विषयगत	छोटो उत्तर	१० प्रश्न × ५ अङ्क	१ घण्टा ३० मिनेट
द्वितीय	सेवा सम्बन्धी (प्राविधिक विषय)		१००	४०	विषयगत	लामो उत्तर	१० प्रश्न × १० अङ्क	३ घण्टा

(ख) द्वितीय चरण : अन्तर्वार्ता (Interview)

विषय	पूर्णाङ्क	परीक्षा प्रणाली
अन्तर्वार्ता	३०	मौखिक

द्रष्टव्यः

- लिखित परीक्षाको भाषा नेपाली वा अंग्रेजी वा दुवै हुन सक्नेछ ।
- प्रथम र द्वितीय पत्रको लिखित परीक्षा छुट्टाछुट्टै हुनेछ ।
- लिखित परीक्षामा सोधिने प्रश्न संख्या र अङ्कभार यथासम्भव सम्बन्धित पत्र/विषयमा दिईए अनुसार हुनेछ ।
- वस्तुगत बहुवैकल्पिक (Multiple choice) प्रश्नहरूको गलत उत्तर दिएमा प्रत्येक गलत उत्तर वापत २० प्रतिशत अङ्क कट्टा गरिनेछ । तर उत्तर नदिएमा त्यस वापत अङ्क दिईने छैन र अङ्क कट्टा गरिने पनि छैन ।
- वस्तुगत बहुवैकल्पिक हुने परीक्षामा परीक्षार्थीले उत्तर लेख्दा अंग्रेजी ठूलो अक्षर (Capital Letter) A, B, C, D मा लेख्नु पर्नेछ । सानो अक्षर (Small Letter) लेखेको वा अन्य कुनै संकेत गरेको भए सबै उत्तरपुस्तिका रद्द हुनेछ ।
- बहुवैकल्पिक प्रश्नहरू हुने परीक्षामा कुनै प्रकारको क्यालकुलेटर (Calculator) प्रयोग गर्न पाईने छैन ।
- विषयगत प्रश्नहरूको हकमा एउटा लामो प्रश्न वा एउटै प्रश्नका दुई वा दुईभन्दा बढी भाग (Two or more parts of a single question) वा एउटै प्रश्न अन्तर्गत दुई वा बढी टिप्पणी (Short note) सोध्न सकिनेछ ।
- विषयगत प्रश्न हुने पत्र/विषयका प्रत्येक खण्डका लागि छुट्टाछुट्टै उत्तरपुस्तिकाहरू हुनेछन् । परीक्षार्थीले प्रत्येक खण्डका प्रश्नको उत्तर सोही खण्डको उत्तर पुस्तिकामा लेख्नुपर्नेछ ।
- यस पाठ्यक्रम योजना अन्तर्गतका पत्र/विषयका विषयवस्तुमा जुनसुकै कुरा लेखिएको भएता पनि पाठ्यक्रममा परेका कानून, ऐन, नियम, विनियम तथा नीतिहरू परीक्षाको मिति भन्दा ३ महिना अगाडि (संशोधन भएका वा संशोधन भई हटाईएका वा थप गरि संशोधन भई) कायम रहेकालाई यस पाठ्यक्रममा परेको सम्झनुपर्छ ।
- प्रथम चरणको परीक्षाबाट छनौट भएका उम्मेदवारहरूलाई मात्र द्वितीय चरणको परीक्षामा सम्मिलित गराईनेछ ।
- पाठ्यक्रम स्वीकृत मिति :- २०८०/०१/२१

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पाठ्यक्रमको विस्तृत विवरण
प्रथम पत्र : प्राविधिक विषय तथा व्यवस्थापन

खण्ड (क) : ५० अङ्क
(प्राविधिक विषय)

1. **Structural Engineering (5 Marks)**
 - 1.1 Center of gravity, moment of inertia , radius of gyration
 - 1.2 Stresses and strains, theory of torsion and flexure
 - 1.3 Analysis of beams and frames: bending moment, shear force and deflection of beams and frames
 - 1.4 Determinate structures (energy methods), three hinged systems, suspension cable system
 - 1.5 Indeterminate structures:- slope deflection method and moment distribution method, use of influence line diagrams for simple beams, unit load method, two hinged arch
 - 1.6 Plastic analysis of beam and frame
2. **Engineering Survey (7 Marks)**
 - 2.1 Introduction and basic principles, classification of surveys
 - 2.2 Linear measurement techniques:- chain and tape method, 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
 - 2.3 Compass:- types of compass, problems and sources of errors in compass survey
 - 2.4 Plane table surveying: principles and methods of plane tabling
 - 2.5 Leveling: principle of leveling, temporary and permanent adjustment of level, bench marks, booking methods and their recording, longitudinal and cross sectioning, reciprocal leveling, trigonometric leveling
 - 2.6 Contouring: contour interval and characteristics of contours, methods of contouring, interpolation, use of contour map
 - 2.7 Theodolite traversing: need of traverse and its significance, principle of traverse, computation of coordinates; adjustment of closed traverse and linked traverse, closing errors
 - 2.8 Tacheometry: principle, tacheometric formula, relation of distance and elevation
 - 2.9 Uses of total station and electronic distance measuring instruments
 - 2.10 Curves: types and suitability, elements, geometry and setting out of curves (simple circular curve, vertical curve, transition curve)
 - 2.11 Calculation of area and volume: methods of area calculation of land, methods of area and volume calculation of cut and fill, mass haul diagram
3. **Construction Materials (6 Marks)**
 - 3.1 Properties of building materials: physical, chemical, constituents, thermal
 - 3.2 Stones: characteristics and requirements of stones as a building materials
 - 3.3 Ceramic materials: ceramic tiles, mosaic tile, brick types and testing
 - 3.4 Cementing materials: types and properties of lime and cement; cement mortar tests
 - 3.5 Metals: types and properties of steel, alloys
 - 3.6 Timber and wood: timber trees in Nepal, types and properties of wood
 - 3.7 Miscellaneous materials: asphaltic materials (asphalt, bitumen and tar), paints and varnishes, polymers

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- 3.8 Soil properties and its parameters
- 3.9 Local and modern building construction material in Nepal
4. **Concrete Technology (5 Marks)**
 - 4.1 Constituents and properties of concrete (physical and chemical)
 - 4.2 Water cement ratio
 - 4.3 Grade and strength of concrete, concrete mix design, testing of concrete
 - 4.4 Mixing, transportation pouring and curing of concrete
 - 4.5 Admixtures
 - 4.6 High strength concrete
 - 4.7 Pre-stressed concrete
5. **Geotechnical Engineering (6 Marks)**
 - 5.1 Formation of soil, general classification of soil depending on transporting agent and deposit media
 - 5.2 Three 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
 - 5.3 Types of water in soil, moisture content and relationship, organic content in soil
 - 5.4 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
 - 5.5 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
 - 5.6 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
6. **Construction Management (6 Marks)**
 - 6.1 Construction scheduling and planning: network techniques (CPM, PERT) and bar charts
 - 6.2 Contractual procedure and management: types of contract, bid and bid notice, preparation of bidding document, contractors pre-qualification, evaluation of tenders and selection of contractor, contract acceptance, condition of contract, quotation and direct purchase, classifications of contractors, dispute resolution, muster roll
 - 6.3 Material management: procurement procedures and materials handling
 - 6.4 Cost, quality and time control
 - 6.5 Project management
 - 6.6 Occupational health and safety
 - 6.7 Project monitoring and evaluation
 - 6.8 Quality assurance plan
 - 6.9 Variation, alteration and omissions
7. **Estimating, Costing, Specification and Valuation (5 Marks)**
 - 7.1 Types of estimates and their specific uses
 - 7.2 Methods of calculating quantities
 - 7.3 Key components of estimating norms and rate analysis
 - 7.4 Preparation of bill of quantities

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- 7.5 Purpose, types and importance of specification
7.6 Purpose, principles and methods of valuation
8. **Engineering Drawing (4 Marks)**
8.1 Drawing sheet composition and its essential components
8.2 Suitable scales, site plans, preliminary drawings, working drawings
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
8.8 Community buildings: School and hospital buildings and their design considerations
9. **Engineering Economics (3 Marks)**
9.1 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
10. **Professional Practices (3 Marks)**
10.1 Ethics, integrity and professionalism: code of conduct and guidelines for professional engineering practices
10.2 Nepal Engineering Council Act, 2055; and regulations, 2056
10.3 Relation with clients, contractor and fellow professionals
10.4 Public procurement practices for works, goods and services and its importance
10.5 National Building Code: Hierarchy of building codes and its application, procedure for implementation of building code in Nepal
10.6 Building bylaws

खण्ड (ख) : ५० अङ्क

(व्यवस्थापन, सामाजिक सुरक्षा प्रणाली तथा विविध)

11. **व्यवस्थापन (२० अङ्क)**
11.1 व्यवस्थापनको परिचय, सिद्धान्तहरू, कार्य, उपयोग चुनौती
11.2 व्यवस्थापनका नवोदित अवधारणाहरू (Emerging concepts of management)
11.3 कार्य उत्प्रेरणा, नेतृत्व तथा निर्णय प्रक्रियाको अभ्यास
11.4 मानव संशाधन व्यवस्थापन, ट्रेड यूनियन, सामूहिक सौदाबाजी र गुनासो व्यवस्थापन
11.5 संस्थागत सुशासन र आन्तरिक नियन्त्रण प्रणाली
11.6 व्यवस्थापन सूचना प्रणाली
11.7 सार्वजनिक सेवा प्रवाह
12. **सामाजिक सुरक्षा प्रणाली (२० अङ्क)**
12.1 कर्मचारी सञ्चय कोष र यसको कार्यक्षेत्र, रणनीतिक योजना र भावी कार्यक्रम
12.2 सामाजिक सुरक्षा प्रणालीको अन्तर्राष्ट्रिय अभ्यास र मान्यता

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- 12.3 सामाजिक सुरक्षा, सामाजिक संरक्षण र नेपालमा यसको अवस्था
12.4 सामाजिक सुरक्षा प्रणालीमा कर्मचारी सञ्चय कोषको योगदान
12.5 अन्तर्राष्ट्रिय श्रम संगठन र अन्तर्राष्ट्रिय सामाजिक सुरक्षा संस्था (International Social Security Association - ISSA)

13. विविध (१० अङ्क)

- 13.1 नेपालको संविधान
13.2 कर्मचारी सञ्चय कोष ऐन, २०१९
13.3 निवृत्तभरण कोष ऐन, २०७५
13.4 विद्युतीय कारोवार ऐन, २०६३
13.5 कर्मचारी सञ्चय कोष, कर्मचारी सेवा शर्त नियमावली, २०७८
13.6 कर्मचारी सञ्चय कोष, सूचना तथा सञ्चार प्रविधि नीति, २०७२

प्रथम पत्रमा पाठ्यक्रमका खण्डबाट लिखित परीक्षामा यथासम्भव देहाय बमोजिम प्रश्नहरू सोधिनेछ ।

खण्ड	इकाई	प्रश्नसंख्या × अङ्क	प्रश्नका किसिम
क	-	५० प्रश्न × १ अङ्क = ५०	वस्तुगत बहुवैकल्पिक प्रश्न
ख	११	४ प्रश्न × ५ अङ्क = २०	विषयगत प्रश्न
	१२	४ प्रश्न × ५ अङ्क = २०	
	१३	२ प्रश्न × ५ अङ्क = १०	

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द्वितीय पत्र :

सेवा सम्बन्धी (प्राविधिक विषय)

खण्ड (क) : ३० अङ्क

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 modules
- 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

खण्ड (ख) : २० अङ्क

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
- 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

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खण्ड (ग) : ३० अङ्क

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

खण्ड (घ) : २० अङ्क

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
- 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 Conservation of historic buildings
- 4.12 Ethics of architects in professional practice

द्वितीय पत्रमा पाठ्यक्रमका खण्डबाट लिखित परीक्षामा यथासम्भव देहाय बमोजिम प्रश्नहरू सोधिनेछ ।

खण्ड	प्रश्न संख्या र अङ्क भार
क	३ प्रश्न × १० अङ्क = ३०
ख	२ प्रश्न × १० अङ्क = २०
ग	३ प्रश्न × १० अङ्क = ३०
घ	२ प्रश्न × १० अङ्क = २०