

खाद्य व्यवस्था तथा व्यापार कम्पनी लिमिटेड
स्तर: अधिकृत, सेवा/समूह: प्राविधिक/सिभिल इञ्जिनियरिङ्ग, तह: ६, पद: सिभिल इञ्जिनियर
खुला/आन्तरिक प्रतियोगितात्मक लिखित परीक्षाका लागि पाठ्यक्रम

पाठ्यक्रम योजनालाई निम्नानुसारका दुई चरणमा विभाजन गरिएको छ :

प्रथम चरण :- लिखित परीक्षा

पूर्णाङ्क :- २००

द्वितीय चरण :- अन्तर्वार्ता

पूर्णाङ्क :- ३०

परीक्षा योजना (Examination Scheme)

१. प्रथम चरण: - लिखित परीक्षा

पूर्णाङ्क :- २००

पत्र	विषय	पूर्णाङ्क	उतीर्णाङ्क	परीक्षा प्रणाली		प्रश्नसंख्या X अङ्क	समय
प्रथम	संस्थागत ज्ञान तथा सेवा सम्बन्धी (प्राविधिक)	१००	४०	वस्तुगत	बहुवैकल्पिक प्रश्न(MCQ)	५० प्रश्न X २अङ्क	४५ मिनेट
द्वितीय		१००	४०	विषयगत	छोटो उत्तर लामो उत्तर	८ प्रश्न X ५अङ्क ६ प्रश्न X १० अङ्क	३ घण्टा

२. द्वितीय चरण : -अन्तर्वार्ता

विषय	पूर्णाङ्क	परीक्षा प्रणाली
अन्तर्वार्ता	३०	मौखिक

द्रष्टव्य :

- यो पाठ्यक्रमको योजनालाई प्रथम चरण र द्वितीय चरण गरी दुई भागमा विभाजन गरिएको छ ।
- प्रथम र द्वितीय पत्रको पत्रको विषयवस्तु एउटै हुनेछ ।
- प्रथम र द्वितीय पत्रको लिखित परीक्षा छुट्टाछुट्टै हुनेछ ।
- लिखित परीक्षाको माध्यम भाषा नेपाली वा अंग्रेजी अथवा नेपाली र अंग्रेजी दुवै हुनेछ ।
- वस्तुगत बहुवैकल्पिक (Multiple Choice) प्रश्नहरूको 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 ।
- वस्तुगत बहुवैकल्पिक हुने परीक्षामा परीक्षार्थीले उत्तर लेख्दा अंग्रेजी ठूलो अक्षर (Capital letter) A,B,C,D मा लेख्नुपर्नेछ । सानो अक्षर (Small letter) a,b,c,d लेखेको वा अन्य कुनै सङ्केत गरेको भए सबै उत्तरपुस्तिका रद्द हुनेछ ।
- बहुवैकल्पिक प्रश्नहरू हुने परीक्षामा कुनै प्रकारको क्याल्कुलेटर (Calculator) प्रयोग गर्न पाइने छैन ।
- परीक्षामा सोधिने प्रश्नसंख्या, अङ्क र अङ्कभार यथासम्भव सम्बन्धित पत्र /विषयमा दिइए अनुसार हुनेछ।
- परीक्षामा परीक्षार्थीले मोबाइल वा यस्तै प्रकारका विद्युतीय उपकरण परीक्षा हलमा लैजान पाइने छैन ।
- विषयगत प्रश्न हुने पत्रका हकमा प्रत्येक खण्डका लागि छुट्टाछुट्टै उत्तरपुस्तिकाहरू हुनेछन् । परीक्षार्थीले प्रत्येक खण्डका प्रश्नहरूको उत्तर सोही खण्डको उत्तरपुस्तिकामा लेख्नुपर्ने छ ।
- यस पाठ्यक्रम योजना अन्तर्गतका पत्र/विषयका विषयवस्तुमा जेसुकै लेखिएको भए तापनि पाठ्यक्रममा परेका कानून, ऐन, नियम, विनियम तथा नीतिहरू परीक्षाको मिति भन्दा ३ महिना अगाडि (संशोधन भएका वा संशोधन भई हटाईएका वा थप गरी संशोधन भई) कायम रहेकालाई यस पाठ्यक्रममा परेको सम्झनु पर्दछ ।
- प्रथम चरणको परीक्षाबाट छनौट भएका उम्मेदवारहरूलाई मात्र द्वितीय चरणको परीक्षामा सम्मिलित गराइनेछ ।
- पाठ्यक्रम लागू मिति :-२०७९

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प्रथम र द्वितीय पत्र :- संस्थागत ज्ञान तथा सेवा सम्बन्धी (प्राविधिक)

भाग (अ)– सेवा सम्बन्धी (प्राविधिक)

खण्ड (क):

1. Structural Analysis and Design

- 1.1 Stress and strain; 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 structure: 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- ties, struts, axially loaded and eccentric columns bases; Design principles on timber beams and columns

2. Construction Materials

- 2.1 Properties of building materials: physical, chemical, constituents, thermal
- 2.2 Stones - characteristics and requirements of stones as a building materials
- 2.3 Ceramic materials: ceramic tiles, mosaic tile, brick types and testing
- 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; paints and varnishes; polymers
- 2.8 Soil properties and its parameters

3. Concrete Technology

- 3.1 Constituents and properties of concrete
- 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
- 4.2 Contractual procedure and management: types of contract, tender and tender notice, preparation of binding (tender) document, contractors prequalification, evaluation of tenders and selection of contractor, contract acceptance, condition of contract; classification of contractors; dispute resolution; muster roll
- 4.3 Material management: procurement procedures and materials handling
- 4.4 Quality control plan, cost control and quality control mechanisms
- 4.5 Technical Auditing

खाद्य व्यवस्था तथा व्यापार कम्पनी लिमिटेड

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4.6 Variation, alteration and omissions

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
- 6.3 Theory of projection drawing: perspective, orthographic and axonometric projection; first and third angle projection
- 6.4 Drawing tools and equipments
- 6.5 Drafting conventions and symbols
- 6.6 Topographic, electric, 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 measurements and common scales; sources of errors; effect of slop 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; method of contouring
- 7.5 Theodolite traversing :need of traverse and its significance; computation of coordinates; adjustment of closed traverse; closing errors
- 7.6 Use of Total Station and Electronic Distance Measuring Instruments

खण्ड (ख):

8. **Transportation and Trail Bridge**

- 8.1 Transportation system and its classification
- 8.2 Road transport and road construction in Nepal
- 8.3 Classification of roads in Nepal (NRS and IRC)
- 8.4 General principles of road network planning
- 8.5 Feasibility study of road projects
- 8.6 Alignment, engineering survey and its stages
- 8.7 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

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- 8.8 Drainage consideration in roads: Introduction and design of culverts and minor bridges, cross drainage structures, subsurface drainage system
 - 8.9 Special consideration in hill roads design: problems associated with hill roads construction; route location, hairpin bends and special structures
 - 8.10 Road Pavement: Types of pavement and their applicability in hill roads, design of pavement
 - 8.11 Bioengineering practices along hill side
 - 8.12 Activities and techniques in road construction in rural roads
 - 8.13 Maintenance, repair and rehabilitation of roads
 - 8.14 Basic knowledge on design, construction and maintenance of suspended and suspension bridge in Nepal
 - 8.15 Low-cost road construction
9. **Water Supply and Sanitation**
- 9.1 Rural and community based water supply system
 - 9.2 Water supply sources and their management : surface and ground water
 - 9.3 Selection of source
 - 9.4 Water quantity and treatment, water demand and supply, source protection
 - 9.5 Intakes, collection chamber and break pressure tanks
 - 9.6 Reservoir and distribution system : Intakes, pipeline design, design of transmission and distribution system, reservoir design
 - 9.7 Pipe and fittings: pipe materials, pipe laying and fittings
 - 9.8 Operation and maintenance of water supply systems
 - 9.9 Sanitation, wastewater and solid waste management:
 - 9.9.1 On-site sanitation system
 - 9.9.2 Types of sewerage system, design and construction of sewers
 - 9.9.3 Types, characteristics, sources, quantity, generation, collection, transportation and disposal of solid wastes
 - 9.9.4 Sanitary landfill, incineration, composting
 - 9.10 Environment health engineering – epidemiology, pathogens (bacteria, virus, helminthes, protozoa)
10. **Technology and Environment**
- 10.1 Technological development in Nepal
 - 10.2 Initial Environmental Examination and Environmental Impact Assessment
 - 10.3 Government rules and Regulation and procedures for EIA
 - 10.4 General concept of global climate change phenomenon
11. **Energy System**
- 11.1 Hydrological study, planning and design of hydropower projects
 - 11.2 Stages of hydropower development: Reconnaissance, Pre-feasibility, feasibility studies and detailed engineering design
 - 11.3 Head works and design of ROR, PROR and storage type hydropower power plant
 - 11.4 Intake, settling basin, forebay, penstock and its basic design
 - 11.5 Head works, dams, spillways, surge tanks, stilling basin and its basic design
 - 11.6 Selection of turbine
 - 11.7 Generators and their types
 - 11.8 Sediment concentration in hydropower project and its impact
 - 11.9 River diversion works

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11.10 Biogas and alternative energy systems in Nepal

12. Irrigation and River Training Works

- 12.1 Status of irrigation development in Nepal
- 12.2 Methods of irrigation and their suitability
- 12.3 Design of irrigation canals
- 12.4 Operation and maintenance of irrigation systems
- 12.5 Management of farmers managed irrigation system
- 12.6 Preventive and remedial measures of water logging
- 12.7 Flood control, its necessity and flood mitigation measures
- 12.8 River training works
- 12.9 Design, operation and management of hill irrigation systems

13. Housing, Building and Urban Planning

- 13.1 Present status and practices of building construction in Nepal
- 13.2 Specific considerations in design and construction of buildings in Nepal
- 13.3 Indigenous technology in building design and construction
- 13.4 Local and modern building construction material in Nepal
- 13.5 Community buildings (school and hospital) and their design considerations
- 13.6 Urban planning needs and challenges in Nepal

14. Engineering Economics

- 14.1 Benefit cost analysis, cost classification, sensitivity analysis, internal rate of return, time value of money
- 14.2 Economic equilibrium, demand, supply and production, net present value, financial and economic evaluation

15. Engineering Professional Practices

- 15.1 Ethics and professionalism: code of conduct and guidelines for professional engineering practices
- 15.2 Nepal Engineering Council Act, 2055 and Regulation, 2056
- 15.3 Relation with clients, contractor and fellow professionals

भाग (आ)– संस्थागत ज्ञान

खण्ड (ग):

16. संविधान, ऐन र नियमहरू तथा संस्थागत ज्ञान

- 16.1 खाद्य व्यवस्था तथा व्यापार कम्पनी लिमिटेडको परिचय, संगठनात्मक संरचना, कार्यक्षेत्र, विद्यमान अवस्था, सम्भावना र चुनौतीहरू
- 16.2 कम्पनीको प्रबन्धपत्र र नियमावली
- 16.3 खाद्य व्यवस्था तथा व्यापार कम्पनी कर्मचारी सेवा, शर्त र सुविधा सम्बन्धी विनियमावली, २०७९
- 16.4 खाद्य व्यवस्था तथा व्यापार कम्पनी खरिद तथा आर्थिक प्रशासन विनियमावली, २०७९
- 16.5 नेपालको वर्तमान संविधान
- 16.6 संस्थान ऐन, २०२१

खाद्य व्यवस्था तथा व्यापार कम्पनी लिमिटेड

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- 16.7 खाद्य ऐन, २०२३ र खाद्य नियमावली, २०२७
- 16.8 उपभोक्ता संरक्षण ऐन, २०७५
- 16.9 वातावरण संरक्षण ऐन, २०७६ र वातावरण संरक्षण नियमावली, २०७७
- 16.10 कम्पनी ऐन, २०६३
- 16.11 सार्वजनिक खरिद ऐन, २०६३ र सार्वजनिक खरिद नियमावली, २०६४
- 16.12 विदेशी लगानी तथा प्रविधि हस्तान्तरण ऐन, २०७५
- 16.13 मुलुकी देवानी (संहिता) ऐन, २०७४ मा करार कानून सम्बन्धी व्यवस्था
- 16.14 भ्रष्टाचार निवारण ऐन, २०५९
- 16.15 अन्तर्राष्ट्रिय खाद्य तथा कृषि सम्बन्धी संघ संस्थाहरु: इफड (IFAD), खाद्य तथा कृषि संगठन (FAO), विश्व खाद्य कार्यक्रम (WFP) र विश्व व्यापार संगठन (WTO) सम्बन्धी जानकारी
- 16.16 नेपालमा खाद्यान्न उत्पादनको वर्तमान अवस्था, माग र आपूर्ति तथा बजार व्यवस्था
- 16.17 खाद्य सुरक्षा र खाद्य सम्प्रभुता
- 16.18 खाद्य व्यवस्था तथा व्यापार कम्पनी लिमिटेडसँग सम्बद्ध निकायहरु र तिनीहरुबीचको अन्तरसम्बन्ध

प्रथम पत्रको लागि यथासम्भव निम्नानुसार प्रश्नहरु सोधिने छ ।

प्रथम पत्र (वस्तुगत)					
भाग	विषय	खण्ड	परीक्षा प्रणाली	अङ्कभार	प्रश्न संख्या
(अ)	सेवा सम्बन्धी	(क)	बहुवैकल्पिक प्रश्न(MCQs)	४०	२० प्रश्न X २ अङ्क = ४०
		(ख)		४०	२० प्रश्न X २ अङ्क = ४०
(आ)	संस्थागत ज्ञान	(ग)		२०	१० प्रश्न X २ अङ्क = २०

द्वितीयपत्रको लागि यथासम्भव निम्नानुसार प्रश्नहरु सोधिनेछ ।

द्वितीय पत्र (विषयगत)					
भाग	विषय	खण्ड	अङ्कभार	छोटो उत्तर	लामो उत्तर
(अ)	सेवा सम्बन्धी	(क)	५०	४ प्रश्न X ५ अङ्क = २०	३ प्रश्न X १० अङ्क = ३०
		(ख)	५०	४ प्रश्न X ५ अङ्क = २०	३ प्रश्न X १० अङ्क = ३०