नेपाल खाद्य संस्थान
६ तह सिभिल इञ्जिनियर पदको प्रतियोगितात्मक परीक्षाको पाठ्यक्रम

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

प्रथम चरण :– लिखित परीक्षा पूर्णाङ्क :– २००

द्वितीय चरण :– अन्तर्वार्ता पूर्णाङ्क :– ३०

परीक्षा योजना (Examination Scheme)

१. प्रथम चरण : लिखित परीक्षा (Written Examination)पूर्णाङ्क :- २००

पत्र	विषय	पूर्णाङ्क	उत्तीर्णाङ्क	परीक्षा प्रणाली	प्रश्नसंख्या X अङ्क	समय
प्रथम	सिभिल इञ्जिनियरिङ्ग I	१००	४०	वस्तुगत	५० प्रश्न X २ अङ्क = १०० अङ्क	४५ मिनेट
द्वितीय	सिभिल इञ्जिनियरिङ्ग II	१००	४०	विषयगत	१० प्रश्न X १० अङ्क = १०० अङ्क	३ घण्टा

२. द्वितीय चरण : अन्तर्वार्ता(Interview)पूर्णाङ्क :- ३०

विषय	पूर्णाङ्क	परीक्षा प्रणाली
व्यक्तिगत अन्तर्वार्ता	३०	मौखिक

द्रष्टव्य :

१. लिखित परीक्षाको माध्यम भाषा नेपाली वा अंग्रेजी हुनेछ ।

२. प्रथम र द्वितीय पत्रको लिखित परीक्षा छुट्टाछुट्टै हुनेछ ।

३. लिखित परीक्षामा यथासम्भव पाठ्यक्रमका सबै एकाईबाट प्रश्नहरु सोधिनेछ ।

४. 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 ।

५. 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 ।

६. प्रथमचरणको परीक्षाबाट छनौट भएका उम्मेदवारहरुलाई मात्र द्वितीयचरणको परीक्षामा सम्मिलित गराइनेछ ।

७. पाठ्यक्रम लागू मिति :–

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प्रथम पत्रः– सिभिल इञ्जिनियरिङ्ग I

Section (A): 50 Marks

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 stricture- 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 mortor 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

Section (B): 50 Marks

4. Construction Management

4.1 Construction scheduling and planning

4.2 Contractural procedure and management:types of contract,tender and tender notice,preparation of binding (tenser) document,contractors pre-qualification,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 handelling

4.4 Quality control plan, cost control and quality controlmechanisms

4.5 Technical Auditing
4.6 Variation,alteration and omissions

5. Estimating and Costing Valuation and Specification

6.1 Types of estimates and their specific uses
6.2 Methods of calculating quantities
6.3 Key components of estimating norms and rate analysis
6.4 Preparation of bill of quantities
6.5 Purpose,types and importance of specification
6.6 Purpose,principles and methods of valuation

6. Drawing Techniques

5.1 Drawing sheet composition and its essential components
5.2 Suitable scales,site plans,preliminary drawings, working drawings
5.3 Theory of projection drawing:perspective,orthographic and axonometric projection;first and third angle projection
5.4 Drawing tools and equipments
5.5 Drafting conventions and symbols
5.6 Topographic,electric,plumbing and structural drawings
5.7 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

8. Engineering Economics

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

9. Engineering Professional Practices

9.1 Ethics and professionalism: code of conduct and guidelines for professional engineering practices
9.2 Nepal Engineering Council Act,2055 and Regulation,2056
9.3 Relation with clients,contractor and fellow professionals

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नेपाल खाद्य संस्थान
६ तह सिभिल इञ्जिनियर पदको प्रतियोगितात्मक परीक्षाको पाठ्यक्रम

द्वितीय पत्र :– सिभिल इञ्जिनियरिङ्ग II

Section (A): 50 Marks

1. Transportation and Trail Bridge

1.1. Transportation system and its classification
1.2. Road transport and road construction in Nepal
1.3. Classification of roads in Nepal (NRS and IRC)
1.4. General principles of road network planning
1.5. Feasibility study of road projects
1.6. Alignment, engineering survey and its stages
1.7. 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
1.8. Drainage consideration in roads:Introduction and design of culverts and minor bridges, cross drainage structures, subsurface drainage system
1.9. Special consideration in hill roads design:problems associated with hill roads construction; route location, hairpin bends and special structures
1.10. Road Pavement: Types of pavement and their applicability in hill roads, design of pavement
1.11. Bioengineering practices along hill side
1.12. Activities and techniques in road construction in rural roads
1.13. Maintenance, repair and rehabilitation of roads
1.14. Basic knowledge on design, construction and maintenance of suspended and suspension bridge in Nepal
1.15. Low-cost road construction

2. Water Supply and Sanitation

2.1 Rural and community based water supply system
2.2 Water supply sources and their management : surface and ground water
2.3 Selection of source
2.4 Water quantity and treatment,water demand and supply,source protection
2.5 Intakes, collection chamber and break pressure tanks
2.6 Reservoir and distribution system : Intakes,pipeline design,design of transmission and distribution system, reservoir design
2.7 Pipe and fittings:pipe materials, pipe laying and fittings
2.8 Operation and maintenance of water supply systems
2.9 Sanitation,wastewater and solid waste management:
  2.9.1 On-site sanitation system
  2.9.2 Types of sewerage system, design and construction of sewers
  2.9.3 Types, characteristics, sources,quantity,generation,collection,transportation and disposal of solid wastes
  2.9.4 Sanitary landfill,incineration,composing

2.10 Environmenthealth engineering – epidemiology,pathogens(bacteria,virus,helminthes,protozoa)

3. Technology and Environment

3.1 Technological development in Nepal
3.2 Initial Environmental Examination and Environmental Impact Assessment
3.3 Government rules and Regulation and procedures for EIA
3.4 General concept of global climate change phenomenon

Section (B): 50 Marks

4. Energy System

4.1 Hydrological study,planning and design of hydropower projects
4.2 Stages of hydropower development:Reconnaissance,Pre-feasibility,feasibility studies and detailed engineering design
4.3 Head works and design of ROR,PROR and storage type hydropower power plant
4.4 Intake, settling basin,forebay,penstock and its basic design
4.5 Head works,dams,spillways,surge tanks,stilling basin and its basic design
4.6 Selection of turbine
4.7 Generators and their types
4.8 Sediment concentration in hydropower project and its impact
4.9 River diversion works
4.10 Biogas and alternative energy systems in Nepal

5. Irrigation and River Training Works

5.1 Status of irrigation development in Nepal
5.2 Methods of irrigation and their suitability
5.3 Design of irrigation canals
5.4 Operation and maintenance of irrigation systems
5.5 Management of farmers managed irrigation system
5.6 Preventive and remedial measures of water logging
5.7 Flood control,its necessity and flood mitigation measures
5.8 River training works
5.9 Design,operation and management of hill irrigation systems

6. Housing, Building and Urban Planning

6.1 Present status and practices of building construction in Nepal
6.2 Specific considerations in design and construction of buildings in Nepal
6.3 Indigenous technology in building design and construction
6.4 Local and modern building construction material in Nepal
6.5 Community buildings (school and hospital) and their design considerations
6.6 Urban planning needs and challenges in Nepal

7. संविधान, ऐन र नियमहरु तथा खाद्य संस्थान सम्बन्धी

7.1 नेपालको वर्तमान संविधान, २०७२

7.2 संस्थान ऐन, २०२१
7.3 नेपाल खाद्य संस्थानकार्यालय सञ्चालनतथा कर्मचारी सेवा शर्त र सुविधा सम्बन्धी विनियमावली २०६४
7.4 खाद्य ऐन, २०२३ र खाद्य नियमावली, २०२७
7.5 करार ऐन, २०५६
7.6 कम्पनी ऐन, २०६३
7.7 सार्वजनिक खरिद ऐन, २०६३ र सार्वजनिक खरिद नियमावली, २०६४
7.8 उपभोक्ता संरक्षण ऐन, २०५४
7.9 वातावरण संरक्षण ऐन, २०५३
7.10 भ्रष्टाचार निवारण ऐन, २०५९
7.11 नेपाल खाद्य संस्थानको परिचय, संगठनात्मक संरचना, कार्यक्षेत्र, विधमान अवस्था, सम्भावना र चुनौतीहरु
7.12 अन्तर्राष्ट्रिय खाद्य तथा कृषि सम्बन्धी संघ संस्थाहरुः इफड (IFAD),खाद्य तथा कृषि संगठन (FAO),विश्व खाद्य कार्यक्रम (WEP)रविश्व व्यापार संगठन (WTO)सम्बन्धी जानकारी
7.13 नेपालमा खाद्यान्न उत्पादनको वर्तमान अवस्था, माग र आपूर्ति तथा बजार व्यवस्था
7.14 खाद्य सुरक्षा र खाद्य सम्प्रभुता
