नेपाल सरकार
नेपाल कृषि अनुसन्धान परिषद्
पदपूर्ति समिति

ईञ्जिनियर, टि-६ पद/तहको खुला तथा आन्तरिक प्रतियोगितात्मक लिखित परीक्षाको पाठ्यक्रम एवं परीक्षा योजना

यस पाठ्यक्रम योजनालाई दुई चरणमा विभाजन गरिएको छ।

प्रथम चरणः लिखित परीक्षा (Written Examination) पूर्णाङ्कः २००
द्वितीय चरणः अन्तरवार्ता (Interview) पूर्णाङ्कः ३०

१. प्रथम चरणः लिखित परीक्षा (Written Examination) पूर्णाङ्कः २००

पत्र	विषय	पूर्णाङ्क	उत्तिर्णाङ्क	परीक्षा प्रणाली	प्रश्न संख्या x अंक	समय
प्रथम	सिभिल ईञ्जिनियरिङ सम्बन्धी	१००	५०	बस्तुगत	५० प्रश्न x २ अंक = १०० बहुवैकल्पिक प्रश्न (MCQs)	४५ मिनेट
द्वितीय	जनरल विषय सम्बन्धी	१००	५०	विषयगत	८ प्रश्न x ५ अंक = ४० (छोटो उत्तर) ६ प्रश्न x १० अंक = ६० (लामो उत्तर)	३ घण्टा

२. द्वितीय चरणः अन्तरवार्ता एवं सिप परीक्षण (Skill Test & Interview) पूर्णाङ्कः ३०

विषय	पूर्णाङ्क	परीक्षा प्रणाली	समय
अन्तरवार्ता (Interview)	३०	मौखिक	

द्रष्टव्यः

१. यो पाठ्यक्रम योजनालाई प्रथम चरणमा लिखित परीक्षा र द्वितीय चरणमा अन्तरवार्ता परीक्षा गरी दुई चरणमा विभाजन गरिएको छ।
२. प्रशासन र लेखा समूहको समान पद/तहको सामान्य ज्ञान तथा सामाजिक अध्ययन खण्ड (क) को पाठ्यक्रम एउटै भएको कारण एकिकृत परीक्षा सञ्चालन हुनेछ।
३. बस्तुगत बहुवैकल्पिक (Multiple Choice) प्रश्नहरुको गलत उत्तर दिएमा प्रत्येक गलत उत्तर बापत २० प्रतिशत अंक कट्टा गरिनेछ। तर उत्तर नदिएमा त्यस बापत अंक दिइने छैन र अंक कट्टा पनि गरिने छैन।
४. बहुवैकल्पिक प्रश्नहरु हुने परीक्षामा कुनै प्रकारको विद्युतीय उपकरण तथा क्याल्कुलेटर (Calculator) प्रयोग गर्न पाइने छैन।
५. बस्तुगत बहुवैकल्पिक प्रश्न (MCQs) को लागि एक उत्तरपुस्तिका हुनेछ। विषयगत प्रश्नका हकमा दुई वटा (Short Answer को लागि एक तथा Long Answer को लागि एक) उत्तरपुस्तिकाहरु हुनेछन्।
६. प्रत्येक खण्डका लागि छुट्टाछुट्टै उत्तरपुस्तिकाहरु हुनेछन्। परीक्षार्थीले प्रत्येक खण्डका प्रश्नहरुको उत्तर सोही खण्डको उत्तरपुस्तिकामा लेख्नु पर्नेछ।
७. यस पाठ्यक्रम योजना अन्तर्गतका पत्र/विषयका विषयबस्तुमा जेसुकै लेखिएको भएतापनि पाठ्यक्रममा परेका कानून, ऐन, नियम, विनियम तथा नीतिहरु परीक्षाको मिति भन्दा ३ महिना अगाडि (संशोधन भएका वा संशोधन भई हटाइएका वा थप गरी संशोधन भई) कायम रहेकालाई यस पाठ्यक्रममा परेको सम्झनु पर्दछ।
८. प्रथम चरणको लिखित परीक्षाबाट छनौट भएका उम्मेदवारहरुलाई मात्र द्वितीय चरणको अन्तरवार्तामा सम्मिलित गराइने छ।
९. प्रथम चरणको लिखित परीक्षाबाट छनौट भएका उम्मेदवारको प्राप्ताङ्क र द्वितीय चरणको अन्तरवार्तामा प्राप्त गरेको अंक जोडी योग्यताक्रम अनुसार सिफारिस गरिनेछ।
१०. पाठ्यक्रम लागू मितिः
११. यस भन्दा अगाडि लागू भएको पाठ्यक्रम खारेज गरिएको छ।

नेपाल सरकार
नेपाल कृषि अनुसन्धान परिषद्
पदपूर्ति समिति

ईञ्जिनियर, टि-६ पद/तहको खुला तथा आन्तरिक प्रतियोगितात्मक लिखित परीक्षाको पाठ्यक्रम

प्रथम पत्र:
सिभिल ईञ्जिनियरिङ सम्बन्धी

1. Structure Analysis and Design

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 suchas ties, struts, axially loaded and eccentric columns, column 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 (Asphalt, Bitumen and Tar); paints and varnishes; polymers

2.8 Soil properties and its parameters

3. Concrete Technology

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 ofconcrete

3.5 Admixtures

3.6 High strength concrete

3.7 Pre-stressed concrete technology

4. Construction Management

4.1 Construction scheduling and planning: networkt echniques (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 directorder, classifications of contractors; dispute resolution

4.3 Material management: procurement procedures and materials handling
4.4 Cost control and quality control
4.5 Project maintenance
4.6 Occupational health and safety
4.7 Project monitoringand evaluation
4.8 Quality assurance plan
4.9 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 Drafting tools and equipments
6.5 Drafting conventions and symbols
6.6 Topographic, electrical, plumbing and structural drawings
6.7 Techniques offree hand drawing

7. Engineering Survey

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

8.1 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

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 forworks, goods and services and its importance

द्वितीय पत्रः
जनरल विषय सम्बन्धी

Section (A)

1. Transportation and Roads

1.1 Transportation systemand its classification
1.2 Transportation planning: rationale, types and its philosophy
1.3 Road transport and road construction in Nepal
1.4 Classification of roads in Nepal (NRS and IRC)
1.5 General principles of road network planning
1.6 Feasibility study of road projects
1.7 Alignment, engineering surveyand its stages
1.8 Geometric design of roads: map study, element of cross-section and highway alignment, design of horizontal curve, superelevation, transition curve, vertical curves, right ofway
1.9 Drainage consideration in roads:
  1.9.1 Introduction and design of culverts and minor bridges, cross drainage structures, sub surface drainage system
1.10 Special consideration in Hill roadsdesign:
  1.10.1 Problems associated with hill roads construction
  1.10.2 Route location, hairpin bends and special structures
1.11 Road Pavement: Types of pavement and their applicability in hill roads, Design ofpavement
1.12 Bioengineering practices along hill side
1.13 Activities andtechniquesin road constructionin ruralroads
1.14 Maintenance, repair and rehabilitation ofroads
1.15 Role ofsocial mobilization in rural roaddevelopment.
1.16 Low-cost road construction

2. Housing, Building and Urban Planning:

2.1 Present status and practices of building construction in Nepal
2.2 Specific considerations in design and construction of buildings in Nepal
2.3 Indigenous technology in building design and construction
2.4 Local and Modern building construction material in Nepal
2.5 Community buildings: School and hospital buildings and their design considerations
2.6 Urban planning needs and challenges in Nepal

Section (B)

1. Water Supply and Sanitation

1.1 Rural and community based water supply system
1.2 Water supply sources and their management
  1.2.1 Surface water
  1.2.2 Ground water
1.3 Selection ofsource
1.4 Water quality and treatment, water demand and supply, source protection
1.5 Intakes, collection chamber and break pressure tanks
1.6 Reservoir and distribution system
1.7 Intakes, Pipeline design, design of transmission and distribution system, reservoir design
1.8 Pipe and fittings: Pipe materials, pipe laying and fittings
1.9 Operation and maintenance of water supply systems
1.10 Sanitation, waste water and solid waste management:
  1.10.1 On-site sanitation system
  1.10.2 Types of sewerage system, design and construction of sewers
  1.10.3 Types, characteristics, sources, quantity, generation, collection, transportation and disposal of solid wastes
  1.10.4 Sanitary landfill, incineration, composting
1.11 Environmental health engineering - Epidemiology, pathogens (Bacteria,Virus, Helminthes, Protozoa)

2. Irrigation

2.1 Status of irrigation development in Nepal
2.2 Methods of irrigation and their suitability
2.3 Operation and maintenance of irrigation systems
2.4 Management of Farmers managed irrigation system
2.5 Preventive and remedial measures of water logging
2.6 Flood control, its necessity and flood mitigation measures

3. NARC General:

3.1 NARC Act and Administration and Financial By-Laws
3.2 Public Procurement Act/Regulations

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