प्राविधिक शिक्षा तथा व्यावसायिक तालीम परिषद्

नेपाल बनेपा पोलिटेक्निक ईन्स्टिच्यूट

पदपूर्ति उप-समिति

बनेपा, काभ्रेको

निर्माण/सिभिल प्रशिक्षक
(सिभिल इन्जिनियरिङ्ग उप-समूह) (अधिकृत स्तर तृतीय श्रेणी प्राविधिक) पदको
लिखित परीक्षाको पाठ्यक्रम

सेवा : प्राविधिक तथा प्रशिक्षण	प्रशिक्षण समूह : इन्जिनियरिङ्ग प्राविधिक प्रशिक्षण	उपसमूह : सिभिल इन्जिनियरिङ्ग
पद : : निर्माण/सिभिल प्रशिक्षक	स्तर : अधिकृत स्तर तृतीय	
पाठ्यक्रमको रुपरेखा : यस पाठ्यक्रमको आधारमा निम्नानुसार दुई चरणमा परीक्षा लिइनेछ।		
प्रथम चरण : लिखित		परीक्षा पूर्णाङ्ग : १००
द्वितीय चरण : अन्तरवार्ता		पूर्णाङ्ग : २५

प्रथम चरणः लिखित परीक्षा योजना

पत्र	बिषय	खण्ड	परीक्षा प्रणाली	प्रश्न संख्या	अंक भार	समय	पूर्णांक	उत्तीर्णांक
द्वितीय	सेवा सम्बन्धी प्राविधिक विषय	सेवा सम्बन्धी समूह/उपसमूहको प्राविधिक विषय	बस्तुगत बहुउत्तर (Multiple Choice)	२५	२५X२ =५०	३० मिनेट	१००	४०
			बिषयगत (Subjective)	५	५X१०=५०	१ घण्टा ३० मिनेट		

द्वितीय चरण :: अन्तरवार्ता योजना

बिषय	पूर्णांक	परीक्षा प्राणली
अन्तर्वार्ता	२५	मौखिक

निर्माण/सिभिल प्रशिक्षक
(सिभिल इन्जिनियरिङ्ग उप-समूह) (अधिकृत स्तर तृतीय श्रेणी प्राविधिक) पदको
लिखित परीक्षाको पाठ्यक्रम

बिषय: सेवा सम्बन्धी सम्बन्धित प्राविधिक विषय

पूर्णाङ्क - १००

1. Construction Materials

1.1 Properties of Building Materials: Physical, Chemical ,constituents, Thermal etc.
1.2 Stones: Characteristics and Requirements of stones as a Building Materials.
1.3 Ceramic Materials: Ceramic Tiles, Mosaic tiles, Bricks type and Testing etc.
1.4 Cementing Materials: Types and properties of Lime and Cement , Manufacturing Process, Cement Mortar and Different Tests 1.5 Metals : Steels, Types and properties , Alloys
1.6 Timber and Wood : Timber trees in Nepal, Hard and Soft wood , Characteristics of good Timber, Seasoning, Preservation of timber , Plywood, Batten board etc
1.7 Miscellaneous Materials : Asphalt , Bitumen , Paint and Varnishes, Glass, Polymers
1.8 Soil Properties and Parameters.

2. Concrete Technology

2.1 Constituents and Properties of Concrete, water Cement ratio, Grade and strength of concrete , Concrete Mix Design, Testing of Concrete
2.2 Mixing Transportation , Pouring and Curing of concrete
2.3 Admixtures,
2.4 High strength concrete
2.5 Pre stressed concrete Technology

3. Structure Analysis and Design

3.1 Stress and strains, Theory of tension and Flexure, Moment of Inertia, Centre of Gravity
3.2 Analysis of Beams and Frames: Bending Moment, Shear force deflection of beams and frames, determinate structure- Energy Methods , Three hinged system. Indeterminate structures - Slope and deflection method and moment distribution method, Use of influence line Diagrams for simple beams, Unit load Method.
3.3 RCC structures: Difference between working Stress and limit State Philosophy, Analysis of RC Beams, Slabs in bending, shear, deflection, bond and end anchorage, Design of axially loaded Columns, isolated and combined footings, Pre Stressed Concrete.
3.4 Steel and Timber Structures: Standard and Built up Sections , Design of Riveted, Bolted and Welded connections , Design of simple elements(Ties, strut, axially loaded and eccentric Columns, column base), Design principles of on Timber beams and columns

4. Construction Management

4.1 Construction scheduling and Planning: Network techniques,(CPM, PERT) and bar Charts.
4.2 Contractual Procedures and Managements: Types of Contract, Tender and Tender notice, Preparation of Tender document, Contractors Pre Qualification, Evaluation of Tenders and Selection of Contractors, Contract acceptance, Condition of contract, Quotation and direct Order, Dispute Resolution, Muster rool etc.
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 Monitoring and Evaluation
4.8 Variation , Alteration and Omissions

5. Estimating costing and valuation

5.1 Types of estimate and their specific uses
5.2 Methods of Calculating Quantities
5.3 Estimate of: Building Works, Road earthwork, Canal earthwork, Retaining walls , sanitary works , Water Supply works.
5.4 Estimating Norms and Rate analysis
5.5 Bill of Quantities, Specifications and its type and purpose
5.6 Running bill and Final Bills and its Payment procedures
5.7 Valuation : Its Purpose , principles and methods

6. Engineering survey

6.1 Introduction and Basic Principles, Linear Measurement, Chain Survey, Compass Survey, Plane tablurvey, Leveling and Conturing, Abney Level survey, Theodolite Traversing , Tachometry survey, Trigonometrically Leveling , Hydrographic Survey etc
6.2 Use of Total Station and Electronic Distance Measuring Instruments

7 Engineering Economics

7.1 Benefit Cost Analysis, Cost classification, sensitivity analysis, internal rate of return, time value and money, economic equlibrium, demand supply and production, net present value, financial and economic evaluation.

8. Drawing Techniques

8.1 Drawing sheet composition and its essential components
8.2 Suitable scales , site plans ,Preliminary Drawings , Working drawings etc
8.3 Theory of Projection drawings: Perspective , Orthographic and Axonometric Projection, First and Third angle Projection
8.4 Drafting Tools and equipments
8.5 Drafting Symbols
8.6 Topographic, Electrical, plumbing and structural drawings
8.7 Technique of Free Hand Drawing.

9. Irrigation Engineering

9.1 Status of Irrigation Development in Nepal
9.2 Methods of Irrigation, Water Requirements for crops, Duty and delta, Canal Losses etc
9.3 Design of Irrigation Canals.
9.4 Operation and Maintenance of Irrigation Systems
9.5 Water logging: Preventive and remedial Measures
9.6 River training and Slope protection Works
9.7 Specific Consideration in design , operation and management of hill irrigation systems

10. Highway engineering

10.1 Transportation system and its Classification
10.2 Road transport and road construction in Nepal
10.3 Classification of Roads in Nepal
10.4 Feasibility study of road projects
10.5 Road Alignment and engineering survey
10.6 Highway Geometric Design
10.7 Hill roads(Problems associated with hill road construction, Route location, Hairpin bends, special structures)
10.8 Types of Road Pavements and their applicability, Construction procedure of Different types of roads
10.9 Bioengineering practices in hill side
10.10 Activities and techniques in road construction in rural roads
10.11 Maintenance of Roads
10.12 Basic Knowledge on design, construction and Maintenance of Suspended and Suspension Bridge in Nepal (Based on TBSSP Manual)

10.13 Low cost road construction

11. Water supply and Sanitary engineering

11.1 Rural and Community Based water Supply system
11.2 Selection of Source, Water demand
11.3 Water quality and Treatment, water demand and Supply, Source Protection 11.4 Intakes, Break Pressure tank, Collection chamber etc
11.5 Reservoir and Distribution system
11.6 Intakes, Pipe lone design, Design of Transmission and distribution System, Reservoir design
1.7 Pipe and Fittings: Pipe Materials, Pipe laying and Fittings
11.8 Operation and Maintenance of water Supply Systems
11.9 Sanitation, waste water and solid waste management : On site sanitation system. Types of sewerage system , design and Construction of sewers. Types , Characteristics, sources , quantity, generation, collection , transportation and disposal of solid wastes.)
11.10 Sanitary Landfill, incineration, Composting etc
11.11 Environmental Health Engineering: Epidemiology, Pathogens (Bacteria, virus, helminthes, protozoa)

12. Building Construction, Housing and Urban planning

12.1 Load bearing and framed structures, Foundation types and its design
12.2 Types of walls , Types of roofs
12.3 Types of Doors and Windows, Types of Stair and design of Dog legged Stair
12.4 Damp Proofing Methods
12.5 Plastering and pointing
12.6 Shoring, Scaffolding, Underpining, Timbering of Trenches, Formworks
12.7 Present Status and Practices of building construction in Nepal
12.8 Specific Consideration in design and consideration of buildings in Nepal
12.9 Community Buildings: Schools and hospital buildings and their design Considerations
12.10 Local and Modern Building Construction Materials in Nepal
12.11 Urban Planning need and challenges in Nepal

13. Energy System

13.1 Hydrological study, planning and design of small Hydropower Projects
13.2 Head Works , Dam , Spillways, Surge tanks , Stilling basin etc
13.3 River Diversion works
13.4 Biogas- Introduction
13.5 Alternative Energy System in Nepal

14. Soil Mechanics

14.1 Phase Diagrams, Physical Properties of soils and classification tests, Classification of Soils, Permeability of soil, Compaction and Consolidation of soil, Shearing Characteristics of Soil, Bearing capacity of soils, Earth pressure, Stability of slopes etc.

15. Hydraulics and fluid Mechanics

15.1 Properties of Fluid, Hydrostatics and Buoyancy
15.2 Types of Flow, Continuity Equation, Bernoulli equation and its application, Momentum equation, Flow in Curved Path etc
15.3 Uniform and Non Uniform flow in channels
15.4 Analysis of pipe flow, Pipelines and Pipe Systems
15.5 Hydraulic structures(Weirs, Gates, Sluices, Flumes, Spillways etc

॥ समाप्त ॥