सशस्त्र प्रहरी बल नेपाल

प्राविधिक सशस्त्र प्रहरी निरीक्षक (ईन्जिनियर - सिभिल (Civil Engineer)) पदको खुला प्रतियोगितात्मक

लिखित परीक्षाको पाठ्यक्रम

एवं परीक्षा योजना

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

प्रथम चरण :– लिखित परीक्षा — पूर्णाङ्क :– २००

द्वितीय चरण :– अन्तर्वार्ता — पूर्णाङ्क :– ३०

१. प्रथम चरण : – लिखित परीक्षा — **पूर्णाङ्क :– २००**

पत्र	विषय	पूर्णाङ्क	उतीर्णाङ्क	परीक्षा प्रणाली		प्रश्नसंख्या X अङ्क	समय
प्रथम	Technical Subject and General Awareness	१००	४०	वस्तुगत	बहुवैकल्पिक प्रश्न (MCQs)	१०० प्रश्न x १अङ्क	१ घण्टा १५ मिनेट
द्वितीय		१००	४०	विषयगत	छोटो उत्तर लामो उत्तर	६ प्रश्न X ५ अङ्क ४ प्रश्न X १० अङ्क	३ घण्टा
					समस्या समाधान	२ प्रश्न X १५ अङ्क	

२. द्वितीय चरण : – अन्तर्वार्ता

विषय	पूर्णाङ्क	उतीर्णाङ्क	परीक्षा प्रणाली		समय
अन्तर्वार्ता	३०	-	मौखिक		

द्रष्टव्य :

१. लिखित परीक्षाको माध्यम भाषा नेपाली वा अंग्रेजी अथवा नेपाली र अंग्रेजी दुवै हुनेछ ।

२ प्रथम र द्वितीय पत्रको पत्रको विषयवस्तु एउटै हुनेछ ।

३ प्रथम र द्वितीय पत्रको लिखित परीक्षा छुट्टाछुट्टै हुनेछ ।

४. लिखित परीक्षामा यथासम्भव पाठ्यक्रमका सबै एकाईबाट प्रश्नहरु सोधिनेछ ।

५. 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 ।

६. विषयगत प्रश्नमा प्रत्येक पत्र/विषयका प्रत्येक खण्डका लागि छुट्टाछुट्टै उत्तरपुस्तिकाहरु हुनेछन् । परिक्षार्थीले प्रत्येक खण्डका प्रश्नहरुको उत्तर सोही खण्डका उत्तरपुस्तिकामा लेख्नुपर्नेछ ।

७ 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 ।

८. प्रथम चरणको परीक्षाबाट छनौट भएका उम्मेदवारहरुलाई मात्र द्वितीय चरणको परीक्षामा सम्मिलित गराइनेछ ।

९. पाठ्यक्रम लागू मिति :- २०७५/०४/२० गते/

२०७५।४।२०

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प्रथम तथा द्वितिय पत्र :- **Technical Subject and General Awareness**

Part I : Technical Subject

Section - (A)

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 such as 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, etc.

2.2 Stones – characteristics and requirements of stones as a binding 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 (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 Admixtures

3.5 High strength concrete

3.6 Pre-stressed concrete technology

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Section - (B)

4. Construction Management

4.1 Construction scheduling and planning: networks techniques(CPM,PERT) and bar charts

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; quotation and direct order ,classification of contractors; dispute resolution; muster roll

4.3 Material management: procurement procedures and materials handelling

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 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 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

Section - (C)

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. 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 Regulations, 2056

9.3 Relation with clients, contractor and fellow professionals

9.4 Public procurement practices for works, goods and services and its importance

10. Transportation and Trail Bridge

10.1 Transportation system and its classification

10.2 Transportation planning: rationale, types and its philosophy

10.3 Road transport and road construction in Nepal

10.4 Classification of roads in Nepal (NRS and IRC)

10.5 General principles of road network planning

10.6 Feasibility study of road projects

10.7 Alignment, engineering survey and its stages

10.8 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

10.9 Drainage consideration in roads

10.9.1 Introduction and design of culverts and minor bridges, cross drainage structures, subsurface drainage system

10.10 Special consideration in hill roads design

10.10.1 Problems associated with hill roads construction

10.10.2 Route location, hairpin bends and special structures

10.11 Road pavements: types of pavement and their applicability in hill roads, design of pavement

10.12 Bio engineering practices along hill side
10.13 Activities and techniques in road construction in rural roads
10.14 Maintenance, repair and rehabilitation of roads
10.15 Basic knowledge on design, construction and maintenance of suspended and suspension bridge in Nepal
10.16 Role of social mobilization in rural road development
10.17 Low-cost road construction

11. Water Supply and Sanitation

11.1 Rural and community based water supply system
11.2 Water supply sources and their management : surface and ground water
11.3 Selection of source
11.4 Water quantity and treatment, water demand and supply, source protection
11.5 Intakes, collection chamber and break pressure tanks
11.6 Reservoir and distribution system
11.7 Intakes, pipeline design, design of transmission and distribution system, reservoir design
11.8 Pipe and fittings: pipe materials, pipe laying and fittings
11.9 Operation and maintenance of water supply systems
11.10 Sanitation, wastewater and solid waste management:
  11.10.1 On-site sanitation system
  11.10.2 Types of sewerage system, design and construction of sewers
  11.10.3 Types, characteristics, sources, quantity, generation, collection, transportation and disposal of solid wastes
11.11 Sanitary landfill, incineration, composing, etc.
11.12 Environment health engineering – epidemiology, pathogens (bacteria, virus, helminthes, protozoa)

12. Energy System

12.1 Hydrological study, planning and design of small, medium and large hydropower projects
12.2 Stages of hydropower development: Reconnaissance, Pre-feasibility, feasibility studies and detailed engineering design
12.3 Head works and design of ROR,PROR and storage type hydropower power plant
12.4 Methods of fixing installed capacity of a hydropower plant
12.5 Estimation of power and energy
12.6 Intake, settling basin, forebay, penstock and its basic design
12.7 Head works, dams, spillways, surge tanks, stilling basin and its basic design
12.8 Selection of turbine
12.9 Generators and their types
12.10 Purpose and working principle of Governors
12.11 Sediment concentration in hydropower project and its impact
12.12 River diversion works

12.13 Biogas-Introduction
12.14 Alternative energy systems in Nepal

Section - (D)

13. Irrigation and River Training Works

13.1 Status of irrigation development in Nepal
13.2 Methods of irrigation and their suitability
13.3 Design of irrigation canals
13.4 Operation and maintenance of irrigation systems
13.5 Management of farmers managed irrigation system
13.6 Preventive and remedial measures of water logging
13.7 Flood control, its necessity and flood mitigation measures
13.8 River training works
13.9 Specific considerations in design, operation and management of hill irrigation systems

14. Housing, Building and Urban Planning

14.1 Present status and practices of building construction in Nepal
14.2 Specific considerations in design and construction of buildings in Nepal
14.3 Indigenous technology in building design and construction
14.4 Local and modern building construction material in Nepal
14.5 Community buildings: school and hospital buildings and their design considerations
14.6 Urban planning needs and challenges in Nepal

15. Technology, Environment and Civil Society

15.1 Technological development in Nepal
15.2 Promotion of local technology and its adaptation
15.3 Environmental Impact Assessment (EIA), Initial Environmental Examination (IEE), Global warming phenomena
15.4 Types of sources of pollution: point/non-point (for air and water)
15.5 Social mobilization in local infrastructure development and utilization in Nepal
15.6 Participatory approach in planning, implementation, maintenance and operation of local infrastructure

Part II: General Awareness

Section - (E)

1. सामान्य ज्ञान

1.1 नेपालको भौगोलिक, ऐतिहासिक, आर्थिक, सामाजिक, सांस्कृतिक र राजनैतिक अवस्था सम्बन्धी सामान्य जानकारी
1.2 राष्ट्रिय र अर्न्तराष्ट्रिय महत्वका समसामयिक घटनाहरु : राजनैतिक, आर्थिक, वैज्ञानिक, खेलकूद, सूचना प्रविधि, पुरस्कार

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1.3 विद्यमान नेपालको संविधानको सामान्य जानकारी
1.4 सशस्त्र प्रहरी बल र सुरक्षा निकाय सम्बन्धी सामान्य जानकारी
1.5 सशस्त्र प्रहरी ऐन, २०५८ र सशस्त्र प्रहरी नियमावली, २०७२

2. **विविध**
   2.1 व्यवस्थापनको अवधारणा र प्रकार
   2.2 निर्देशन
   2.3 नेतृत्व
   2.4 उत्प्रेरणा
   2.5 निर्णय प्रक्रिया
   2.6 द्वन्द व्यवस्थापन
   2.7 समावेशीकरण

प्रथम तथा द्वितीय पत्रमा यथासम्भव निम्नानुसार प्रश्नहरु सोधिनेछ।

प्रथम पत्र				
Part	**Section**	**अङ्कभार**	**प्रश्न संख्या**	
			वस्तुगत	**विषयगत**
I	**A**	१५	१५ प्रश्न x १ अङ्क = १५	-
	B	२५	२५ प्रश्न x १ अङ्क = २५	-
	C	२५	२५ प्रश्न x १ अङ्क = २५	-
	D	१५	१५ प्रश्न x १ अङ्क = १५	-
II	**E**	२०	२० प्रश्न x १ अङ्क = २०	-
द्वितीय पत्र				
Part	**Section**	**अङ्कभार**	**प्रश्न संख्या**	
			विषयगत	**समस्या समाधान**
I	**A**	२०	४ प्रश्न x ५ अङ्क = २० ४ प्रश्न x १० अङ्क = ४०	२ प्रश्न x १५ अङ्क = ३०
	B	३०		
	C	३०		
	D	२०		
II	**E**	१०	२ प्रश्न x ५ अङ्क = १०	-