नेपाली सेना

श्री भर्ना छनौट निर्देशनालय कार्यरथी विभाग

जंगी अड्डा

प्रा.उ.से. सिभिल ईन्जिनियर (आन्तरिक) पदको लिखित परीक्षाको पाठ्यक्रम

२०७७

प्रा.उ.से. सिभिल ईन्जिनियर (आन्तरिक)पदको लिखित परिक्षाको पाठ्यक्रम योजना

समयः-४ घण्टा १५ मिनेट

पूर्णाङ्कः-१५०
उत्तीर्णाङ्कः- ६०

यो पाठयक्रम नेपाली सेनाको सैनिक प्राविधिक सेवा , सैनिक ईन्जिनियरिङ्ग समुह , सिभिल तथा आर्किटेक्चर उप-समुह अन्तर्गत प्रा.उ.से. सिभिल ईन्जिनियर (आन्तरिक) पदको उम्मेदवार छनौट परिक्षाको लागि निर्धारण गरिएको हो । लिखित परीक्षामा सरिक हुने उम्मेदवारहरुको पेशा सम्बन्धी विषय र पेशागत विषयको प्रयोगात्मक परिक्षाको लागी निम्न विषयहरुलाई आधार मानि प्रश्नहरु सोधिनेछ।

(क) लिखित परीक्षाको माध्यम नेपाली/अंग्रेजी वा दुवै भाषा हुनेछ ।
(ख) लिखित परीक्षाबाट छनौट भएका उम्मेदवारहरुलाई मात्र अर्को चरणको परीक्षामा सम्मिलित गराईनेछ ।
(ग) प्रश्नपत्र निर्माण गर्दा पाठ्क्रममा समावेश भएका सबै विषयहरुलाई यथासंभव समिटनेछ ।
(घ) बस्तुगत र विषयगत संयुक्त रुपमा पूर्णाङ्क र उत्तीर्णाङ्क कायम गरिनेछ ।
(ङ) बस्तुगत र विषयगत परीक्षाको पाठ्यक्रम एउटै हुनेछ ।
(च) बस्तुगत र विषयगत विषयको लिखित परीक्षा एकैपटक वा छुट्टाछुट्टै गरी लिन सकिनेछ ।
(छ) यो पाठ्यक्रम मिति २०७७/०६/१४ गतेबाट लागु हुनेछ ।

लिखित परिक्षा योजना र पाठ्यक्रम

विषय	पूर्णाङ्क	उत्तीर्णाङ्क	परिक्षा प्रणाली		प्रश्नकोसंख्याx अंक	समय
पेशा सम्वन्धि	७५	६०	वस्तुगत (Objective)	बहु बैकल्पिक प्रश्न (Objective)	७५ प्रश्न X१अङ्क= ७५	१ घण्टा १५ मिनेट
	७५		विषयगत (Subjective)	छोटोउत्तर	९ प्रश्नX५ अङ्क = ४५	३ घण्टा
				लामोउत्तर	३ प्रश्नX१० अङ्क = ३०	

लिखित परीक्षाको पाठ्यक्रम

PART-A
OBJECTIVE TYPE

1. **Construction Materials**
   - 1.1. Properties of building materials; physical, chemical, constituents, thermal etc.
   - 1.2. Stones: characteristics and requirements of stones as a binding materials
   - 1.3. Ceramic materials: ceramic tiles, mosaic tile, brick type and testing
   - 1.4. Cementing materials: types and properties of lime and cement; cement mortar tests
   - 1.5. Metals: Steel; types and properties; Alloys
   - 1.6. Timber and wood: timber trees in Nepal, types and properties of wood
   - 1.7. Miscellaneous materials: Asphaltic materials (Asphalt, Bitumen and Tar); paints and varnishes; polymers

2. **Concrete Technology**
   - 2.1. Constituents and properties of concrete (physical and chemical)
   - 2.2. Water cement ratio
   - 2.3. Grade and strength of concrete, concrete mix design, testing of concrete
   - 2.4. Mixing, transportation, pouring and curing of concrete
   - 2.5. Admixtures

3. **Construction Management**
   - 3.1. Construction scheduling and planning: networks techniques (CPM, PERT) and bar charts
   - 3.2. Contract procedure and management: types of contract, tender and tender notice, preparation of bidding 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
   - 3.3. Material management: procurement procedures and materials handling
   - 3.4. Cost control and quality control
   - 3.5. Project maintenance
   - 3.6. Occupational health and safety
   - 3.7. Project monitoring and evaluation
   - 3.8. Quality assurance plan
   - 3.9. Variation, alteration and omissions

4. **Drawing techniques**
   - 4.1. Drawing sheet composition and its essential components
   - 4.2. Suitable scales, site plans, preliminary drawings, working drawings
   - 4.3. Theory of projection drawing: perspective, orthographic and axonometric projection; first angle and third angle projection
   - 4.4. Drawing tools and equipments
   - 4.5. Drafting conventions and symbols
   - 4.6. Topographic, electric, plumbing and structural drawings
   - 4.7. Techniques of free hand drawing

5. **Engineering survey**
   - 5.1. Introduction and basic principles
   - 5.2. Linear measurements; chain, tape, ranging rod, and arrows, representation of measurements and common scales; source of error; effect of slope and slope correction for chain and tape measurements; abney level and clinometers

5.3. Compass and plane table surveying: bearing; types of compass; problem and source of error of compass survey; principles and method of plane tabling
5.4. Levelling and contouring: Principle of levelling; temporary and permanent adjustment of level; bench marks; booking method and their reduction; longitudinal and cross sectioning; reciprocal leveling; trigonometric leveling; contour interval and characteristics of contours; method of contouring
5.5. Theodolite traversing: need of traverse and its significance; computation of coordinates; adjustment of closed traverse; closing errors
5.6. Uses of total station and electronic distance measuringinstruments

6. **Engineering Economics**

6.1. 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

7. **Professional practices**

7.1. Ethics, integrity and professionalism: code of conduct and guidelines for professional engineering practices
7.2. Nepal Engineering Council Act, 2055 and regulation, 2056
7.3. Relation with clients, contractor and fellow professionals
7.4. Public procurements practices for works, good and services and its importance
7.5. Building Bylaws

PART-B

SUBJECTIVE TYPE

1. **Highway Engineering**

1.1. **General**

1.1.1. Introduction to transportation systems
1.1.2. Classification of road in Nepal
1.1.3. Basic requirements of road alignment

1.2. **Geometric Design**

1.2.1. Basic design control and criteria for design
1.2.2. Elements of cross section, typical cross-section for all roads in filling and cutting
1.2.3. Camber
1.2.4. Determination of radius of horizontal curves
1.2.5. Super elevation
1.2.6. Sight distances
1.2.7. Gradient

1.3. **Drainage System**

1.3.1. Importance of drainage system and requirements of a good drainage system
1.4. Road Pavement
1.4.1. Pavement structure and its components: subgrade, sub-base, base and surface courses

1.5. **Road Machineries**

1.5.1. Earth moving and compacting machines

2. **Water Supply and Sanitation Engineering**

2.1. **General**

2.1.1. Objectives of water supply system

2.1.2. Sourceof water and its selection: gravity and artisan springs, shallow and deep wells; infiltration galleries.

2.2. **Gravity Water Supply System**

2.2.1. Design period

2.2.2. Determination of daily water demand

2.2.3. Determination of storage tank capacity

2.2.4. Selection of pipe

2.3. **Design of Sewer**

2.3.1. Quantity of sanitary sewage

2.3.2. Maximum, Minimum and self-cleaning velocity

3. **Estimating and Costing Valuation and Specification**

3.1. Types of estimates and their specific uses

3.2. Methods of calculating quantities

3.3. Key components of estimating norms and rate analysis

3.4. Preparation of bill of quantities

3.5. Purpose, types and importance of specification

3.6. Purpose, principles and methods of valuation

4. **Energy System**

4.1. Stages of hydropower development: Reconnaissance, Pre-feasibility, feasibility studies and detailed engineering design

4.2. Intake, settling basin, forebay, penstock and its basic design

4.3. Head works, dams, spillways, surge tanks, stilling basin

4.4. Selection of turbine

4.5. Generators and their types

4.6. Biogas-Introduction

4.7. Alternative energy systems in Nepal

5. **Technology, Environment and Civil Society**

5.1. Technological development in Nepal

5.2. Promotion of local technology and its adaptation

5.3. Environmental Impact Assessment (EIA), Initial Environment Examination (IEE), Global warming phenomena

5.4. Types of sources of pollution: point/non point (for air and water)

5.5. Social mobilization in local infrastructure development and utilization in Nepal

5.6. Participatory approach in planning, implementation, maintenance and operation of local infrastructure

PART-A
FOR OBJECTIVE QUESTION

Specification Grid			
Units	Objective		Total Marks
	No of Questions	Marks	
1. Construction Materials			
1.1	2	2	
1.2	2	2	
1.3	3	3	
1.4	2	2	**15**
1.5	2	2	
1.6	2	2	
1.7	2	2	
2. Concrete Technology			
2.1	2	2	
2.2	3	3	
2.3	2	2	**12**
2.4	3	3	
2.5	2	2	
3. Construction Management			
3.1	2	2	
3.2	1	1	
3.3	2	2	
3.4	2	2	
3.5	1	1	**14**
3.6	2	2	
3.7	1	1	
3.8	2	2	
3.9	1	1	
4. Drawing techniques			
4.1	1	1	
4.2	2	2	
4.3	1	1	
4.4	2	2	**10**
4.5	1	1	
4.6	2	2	
4.7	1	1	
5. Engineering survey			
5.1	2	2	
5.2	2	2	
5.3	2	2	**12**
5.4	2	2	
5.5	2	2	
5.6	2	2	
6. Engineering Economics			
6.1	7	7	**7**

7. Professional practices			
7.1	1	1	5
7.2	1	1	
7.3	1	1	
7.4	1	1	
7.5	1	1	
Total	75	75	**75**

PART-B

FOR SUBJECTIVE QUESTION

Specification Grid					
Units	Subjective (Short Questions)		Subjective (Long Questions)		Total Marks
	No of Questions	Marks	No of Questions	Marks	
1. Highway Engineering					**20**
1.1	2	10	1	10	
1.2					
1.3					
1.4					
1.5					
2. Water Supply and Sanitation Engineering					**15**
2.1	3	15	_	_	
2.2					
2.3					
3. Estimating and Costing Valuation and Specification					**15**
3.1	1	5	1	10	
3.2					
3.3					
3.4					
3.5					
3.6					
4. Energy System					**10**
4.1	2	10	_	_	
4.2					
4.3					
4.4					
4.5					
4.6					
4.7					
5. Technology, Environment and Civil Society					**15**
5.1	1	5	1	10	
5.2					
5.3					
5.4					
5.5					
5.6					
Total	9	45	3	30	**75**

प्रा.उ.से. सिभिल ईन्जिनियर (आन्तरिक) पदको प्रयोगात्मक परिक्षा

समयः १ घण्टा पूर्णाङ्क :५०

उत्तीर्णाङ्कः २५

क्र.सं.	विषयवस्तु शिर्षक	अंक भार	समय
१	Building layout as per drawing	२५	३० मिनेट
२	Setting out simple circular curve	२५	३० मिनेट

समाप्त