

नेपाली सेना

प्रा.उ.से. वेपनरी इन्जिनियर (खुला) पदको पेशा सम्बन्धी विषयको

लिखित परीक्षा योजना र पाठ्यक्रम

समय : २ घण्टा ३० मिनेट

पूर्णाङ्क : १००

उत्तीर्णाङ्क : ४०

यो पाठ्यक्रम नेपाली सेनाको विभिन्न ईकाईहरूमा रिक्त रहेको प्रा.उ.से. वेपनरी इन्जिनियर पदका उम्मेदवार छनौट परीक्षाको लागि निर्धारण गरिएको हो । लिखित परीक्षामा सरिक हुने उम्मेदवारहरूको पेशा सम्बन्धि विषयलाई आधारमानी प्रश्नहरूसोधिने छ ।

- (क) लिखित परीक्षाको माध्यम नेपाली/अंग्रेजी वा दुवै भाषा हुनेछ ।
- (ख) लिखित परीक्षाबाट छनौट भएका उम्मेदवारहरूलाई मात्र अर्को चरणको परीक्षामा सम्मिलित गराईने छ ।
- (ग) प्रश्ना पत्र निर्माण गर्दा पाठ्यक्रममा समावेश भएका सबै विषयहरूलाई समेटिनेछ ।
- (घ) नेपाली सेनाको आवश्यकता तथा विविध परिस्थितमा नेपाली सेना अनुकूल हुने गरी उल्लेखित विवरणहरूमा हेरफेर हुन सक्नेछ ।
- (ङ) पाठ्यक्रमको रूपरेखा देहायमा उल्लेख गरे अनुसार हुनेछ ।
- (च) पाठ्यक्रम लागु मिति २०७५/०३/२७ गतेदेखि ।

प्रा.उ.से. वेपनरी इन्जिनियर (खुला) पदको पेशा सम्बन्धी विषयको लिखित परीक्षा योजना

र पाठ्यक्रम

विषय	पूर्णाङ्क	उत्तीर्णाङ्क	परीक्षा प्रणाली		प्रश्न संख्या X अङ्क	समय
पेशा सम्बन्धी	१००	४०	वस्तुगत (Objective)	बहुवैकल्पिकप्रश्न (MCQs)	४० प्रश्नX १ अङ्क = ४०	२ घण्टा ३० मिनेट
			विषयगत (Subjective)	छोटो उत्तर	६ प्रश्नX ५ अङ्क= ३०	
				लामो उत्तर	३ प्रश्नX १० अङ्क= ३०	

प्रा.उ.से. वेपनरी इन्जिनियर (खुला) पदको पेशा सम्बन्धी विषयको पाठ्यक्रम

Section I:

1. Weapon System

- 1.1 Weaponry Inspection Technology
- 1.2 General Course of Infantry weaponry
- 1.3 Principle of Infantry Weaponry
- 1.4 General Introduction and Principle of Artillery Weaponry
- 1.5 General Course of Air- Defense Weaponry
- 1.6 Principle of Air Defense Weaponry
- 1.7 General Course of Science & Technology of Weaponry
- 1.8 Weapon system Application & Engineering
- 1.9 Weapon Principle & Structure
- 1.10 General Design of Weapon System
- 1.11 Operation of Basic Weapon of Infantry
- 1.12 Light Gun System: Introduction and Principle & Mechanism of Light Gun System
- 1.13 Anti-Air Craft Gun: Principle & Mechanism of Anti-Air Craft Gun
- 1.14 Weapon Firing Command
- 1.15 Missile: Portable Missile Basic Principle & Mechanism QW-2

2. Principle of Artillery Equipment

- 2.1 Gun and howitzer
- 2.2 Basic of Ordnance, Projectile, Obturation, Bore, lands, Caliber length, Driving board, Short seating, Extraction, Recoil, Recoil cycle, Run up, Commencement of Rifling (C of R), Quarter of life, Range, (Safety Arrangement) and Gun Safety
- 2.3 Traveling/Elevating gear, Recoil system, Breech mechanism, Breech block, Balancing gear, Equilibrator, Muzzle break, firing mechanism, miss fire, Calibration
- 2.4 Sighting system and terminology used
- 2.5 Inspection and Examination of Artillery Equipments, pre firing check Gauges and tools, Sentencing Procedure
- 2.6 Lubrication and cooling system

Section II:

3. Material Science and Metallurgy

- 3.1 Basic concepts on structure of solids
- 3.2 Crystalline materials
- 3.3 Imperfections in atomic arrangement
- 3.4 Alloys and binary phase diagrams
- 3.5 Iron-carbon equilibrium diagram
- 3.6 Types of steel
- 3.7 Heat treatment of steels
- 3.8 Plastics
- 3.9 Ceramics and composite materials
- 3.10 Criteria for material selection in weapon system

4. Machine Component Design and Drawing

- 4.1 Types of projection, sectional views, auxiliary views
- 4.2 Developments and Intersections
- 4.3 Production Drawings
- 4.4 Terminologies of mechanisms
- 4.5 Mobility and Degrees of Freedom
- 4.6 Design Process
- 4.7 Basic design consideration of weaponry system
- 4.8 Factors affecting choice of materials for design: Strength, Toughness, Durability, Hardness
- 4.9 Loading: Tensile, Compressive, Shearing, Bending, Bearing and Torsion
- 4.10 Common Types of Failure in guns: theories of failure, stress concentration effects, ductile and brittle materials, factor of safety

5. Workshop Technology

- 5.1 Workshop hand tools and basic hand operations
- 5.2 Metal Forming: basic principles of forging, drawing and extrusion
- 5.3 Metal Casting: Gating and Riser design, melting furnaces
- 5.4 Metallurgy of Welding
- 5.5 Principles of Gas, Arc, Shielded Arc Welding, Weldability
- 5.6 Machine tools: Lathe, Shaper, Milling, Grinding, Drilling Machines.
- 5.7 Metal Cutting: Turning, Methods of Screw Production, Drilling, Boring, Milling, Gear Manufacturing, and Production of flat surfaces
- 5.8 Grinding and finishing processes
- 5.9 Cutting Tools Materials
- 5.10 Fits and tolerances, Linear Measurement

6. Thermodynamics

- 6.1 Basic concepts, open and closed systems, heat and work
- 6.2 Zeroth, First and Second Law of thermodynamics

- 6.3 Properties of ideal gases and vapors
- 6.4 Thermodynamic Cycles: Carnot cycle, Otto cycle, Diesel cycle, Brayton cycle, Rankine cycle
- 6.5 Refrigeration: Reversed Carnot cycle, vapor compression cycle, absorption refrigeration systems, Refrigerants and their properties
- 6.6 Air Conditioning: Psychometric properties and psychometric chart, heating, cooling, humidification and dehumidification process
- 6.7 Heat generation and heat dissipation method in weaponry system

7. Fluid Mechanics

- 7.1 Properties and classification of fluids, forces on immersed surfaces, center of pressure, buoyancy, elements of stability of floating bodies
- 7.2 Equations of Fluid Flow: types of flow, continuity equation, Bernoulli's equation, and momentum equation, fully developed flow through pipes, pressure drop calculations, measurement of flow rate and pressure drop
- 7.3 Application of fluid mechanics and hydraulics in weaponry engineering

8. Engineering Mathematics

- 8.1 Linear Algebra and Matrices, Vector Algebra and Calculus, Differential Equations, Integral Equations, Calculus of Variations Approximation,
- 8.2 Engineering Statistics, Numerical Methods,

9. Engineering Economics

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

Section III:

10. Computer

- 10.1 Input and Output Formatted input/output, Character input/output, Programs using input/output statements
- 10.2 Basics of Computer Technology
- 10.3 Basic Network Technology
- 10.4 Basic Information Technology

11. Control System

- 11.1 Component Modeling, Linearization: Differential equation and transfer function notations, State-space formulation of differential equations, matrix notation, Mechanical components: mass, spring, damper, Electrical components: inductance, capacitance, resistance, sources, motors, tachometers, transducers, operational amplifier circuit, Fluid and fluidic components, Thermal system components, Mixed system, Linearized approximations of nonlinear characteristics

- 11.2 System Transfer Functions and Responses: Combinations of components to physical systems, Block diagram algebra and system reduction, Mason's loop rules, Laplace transform analysis of systems with standard input functions - steps, ramps, impulses, sinusoids, Initial and final steady-state equilibrium of systems, Principles and effects of feedback on steady-state gain, bandwidth, error magnitude, dynamic responses
- 11.3 Stability Heuristic interpretation of the conditions for stability of a feedback system, Characteristic equation, complex plane interpretation of stability, root locations and stability, Routh-Hurwitz criterion, eigen value criterion, Setting loop gain using the R-H criterion, Relative stability from complex plane axis shifting
- 11.4 Application and Importance of control system in weaponry system

12. Logic Circuit

- 12.1 Digital Logic, the basic gates (NOT, OR, AND) universal logic gates (NOR, NAND) AND -OR- INVERT gates
- 12.2 Combinational Logic Circuits Boolean Laws and Theorems, Truth Table

Section IV:

13. Maintenance Management

- 13.1 Maintenance objectives and maintenance costs
- 13.2 Workshop Layout
- 13.3 Inspection and Types
- 13.4 Types of maintenance schemes
- 13.5 Basic maintenance decisions
- 13.6 Occupational safety and health
- 13.7 Basics of military management
- 13.8 Need and importance of inspection and maintenance for operational readiness of military equipment

यस पेशा सम्बन्धी विषयको पाठ्यक्रमका एकाईहरूबाट सोधिने प्रश्नहरूको संख्या निम्नानुसार हुनेछ ।

एकाइ नं. (Unit No.)	अङ्कभार (Weightage)	बहु वैकल्पिक प्रश्न (MCQs) को संख्या	छोटो उत्तर प्रश्नको संख्या	लामो उत्तर प्रश्नको संख्या
Section I	५०	४० प्रश्न x १अङ्क	६ प्रश्न X ५अङ्क	३ प्रश्न X १०अङ्क
Section II	२५			
Section III	२०			
Section IV	५			
जम्मा	१००	४० प्रश्न x १अङ्क = ४० अङ्क	६ प्रश्न X ५अङ्क = ३० अङ्क	३ प्रश्न X १० अङ्क = ३० अङ्क

प्रा.उ.से. वेपनरी इन्जिनियर (खुला) पदको पेशागत विषयको
प्रयोगात्मक परीक्षा

समय : २ घण्टा

पूर्णाङ्क : ५०

उत्तीर्णाङ्क : २५

क्र.सं.	विषयवस्तु शीर्षक	अंक भार	समय
१	AD Gun and Small Arms Parts Identification	२५	१ घण्टा
२	General Layout of different AD Guns and Viva	२५	१ घण्टा