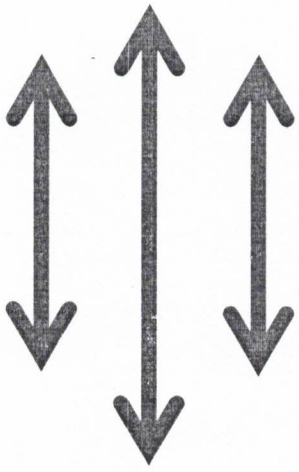
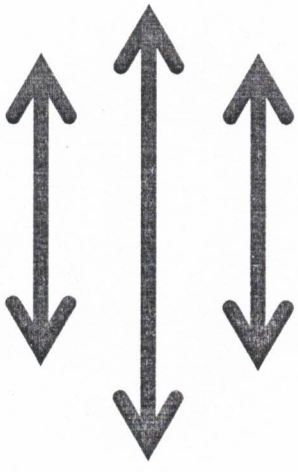
नेपाली सेना
श्री भर्ना छनौट निर्देशनालय, कार्यरथी विभाग,
जंगी अड्डा



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



२०७७

नेपाली सेना

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

समय: ४ घण्टा

पुर्णाङ्क : १५०
उत्तीर्णाङ्क : ६०

यो पाठ्यक्रम नेपाली सेनाको प्रा.उ.से. कम्प्युटर ईन्जिनियर (आन्तरिक) पदका उम्मेदवार छनौट परीक्षाको लागि निर्धारण गरिएको हो । लिखित परीक्षामा सरिक हुने उम्मेदवारहरुको पेशा सम्बन्धी विषयलाई आधारमानी प्रश्नहरु सोधिने छ ।

(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 २०७७/०६/०८ गतेबाट लागु हुनेछ ।

लिखित परीक्षाको योजना र पाठ्यक्रम

विषय	पूर्णाङ्क	उत्तिर्णाङ्क	परीक्षा प्रणाली		प्रश्न संख्या अङ्क	समय
पेशा सम्वन्धि	७५	६०	बस्तुगत (Objective)	बहुवैकल्पिक प्रश्न (MCQs) ७५	७५ प्रश्न x १ अङ्क=७५	१ घण्टा
	७५		विषयगत (Subjective)	छोटो उत्तर ७x ५= ३५	७ प्रश्न x ५ अंङ्क =३५	३ घण्टा
				लामो उत्तर ४x १० =४०	४ प्रश्न x १० अङ्क =४०	

लिखित परीक्षाको पाठ्यक्रम

S. N.	Topics	No. of Questions		Total Marks
		Objective	Subjective Questions	
1	**1. Operating System:** 1.1 OS Fundamentals: Definition of OS, Functions of OS, Components of OS, Types of Operating System, Application Software vs System Software, LINUX vs. UNIX, 1.2 Process Management: Process Control Block, Concept of Threads, User level and Kernel level Threads, Process vs. Threads 1.3 Process Scheduling: Concept of Process Scheduling: FCFS, SPN, SRT, Round Robin, 1.4 Deadlock:Definition, Necessary Conditions of the Dead Lock, Avoidance, Prevention and Recovery examples	**7**	**10**	**17**
2	**2. Computer Organization and Architecture** 2.1 Computer Organization Fundamentals: Instruction Cycle, CPU Bus Structure, Codes, Micro-operations (Arithmetic, Logic and Shift), Von Neumann/Harvard Architecture, Gray Code 2.2CPU: CPU Design, RISC vs. CISC, One address and two address instruction, Instruction Format, 2.3 Control Unit: Design of control unit, Hardwired control, MicroProgrammed Control 2.4 Memory: Cache memory principles, Elements of Cache design, Cache size, mapping function	**8**	**5**	**13**
3	**3. Computer Network** 3.1 OSI model vs TCP/IP model; Half and Full Duplex Ethernet, Straight-Through, Crossover and Rolled Cabling, Wireless Networking (802.11 a,b,c,d,e,g), Spanning Tree Protocol , ARP, RARP 3.2 Data Link Layer: Collision Domain, Broadcast Domain, CSMA/CD Protocol, 3.3 Virtual LANS(VLAN): VLAN Basics, Static and Dynamic VLANS, Identifying VLANs, VLAN Trucking Protocol(VTP), Configuring VLANs 3.4 TCP and IP: Public and Private IP address, IP Address Classes, CIDR, Introduction to NAT, Broadcast Addresses, IP sub netting, Super netting 3.5 Routing: Distance-Vector Routing Protocols and Link State Routing Protocols, Routing Information Protocol(RIP), Interior gateway Routing Protocol (IGRP), Enhanced IGRP, Open Shortest Path First Routing 3.6 TransportLayer: UDP, TCP, multiplexing and demultiplexing, Circuit Switching Vs Packet Switching 3.7 Application Layer: DHCP and DNS Operations, Cookies Operation, FTP, E-mail, POP3, and Private Cloud,Public Cloud and Hybrid Cloud	**7**	**10**	**17**

	3.8Common Security Threats: Social Engineering, Malware, Phishing, Spyware, Viruses, Worms, Trojans, DOS/DDOS, SQL Injections			
4	**4 .Database Management Systems** 4.1 Entity Relationship Model and Enhanced Entity Relationship Development ,OODBMS, RDBMS 4.2 Normalization (1NF, 2NF, 3NF, BCNF, 4NF),ACID properties 4.3 Common Data Types ,SQL Queries (Create ,Modify,Delete)DDL and DML Operations, DCL and TCL 4.4 Role of Data Base Administrator	**7**	**5**	**12**
5	**5.Software Engineering:** 5.1 SDLC Types: Waterfall Model, Iteration Model, Prototype Software System, (TPS)Transaction Processing System,DDS Decision Support System Software, Enterprise Resource Planning 5.2Software Design, Implementation, Maintenance and Support 5.3 Software Testing: Black box Test, White Box test, Gray box Test, Map Reduce and Hadoop	**7**	**5**	**12**
6	**6.Data Structure and Algorithms** 6.1 Stack and Queue Operation 6.2 Trees: Operation in Binary tree, Tree search, insertion/deletions, Tree traversals (preorder, post-order and in-order, Height, level and depth of a tree, AVL balanced trees and Balancing algorithm 6.3 Searching: Sequential, Binary and Tree search, General search tree, Hashing, Hash function and hash table	**6**	**5**	**11**
7	**7. Concepts of Programming Language** 7.1 Overview of Programming Language: History, Programming Paradigms, The role of Language translates in the Programming Process. 7.2 Virtual Machines, Code Generation, Loop Optimization. 7.3 Concept of Procedural Programming, Structural Programming, Object-Oriented Programming,Concept of C programming, C++ Programming, 7.4 Operators and Expressions, Data Types and Input/Output Operators 7.5 Control Statements and Decision Making,Thegoto statement, The if statement, The if-else statement, Nesting of if statements, The conditional expression, The switch statement, The while loop, The do…while loop, The for loop, The nesting of for loops, The break statement and continue statement. 7.6 Arrays and Strings, Pointers, Structures and Unions, Functions, Dynamic Memory Allocation and Linked List, File Management 7.7Program Bugs and Testing , Functional & Structural Testing	**7**	**10**	**17**

8	**8. Electronic and Digital Circuit** 8.1 NOT,OR,XOR,AND,NOT,NAND, AND-OR-INVERT Gate,Half Adder, Full Adder, Half Sub tractor,Flip flops BCD to decimal Decoders ,R-S Flip Flops ,Gated FlipFlops ,JK Flip Flops 8.2 Electronics Fundamentals: Kirchhoff's law, Superposition theorem; Thevenin's theorem; Norton's theorem, Zener diode, rectifier-half wave, full wave (center tapped, bridge), Zener regulated power supply, BJT configuration and biasing, small and large signal model, MOSFET as logic circuits.	**6**	**5**	**11**
9	**9. Data Communication** 9.1 Communication Fundamentals, Analog and Digital Data Communication Systems, Transmission Impairments (Attenuation, Noise, Distortion),Periodic and Non-periodic Signals 9.2 Data Encoding and Modulation, Amplitude Modulation, Phase Modulation and Pulse Modulation 9.3 Information Theory and Coding : Introduction to Informatic Average Information, Source Coding-Huffman Coding, Error D and Correction Codes, Hamming Distance, Linear Block Codin Cyclic Codes, CRC,Convolution Codes.	**7**	**5**	**12**
10	**10. Network system security** 10.1 Concept of computer network security, main threat of computer network, introduction of virus, worms, malware virus and spreading way, common antivirus software 10.2 Basic theory of data encryption and decryption, destruction and recovery of data ,digital signature and certification 10.3 common ways of network attack, firewall, IPS and IDS ,SSL, Access Control, IPsec	**7**	**10**	**17**
11	**11. GIS (Geographical Information System)** 11.1 Introduction to GIS 11.2 Data models 11.3 Data sources and metadata 11.4 Geographic data 11.5 Vector analysis techniques 11.6 Raster analysis 11.7 Geographical statistics and optimization techniques	**6**	**5**	**11**

यस पेशा सम्बन्धी विषयको पाठ्यक्रमका एकाईहरुबाट सोधिने प्रश्नहरुको संख्या निम्नानुसार हुनेछ ।

S.No	Unit No एकाइ नं	MCQs (बहुवैकल्पिक प्रश्नको संख्या)	Subjectives		Weightage अङ्कभार
			छोटो उत्तर प्रश्नको संख्या	लामो उत्तर प्रश्नको संख्या	
१	Operating System	७	-	१०	१७
२	Computer Organization and Architecture	८	५	-	१३
३	Computer Network	७	-	१०	१७
४	Database Management System	७	५	-	१२
५	Software Engineering	७	५	-	१२
६	Data Structure and Algorithms	६	५	-	११
७	Concepts of Programming Language	७	-	१०	१७
८	Electronic and Digital Circuit	६	५	-	११
९	Data communication	७	५	-	१२
१०	Network System Security	७	-	१०	१७
११	GIS	६	५	-	११
	जम्मा	**७५**	**३५**	**४०**	**१५०**

प्रयोगात्मक परीक्षाको पाठ्यक्रम

समय:१ घण्टा ३० मिनेट

पुर्णाङ्क: ५०
उत्तीर्णाङ्क: २५

S.N	Topics	Marks	Time
1	Software: Website Design, Database Design, Programming Concepts.	25	1 Hrs
2	Network: Network, Server (DNS, DHCP) Configuration, Virtualization and N/W Trouble shooting.	10	30 Mins
3	Hardware: Hardware identification and Trouble shooting, assembling etc.	10	
4	Network and Hardware related Viva	5	
Total		50 Marks	1 Hrs 30 Mins

समाप्त