

नेपाल नागरिक उड्डयन प्राधिकरण
प्राबिधिक सेवा, सूचना प्रविधि समूह,
उपप्रबन्धक (इन्फरमेशन टेक्नोलोजि), आठौँ तहको खुला तथा आन्तरिक
प्रतियोगितात्मक परीक्षाको पाठ्यक्रम

लिखित परीक्षाको विषय, पूर्णाङ्क, परीक्षा प्रणाली, प्रश्नसंख्या, अंकभार र समय निम्नानुसार हुनेछ ।

पत्र	विषय	पूर्णाङ्क	परीक्षा प्रणाली	प्रश्न संख्या	अंक भार	समय
प्रथम	प्रशासन तथा व्यवस्थापन र ऐन नियम	१००	तर्कयुक्त समस्या समाधान	२ x २०	४०	३ घण्टा
			छोटो उत्तर	६ x १०	६०	
द्वितीय	सेवा सम्बन्धी	१००	तर्कयुक्त समस्या समाधान	२ x २०	४०	३ घण्टा
			छोटो उत्तर	६ x १०	६०	

द्रष्टव्य :

- प्रथमपत्र र द्वितीयपत्रको परीक्षा २ दिनमा हुनेछ ।
- परीक्षाको माध्यम नेपाली वा अंग्रेजी वा दुवै हुनसक्ने छ ।
- प्रत्येक पत्रको उत्तिर्णाङ्क ४०% (चालिस प्रतिशत) हुनेछ । दुवै पत्रमा न्यूनतम उत्तिर्णाङ्क प्राप्त नगर्ने उम्मेदवारहरु अन्तर्वार्तामा सम्मिलित हुन योग्य हुनेछैनन् ।
- अन्तर्वार्ता र शैक्षिक योग्यता
 - क) अन्तर्वार्ताको अङ्क भार - ३०
 - ख) शैक्षिक योग्यताको अङ्कभार - ३

शैक्षिक योग्यता वापतको अङ्क : न्यूनतम शैक्षिक योग्यता वापत प्रथम श्रेणीलाई ३, द्वितीय श्रेणीलाई २ र तृतीय श्रेणीलाई १ अङ्क प्रदान गरिनेछ ।
- यस पाठ्यक्रममा जेसुकै विषयवस्तु समावेश गरिएको भएतापनि पाठ्यक्रममा परेका कानून, ऐन, नियम तथा नीतिहरु परीक्षाको मितिभन्दा ३ महिना अगाडि संशोधन भएका वा संशोधन भई हटाईएका वा थप गरी संशोधन भई कायम रहेकालाई यस पाठ्यक्रममा परेको संभन्नुपर्दछ ।
- यस पाठ्यक्रममा उल्लेख भएका विषयहरुका अतिरिक्त समसामयिक घटना तथा विषयवस्तुहरुका सम्बन्धमा समेत प्रश्न सोध्न सकिनेछ ।

प्रथमपत्र : प्रशासन तथा व्यवस्थापन र ऐन नियम

क) प्रशासन तथा व्यवस्थापन

१. सार्वजनिक प्रशासनको परिचय, नवीनतम अवधारणा
२. प्रशासनिक विधिहरू :- कार्य विश्लेषण, कार्य विवरण, कार्य मूल्यांकन र नेपाल नागरिक उड्डयन प्राधिकरणको संगठन संरचना तथा कार्यविधि
३. संगठनात्मक व्यवहार, समूहगत गतिशीलता, समूहगत कार्य र यिनको प्रभावकारिता
४. व्यवस्थापनमा मनोबल, उत्प्रेरणा, बृत्तिविकास र उत्तरदायित्व
५. व्यवस्थापनमा संचार, समन्वय, सुपरिवेक्षण, अनुगमन तथा मूल्यांकन
६. अधिकार प्रत्यायोजन, निर्णय प्रक्रिया र प्रभावकारिता
७. व्यवस्थापन सूचना प्रणाली र महत्व
८. आयोजना व्यवस्थापन
९. वार्ता तथा संभौता गर्ने सम्बन्धी सैद्धान्तिक र व्यवहारिक ज्ञान ।
१०. योजनाको परिचय, तर्जुमाका चरणहरू र नेपालमा आवधिक योजना वारे जानकारी
११. नेपाल नागरिक उड्डयन प्राधिकरणको उद्देश्य, कार्य, नेपाल सरकारसित सम्पर्क
१२. नेपालमा हवाई यातायातको विकासक्रम र चुनौतीहरू
१३. विश्वव्यापीकरण, उदारीकरण र सार्वजनिक संस्थानको अवधारणा र प्रयोग
१४. नेपाल सरकारको राष्ट्रिय हवाई तथा पर्यटन नीति

ख) ऐन नियम

१. नेपालको अन्तरिम संविधान, २०६३
२. नेपाल नागरिक उड्डयन प्राधिकरण ऐन, २०५३
३. नेपाल नागरिक उड्डयन प्राधिकरण कर्मचारीहरूको सेवाका सर्त र सुविधा सम्बन्धी नियमावली, २०५६
४. नेपाल नागरिक उड्डयन प्राधिकरण आर्थिक प्रशासन सम्बन्धी नियमावली, २०५७
५. नागरिक उड्डयन नियमावली, २०५८
६. नेपाल नागरिक उड्डयन प्राधिकरण विमानस्थल सेवा शुल्क नियमावली, २०६७
७. हवाई सुरक्षा व्यवस्था नियमावली, २०४६
८. भ्रष्टाचार निवारण ऐन, २०५९
९. सार्वजनिक खरिद ऐन, २०६३ तथा नियमावली, २०६४

ग) नीति तथा नियम

1. IT Policy of Nepal, 2057 B.S.
2. Electronic Transaction Act, 2063 B.S.
3. Copy right Act, 2059 B.S.
4. Copy-right and licensing issues in IT

द्वितीयपत्र : सेवा सम्बन्धी

1. Computer Architecture

- 1.1 Architecture, Programming and I/O, Computer Structure and typical processor architecture, Processing unit and controller design, hardware and micro program control
- 1.2 CPU and memory organization, buses, characteristics of I/O and storage devices, Instruction sets and addressing modes, assembly language programming, I.O and interrupt servicing
- 1.3 Multiple processor architectures, highly parallel machines, systolic arrays, Neural networks, multitasking machines, real time systems, interconnection of multiple processor systems.
- 1.4 Architectures for specialized purposes, array processors, vector processors, and virtual machines.
- 1.5 Very large scale integrated circuits.
- 1.6 Simplified design rules, Static and dynamic logic, multiphase clocking, Memory elements and memory structures, Gate arrays and standard cell technology; placement and routing, Programmable logic devices.

2. Computer Network

- 2.1 Protocol stack, switching
- 2.2 Link Layer : services, error detection and correction, multiple access protocols, LAN addressing and ARP (Address Resolution Protocol), Ethernet, CSMA/CD multiple access protocol, Hubs, Bridges and Switches, Wireless LANs, PPP (Point to Point Protocol), Wide area protocols
- 2.3 Network Layer : services, datagram and virtual circuits, routing principles and algorithms, Internet Protocol (IP), IP addressing, IP transport, fragmentation and assembly, ICMP (Internet Control Message Protocol), Routing on the Internet, RIP (Routing Information Protocol), OSPF (Open Shortest Path First), Router Internals, IPv6

- 2.4 Transport Layer : Principles, multiplexing and demultiplexing, UDP, TCP, flow control, principles of congestion control, TCP congestion control
- 2.5 Application Layer : Web and Web caching, FTP (File Transfer Protocol), Electronic mail, DNS (Domain Name Service), Socket Programming
- 2.6 Distributed System Clusters

3. Computer Communications

- 3.1 Data communications including signals, modulation and reception, Error detecting and correcting codes, Circuit and Packet Switching
- 3.2 Multiplexing, including time, frequency and code division multiplexing
- 3.3 Digital networks : ADSL, Wi-Fi, ISDN, frame relay, ATM, MPLS etc
- 3.4 Protocols : the ISO/OSI reference model X.25
- 3.5 Internetworking and router-based networks : the TCP/IP suite of protocols, routing and flow control, Internet addressing and domain names.
- 3.6 Local Area Networks, Topologies, Access Schemes, Medium Access and Logic

4. Distributed Systems

- 4.1 Characteristics of distributed systems, Fundamental concepts and mechanisms.
- 4.2 Networked vs. centralized systems
- 4.3 Client Server Systems
- 4.4 Process synchronization and inter process communications.
- 4.5 Principles of fault tolerance
- 4.6 Transaction processing techniques
- 4.7 Distributed file systems
- 4.8 Operating systems for distributed architectures.

5. Operating Systems

- 5.1 Operating system principles, components and usage, Design and implementation of operating systems
- 5.2 Synchronization of concurrent processes, resource allocation, scheduling, protection and privacy. Data, task and job management : loading, linking I/O control.
- 5.3 Multitasking and multiprocessing Real time aspects
- 5.4 Basic characteristics of modern operating systems: Unix, Linux, Windows.

6. Software Engineering

- 6.1 Programming language syntax and semantics
- 6.2 Design of structured and modular programs in a high level language (C, C++)
- 6.3 Basics of object-oriented programming, Non-numerical processing, Design and construction of programs involving structured data : arrays, stacks, queues, lists,trees and records.
- 6.4 Software cycles and requirements analysis, Design, Implementation text, verification and validation, documentation, quality assurance, control and life-cycle management of correct, reliable, maintainable and cost effective software.
- 6.5 Object Oriented design, Graphical design tools, design in high level languages and data flow driven designs.
- 6.6 Planning and management of software projects
- 6.7 Software maintenance and configuration management and source code management

7. Databases and File Systems

- 7.1 Data models, data normalization, data description languages, query facilities, data integrity and reliability, concurrency
- 7.2 Databases : hierarchical, network and relational databases; data organization
- 7.3 Relational query languages : relational algebra and calculus, SQL
- 7.4 Relational database design
- 7.5 Transaction processing, query processing, reports, Security and integrity; concurrency control
- 7.6 File organization : sequential indexed and direct access, multiple key and hashing
- 7.7 File processing : records, files, compaction, Sorting, merging and updating files
- 7.8 Algorithms for inverted lists, multi list, indexed sequential and hierarchical structures, File I/O: control, utility, space allocation and cataloguing, Index organization

8. Client Server Computing

- 8.1 Client server computing concepts : Building blocks, the state of client server infrastructure
- 8.2 SQL database services : fundamentals of database servers, functions, procedures, triggers and rules
- 8.3 SQL middleware basics : SQL API, Open SQL Gateway
- 8.4 Concept of Data Warehouses and Data Mining
- 8.5 Client Server Transaction Processing : Transaction Concepts, Transaction Models, Transaction Processing Monitors, Transaction Management Standards

9. Database Management System

- 9.1 Introduction : The relational model, ER model , SQL, Functional dependency and relational database design, File structure
- 9.2 Transaction Management and Concurrency Control: Concurrent execution of the user programs, transactions, Concurrency control techniques
- 9.3 Crash Recovery: types of failure, Recovery techniques
- 9.4 Query Processing and Optimization
- 9.5 Indexing: Hash based indexing, Tree based indexing
- 9.6 Distributed Database Systems and Object oriented database system
- 9.7 Data Mining and Data Warehousing
- 9.8 Security Management System

10. Internet Programming

- 10.1 Common Gateway Interface (CGI) Application, Input to CGI : environmental variables, accessing from input, Output from CGI : CGI and response headers, Forms and CGI: Sending data to the server using HTML tags and Executing External Program and Executing external program ad CGI program.
- 10.2 Hypermedia Documents : Creating dynamic pages using CGI, PHP
- 10.3 JAVA evolution, and JAVA features, Difference between JAVA and C / C++
- 10.4 JAVA program structure, JAVA Statements, JAVA virtual machine – Introduction and Implementation basics.

11. Cryptography and Network Security

- 11.1 Introduction to Cryptography : Security Attacks, Conventional Encryption Model, Simplified DES, Block Cypher Principle.
- 11.2 Principles of Public Key, Crypto Systems : RSA algorithm, Diffie-Hellman Key exchange, Number Theory – Prime and Relatively Prime Numbers
- 11.3 Message Authentication and Hash Function
- 11.4 Digital Signature and authentication Protocols : Digital Signatures, Digital Signature Standards, Authentication protocols
- 11.5 Network Security : Authentication Applications – Kerberos, Electronic Mail Security
- 11.6 Web Security : Web Security Requirements, Secure Sockets Layers and Transport Layer Security, Secure Electronic Transaction
- 11.7 Intruders and Viruses Related Threats

11.8 Firewall Design Principles

11.9 Introduction to Trusted Systems

12. Management Information Systems

12.1 Organizations and Information Systems

12.2 How information system impact organizations and business firms

12.3 The impact of IT on management decision making

12.4 Organization and Information, Information: Classification and value, Information requirements,

12.5 Development and Implementation of MIS

12.6 Management of quality in MIS

12.7 Decision support systems

13. Technology and its recent trends

13.1 Technology behind E-commerce, E-government, E-payment and E-transaction, ATM, Point to Sales, Internet, Digital Signature etc.

13.2 GIS

13.3 Advanced data storage techniques: Enterprise data storage, clustering, network attached storage (NAS), storage area networks (SAN)

14. Software Management

14.1 Open source software Vs Proprietary Software, Linux, Windows etc

14.2 Software package Vs Software development in-house outsourcing

14.3 Software Integration

14.4 Evaluation of software