

पूर्वाञ्चल विश्वविद्यालय



खुल्ला प्रतियोगिता लिखित परीक्षाको पाठ्यक्रम

अधिकृतस्तर  
अधिकृत (कम्प्युटर)

प्रथम पत्र (वस्तुगत)

पूर्णाङ्क: १×१००=१००

समय: ३:०० घण्टा

१. पूर्वाञ्चल विश्वविद्यालय ऐन नियम
२. नेपालमा विश्वविद्यालयको इतिहास
३. उच्च शिक्षाको विकास
४. नेपालको भूगोल
५. नेपालको विकासक्रम तथा इतिहास
६. नेपालको राजनैतिक घटनाक्रम
७. नेपालका धर्म संस्कृति तथा परम्परा
८. राष्ट्रिय तथा अन्तराष्ट्रिय नवीनतम गतिविधिहरू
९. नेपालको आर्थिक विकासक्रम तथा यससँग सम्बद्ध घटनक्रमहरू
१०. नेपालको संविधान, ऐन तथा कानूनहरू
११. सार्वजनिक प्रशासन
१२. सार्वजनिक खरिद ऐन
१३. शैक्षिक प्रशासन
१४. सामान्य प्रशासन
१५. आर्थिक प्रशासन
१६. कर्मचारी प्रशासन
१७. अभिलेख व्यवस्थापन
१८. सुशासन
१९. E-Governance
२०. विज्ञान प्रविधि
२१. खेलकुद
२२. वातावरण
२३. संवैधानिक अंगहरू
२४. साहित्य
२५. बजेट
२६. विश्वको राजनीति
२७. राष्ट्रिय क्षेत्रीय तथा अन्तराष्ट्रिय संघ संस्थाहरू
२८. योजना निर्माण तथा राष्ट्रिय योजना आयोग सम्बन्धी



अधिकृतस्तर  
अधिकृत (कम्प्युटर)  
द्वितीय पत्र (विषयगत)

पूर्णाङ्क: १००  
समय: ३:०० घण्टा

### 1. Computer Fundamentals:

- 1.1 Introduction to computer and computer system; Evolution and history of computers
- 1.2 Types of computer based on purpose, work, size, model and brand; Computer generations
- 1.3 Introduction to hardware;  
Input devices: keyboard, mouse, scanner, microphone, joystick, light pen, touch screen, BCR, OCR, MICR, etc.  
Output devices: monitor and its types, printer and its types, plotter, speaker, etc.  
Storage devices: primary, secondary and auxiliary storage devices  
CPU: Arithmetic Logic Unit (ALU), Control Unit (CU), Registers  
Other devices: network card, modem, sound card, VGA card, cables, etc.
- 1.4 Introduction to software;  
Types of software: system software, application software, utility software  
Operating system and its roles; Web-based software and Mobile Apps
- 1.5 Motherboard; BIOS; Cache memory
- 1.6 Computer viruses and remedies
- 1.7 Software installation and troubleshooting methods

### 2. Number System and Digital Logic:

- 2.1 Introduction to Decimal, Binary, Octal and Hexadecimal number system
- 2.2 Number from one number system to another
- 2.3 Binary Arithmetic: Binary addition, subtraction, multiplication and division; 1's and 2's complement methods of binary subtraction; Binary representation of floating-point numbers
- 2.4 Boolean Algebra: Introduction to Boolean values, truth table, Boolean expression and Boolean function
- 2.5 Logic Gates: Introduction to AND, OR, NOT, NAND, NOR, XOR and XNOR logic gates; Truth table, Symbol and Logic function of logic gates
- 2.6 Laws of Boolean Algebra: Identity, Complement, Commutative, Associative and Distributive Laws; De Morgan's Theorem
- 2.7 Statement and verification of laws of Boolean Algebra using truth table

### 3. Computer Organization and Architecture:

- 3.1 Flip-flops, logic gates and logic circuit; Sequential circuits; Design procedure; State table and state diagram

- 3.2 Computer registers and its types
- 3.3 Basic structures: Von Neumann architecture, Harvard architecture, RISC/CISC architecture
- 3.4 Micro-operations; Logic micro-operations; Shift micro-operations
- 3.5 Instruction codes; Instruction formats; Instruction set; Instruction cycle and excitation cycle
- 3.6 Addressing modes and its types; RISC vs CISC; Pipelining
- 3.7 Synchronous and asynchronous data transfer
- 3.8 Interrupt and its types; Interrupt cycle; Stored program concept; DMA
- 3.9 8085 and 8086 microprocessors; Programming and interfacing

#### 4. Programming Languages:

- 4.1 Procedural Programming Language: Introduction to C; Data types; Variables and constants; Operators and expressions; Control statements; Looping; Arrays; Functions; Pointers; Structure and Union; File handling
- 4.2 Object Oriented Programming Language: Class and Object; Abstraction; Encapsulation; Function overloading; Constructor and destructor; Inheritance; Polymorphism, operator overloading and virtual function
- 4.3 Programming with C, C++, and Java

#### 5. Data Structures and Algorithms:

- 5.1 Abstract data types; Time and space analysis of algorithms; Asymptotic notations
- 5.2 Stack: Operations on stack; Array and linked representation of stack; Stack applications: Conversion from infix to postfix/prefix expression; Evaluation of postfix/prefix expressions
- 5.3 Queue: Operations on queue; Array and linked representation of queue; Linear Queue; Circular Queue; Priority Queue; Queue Applications
- 5.4 Recursion: Factorial, Fibonacci sequence, GCD, Tower of Hanoi (TOH)
- 5.5 Trees: Binary tree; Binary search tree; AVL tree and Balancing tree; Operations on Binary tree; Traversals on tree
- 5.6 Graphs: Traversals on graphs; Shortest path problems; Minimum spanning trees
- 5.7 Sorting and Searching: Internal and external sort; Selection sort; Bubble sort, Insertion sort; Quick sort; Merge sort; Heap sort; Shell sort; Radix sort; Sequential search; Binary search; Comparison of sorting and searching algorithms

#### 6. Web Technology:

- 6.1 Introduction to web page; Static and dynamic web page; Web browser and web server; Tier technology
- 6.2 Introduction to HTML and HTML tags
- 6.3 Working with texts and images; Creating hyperlinks, lists, tables, forms and frames; Working with tables
- 6.4 Applying styles in HTML page using Cascading Style Sheet (CSS)





- 6.5 Using JavaScript with HTML; Using XML
- 6.6 Using MySQL; Using PHP
- 6.7 Management of Web Server and Proxy Server
- 6.8 Social Networking and Social Media in Governance

## **7. Operating System:**

- 7.1 Concept and history of operating system; Types and functions of operating system
- 7.2 Introduction to process; Process states; Process scheduling algorithms
- 7.3 Memory management; Partitioning; Swapping; Paging and Page replacement algorithms
- 7.4 Introduction to files and directories; File system implementation; Disks and disk scheduling algorithms
- 7.5 Deadlock and its conditions; Detection, prevention, recovery and avoidance of deadlock
- 7.6 Distributed Systems: Message passing; RPC; Client-server computing
- 7.7 Security: System flaws and attacks; File protection; Security mechanisms; Authentication and access authorization; Trusted system
- 7.8 Features and commands of MS-DOS; Introduction to Windows, UNIX and Linux family
- 7.9 Concept of Mobile Operating System

## **8. Database Management System:**

- 8.1 Introduction to database and DBMS; Concepts of Relational data model; ER Modeling and ER Diagram
- 8.2 Introduction to SQL: Basic query structure
- 8.3 DDL and DML: Basic operations; Creating tables; Aggregate and grouping; Updates and joins; Nested sub-queries and sets
- 8.4 Database Normalization; Functional dependencies: 1NF, 2NF, 3NF and BCNF
- 8.5 Transaction processing and concurrency control
- 8.6 Database failure; Database backup; Crash recovery; Database security
- 8.7 Query processing and optimization
- 8.8 Distributed database system; Object-oriented database system

## **9. Computer Networks and Network Security:**

- 9.1 Introduction to Networking; Types of network, network topologies and networking media
- 9.2 Networking devices: Basic concepts of hubs, switches, gateways and routers
- 9.3 Networking technologies: Ethernet, Token bus and Token ring, WANs and Remote Connectivity, Wireless Networking; Video Conferencing and VOIP
- 9.4 OSI/ISO Model; TCP/IP; UDP; IPv4 and IPv6



9.5 Data Link Layer services and protocols; Network Layer services and protocols; Transport Layer services and protocols; Application Layer services and protocols

9.6 Introduction to Network Security; Virus protection; LAN security; Internet security

9.7 Firewalls; Intrusion Detection and Protection System

9.8 Disaster recovery; Network Troubleshooting

## 10. Software Engineering:

10.1 Software Process Models: SDLC; Waterfall model; RAD model: Prototyping; Incremental model

10.2 Requirement Analysis Tools; Software design and architecture; Implementation and Testing

10.3 Software Project Management: Project planning; Project scheduling; Risk management; Configuration management; Software quality and quality assurance

## 11. Emerging Technologies:

11.1 E-commerce; M-commerce; E-governance

11.2 Cryptography; Digital Signature

11.3 Artificial Intelligence; Expert System; Machine Learning; Neural Network; Natural Language Processing

11.4 Big Data; Data Analytics; Cloud Computing; Internet of Things (IoT)

## 12. IT Policy:

12.1 IT Policy:

- ICT Policy, 2072 B. S.
- Electronic Transaction Act, 2063 B. S. (कशुर र दण्ड, सजाय)
- Digital Nepal Framework 2076 B. S.

## 13. पूर्वञ्चल विश्वविद्यालय ऐन र नियमावली सम्बन्धी



अधिकृतस्तर  
अधिकृत (कम्प्युटर)  
तृतीय पत्र (प्रयोगात्मक)

पूर्णाङ्क: १००

पाठ्यक्रम पछि प्रकाशित गरिने छ ।  
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