

प्रदेश लोक सेवा आयोग

सुदूरपश्चिम प्रदेश

प्रदेश निजामती सेवा तथा स्थानीय सरकारी सेवा अन्तरगत विविध सेवा, सातौं तह, कम्प्युटर अधिकृत वा सो सरह पदको खुला, अन्तर तह र आन्तरिक प्रतियोगितात्मक परीक्षाको पाठ्यक्रम

यस पाठ्यक्रम योजनालाई निम्न अनुसार दुई चरणमा विभाजन गरिएको छ :

प्रथम चरण : लिखित परीक्षा (Written Examination)

पूर्णांक : २००

द्वितीय चरण : (क) प्रयोगात्मक परीक्षा (Practical Test)

पूर्णांक : ५०

(ख) सामूहिक परीक्षण (Group Test)

पूर्णांक : १०

(ग) अन्तरवार्ता (Interview)

पूर्णांक : २५

**परीक्षा योजना (Examination Scheme)**

प्रथम चरण : लिखित परीक्षा (Written Examination)

पूर्णांक : २००

पत्र	विषय	खण्ड	पूर्णांक	उत्तीर्णांक	परीक्षा प्रणाली		प्रश्न × अंक	समय
प्रथम	General Subject	खण्ड (क) General Awareness & General Reasoning Test	100	40	वस्तुगत (Objective)	(MCQs)	50 × 1	1:30 Hrs
		खण्ड (ख) General Technical Subject					50 × 1	
द्वितीय	Technical Subject		100	40	विषयगत (Subjective)	छोटो उत्तर लामो उत्तर	10 × 10	3 Hrs

द्वितीय चरण : प्रयोगात्मक परीक्षा, सामूहिक परीक्षण र अन्तरवार्ता

पूर्णांक : ८५

पत्र/विषय	पूर्णांक	उत्तीर्णांक	परीक्षा प्रणाली	समय
*प्रयोगात्मक परीक्षा (Practical Text)	५०	२५	प्रयोगात्मक (Practical) (५ प्रश्न × १० अंक)	१:३० मिनेट
सामूहिक परीक्षण (Group Test)	१०	-	सामूहिक छलफल (Group Discussion)	३० मिनेट
अन्तरवार्ता (Interview)	२५	-	मौखिक (Oral)	-

**द्रष्टव्य :**

- लिखित परीक्षाको माध्यम भाषा नेपाली वा अंग्रेजी अथवा नेपाली र अंग्रेजी दुबै हुन सक्नेछ ।
- प्रथम र द्वितीय पत्रको लिखित परीक्षा छुट्टाछुट्टै हुनेछ ।
- वस्तुगत बहुवैकल्पिक प्रश्नहरू (Multiple Choice Questions) को गलत उत्तर दिएमा प्रत्येक गलत उत्तर बापत २० प्रतिशत अंक कट्टा गरिनेछ । तर उत्तर नदिएमा त्यस बापत अंक दिइने छैन र अंक कट्टा पनि गरिने छैन ।
- बहुवैकल्पिक प्रश्नहरू हुने परीक्षामा कुनै प्रकारको क्याल्कुलेटर (Calculator) प्रयोग गर्न पाइने छैन ।
- विषयगत प्रश्नका लागि तोकिएका १० अंकका प्रश्नहरूको हकमा १० अंकको एउटा लामो प्रश्न वा एउटै प्रश्नका दुई वा दुई भन्दा बढी भाग (Two or more parts of a single question) वा एउटा प्रश्न अन्तर्गत दुई वा बढी टिप्पणीहरू (Short notes) सोध्न सकिने छ ।
- द्वितीय पत्रमा प्रत्येक खण्डका लागि छुट्टाछुट्टै उत्तर पुस्तिकाहरू हुनेछन । परीक्षार्थीले प्रत्येक खण्डका प्रश्नहरूको उत्तर सोही खण्डको उत्तर पुस्तिकामा लेख्नु पर्नेछ ।
- यस पाठ्यक्रम योजना अन्तर्गतका पत्र/विषयका विषयवस्तुमा जेसुकै लेखिएको भए तापनि पाठ्यक्रममा परेका ऐन, नियम तथा नीतिहरू परीक्षाको मिति भन्दा ३ महिना अगाडि संशोधन भएका वा संशोधन भई हटाइएका वा थप गरी संशोधन भई कायम रहेकालाई यस पाठ्यक्रममा परेको सम्झनु पर्दछ ।
- प्रथम चरणको लिखित परीक्षाबाट छनौट भएका उम्मेदवारहरूलाई मात्र द्वितीय चरणको परीक्षामा सम्मिलित गराइनेछ ।
- प्रथम चरण र द्वितीय चरणको परीक्षाको कुल अंक योगका आधारमा प्रयोगात्मक परीक्षा उत्तीर्ण हुने परीक्षार्थीहरूलाई मात्र योग्यताक्रम सूचीमा समावेश गरी अन्तिम परीक्षाफल प्रकाशित गरिने छ ।
- पाठ्यक्रम लागु मिति : २०८१।१०।२९ गते देखि

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सुदूरपश्चिम प्रदेश  
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अन्तर तह र आन्तरिक प्रतियोगितात्मक परीक्षाको पाठ्यक्रम  
प्रथम चरण : लिखित परीक्षा (Written Examination)

प्रथम पत्र : खण्ड (क)

**General Awareness & General Reasoning Test (50 Marks)**

**1. General Awareness and Contemporary Issues**

**(30 Marks)**

- 1.1. Physical, socio-cultural and economic geography and demography of Nepal
- 1.2. Major natural resources of Nepal
- 1.3. Geographical diversity, climatic conditions, livelihood & lifestyle of people
- 1.4. Notable events and personalities, social, cultural and economic conditions in modern history of Nepal
- 1.5. Current National and Sudurpashchim Province periodic plan
- 1.6. Information on sustainable development, environment, pollution, climate change, Biodiversity, science and technology
- 1.7. Nepal's international affairs and general information on the UNO, SAARC & BIMSTEC
- 1.8. The Constitution of Nepal (From Part 1 to 5 and Schedules)
- 1.9. Governance system and Government (Federal, Provincial and Local)
- 1.10. Sudurpashchim Province Civil Service Act, 2079 & Regulation, 2081
- 1.11. Sudurpashchim Province Good Governance Act, 2075
- 1.12. Local Government Operation Act, 2074
- 1.13. Functional scope of public services
- 1.14. Public Service Charter
- 1.15. Concept, objective and importance of public policy
- 1.16. Fundamentals of management: planning, organizing, directing, controlling, coordinating, decision making, motivation and leadership
- 1.17. Government planning, budgeting and accounting system
- 1.18. Major events and current affairs of national and international importance

**2. General Reasoning Test**

**(20 Marks)**

**2.1. Logical Reasoning (7 Marks)**

Verbal Ability, Alphanumeric Series, Reasoning Analogies, Classification, Coding-Decoding, Order & Ranking, Distance & Directions, Analytical and Logical Reasoning, Assertion and Reason, Statement and Conclusion, Input-Output, Venn- diagram

**2.2. Numerical Reasoning (7 Marks)**

Arithmetic Series, Analogy, Classification, Arithmetical Reasoning, Fraction, Percentage, Ratio, Average, Profit & Loss, Time & Work, Date & Calendar, Data Sufficiency, Data Interpretation & Data Verification

**2.3. Spatial Reasoning (6 Marks)**

Figure Series, Figure Analogy, Figure Classification, Figure Matrix, Pattern Completion, Embedded Images, Image Formation & Analysis, Mirror and Water Images, Cubes and Dices, Paper Folding & Cutting

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अन्तर तह र आन्तरिक प्रतियोगितात्मक परीक्षाको पाठ्यक्रम

प्रथम पत्र : खण्ड (ख)

**General Technical Subject (50 Marks)**

**1. Computer Fundamentals**

**(5 Marks)**

- 1.1. Computers, Kinds of Computers in respect of size and function
- 1.2. Generation of Computers
- 1.3. Components and Architecture of Computers, Connecting the Components,
- 1.4. Getting started: Orientation to personal computers, system unit, Starting the computers
- 1.5. Input Devices: keyboard, mouse, other input devices
- 1.6. Processing: CPU, Memory
- 1.7. Storage devices: Overview of Storage Devices, Floppy Disk Drive, Hard Drive, Universal Serial Bus (USB) Devices and Other Storage Devices
- 1.8. Output devices: Monitors, Printers, Modems, Soundboards
- 1.9. Dos survival guide: Using Command Prompt, Creating and using AUTOEXEC.BAT and CONFIG.SYS
- 1.10. Windows survival guide: Windows Desktop, Program Manager, Organizing the Desktop, File Manager
- 1.11. Application software: Using Application Software
- 1.12. Windows Explorer, E-mails, Internet, Intranet, Extranets, Ethernet, HTTP
- 1.13. Computer Viruses, Antivirus

**2. Data Structure and Algorithms**

**(4 Marks)**

- 2.1. Fundamental of Data Structures, Abstract Data types
- 2.2. Lists, Linked Lists, Stacks
- 2.3. Queues, Priority Queue
- 2.4. Trees: Traversal, Implementations, Binary Trees, Binary Search Trees, Balanced Search Trees, AVL Trees
- 2.5. Indexing Methods, Hashing Trees, Suffix Trees
- 2.6. Worst-Case and Expected time Complexity
- 2.7. Analysis of Simple Recursive and Non-recursive
- 2.8. Algorithms
- 2.9. Searching, Merging and Sorting
- 2.10. Introductory Notions of algorithm design: Divide-and-Conquer, Dynamic Programming, Greedy Methods, Backtracking
- 2.11. Graph algorithms: Depth-first Search and Breadth-first Search, Shortest Path Problems, Minimum Spanning Trees, Directed Acyclic Graphs

**3. System Analysis and Design**

**(5 Marks)**

- 3.1. Definition of the System, System Owner, System User, System Designers and system Builders, System Analysts, Variations on the System Analyst title, System life Cycle
- 3.2. Joint Application Development (JAD): JAD definition, JAD purpose, JAD Philosophy, JAD Scope
- 3.3. Involved in a JAD: Sponsor, Business Users, System Analyst
- 3.4. Roles of JAD Group Member: Project Leader, Record Keeper, Timekeeper.
- 3.5. The System Design Environment: Development Process, Management Process, System Structure, Basic Component of Computer based Information System, Personal/ Centralized/Distribution System
- 3.6. Concept formations: Introduction, Finding the Problem, Evaluating the Proposal, Technical Feasibility, Operational Feasibility, Economic Feasibility.

## प्रदेश लोक सेवा आयोग

### सुदूरपश्चिम प्रदेश

प्रदेश निजामती सेवा तथा स्थानीय सरकारी सेवा अन्तरगत विविध सेवा, सातौं तह, कम्प्युटर अधिकृत वा सो सरह पदको खुला, अन्तर तह र आन्तरिक प्रतियोगितात्मक परीक्षाको पाठ्यक्रम

- 3.7. Requirements analysis: Representing System Analysis Model, Requirement Model, Design Model
- 3.8. Development Process: Design Method
- 3.9. Entity Relationship Diagram (E-R Diagram): Notations, Entities: Strong Entities, Weak Entities, Attributes: Simple and Composite, Single Valued and Multiple Valued, Null and Derived Attribute
- 3.10. Relationship Sets: Degree of Relationship and Cardinality Relationship, Specialization, Generalization, Aggregation
- 3.11. Data Flow Diagrams (DFDs): Introductions, Data flow Diagram, Symbol, Files or data store, External entities, Data flows,
- 3.12. Describing System by Data Flow Diagram: Context diagram, Top level DFD, Expansion Level DFD, Conversions of Data.
- 3.13. Object Modeling: Object -Oriented Concept, Object Structure, Object Feature, Class and Object
- 3.14. Representation: Association, Composition, Inheritance, Multiple Inheritances
- 3.15. Modeling: Use Case Diagram, State Diagram, Event Flow Diagram.
- 3.16. Documentation: Automatic and Manual System

#### 4. Operating Systems

(5 Marks)

- 4.1. Definition, Development and Functions of Operating Systems
- 4.2. Basic components of the Operating Systems, Information Storage and Management Systems
- 4.3. Disk Allocation and Scheduling Methods, Basic Memory Management strategies, Virtual Memory Management Techniques, Define a Process and features of the Process Management System
- 4.4. Features of Process Scheduling; List the features of Inter-Process Communication and Deadlocks
- 4.5. Concepts of Parallel and Distributed Processing, Identify Security Threats to Operating Systems
- 4.6. Overview of the MS-DOS Operating System
- 4.7. Introduction to the Windows Family of Products, Unix Family of Products, Linux Family of Products
- 4.8. Introduction to Windows Networking
- 4.9. Windows Architecture, Linux Architecture
- 4.10. Troubleshooting Windows & Linux
- 4.11. Managing Network Printing
- 4.12. Managing Hard Disks and Partitions
- 4.13. Monitoring and Troubleshooting Windows
- 4.14. Users, Groups and Permission Linux and Windows

#### 5. Database Management System and Design

(7 Marks)

- 5.1. Introduction, A Database Model, Relational Database Model, Integrity, RDBMS
- 5.2. SQL and Embedded SQL
- 5.3. Writing Basic SQL SELECT Statements
- 5.4. Restricting and Sorting data
- 5.5. Single Row Functions
- 5.6. Displaying Data from Multiple Tables
- 5.7. Aggregation Data Using Group Functions
- 5.8. Sub Queries, Manipulating Data and Creating & Managing Tables
- 5.9. Creating Views and Controlling User Access
- 5.10. Using Set Operators, Date time Function

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- 5.11. Database Design: Logical Design, Conceptual Design, Mapping Conceptual to Logical, Pragmatic issues, Physical Design, Integrity and Correctness, Relational Algebra, Relational Calculus
- 5.12. Normalization: 1N, 2N, 3NF, BCNF, 4NF, 5NF, DKNF
- 5.13. Architecture of DBMS: Client-server, Open Architectures, Transaction Processing, Multi-User & Concurrency and Backup & Recovery Database
- 5.14. Basic Concept of major RDBMS products: Oracle, Sybase, DB2, SQL Server and other Databases

**6. Programming Language (4 marks)**

- 6.1. Overview of Programming Language: History, Programming Paradigms, The role of Language translator in the Programming Process.
- 6.2. Fundamental Issues in Language Design.
- 6.3. Virtual Machines, Code Generation, Loop Optimization.
- 6.4. Concept of Procedural Programming, Structural Programming, Object-Oriented Programming.
- 6.5. Concept of C programming, C++ Programming,
- 6.6. Java Programming for Declaration, Modularity and Storage Management Software Development

**7. Networking (5 marks)**

- 7.1. Basic Network Theory: Network Definition, Network Models, Connectivity, Network Addressing.
- 7.2. Network Connectivity: Data Package, establishing a Connection, Reliable Delivery, Network Connectivity, Noise Control, Building Codes, Connection Devices
- 7.3. Advanced Network Theory: OSI model, Ethernet, Network Resources, Token ring, FDDI, Wireless Networking
- 7.4. Common Network Protocols: Families of Protocols, NetBEUI, Bridge and Switches, TCP/IP Protocol, Building TCP/IP Network, TCP/IP Suite
- 7.5. TCP/IP Services: Dynamic Host Configuration Protocol, DNS Name Resolution, NetBIOS support, SNMP, TCP/IP Utilities, FTP
- 7.6. Network LAN Infrastructure: LAN Protocols on a Network, IP Routing, IP Routing Tables, Router Discovery Protocols, Data Movement in a Routed Network, Virtual LANs (VLANs)
- 7.7. Network WAN Infrastructure: WAN Environment, Wan Transmission Technologies, Wan Connectivity Devices, Voice Over Data Services
- 7.8. Remote Networking: Remote Networking, Remote Access Protocols, VPN Technologies
- 7.9. Computer Security: Computer Virus, Worm, Trojan Horse
- 7.10. Network Security: Introduction, Virus Protection, Local Security, Network Access, Internet Security
- 7.11. Disaster Recovery: Need for Disaster Recovery, Disaster Recovery plan, Data backup, Fault Tolerance
- 7.12. Advanced Data Storage Techniques: Enterprise Data Storage, Clustering, Network Attached Storage, Storage Area Networks
- 7.13. Network Troubleshooting: Using Systematic Approach to Troubleshooting.
- 7.14. Network Support Tools: Utilities, Network Baseline
- 7.15. Network Access Points, Common Network Component, Common Peripheral Ports

**8. Computer Architecture & Organization (2 marks)**

- 8.1. Evaluation of Computers, Design Methodology, Set Architecture, MIPS ISA, ALU Design
- 8.2. Datapath Design: Single and Multiple Cycle Implementations, Pipelining, Memory Hierarchy, Input/output System: Bus & Role of Operating System

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**9. Compiler Design**

**(1 Marks)**

- 9.1. Introduction to Compiling
- 9.2. Logical Analysis, Syntax Analysis, Semantic Analysis
- 9.3. Run Time environment
- 9.4. Intermediate Code Generation, Code Optimization
- 9.5. Compiler Generation Tools

**10. E-Commerce Technology**

**(2 Marks)**

- 10.1. Introduction to E-Commerce
- 10.2. Electronic Commerce Strategies
- 10.3. Electronic Commerce Security Issues
- 10.4. Success Models of E-Governance
- 10.5. E-Business: b2b, b2c, b2e, c2c, g2g, g2c
- 10.6. Principles of Electronic Payment, Strategies & Systems
- 10.7. E-marketing, Reverse Engineering
- 10.8. E-Banking, EDI Methods, SWIFT
- 10.9. Encryption and Decryption Methods, XML, Layout Managers, Event Model

**11. MIS and Web Engineering**

**(5 Marks)**

- 11.1. Information Systems, Client-Server Computing
- 11.2. Information Systems and Decision Making.
- 11.3. Database Design issues, Data Mining, Data Warehousing
- 11.4. Knowledge Management, The strategic use of Information Technology.
- 11.5. Work Process Redesign (Reengineering) with Information Technology, Enterprise Resources Planning Systems, Information Systems Security, Information Privacy and Global Information Technology issues
- 11.6. Software Supported Demonstrations including advanced Spreadsheet topics Software Component Based Systems
- 11.7. Multimedia
- 11.8. Object-Oriented Programming with COMS & DECOMS
- 11.9. Group Decision Support Systems
- 11.10. Basics of Website Design

**12. IT in Nepal**

**(5 Marks)**

- 12.1. History of IT in Nepal
- 12.2. ICT Policy of Nepal
- 12.3. Current Electronic Transaction Act
- 12.4. Current Copyright Act
- 12.5. Uses of Computers and Software Development
- 12.6. Artificial Intelligence
- 12.7. Licensing Issues



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अन्तर तह र आन्तरिक प्रतियोगितात्मक परीक्षाको पाठ्यक्रम  
**द्वितीय पत्र : Technical Subject**

**Section (A) – 30 Marks**

**1. Computer Fundamentals**

- 1.1. Computers, Kinds of Computers in respect of size and function
- 1.2. Generation of Computers
- 1.3. Components and Architecture of Computers, Connecting the Components,
- 1.4. Getting started: Orientation to personal computers, system unit, starting the computers
- 1.5. Input Devices: keyboard, mouse, other input devices
- 1.6. Processing: CPU, Memory
- 1.7. Storages devices: Overview of Storage Devices, Floppy Disk Drive, Hard Drive, Universal Serial Bus (USB) Devices and Other Storage Devices
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**2. Data Structure and Algorithms**

- 2.1 Fundamental of Data Structures, Abstract Data types
- 2.2 Lists, Linked Lists, Stacks
- 2.3 Queues, Priority Queue
- 2.4 Trees: Traversal, Implementations, Binary Trees, Binary Search Trees, Balanced Search Trees, AVL Trees
- 2.5 Indexing Methods, Hashing Trees, Suffix Trees
- 2.6 Worst-Case and Expected time Complexity
- 2.7 Analysis of Simple Recursive and Non-recursive Algorithms
- 2.8 Searching, Merging and Sorting
- 2.9 Introductory Notions of algorithm design: Divide-and-Conquer, Dynamic Programming, Greedy Methods, Backtracking
- 2.10 Graph algorithms: Depth-first Search and Breadth-first Search, Shortest Path Problems, Minimum Spanning Trees, Directed Acyclic Graphs

**3. Programming Language**

- 3.1 Overview of Programming Language: History, Programming Paradigms, The role of Language translator in the Programming Process.
- 3.2 Fundamental Issues in Language Design.
- 3.3 Virtual Machines, Code Generation, Loop Optimization.
- 3.4 Concept of Procedural Programming, Structural Programming, Object-Oriented Programming.
- 3.5 Concept of C programming, C++ Programming,
- 3.6 Java Programming for Declaration, Modularity and Storage Management Software Development

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सुदूरपश्चिम प्रदेश

प्रदेश निजामती सेवा तथा स्थानीय सरकारी सेवा अन्तर्गत विविध सेवा, सातौं तह, कम्प्युटर अधिकृत वा सो सरह पदको खुला,  
अन्तर तह र आन्तरिक प्रतियोगितात्मक परीक्षाको पाठ्यक्रम

**Section B– 20 Marks**

**4. System Analysis and Design**

- 4.1 Definition of the System, System Owner, System User, System Designers and system Builders, System Analysts, Variations on the System Analyst title, System life Cycle
- 4.2 Joint Application Development (JAD): JAD definition, JAD purpose, JAD Philosophy, JAD Scope
- 4.3 Involved in a JAD: Sponsor, Business Users, System Analyst
- 4.4 Roles of JAD Group Member: Project Leader, Record Keeper, Timekeeper.
- 4.5 System Design Environment: Development Process, Management Process, System Structure, Basic Component of Computer based Information System, Personal/ Centralized/Distribution System
- 4.6 Concept formations: Introduction, Finding the Problem, Evaluating the Proposal, Technical Feasibility, Operational Feasibility, Economic Feasibility.
- 4.7 Requirements analysis: Representing System Analysis Model, Requirement Model, Design Model
- 4.8 Development Process: Design Method
- 4.9 Entity Relationship Diagram (E-R Diagram): Notations, Entities: Strong Entities, Weak Entities, Attributes: Simple and Composite, Single Valued and Multiple Valued, Null and Derived Attribute
- 4.10 Relationship Sets: Degree of Relationship and Cardinality Relationship, Specialization, Generalization, Aggregation
- 4.11 Data Flow Diagrams (DFDs): Introductions, Data flow Diagram, Symbol, Files or data store, External entities, Data flows
- 4.12 Describing System by Data Flow Diagram: Context diagram, Top level DFD, Expansion Level DFD, Conversions of Data
- 4.13 Object Modeling: Object -Oriented Concept, Object Structure, Object Feature, Class and Object
- 4.14 Representation: Association, Composition, Inheritance, Multiple Inheritances
- 4.15 Modeling: Use Case Diagram, State Diagram, Event Flow Diagram.
- 4.16 Documentation: Automatic and Manual System

**Section C– 20 Marks**

**5. Operating Systems**

- 5.1 Definition, Development and Functions of Operating Systems
- 5.2 Basic components of the Operating Systems, Information Storage and Management Systems
- 5.3 Disk Allocation and Scheduling Methods, Basic Memory Management strategies, Virtual Memory Management Techniques, Define a Process and features of the Process Management System
- 5.4 Features of Process Scheduling; List the features of Inter-Process Communication and Deadlocks
- 5.5 Concepts of Parallel and Distributed Processing, Identify Security Threats to Operating Systems
- 5.6 Overview of the MS-DOS Operating System
- 5.7 Introduction to the Windows Family of Products, Unix Family of Products, Linux Family of Products
- 5.8 Introduction to Windows Networking
- 5.9 Windows Architecture, Linux Architecture
- 5.10 Troubleshooting Windows & Linux
- 5.11 Managing Network Printing
- 5.12 Managing Hard Disks and Partitions
- 5.13 Monitoring and Troubleshooting Windows
- 5.14 Users, Groups and Permission Linux and Windows



प्रदेश लोक सेवा आयोग

सुदूरपश्चिम प्रदेश

प्रदेश निजामती सेवा तथा स्थानीय सरकारी सेवा अन्तर्गत विविध सेवा, सातौं तह, कम्प्युटर अधिकृत वा सो सरह पदको खुला,  
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**6. Database Management System and Design**

- 6.1 Introduction, a Database Model, Relational Database Model, Integrity, RDBMS
- 6.2 SQL and Embedded SQL
- 6.3 Writing Basic SQL SELECT Statements
- 6.4 Restricting and Sorting data
- 6.5 Single Row Functions
- 6.6 Displaying Data from Multiple Tables
- 6.7 Aggregation Data Using Group Functions
- 6.8 Sub Queries, Manipulating Data and Creating & Managing Tables
- 6.9 Creating Views and Controlling User Access
- 6.10 Using Set Operators, Date time Function
- 6.11 Database Design: Logical Design, Conceptual Design, Mapping Conceptual to Logical, Pragmatic issues, Physical Design, Integrity and Correctness, Relational Algebra, Relational Calculus
- 6.12 Normalization: 1NF, 2NF, 3NF, BCNF, 4NF, 5NF, DKNF
- 6.13 Architecture of DBMS: Client-server, Open Architectures, Transaction Processing, Multi-User & Concurrency and Backup & Recovery Database
- 6.14 Basic Concept of major RDBMS products: Oracle, Sybase, DB2, SQL Server and other Databases

**Section D– 30 Marks**

**7. Networking**

- 7.1 Basic Network Theory: Network Definition, Network Models, Connectivity, Network Addressing.
- 7.2 Network Connectivity: Data Package, establishing a Connection, Reliable Delivery, Network Connectivity, Noise Control, Building Codes, Connection Devices
- 7.3 Advanced Network Theory: OSI model, Ethernet, Network Resources, Token ring, FDDI, Wireless Networking
- 7.4 Common Network Protocols: Families of Protocols, NetBEUI, Bridge and Switches, TCP/IP Protocol, Building TCP/IP Network, TCP/IP Suite
- 7.5 TCP/IP Services: Dynamic Host Configuration Protocol, DNS Name Resolution, NetBIOS support, SNMP, TCP/IP Utilities, FTP
- 7.6 Network LAN Infrastructure: LAN Protocols on a Network, IP Routing, IP Routing Tables, Router Discovery Protocols, Data Movement in a Routed Network, Virtual LANs (VLANs)
- 7.7 Network WAN Infrastructure: WAN Environment, Wan Transmission Technologies, Wan Connectivity Devices, Voice over Data Services
- 7.8 Remote Networking: Remote Networking, Remote Access Protocols, VPN Technologies
- 7.9 Computer Security: Computer Virus, Worm, Trojan horse
- 7.10 Network Security: Introduction, Virus Protection, Local Security, Network Access, Internet Security
- 7.11 Disaster Recovery: Need for Disaster Recovery, Disaster Recovery plan, Data backup, Fault Tolerance
- 7.12 Advanced Data Storage Techniques: Enterprise Data Storage, Clustering, Network Attached Storage, Storage Area Networks
- 7.13 Network Troubleshooting: Using Systematic Approach to Troubleshooting.
- 7.14 Network Support Tools: Utilities, Network Baseline
- 7.15 Network Access Points, Common Network Component, Common Peripheral Ports

**8. Computer Architecture & Organization**

- 8.1 Evaluation of Computers, Design Methodology, Set Architecture, MIPS ISA, ALU Design
- 8.2 Datapath Design: Single and Multiple Cycle Implementations, Pipelining, Memory Hierarchy, Input/output System: Bus & Role of Operating System

**9. Compiler Design**

- 9.1 Introduction to Compiling
- 9.2 Logical Analysis, Syntax Analysis, Semantic Analysis
- 9.3 Run Time environment
- 9.4 Intermediate Code Generation, Code Optimization
- 9.5 Compiler Generation Tools

**10. E-Commerce Technology**

- 10.1 Introduction to E-Commerce
- 10.2 Electronic Commerce Strategies
- 10.3 Electronic Commerce Security Issues
- 10.4 Success Models of E-Governance
- 10.5 E-Business: b2b, b2c, b2e, c2c, g2g, g2c
- 10.6 Principles of Electronic Payment, Strategies & Systems
- 10.7 E-marketing, Reverse Engineering
- 10.8 E-Banking, EDI Methods, SWIFT
- 10.9 Encryption and Decryption Methods, XML, Layout Managers, Event Model

**11. MIS and Web Engineering**

- 11.1 Information Systems, Client-Server Computing
- 11.2 Information Systems and Decision Making.
- 11.3 Database Design issues, Data Mining, Data Warehousing
- 11.4 Knowledge Management, The strategic use of Information Technology.
- 11.5 Work Process Redesign (Reengineering) with Information Technology, Enterprise Resources Planning Systems, Information Systems Security, Information Privacy and Global IT issues
- 11.6 Software Supported Demonstrations including advanced Spreadsheet topics Software Component Based Systems
- 11.7 Multimedia
- 11.8 Object-Oriented Programming with COMS & DECOMS
- 11.9 Group Decision Support Systems
- 11.10 Basics of Website Design

**12. IT in Nepal**

- 12.1 History of IT in Nepal
- 12.2 ICT Policy of Nepal
- 12.3 Current Electronic Transaction Act
- 12.4 Current Copyright Act
- 12.5 Uses of Computers and Software Development
- 12.6 Artificial Intelligence
- 12.7 Licensing Issues

प्रदेश लोक सेवा आयोग

सुदूरपश्चिम प्रदेश

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\*प्रयोगात्मक परीक्षा (Practical Test) का प्रश्नसंख्या निम्नानुसार हुनेछन ।

प्रयोगात्मक परीक्षाका एकाईहरू	प्रश्न संख्या
Operating System	1
Database Management System And Design	2
Programming Language	1
Networking	1

**द्वितीय चरण (Second Phase) : सामूहिक परीक्षण (Group Test) र अन्तरवार्ता (Interview)**

**सामूहिक परीक्षण (Group Test)**

(१० अंक)

**सामूहिक छलफल (Group Discussion)**

यस प्रयोजनको लागि गरिने परीक्षण १० पूर्णाङ्क र ३० मिनेट अवधिको हुनेछ, जुन नेता विहिन सामूहिक छलफल (Leaderless Group Discussion) को रूपमा अवलम्बन गरिने छ । दिइएको प्रश्न वा Topic का विषयमा पालैपालोसंग निर्दिष्ट समय भित्र समूह बीच छलफल गर्दै प्रत्येक उम्मेदवारले व्यक्तिगत प्रस्तुति (Individual Presentation) गर्नु पर्नेछ ।

**सामूहिक छलफलमा दिइने नमुना प्रश्न वा Topic**

उदाहरणको लागि - उर्जा संकट, गरीबी निवारण, बाली बीमा, सामाजिक सुरक्षा, खाद्य सुरक्षा, प्रतिभा पलायन, स्वास्थ्य बीमा, जलवायु परिवर्तन, आरक्षण जस्ता समसामयिक विषयवस्तुहरूबाट कुनै एक Topic दिइनेछ ।

**अन्तरवार्ता (Interview)**

(२५ अंक)

मौखिक (Oral)

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