



प्राविधिक शिक्षा तथा व्यावसायिक तालीम परिषद्
पदपूर्ति समिति
सानोठिमी, भक्तपुर ।

प्राविधिक तथा प्रशिक्षण सेवा, इन्जिनियरिङ्ग प्राविधिक प्रशिक्षण समूह, सूचना प्रविधि उपसमूह
सहायकस्तर प्रथम श्रेणी सूचना प्रविधि सहायक पदको
खुला प्रतियोगितात्मक लिखित परीक्षाको पाठ्यक्रम

द्वितीय पत्र : सेवा सम्बन्धी विषय

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1. Computer Fundamentals

- Computers, Kinds of Computers in respect of size and function
- Generation of Computers
- Components and Architecture of Computers, Connecting the Components
- Getting started:** Orientation to personal computers, The system unit, Starting the computers 1.5 **Input Devices:** The keyboard, The mouse, Other input devices
- Processing:** CPU, Memory
- Storages devices:** Overview of Storage Devices, The Floppy Disk Drive, The Hard Drive, The Universal Serial Bus(USB) Devices and Other Storage Devices
- Output devices:** Monitors, Printers, Modems, Soundboards
- Dos survival guide:** Using Command Prompt, Creating and using AUTOEXEC.BAT and CONFIG.SYS
- Windows survival guide:** The Windows Desktop, The Program Manager, Organizing the Desktop, The File Manager
- Hardware Troubleshooting:** Basic Hardware uses, troubles that may occur during its usage and repairing it

2. Computer Applications

- Application software:** Using Application Software (Word, Spreadsheet, PowerPoint)
- Utility Software:** Antivirus, Spyware
- Windows Explorer, E-mails, Internet, Intranet, Extranets, Ethernet, HTTP

3. Computer Network

- Basic Network Theory: Network Definition, Network Models, Connectivity, Network Addressing.
- Network Connectivity:** The Data Package, Establishing a Connection, Reliable Delivery, Network Connectivity, Noise Control, Building Codes, Connection Devices.
- Advanced Network Theory:** The OSI model, Ethernet, Network Resources, Token ring, FDDI, Wireless Networking.
- Common Network Protocols:** Families of Protocols, NetBEUI, Bridge and Switches, The TCP/IP Protocol, Building TCP/IP Network, The TCP/IP Suite
- TCP/IP Services:** Dynamic Host Configuration Protocol, DNS Name Resolution, NetBIOS support, SNMP, TCP/IP Utilities, FTP
- 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)
- Network WAN Infrastructure:** The WAN Environment, Wan Transmission Technologies, Wan Connectivity Devices, Voice Over Data Services
- Remote Networking:** Remote Networking, Remote Access protocols, VPN Technologies.
- Computer Security:** Computer Virus, Worm, Trojan Horse.
- Network Security:** Introduction, Virus Protection, Local Security, Network Access, Internet Security.
- Disaster Recovery:** The need for Disaster Recovery, Disaster Recovery plan, Data backup, Fault Tolerance.

- l. **Advanced Data Storage Techniques:** Enterprise Data Storage, Clustering, Network Attached Storage, Storage Area Networks.
- m. **Network Troubleshooting:** Using Systematic Approach to Troubleshooting.
- n. **Network Support Tools:** Utilities, The Network Baseline.
- o. Network Access Points (NAP), Common Network Component, Common Peripheral Ports.

4. Data Structures

- a. Fundamental of Data Structures, Abstract Data types
- b. Lists, Linked Lists, Stacks
- c. Queues, Priority Queue
- d. **Trees:** Traversal, Implementations, Binary Trees, Binary Search Trees, Balanced Search Trees, AVL Trees.
- e. Indexing Methods. Hashing Trees, Suffix Trees
- f. Worst-Case and Expected time Complexity.
- g. Analysis of Simple Recursive and Nonrecursive Algorithms.
- h. Searching, Merging and Sorting.
- i. **Introductory Notions of algorithm design:** Divide-and-Conquer, Dynamic Programming, Greedy Methods, Backtracking
- j. **Graph algorithms:** Depth-first Search and Breadth-first Search, Shortest Path Problems, Minimum Spanning Trees, Directed Acyclic Graphs.

5. Database

- a. Introduction, A Database Model, Relational Database Model, Integrity, RDBMS.
- b. SQL and Embedded SQL
- c. Writing Basic SQL SELECT Statements
- d. Restricting and Sorting data
- e. Single Row Functions
- f. Displaying Data from Multiple Tables
- g. Aggregation Data Using Group Functions
- h. Sub Queries, Manipulating Data and Creating & Managing Tables
- i. Creating Views and Controlling User Access
- j. Using Set Operators, Date time Function
- k. **Database Design:** Logical Design, Conceptual Design, Mapping Conceptual to Logical, Pragmatic issues, Physical Design, Integrity and Correctness, Relational Algebra, Relational Calculus.
- l. Normalization: 1NF, 2NF, 3NF, BCNF, 4NF, 5NF, DKNF
- m. **Architecture of DBMS:** Client-server, Open Architectures, Transaction Processing, Multi-User & Concurrency, and Backup & Recovery Database.
- n. **Basic Concept of major RDBMS products:** Oracle, Sybase, DB2, SQL Server and other Databases.

6. Operation System

- a. Define an Operating System, Trace the Developments in Operating Systems, Identify the functions of Operating Systems,
- b. Describe the basic components of the Operating Systems, Understand Information Storage and Management Systems,
- c. List Disk Allocation and Scheduling Methods, Identify the Basic Memory Management strategies, List the Virtual Memory Management Techniques, Define a Process and list the features of the Process Management System
- d. Identify the Features of Process Scheduling; List the features of Inter-Process Communication and Deadlocks,
- e. Identify the Concepts of Parallel and Distributed Processing, Identify Security Threats to Operating Systems
- f. Overview of the MS-DOS Operating System

- g. Introduction to the Windows Family of Products, Unix Family of Products, Linux Family of Products.
- h. Introduction to Windows Networking
- i. Windows Architecture, Linux Architecture
- j. Troubleshooting Windows, & Linux
- k. Managing Network Printing
- l. Managing Hard Disks and Partitions
- m. Monitoring and Troubleshooting Windows
- n. Users, Groups and Permission Linux and Windows

7. Programming Language

- a. Overview of Programming Language: History, Programming Paradigms, The role of Language translates in the Programming Process.
- b. Fundamental Issues in Language Design.
- c. Virtual Machines, Code Generation, Loop Optimization.
- d. Concept of Procedural Programming, Structural Programming, Object-Oriented Programming.
- e. Concept of C programming, C++ Programming,
- f. Java Programming for Declaration, Modularity and Storage Management Software Development.

॥समाप्त ॥