प्राविधिक सेवा, सूचना प्रविधि (आई.टी.) समूह, पाँचौं तह, वरिष्ठ सहायक पदको खुला प्रतियोगितात्मक परीक्षाको पाठ्यक्रम

द्वितीय पत्र — सेवा सम्वन्धी

खण्ड (क) – ५० अङ्क

1. Computer Fundamentals
1.1   Computer– Definition, History, Generation, Characteristics, Types & Applications
1.2   Overview of a computer system:
     1.2.1   Data and data processing
     1.2.2   Hardware (Input Devices, CPU, Output Devices, Storage devices, Network card, Modem, Sound card, etc.)
     1.2.3   Interfaces –ATA, SATA, SCSI, USB DVI, HDMI and related connectivity etc.
     1.2.4   Software
         1.2.4.1 Definition & Types of Software
         1.2.4.2 Programming Language
     1.2.5   Bios configuration and functions (Firmware)
     1.2.6   Device Drivers and configuration
1.3   Concept of Multimedia
1.4   Number Systems (Binary, octal, decimal and hexadecimal number system)
1.5   ASCII and Unicode standards

2. Operating System
2.1 Introduction to Operating System
2.2 Types of Operating System
2.3 Functions of Operating Systems
2.4 Command line Operation (Internal and External Commands)
2.5 Introduction to GUI and Command line operation
2.6 Windows
     2.6.1   Introduction of Windows Operating System
         2.6.1.1 Installation of Windows Operating System
         2.6.1.2 Basic Windows Elements
         2.6.1.3 Starting and shutting down Windows
         2.6.1.4 Managing information storage, disks and partitions
         2.6.1.5 Sharing file, folder, printer, application, etc.
         2.6.1.6 File Management with Windows Explorer
         2.6.1.7 Managing Directory Service, Users, Groups and Permissions
         2.6.1.8 Installation and configuration of device drivers, applications, fonts
         2.6.1.9 Windows applications
         2.6.1.10 Finding files and folders
         2.6.1.11 Starting a program by command line operation
         2.6.1.12 Changing window setting
             2.6.1.12.1 Adding/Removing programs
             2.6.1.12.2 Clearing the contents of document menu
             2.6.1.12.3 Customizing the taskbar
             2.6.1.12.4 Control panel items
         2.6.1.13 Creating shortcut (icons) on desktop
         2.6.1.14 System tools– disk scanning, disk defragmenter, backup, restore, format
         2.6.1.15 Installation, backup, recovery and optimization of operating system
2.7 2.6 Unix/Linux Operating systems
         2.7.1.1 Introduction to Unix Operating Systems
         2.7.1.2 Basic Linux Commands

3. Communication and Networking
3.1   Introduction to Computer Networking - definition, types, and topologies
3.2   Client server and peer to peer network
3.3   Concepts of E-mail, Internet, Extranet, Intranet, World Wide Web (WWW)
3.4   Internet Browsers

3.5   Connectivity and media: Network cables and connectors
3.6   Network devices, their functions, features and configuration (Switch, Router, Access point, Modem, Firewall etc.)
3.7   Network cabling and cable testing
3.8   OSI Reference model, TCP/IP model
3.9   Common TCP and UDP ports, protocols, and their purpose (e.g. HTTP, FTP, etc.)
3.10   Application of Network utilities (e.g. IPCONFIG, PING, TRACERT, NSLOOKUP)
3.11   Familiarity with IP Addressing, subnet mask, gateway, DNS, static and dynamic address assignment
3.12   Concept of Cloud based services (Drop box, Google Cloud, iCloud, etc.)
3.13   Setting up Microsoft Network

4. Cyber Security
4.1 Introduction to Cyber Security
4.2 Common security threats: Social engineering; Distributed Denial of Services; Malwares: Phishing, Spyware, Viruses, Worms, Trojans, etc.
4.3 Security Mechanisms
     4.3.1   Identity and Access Control
     4.3.2   Firewalls, IDS and IPS
     4.3.3   Email Filtering
     4.3.4   Vulnerability Scanning
     4.3.5   Antivirus Software
4.4 Cryptography: Encryption and decryption; Hashing; Digital Signature
4.5 Application Security
4.6 Business Continuity Planning
4.7 Introduction to Security Standards: ISO 27001

5. Word Processing
5.1 Concept of Word Processing, Types of Word Processing - Proprietary and Open Source
5.2 Word Processor - applications and functions
     5.2.1   Creating, Saving, Opening, Previewing and Printing documents; Changing Default Settings
     5.2.2   Elements of Word Processing Environment (Menu, Toolbars, Status bar, Rulers, Scrollbars)
     5.2.3   Copying, Moving, Deleting and Formatting text (Font, Size, Color, Alignment, line & paragraph spacing); Finding and Replacing text; Setting Page Layout
     5.2.4   Creating lists with Bullets and Numbering
     5.2.5   Creating and Manipulating Tables; Borders and Shading
     5.2.6   Use of Indentation and Tab Setting; Creating Newspaper Style Documents using Column
     5.2.7   Inserting Header, Footer, Footnotes, Endnotes, Page Numbers, File, Page break,
     5.2.8   Section break, Graphics, Pictures, Charts, Word Art, Symbols &Organization Chart
     5.2.9   Mail Merge
     5.2.10   AutoCorrect, Spelling and Grammar Checking, and Thesaurus
     5.2.11   Security Technique of Documents
     5.2.12   Familiarity with Devanagari fonts

6. Electronic Spreadsheet
6.1 Concept of Electronic Spreadsheet
6.2 Organization of Electronic Spreadsheet application (Cells, Rows, Columns, Worksheet, Workbook and Workspace)
6.3 Using Electronic Spreadsheet:
     6.3.1   Creating, Opening, Saving, Page Setting, Previewing and Printing Work Book; Changing default options
     6.3.2   Elements of Electronic Spreadsheet Environment (Menu, Toolbars, Status bar, Rulers, Scrollbars)

6.3.3   Editing, Copying, Moving, Deleting Cell Contents; Formatting Cells (Font, Border, Pattern, Alignment, Number and Protection); Formatting Rows, Column and Sheets
6.3.4   Using Formula - Relative Cell and Absolute Cell Reference
6.3.5   Using basic Functions
6.3.6   Generating Series; Sorting and Filtering Data; Summarizing Data with Sub Totals
6.3.7   Creating Charts
6.3.8   Inserting Header and Footer
6.3.9   Spell Checking
6.3.10 Importing data from and Exporting into other formats

7. **Presentation System**
    7.1   Introduction to presentation application
    7.2   Creating, Opening & Saving Slides
    7.3   Formatting Slides
    7.4   Slide Show
    7.5   Animation
    7.6   Inserting Built-in picture, Picture, Table, Chart, Graphs, and Organization Chart etc.

खण्ड (ख) – ५० अङ्क

8. **Database Management System**
    8.1   Introduction to Data, Database and DBMS
    8.2   Types of DBMS
    8.3   Basic Concept of Tables, Fields, Records, Relationships and Indexing
    8.4   Database design and Normalization
    8.5   Common data types
    8.6   Familiarity with Structured Query Language statements for manipulating database objects and information from database
    8.7   Basics of MySQL and PostGres Database
    8.8   Database Application: MS Access
        8.8.1   Data Types
        8.8.2   Creating, Modifying & Deleting Tables
        8.8.3   Establishing relationships among tables
        8.8.4   Formatting and validating field data
        8.8.5   Inserting, Modifying, and deleting data
        8.8.6   Creating, Modifying, Deleting and Using simple Queries / Forms / Reports

9. **Web Designing and Social Media**
    9.1   Introduction to Web Page and CMS (Content Management System)
    9.2   Designing Simple Webpage with HTML
        9.2.1   HTML Document
        9.2.2   HTML Tags
        9.2.3   Working with Text, Hyperlinks, Images, Lists, Forms, Tables, Frames, etc.
    9.3   Familiarity with Cascading Style Sheet, Rich Site Summary and social networking
    9.4   Concept of Web server and Proxy server
    9.5   Use of Video Conference tools (Zoom, Meet, Team, etc.)
    9.6   Use of Social Media in governance
        9.6.1   Introduction to Social Media
        9.6.2   Social Media Platforms
        9.6.3   Applications in government organizations
        9.6.4   Operating and Managing Social Media

10. **Management Information Systems**
    10.1 Introduction to Information Systems, Types
    10.2 How information system impact organizations and business firms

10.3 The impact of IT on management decision making

10.4 Decision support systems

10.5 Basics of Data Mining, Data Warehousing

11. Programming Concept and Data Structure

11.1 Programming Concept:

11.1.1 Concept of Procedural Programming, Structural Programming and Object-Oriented Programming

11.1.2 Concept of Algorithm, Flowchart and Pseudo code

11.1.3 Concept of C programming, C++ Programming, JAVA Programming

11.1.4 Basic Concept of control, loop, array and function

11.2 Data Structure:

11.2.1 Introduction of Data structure and Abstract data Type

11.2.2 Linear data structures, Lists, Linked Lists, Stacks, Queues

11.2.3 Recursive Algorithms

11.2.4 Sorting Algorithms

12. Software Engineering

12.1 Software Development Life Cycle; Software Process Model: Waterfall model, Prototyping model, Incremental model, Spiral model, Agile model, RAD model

12.2 Software Project management: Relationship to lifecycle, project planning, project control, project organization, risk management, cost models, configuration management, version control, quality assurance, metrics

12.3 Software requirements: Requirements analysis, analysis tools, requirements definition, requirements specification, static and dynamic specifications, requirements review

12.4 Software design: Design for reuse, design for change, design evaluation and validation

12.5 Implementation: Programming standards and procedures; modularity; Testing: unit testing, integration testing, regression testing, tools for testing

12.6 Maintenance: The maintenance problem, the nature of maintenance, planning for maintenance

13. Relevant Legislations and Institutions

13.1 ICT Policy, 2072

13.2 Electronic Transaction Act, 2063

13.3 Government Website Development and Management Directive, 2078

द्वितीय पत्रबाट निम्नानुसार प्रश्न सोधिनेछ :

खण्ड	अङ्कभार	विषयगत प्रश्न संख्या	
		छोटो उत्तर	लामो उत्तर
(क)	५०	६ प्रश्न X ५ अङ्क= ३०	२ प्रश्न X १० अङ्क= २०
(ख)	५०	६ प्रश्न X ५ अङ्क= ३०	२ प्रश्न X १० अङ्क= २०
जम्मा	१००	१२ प्रश्न X ५ अङ्क= ६०	४ प्रश्न X १० अङ्क= ४०