निक्षेप तथा कर्जा सुरक्षण कोष

प्राविधिक सेवा, बरिष्ठ कम्प्युटर सहायक (पाँचौ तह) पदको

खुला/आन्तरिक प्रतियोगितात्मक परीक्षाको पाठ्यक्रम

पाठ्यक्रम योजनालाई निम्नानुसारका दुई चरणमा विभाजन गरिएको छ :

प्रथम चरणः-	लिखित परीक्षा	पूर्णाङ्कः-२००
द्वितीय चरणः-	अन्तर्वार्ता	पूर्णाङ्कः-३०

<u>परीक्षा योजना (Examination Scheme)</u>

१. प्रथम चरणः- लिखित परीक्षा (Written Examination)　　　पूर्णाङ्कः-२००

पत्र	विषय	पूर्णाङ्क	उत्तीर्णाङ्क	परीक्षा प्रणाली	प्रश्न संख्या X अङ्क	समय
प्रथम	कम्प्युटर सम्बन्धी	१००	४०	वस्तुगत बहुवैकल्पिक प्रश्न (MCQ)	५० प्रश्न x २ अङ्क	४५ मिनेट
द्वितीय		१००	४०	विषयगत (Subjective)	१० प्रश्न x १० अङ्क	२ घण्टा ३० मिनेट

२. द्वितीय चरणः अन्तर्वार्ता (Interview)　　　पूर्णाङ्कः-३०

विषय	पूर्णाङ्क	उत्तीर्णाङ्क	परीक्षा प्रणाली	समय
अन्तर्वार्ता (Interview)	३०	-	मौखिक (Oral)	-

<u>द्रष्टव्यः</u>

१. लिखित परीक्षाको माध्यम भाषा नेपाली वा अंग्रेजी हुनेछ अथवा नेपाली र अंग्रेजी दुवै हुन सक्नेछ।

२. प्रथम र द्वितीय पत्रको पाठ्यक्रम एउटै हुनेछ।

३. प्रथम र द्वितीय पत्रको लिखित परीक्षा छुट्टाछुट्टै हुनेछ।

४. लिखित परीक्षामा सोधिने **प्रश्नसंख्या र अङ्कभार** यथासम्भव सम्बन्धित पत्र/विषयमा दिईए अनुसार हुनेछ ।

५. वस्तुगत बहुवैकल्पिक (Multiple Choice) प्रश्नहरुको गलत उत्तर दिएमा प्रत्येक गलत उत्तर बापत २० प्रतिशत अङ्क कट्टा गरिनेछ । तर उत्तर नदिएमा त्यस बापत अङ्क दिइने छैन र अङ्क कट्टा पनि गरिने छैन ।

६. वस्तुगत बहुवैकल्पिक हुने परीक्षामा परीक्षार्थीले उत्तर लेख्दा अंग्रेजी ठूलो अक्षर (Capital letter) A,B,C,D मा लेख्नुपर्नेछ । सानो अक्षर (Small letter) a,b,c,d लेखेको वा अन्य कुनै सङ्केत गरेको भए सबै उत्तरपुस्तिका रद्द हुनेछ ।

७. बहुवैकल्पिक प्रश्नहरु हुने परीक्षामा कुनै प्रकारको क्याल्कुलेटर (Calculator) प्रयोग गर्न पाइने छैन ।

८. विषयगत प्रश्नहरुको हकमा 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 दुई बढी टिप्पणीहरु (short notes) सोध्न सकिने छ ।

९. विषयगत प्रश्न हुने पत्र/विषयका प्रत्येक खण्डका लागि छुट्टाछुट्टै उत्तरपुस्तिकाहरु हुनेछन ।परीक्षार्थीले प्रत्येक खण्डका प्रश्नको उत्तर सोही खण्डको उत्तरपुस्तिकामा लेख्नु पर्नेछ ।

१०. यस पाठ्यक्रम योजना अन्तर्गतका पत्र/विषयका विषयवस्तुमा जुन सुकै लेखिएको भएतापनि पाठ्यक्रममा परेका कानून, ऐन, नियम, विनियम तथा नीतिहरु परीक्षाको मिति भन्दा ३ महिना अगाडि (संशोधन भएका वा संशोधन भई हटाईएका वा थप गरी संशोधन भई) कायम रहेकालाई यस पाठ्क्रममा परेको सम्झनु पर्दछ ।

११. प्रथम चरणको परीक्षाबाट छनौट भएका उम्मेदवारलाई मात्र द्वितीय चरणको परीक्षामा सम्मिलित गराइनेछ ।

१२. **पाठ्यक्रम स्वीकृत मितिः २०८०/१२/३०**

प्राविधिक सेवा, बरिष्ठ कम्प्युटर सहायक (पाँचौ तह) पदको

खुलारआन्तरिक प्रतियोगितात्मक परीक्षाको पाठ्यक्रम

प्रथम र द्वितीय पत्र : कम्प्युटर सम्बन्धी

<u>खण्ड (क) — (५० % अङ्क)</u>

1. Computer Fundamental
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
        1.2.2.1   Definition of Hardware
        1.2.2.2   Input Unit- Keyboard, Mouse, Scanner etc.
        1.2.2.3   CPU-Arithmetic Logic Unit (ALU), Control Unit (CU), Memory Unit
        1.2.2.4   Output Unit: - Monitor, Printer, etc.
        1.2.2.5   Storage devices :- Primary & Auxiliary Memory (Floppy Disk, Hard Disk, Compact Disk, DVD, Super Disks, Zip Disks, Cartridge tape, Flash Disks, etc.)
        1.2.2.6   Others: - Network card, Modem, Sound card, etc.
    1.2.3   Software
        1.2.3.1   Definition & Types of Software
        1.2.3.2   Programming Language
    1.2.4   Live ware
    1.2.5   Firmware and Cache Memory
1.3 Setting & Protection of Computer Room and Computer
1.4 Concept of Computer related threats (Viruses, worms, Trojan, phishing etc.),their Remedies and protection
1.5 Concept of Multimedia
1.6 Introduction to ASCII and Unicode and font types
1.7 Number System: Number Systems (Binary, Octal Decimal, Hexadecimal) and their conversion
1.8 Security
    1.8.1   Physical Security of Information Technology Infrastructure
    1.8.2   Digital security: Antivirus, Firewalls, Antispyware, User authentication types, IPS/IDS
    1.8.3   Common security threats: Social engineering, Malware, Phishing, Spyware, Viruses, Worms, Trojans, Distributed Denial of Services

2. Operating System
2.1 Introduction, Types and Functions of operating systems
2.2 Processing and Threads: Symmetric Multiprocessing, Micro-kernels, Concurrency, Mutual Exclusion and Synchronization, Deadlock
2.3 Scheduling
2.4 Memory Management
2.5 Input Output and Files: I/O devices and its organization, Principles of I/O software and hardware, Disks, Physical Structure of the disk, Files and directories organization, File System Implementation Concept of File and Folder, Types of files and file extensions, Wildcards and Pathname
2.6 **Security**: Authentication and Access Authorization, System Flaws and Attacks, Trusted System
2.7 **Common Operating Systems**: MS-DOS (Introduction, System files of MS-DOS

and their functions, using DOS commands), Windows Architecture, Linux Architecture, Troubleshooting Windows& Linux, Windows Networking, Managing Network Printing, Managing Hard Disks and Partitions, Monitoring and Troubleshooting Windows, Users, Groups and Permission on Linux and Windows. Sharing file, folder, printer, application

3. **Office Package**
   3.1 **Word Processing**: Concept of Word Processing, Application of Word Processor, Types of Word Processor
   3.1.1 Using MS-Word
   - 3.1.1.1 Introduction to MS Word, Starting and Closing MS-Word
   - 3.1.1.2 Creating, Saving and Opening the documents
   - 3.1.1.3 Elements of MS-Word Environment (Menu, Toolbars, Status bar, Rulers, Scrollbars, etc.), Show or Hide Toolbars, Customizing Menu and Toolbars, Using Shortcut Menu, Using Right mouse Click, Using Shortcut key, Inserting and Overtyping Text, Viewing a Document, Selection Techniques, Using UNDO/REDO, Getting help: Use of Office Assistant Help, Contents Help
   - 3.1.1.4 Changing Default setting of the MS-Word
   - 3.1.1.5 Copying, Moving, Deleting and Formatting Text
   - 3.1.1.6 Finding and Replacing Text
   - 3.1.1.7 Familiarity with Devanagari Fonts
   - 3.1.1.8 Formatting Font: Changing the Font and Font Size, Character Formatting, Using Font Dialog Box, using Format Painter, Changing Case, Using Drop Caps, Using Text Animation Effects
   - 3.1.1.9 Formatting Paragraph: Aligning Text, Bullets and Numbering, Line Spacing, Paragraph Spacing, Borders and Shading, Use of Indentation and Tab Setting
   - 3.1.1.10 Formatting Page: Setting Page Layout (Margins, Paper Size and Page Orientation), Inserting Page Break and Section Break, Headers, and Footers, Footnotes, Endnotes and Page Numbers
   - 3.1.1.11 Paragraph and Page Borders and Shading
   - 3.1.1.12 Proofing (Track Change, AutoCorrect, Spelling and Grammar Checking, and Thesaurus), previewing and printing document
   - 3.1.1.13 Working with Tables: Creating, Selecting, resizing a Tables, Adding and Deleting Columns and Row, Formatting Tables, Performing Calculation
   - 3.1.1.14 Working with Styles: Creating Styles, Applying a Different Style. Managing Styles
   - 3.1.1.15 Working with Graphics: Inserting and Formatting Text Boxes, Adding Auto Shape, Inserting Pictures, Charts, Word Art, Symbols & Organization Chart, Creating Watermark
   - 3.1.1.16 Working with Columns: Creating and Formatting Columns
   - 3.1.1.17 Opening & Saving different types of documents
   - 3.1.1.18 Mail Merge Creating mail merge and labels: Creating Mail Merge, Selecting Specific Records To Merge, Creating Labels
   - 3.1.1.19 Security Techniques of Documents
   - 3.1.1.20 Master Document, Organizing a Document in Outline View, Cross Reference, Index, Table of Contents, Table of Figures, List of Tables
   - 3.1.1.21 Using Templates and Macros,

3.1.1.22   Working with Object Linking and Embedding (OLE): Creating OLE, Editing OLE

3.1.1.23   Working with online forms, Creating web pages with word

3.2 **Electronic Spreadsheet :** Concept of Electronic Spreadsheet, Application of Electronic Spreadsheet, Types of Electronic Spreadsheet Applications

    3.2.1   Using MS-Excel

      3.2.1.1   Introduction to MS-Excel

      3.2.1.2   Organization of Excel (Cells, Rows, Columns, Worksheet, Workbook and Workspace)

      3.2.1.3   Creating, Opening and Saving Workbook

      3.2.1.4   Managing worksheet and workbook information

      3.2.1.5   Elements of MS-Excel (Menu, Toolbars, Status bar, Rulers, Scrollbars, etc.), Getting Help, Moving Around, Selecting Range in Workbook, Entering Data into Worksheet, Spell Checking, Using Devanagari Fonts in MS-Excel

      3.2.1.6   Changing default option of the MS-Excel, Customizing Menu & Toolbars

      3.2.1.7   Managing Worksheet Information: Cut and Paste, Drag and Drop, Copy and Paste, Insert a New Row, Insert Multiple Rows, Delete Rows, Insert a New Column, Insert Multiple Columns, Delete Columns, Insert a Cell

      3.2.1.8   Performing Calculations: Relative Cell and Absolute Cell Reference, Generating Series, Using Simple Formula and Using Common Functions, Using Auto Calculate and Labels.

      3.2.1.9   Formatting Worksheets: Adjusting Column Width and Row Height, Formatting Cell (Font, Border, Pattern, Alignment, Number and Protection) using Toolbar and using Menu Options

      3.2.1.10   Conditional Formatting, Sorting and Filtering Data, Summarizing Data with Sub Totals

      3.2.1.11   Creating chart: Change Chart Title, X axis and Y axis Title, Change Gridlines Change Legend Options; Change Data Labels; Add Data Table Delete Data Series; Add Data Series Using Mouse, Delete Chart; Formatting Chart

      3.2.1.12   Goal Seek, Scenario & Audit

      3.2.1.13   Creating Pivot Table and analyzing data: Creating Pivot Table, Updating Pivot Table, Modifying Calculated Field in Pivot Table, Creating Chart From Pivot Table

      3.2.1.14   Importing from and Exporting into other Formats

      3.2.1.15   Setting up Page and Print: Setting up Page, Change Page Orientation, Change Scaling, Change Paper Size, Change Page Margin, Align to Center of Page, Add Header, Footer, Previewing and Printing Worksheet: Print preview, Print Active Sheets, Print Selected Cells, Print Chart

      3.2.1.16   Validating and protecting worksheet and workbook: Protecting Worksheet Style And Content, Protecting Your Workbook From Unauthorized Users Access

      3.2.1.17   Using workgroup features: Add Comment into a Cell, Show/Hide Comment Indicators, Edit And Delete Comments, Sharing Workbooks: Enable Workbook Sharing, Disable Workbook Sharing, Copies of Shared Workbook, Track Changes in Shared Workbook, Accept or Reject

Changes

3.3 Presentation System
    3.3.1 Using MS-Power Point
- 3.3.1.1 Creating, Opening& Saving presentation
- 3.3.1.2 Formatting Slides
- 3.3.1.3 Slide show and Slide Transition
- 3.3.1.4 Animation
- 3.3.1.5 Inserting Clip Art, Picture, Tables, Chart, Graphs, Organization Chart etc.
- 3.3.1.6 Exporting and Printing slides

4. Web Technology
- 4.1 Introduction to Web Page and Content Management System
- 4.2 Introduction to HTML, HTML document and HTML Tags
- 4.3 Working with Text, Hyperlinks, Images, Lists, Forms, Tables, Frames, etc.
- 4.4 Familiarity with Cascading Style Sheet, and Rich Site Summary
- 4.5 Familiarity with JavaScript, XML
- 4.6 Concept of Web server and Proxy server
- 4.7 Social Networking and Social Media in Governance

खण्ड (ख) – (५० % अङ्क)

5. Computer Networks
- 5.1 **Introduction**: Definition, Types, Network Media and Topologies
- 5.2 Concept about E-mail, Internet, Intranet, Extranet
- 5.3 **Network Connectivity**: The Data Package, Establishing a Connection, Reliable Delivery, Network Connectivity, Noise Control, Building Codes, Connection Devices.
- 5.4 The OSI model, Ethernet, Network Resources, Token ring, FDDI, Wireless Networking.
- 5.5 **Common Network Protocols**: Families of Protocols, NetBEUI, Bridge and Switches, The TCP/IP Protocol, IP address, Subnet mask, IP addressing, Building TCP/IP Network, The TCP/IP Suite
- 5.6 **TCP/IP Services**: Dynamic Host Configuration Protocol, DNS Name Resolution, NetBIOS support, SNMP, TCP/IP Utilities, FTP
- 5.7 **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)
- 5.8 **Network Security**: Introduction, Virus Protection, Local Security, Network Access, Internet Security.
- 5.9 Network Support Tools

6. Structured and Object Oriented Programming
- 6.1 Data types, ADT
- 6.2 Operators, variables and assignments, control structures, Procedure/function
- 6.3 Concept of Procedural Programming, Structured Programing and object oriented Programming
- 6.4 Class definitions, encapsulation, inheritance, object composition, Polymorphism
- 6.5 Pattern and framework
- 6.6 Programming with C, C++, Java

7. Data Structures and Algorithms

7.1 **General concepts**: Abstract data types, Time and space analysis of algorithms, Big Oh and theta notations, Average, best and worst case analysis

7.2 **Linear data structures**: Lists, Linked Lists, Stacks, Queues, Priority Queue

7.3 **Trees**: General and binary trees, Representations and traversals, Binary search trees, balancing trees, AVL trees, 2-3 trees, red-black trees, self- adjusting trees, Splay Trees

7.4 **Algorithm design techniques**: Greedy methods, Priority queue search, Exhaustive search, Divide and conquer, Dynamic programming, Backtracking and Recursion

7.5 **Graph algorithms**: Depth-first Search and Breadth-first Search, Shortest Path Problems, Minimum Spanning Trees, Directed Acyclic Graphs.

7.6 Searching, Merging and Sorting

8. System Analysis and Design

8.1 Defining the System, System Owner, System User, System Designers and system Builders, System Analysts, Variations on the System Analyst title, System life Cycle

8.2 **Joint Application Development (JAD):** JAD definition, JAD purpose, JAD Philosophy, JAD Scope, Involved in a JAD: Sponsor, Business Users, System Analyst

8.3 **Roles of JAD Group Member**: Project Leader, Record Keeper, Time Keeper

8.4 **The System Design Environment**: Development Process, Management Process, System Structure, Basic Component of Computer based Information System, Personal/ Centralized/Distribution System

8.5 **Concept formations**: Introduction, Finding the Problem, Evaluating the Proposal, Technical Feasibility, Operational Feasibility, Economic Feasibility

8.6 **Requirements analysis**: Representing System Analysis Model, Requirement Model, Design Model,

8.7 **Development Process**: Design Method

8.8 **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

8.9 **Relationship Sets:** Degree of Relationship and Cardinality Relationship, Specialization, Generalization, Aggregation

8.10 **Data Flow Diagrams (DFDs):** Introductions, Data flow Diagram, Symbol, Files or data store, External entities, Data flows, Context diagram, Top level DFD, Expansion Level DFD, Conversions of Data

8.11 **Object Modeling:** Object-Oriented Concept, Object Structure, Object Feature, Class and Object.

8.12 **Representation:** Association and Composition, Inheritance, Multiple Inheritances

8.13 **Modeling:** Use Case Diagram, State Diagram, Event Flow Diagram

8.14 **Documentation:** Automatic and Manual System

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 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
9.9 SQL and Embedded SQL, Writing Basic SQL Statements, Restricting and Sorting data, Single Row Functions, Displaying Data from Multiple Tables, Aggregation of Data Using Group Functions, Sub Queries, Manipulating Data and Creating & Managing Tables, Creating Views and Controlling User Access,
9.10 **Database Design**: Logical Design, Conceptual Design, Mapping Conceptual to Logical, Pragmatic issues, Physical Design, Integrity and Correctness, Relational Algebra, Relational Calculus. Normalization: 1NF, 2NF, 3NF, BCNF, 4NF, 5NF, DKNF, Database Design with major RDBMS products: Oracle, Sybase, DB2, SQL Server

10. **IT in Nepal, Policy, Laws and Emerging Technologies**
    10.1 History of IT in Nepal
    10.2 Cryptography, Digital Signature
    10.3 E-Commerce, E-Governance, E-Banking
    10.4 ICT Policy, 2072 B.S.
    10.5 Electronic Transaction Act, 2063 B.S.
    10.6 निक्षेप तथा कर्जा सुरक्षण कोष ऐन, २०७३
    10.7 निक्षेप तथा कर्जा सुरक्षण कोष कर्मचारी सेवा, शर्त सम्बन्धी विनियमावली, २०७४
    10.8 राष्ट्रिय साईबर सुरक्षा नीति, २०८०

निक्षेप तथा कर्जा सुरक्षण कोष

प्राविधिक सेवा, बरिष्ठ कम्प्युटर सहायक (पाँचौ तह) पदको

खुलारआन्तरिक प्रतियोगितात्मक परीक्षाको पाठ्यक्रम

लिखित परिक्षाका प्रश्न संख्या निम्नानुसार हुनेछन् ।

क्र.सं	पाठ्यक्रम	प्रश्न संख्या र प्रश्नभार	
		वस्तुगत बहुबैकल्पिक	विषयगत
1.	Computer Fundamentals	७×२=१४	१×१०=१०
2.	Operating System	५×२=१०	१×१०=१०
3.	Office Package	१०×२=२०	१×१०=१०
4.	Web Technology	४×२=८	१×१०=१०
5.	IT in Nepal, Policy, Laws and Emerging Technologies	३×२=६	१×१०=१०
6.	Computer Networks	५×२=१०	१×१०=१०
7.	Structured and OOP	४×२=८	१×१०=१०
8.	Data Structures and Algorithm	३×२=६	१×१०=१०
9.	System Analysis and Design	४×२=८	१×१०=१०
10.	Database Management System	५×२=१०	१×१०=१०
जम्मा		१००	१००

निक्षेप तथा कर्जा सुरक्षण कोष

प्राविधिक सेवा, बरिष्ठ कम्प्युटर सहायक (पाँचौ तह) पदको
खुलारआन्तरिक प्रतियोगितात्मक परीक्षाको पाठ्यक्रम
अंग्रेजी वा देवानगरी **Typing Skill Test** को लागिः-

१. देवनागरी Typing Skill Test को लागि २०० शब्दहरुको Text दिइनेछ र देहाय अनुसार अंक प्रदान गरिनेछ:-

शुद्ध शब्द प्रति मिनेट (Correct Words/Minute)	पाउने अंक
७ भन्दा कम शुद्ध शब्द प्रति मिनेट बापत	० अंक
७ वा सो भन्दा बढी र १४ भन्दा कम शुद्ध शब्द प्रति मिनेट बापत	१ अंक
१४ वा सो भन्दा बढी र २१ भन्दा कम शुद्ध शब्द प्रति मिनेट बापत	२ अंक
२१ वा सो भन्दा बढी र २८ भन्दा कम शुद्ध शब्द प्रति मिनेट बापत	३ अंक
२८ वा सो भन्दा बढी र ३५ भन्दा कम शुद्ध शब्द प्रति मिनेट बापत	४ अंक
३५ वा सो भन्दा बढी शुद्ध शब्द प्रति मिनेट बापत	५ अंक

२. English Typing Skill Test को लागि २५५ शब्दहरुको Text दिइनेछ र देहाय अनुसार अंक प्रदान गरिनेछ:-

शुद्ध शब्द प्रति मिनेट (Correct Words/Minute)	पाउने अंक
८ भन्दा कम शुद्ध शब्द प्रति मिनेट बापत	० अंक
८ वा सो भन्दा बढी र १६ भन्दा कम शुद्ध शब्द प्रति मिनेट बापत	१ अंक
१६ वा सो भन्दा बढी र २४ भन्दा कम शुद्ध शब्द प्रति मिनेट बापत	२ अंक
२४ वा सो भन्दा बढी र ३२ भन्दा कम शुद्ध शब्द प्रति मिनेट बापत	३ अंक
३२ वा सो भन्दा बढी र ४० भन्दा कम शुद्ध शब्द प्रति मिनेट बापत	४ अंक
४० वा सो भन्दा बढी शुद्ध शब्द प्रति मिनेट बापत	५ अंक

३. अंग्रेजी वा देवनागरी Typing मा दिइएको Text लाई आधार मानी टाइप गरेको Text संग भिडाई चेक गरिनेछ । दिइएको अंग्रेजी वा देवनागरी Text मा उल्लेखित स्थान बमोजिम परीक्षार्थीहरुले आफ्नो Text मा Punctuation टाइप नगरेको पाइएमा त्यसको शब्दमा गणना गरिने छैन । तत्पश्चात निम्न Formula प्रयोग गरी शुद्ध प्रति मिनेट (Correct words/Minute) निकालिनेछ ।

सुत्र (Formula) :

शुद्ध शब्द प्रति मिनेट (Correct words/ Minute) $= \dfrac{(Total\ Words\ typed - Wrong\ Words)}{5}$