Ichchhakamana Rural Municipality
Kurintar, Chitwan

Curriculum for IT officer Examination

Written MCQ (50 Marks) 1 Hour

1. **Computer Fundamentals (4 Marks)**
   1.1. Introduction, Characteristics, Types and Applications of Computer
   1.2. Overview of a computer system:-
      1.2.1. Hardware: Input Unit, CPU and Output Unit, and Storage devices
      1.2.2. Software:- Definition and types of Software
   1.3. Introduction to ASCII, Unicode standards and font types
   1.4. Basic electronics and communication
      1.4.1. Difference between vacuum tube and semiconductor
      1.4.2. Basic concept of integrated circuits and its use
      1.4.3. Communication System: definition, types, and elements of communication system
   1.5. Smart phone, tablets and computing devices

2. **System Analysis and Design (4 Marks)**
   2.1. Definition of the System, System Owner, System User, System Designers and system Builders, System Analysts, Variations on the System Analyst title, System life Cycle
   2.2. System Design Environment: Development Process, Management Process, System Structure, Basic Component of Computer based Information System, Personal/ Centralized/Distribution System
   2.3. Concept formations: Introduction, Finding the Problem, Evaluating the Proposal, Technical Feasibility, Operational Feasibility, Economic Feasibility.
   2.4. Requirements analysis: Representing System Analysis Model, Requirement Model, Design Model
   2.5. Development Process: Design Method
   2.6. 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
   2.7. Relationship Sets: Degree of Relationship and Cardinality Relationship, Specialization, Generalization, Aggregation
   2.8. Data Flow Diagrams (DFDs): Introductions, Data flow Diagram, Symbol, Files or data store, External entities, Data flows
   2.9. Describing System by Data Flow Diagram: Context diagram, Top level DFD, Expansion Level DFD, Conversions of Data
   2.10. Modeling: Use Case Diagram, State Diagram, Event Flow Diagram.
   2.11. Documentation: Automatic and Manual System

3. **Operating System (4 Marks)**
   3.1. Definition, Development, and Functions of Operating Systems
   3.2. Basic components of the Operating Systems, Information Storage, and Management Systems
   3.3. Disk Allocation and Scheduling Methods, Basic Memory Management strategies, Virtual Memory Management Techniques, Define a Process and features of the Process Management System
   3.4. Features of Process Scheduling; List the features of Inter-Process Communication and Deadlocks

3.5. Concepts of Parallel and Distributed Processing, Identify Security Threats to Operating Systems

3.6. Virtualization and cloud computing

3.7. Basic components Windows Operation System, Users, Role, Disk Management, Device Management

4. Networking (4 Marks)

4.1. Basic Network Theory: Network Definition, Network Models, Connectivity, Network Addressing.

4.2. Network Connectivity: Data Package, Establishing a Connection, Reliable Delivery, Network Connectivity, Noise Control, Building Codes, Connection Devices

4.3. Advanced Network Theory: OSI model, Ethernet, Network Resources, Token ring, FDDI, Wireless Networking

4.4. Common Network Protocols: Families of Protocols, NetBEUI, Bridge and Switches, TCP/IP Protocol, Building TCP/IP Network, TCP/IP Suite

4.5. TCP/IP Services: Dynamic Host Configuration Protocol, DNS Name Resolution, NetBIOS support, SNMP, TCP/IP Utilities, FTP

4.6. 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)

4.7. Network WAN Infrastructure: WAN Environment, Wan Transmission Technologies, Wan Connectivity Devices, Voice Over Data Services

4.8. Remote Networking: Remote Networking, Remote Access protocols, VPN Technologies

4.9. Computer Security: Computer Virus, Worm, Trojan Horse

4.10. Network Security: Introduction, Virus Protection, Local Security, Network Access, Internet Security

4.11. Disaster Recovery: Need for Disaster Recovery, Disaster Recovery plan, Data backup, Fault Tolerance

4.12. Advanced Data Storage Techniques: Enterprise Data Storage, Clustering, Network Attached Storage, Storage Area Networks

5. Computer Architecture (4 Marks)

5.1. Basic Structures: sequential circuits, design procedure, state table and state diagram, Von Neumann / Harvard architecture, RISC/CISC architecture

5.2. Addressing methods and programs, representation of data, arithmetic operations, basic operational concepts, bus structures, instruction, cycle and excitation cycle

5.3. Processing Unit: instruction formats, arithmetic and logical instruction

5.4. Addressing modes

5.5. Input Output Organization : I/O programming , memory mapped I/O, basic interrupt system, DMA

5.6. Memory Systems

6. Database Management System (6 Marks)

6.1. Introduction, A Database Model, Relational Database Model, Integrity, RDBMS

6.2. SQL and Embedded SQL

6.3. Sub Queries, Join Queries

6.4. Creating Views and Controlling User Access

6.5. Using Set Operators, Datetime Function
6.6. Database Design: Logical Design, Conceptual Design, Mapping Conceptual to Logical, Pragmatic issues, Physical Design, Integrity and Correctness, Relational Algebra, Relational Calculus
6.7. Normalization
6.8. Architecture of DBMS: Client-server, Open Architectures, Transaction Processing, Multi-User & Concurrency, and Backup & Recovery Database
6.9. Basic Concept of major RDBMS products: Oracle, My SQL, SQL Server, and other Databases

7. Application Package (6 Marks)
7.1. Word Processing
    7.1.1. Concept of Word Processing
    7.1.2. Creating, Saving and Opening the documents
    7.1.3. Editing and formatting document: copying, moving, deleting, finding and replacing text; Bullets and Numbering; Tables, Borders and Shadings; Indentation and Tab Setting; Columns, Header, Footer, Page Numbers; References, Footnotes, and Endnotes; Page break and Section break; Graphics, Pictures, Charts, Word Art, Symbols &Organization Chart
    7.1.4. AutoCorrect, Spelling and Grammar Checking, and Thesaurus
    7.1.5. Mail Merge
    7.1.6. Document security
    7.1.7. Document previewing and printing
7.2. Spreadsheet
    7.2.1. Concept of Electronic Spreadsheet
    7.2.2. Creating, Opening and Saving Work Book
    7.2.3. Editing, Copying, Moving, Deleting Cells/Rows/Columns/Range/Worksheets
    7.2.4. Formatting (Cells, Rows, Columns, Worksheets, etc.)
    7.2.5. Using Formula with Relative Cell and Absolute Cell Reference
    7.2.6. Using Functions
    7.2.7. Creating and editing Charts
    7.2.8. Inserting Header and Footer, Page Setting, Previewing and Printing
7.3. Presentation System
    7.3.1. Introduction to presentation applications
    7.3.2. Creating, Opening & Saving presentation
    7.3.3. Formatting Slides
    7.3.4. Slide Show and animation
    7.3.5. Inserting Built-in picture, Table, Chart, Graphs, and Organization Chart etc.
    7.3.6. Exporting and printing slides

8. Programming Concept and Data Structure (4 Marks)
8.1. Concept of Procedural Programming, Declarative Programming, Structural Programming and Object-Oriented Programming
8.2. Concept of Algorithm, Flowchart and Pseudo code
8.3. Concept of C programming, C++ Programming, JAVA Programming
8.4. Basic Concept of control, loop, array and function
8.5. Introduction of Data structure and Abstract data Type
8.6. Linear data structures, Lists, Linked Lists, Stacks, Queues
8.7. Recursive Algorithms

8.8. Sorting Algorithms

9. **Web Technology, Social Media and Video Conference (4 Marks)**
   9.1. Introduction to Web Page and Content Management System
   9.2. Introduction to HTML
   9.3. HTML document
      9.3.1. HTML Tags
      9.3.2. Working with Text, Hyperlinks, Images, Lists, Forms, Tables, Frames, etc.
   9.4. Familiarity with Cascading Style Sheet, Rich Site Summary and social networking
   9.5. Concept of Web server and Proxy server
   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
   9.7. Use of Video Conference tools (Zoom, Meet, Team, etc.)

10. **Cyber Security (4 Marks)**
   10.1. Introduction to Cyber Security
   10.2. Common security threats: Social engineering; Distributed Denial of Services; Malwares: Phishing, Spyware, Viruses, Worms, Trojans, etc.
   10.3. Identity and Access Management

   10.4. Security Engineering: Firewalls, Router/switch security, IDS and IPS, Email Filtering, Vulnerability Scanning, Host based Security tools (use of antivirus software)
   10.5. Cryptography: Encryption and decryption; Hashing; Digital Signature
   10.6. Application Security
   10.7. Business Continuity Planning
   10.8. Introduction to Security Standards: ISO 27001

11. **Software Engineering (4 Marks)**
   11.1. Software Development Life Cycle; Software Process Model: Waterfall model, Prototyping model, Incremental model, Spiral model, Agile model, RAD model
   11.2. Software Project management: Relationship to lifecycle, project planning, project control, project organization, risk management, cost models, configuration management, version control, quality assurance, metrics
   11.3. Software requirements: Requirements analysis, analysis tools, requirements definition, requirements specification, static and dynamic specifications, requirements review
   11.4. Software design: Design for reuse, design for change, design evaluation and validation
   11.5. Implementation: Programming standards and procedures; modularity; Testing: unit testing, integration testing, regression testing, tools for testing
   11.6. Maintenance: The maintenance problem, the nature of maintenance, planning for maintenance

12. **Relevant Legislations and Institutions (2 Marks)**
   12.1. ICT Policy, 2072
   12.2. Electronic Transaction Act, 2063
   12.3. Information Technology Emergency Response Team (ITERT) Operation and

Management Directive, 2075

12.4. Government Website Development and Management Directive, 2078

Practical (8 * 5 = 40 Marks), 1.5 Hours

Unit	No. of task	Marks
Computer Fundamentals (Windows OS)	2	10
Networking (Cisco Packet Tracer)	2	10
Database Management System (My-SQL)	2	10
Application Package (Microsoft Office Package)	1	5
Web Technology (Web design)	1	5

<div align="center">देवनागरी Typing Skill Test का लागि निर्देशनः-</div>

1. देवनागरी Typing Skill Test का लागि २०० शब्दहरुका एउटा Text दिइनेछ र देहाय अनुसार अंक प्रदान गरिनेछः-

शुद्ध शब्द प्रति मिनेट (Correct Words/Minute)	पाउन अंक
३.५ भन्दा कम शुद्ध शब्द प्रति मिनेट बापत	० अंक
३.५ वा सा भन्दा बढी र ७ भन्दा कम शुद्ध शब्द प्रति मिनेट बापत	०.५० अंक
७ वा सा भन्दा बढी र १०.५ भन्दा कम शुद्ध शब्द प्रति मिनेट बापत	१.०० अंक
१०.५ वा सा भन्दा बढी र १४ भन्दा कम शुद्ध शब्द प्रति मिनेट बापत	१.५० अंक
१४ वा सा भन्दा बढी र १७.५ भन्दा कम शुद्ध शब्द प्रति मिनेट बापत	२.०० अंक
१७.५ वा सा भन्दा बढी र २१ भन्दा कम शुद्ध शब्द प्रति मिनेट बापत	२.५० अंक
२१ वा सा भन्दा बढी र २४.५ भन्दा कम शुद्ध शब्द प्रति मिनेट बापत	३.०० अंक
२४.५ वा सोभन्दा बढी र २८ भन्दा कम शुद्ध शब्द प्रति मिनेट बापत	३.५० अंक
२८ वा सोभन्दा बढी र ३१.५ भन्दा कम शुद्ध शब्द प्रति मिनेट बापत	४.०० अंक
३१.५ वा सोभन्दा बढी र ३५ भन्दा कम शुद्ध शब्द प्रति मिनेट बापत	४.५० अंक
३५ वा सोभन्दा बढी शुद्ध शब्द प्रति मिनेट बापत	५.०० अंक

2. देवनागरी Typing मा दिइएका Text लाइ आधार मानी टाइप गरेका Text सँग भिडाई चेक गरिनेछ । दिइएका देवनागरी Text मा उल्लेखित स्थान बमोजिम परीक्षार्थीहरुले आफ्नो Text मा Punctuation टाइप नगरेका पाइएमा त्यसका शब्दमा गणना गरिन छैन । देवनगरीको लागि युनिकोडमा समेत **Type** गर्न सकिने छ । तत्पश्चात निम्न Formula प्रयोग गरी शुद्ध शब्द प्रति मिनेट(Correct words/minute) निकालिनेछ ।

Formula:

$$\text{शुद्ध शब्द प्रति मिनेट (Correct words/minute)} = \frac{\text{(Total words typed − Wrong words)}}{5}$$

Interview 10 Marks