CPA FOUNDATION LEVEL

CS FOUNDATION LEVEL

INFORMATION COMMUNICATION TECHNOLOGY

WEDNESDAY: 21 August 2024. Afternoon Paper. Time Allowed: 3 hours.

QUESTION ONE

(a) **Operating System in Job Accounting (2 marks)**
An operating system (OS) tracks and manages job execution by allocating resources (CPU time, memory, etc.) to different tasks. Job accounting ensures that the OS logs the usage of resources by each job for billing or auditing purposes.

(b) **Ways Operating Systems Authenticate Users (3 marks)**

1. **Username and Password**: The most common method for verifying user identity.
2. **Biometric Authentication**: Uses physical characteristics (e.g., fingerprints, retina scan) for authentication.
3. **Two-Factor Authentication (2FA)**: Requires a second form of identification, such as a code sent to a mobile device.

(c) **Functions of User Documentation (4 marks)**

1. **Guides Users**: Helps users understand how to operate and interact with the system.
2. **Troubleshooting**: Provides solutions to common issues.
3. **System Features Explanation**: Explains the functionalities and capabilities of the system.
4. **Training Aid**: Assists in training new users or employees on the system.

(d) **Factors to Consider When Designing Information System Output (5 marks)**

1. **User Needs**: Ensure output is tailored to user needs and business requirements.
2. **Clarity**: Output should be clear and easily interpretable.
3. **Format**: Choose the right format (e.g., report, graph, etc.) for presenting data.
4. **Timeliness**: Ensure that the output is delivered in a timely manner.
5. **Security**: Ensure that the output data is protected against unauthorized access.

(e) **Technological Trends Leading to Ethical Issues (6 marks)**

1. **Big Data**: Raises concerns about privacy and the ethical use of personal data.

2. **AI and Automation**: Increases job displacement and raises questions about decision-making accountability.
3. **Cloud Computing**: Issues around data ownership, access, and security.

QUESTION TWO

(a) **Benefits of Using Pivot Tables (4 marks)**

1. **Data Summarization**: Pivot tables quickly summarize large amounts of data, making it easier to analyze.
2. **Dynamic Data Exploration**: Allows users to slice and dice data in multiple ways without altering the source data.

(b) **Applications of Mobile Computing in the Financial Sector (4 marks)**

1. **Mobile Banking**: Allows users to perform banking activities remotely.
2. **Mobile Payment Solutions**: Facilitates payments through smartphones (e.g., PayPal, Google Pay).

(c) **Impact of Internet of Things (IoT) on Daily Lives (4 marks)**

1. **Smart Homes**: IoT enables automation of home appliances, enhancing comfort.
2. **Health Monitoring**: Wearables track health metrics and send alerts to users and healthcare providers.
3. **Smart Cities**: IoT devices improve urban infrastructure like traffic management and waste disposal.
4. **Personalized Services**: IoT enables companies to offer personalized recommendations based on user behavior.

(d) **Handling Sensitive Data for Confidentiality (8 marks)**

1. **Encryption**: Use encryption to protect data both at rest and in transit.
2. **Access Control**: Limit access to sensitive data to authorized users only.
3. **Data Masking**: Hide sensitive information in non-production environments.
4. **Regular Audits**: Conduct periodic audits to ensure compliance with data security policies.

QUESTION THREE

(a) **Factors in Choosing Network Topology (3 marks)**

1. **Scalability**: Consider whether the topology can accommodate future growth.

2. **Cost**: Evaluate the cost of setup and maintenance.
3. **Reliability**: Choose a topology that provides the required network reliability.

(b) **Data Security Goals in Large Data Systems (3 marks)**

1. **Confidentiality**: Ensure data is accessible only to authorized users.
2. **Integrity**: Maintain the accuracy and consistency of data.
3. **Availability**: Ensure data is available to authorized users when needed.

(c) **Challenges of E-Commerce Infrastructure (4 marks)**

1. **Security**: Ensuring secure payment transactions and customer data protection.
2. **Reliability**: Maintaining uptime for online stores to avoid losing sales.

(d) **Securing E-Commerce Infrastructure (4 marks)**

1. **Use of SSL/TLS Encryption**: Secure communication over the web.
2. **Firewalls and Anti-malware**: Protect e-commerce servers from malicious attacks.
3. **Regular Software Updates**: Keep the infrastructure secure by updating software regularly.
4. **Secure Payment Gateways**: Ensure that payment transactions are safe.

QUESTION FOUR

(a) **Circumstances for Outsourcing Information Systems (4 marks)**

1. **Lack of Internal Expertise**: When an organization lacks the required skills to develop or manage an information system.
2. **Cost Efficiency**: Outsourcing can be more cost-effective than building an in-house system.

(b) **Limitations of Cloud Computing (4 marks)**

1. **Security Concerns**: Potential risks of unauthorized data access.
2. **Downtime**: Cloud services may experience outages, affecting availability.
3. **Limited Control**: Users have less control over the infrastructure.
4. **Latency Issues**: Dependence on internet speed may cause delays.

(c) **Circumstances for Setting Up LAN (6 marks)**

1. **Sharing Resources**: If an organization needs to share resources like printers or files.
2. **High-Speed Communication**: For fast, reliable communication within a local area.
3. **Collaboration**: Facilitates collaboration by allowing users to access shared files and applications.

(d) **Measures to Minimize Unethical ICT Practices (6 marks)**

1. **Implement Clear Policies**: Establish codes of conduct for ethical behavior.
2. **Employee Training**: Train staff on ethical use of ICT.
3. **Regular Audits**: Conduct audits to identify and prevent unethical activities.
4. **Access Control**: Restrict access to sensitive information.

QUESTION FIVE

(a) **Factors Determining Data Collection Method (2 marks)**

1. **Data Type**: Whether the data is qualitative or quantitative.
2. **Time and Resources**: Available time and budget for data collection.

(b) **Deliverables in Systems Analysis (3 marks)**

1. **System Requirements Specification**: Detailed description of system functionality.
2. **Data Flow Diagrams (DFDs)**: Visual representation of data movement in the system.
3. **Entity-Relationship Diagrams (ERDs)**: Visual representation of data entities and their relationships.

(c) **Prototyping in Systems Development (3 marks)**

1. **User Feedback**: Helps clarify user requirements based on early prototypes.
2. **Quick Iteration**: Allows for rapid development and refinement of the system.
3. **Risk Mitigation**: Identifies potential issues early in development.

(d) **Difference Between Application Suite and Integrated Software (6 marks)**

- **Application Suite**: A collection of related applications (e.g., Microsoft Office includes Word, Excel, PowerPoint).
- **Integrated Software**: A single software solution that combines multiple functionalities (e.g., CRM software).

(e) **Factors Determining Data Transmission Medium Capabilities (6 marks)**

1. **Bandwidth**: Maximum data transfer rate the medium can support.
2. **Distance**: How far data can travel through the medium.
3. **Interference**: External factors that affect the data quality and speed.

QUESTION SIX

(a) **Characteristics of Mobile Cloud Computing (3 marks)**

1. **Accessibility**: Data and applications are accessible from any mobile device with an internet connection.
2. **Scalability**: Can easily scale based on user demand.
3. **Synchronization**: Synchronizes data across devices in real time.

(b) **Services Offered by ISPs (4 marks)**

1. **Internet Access**: Provides the user with an internet connection.
2. **Email Hosting**: Offers email services with custom domains.
3. **Domain Name Registration**: Allows users to register domain names.
4. **Web Hosting**: Provides storage and access for websites.

(c) **Mail Merge in Word Processing (4 marks)**

1. **Personalized Letters**: Automatically generate personalized letters or documents for a list of recipients.
2. **Mass Invitations**: Create and send personalized invitations to many people.

(d) **Disadvantages of Prototyping (4 marks)**

1. **User Expectations**: Users may expect a fully functional system too early.
2. **Scope Creep**: Frequent changes can lead to project delays and cost overruns.
3. **Quality Issues**: Prototypes may not fully meet performance or security standards.
4. **Incomplete Requirements**: Early-stage prototypes may miss key requirements.

(e) **Operating System Activities for Process Management (5 marks)**

1. **Process Scheduling**: Decides which process gets CPU time.
2. **Context Switching**: Saves and restores the state of a process during execution.
3. **Process Creation and Termination**: Handles the creation and termination of processes.
4. **Inter-process Communication**: Manages communication between processes.
5. **Resource Allocation**: Allocates resources to processes.

QUESTION SEVEN

(a) **Information System Requirements Elicitation (6 marks)**

1. **Interviews**: Direct conversations with stakeholders to gather requirements.
2. **Surveys**: Distributing questionnaires to collect feedback from users.
3. **Observation**: Analyzing how users currently interact with the system.

(b) **Operating System Activities in Secondary Storage Management (4 marks)**

1. **Disk Scheduling**: Determines the order in which disk I/O requests are processed.

2. **File System Management**: Organizes data into files and directories.
3. **Memory Allocation**: Manages the allocation of storage space.
4. **Data Retrieval**: Manages the process of retrieving data from secondary storage.

(c) **Environmental Impact of ICT (4 marks)**

1. **Energy Consumption**: The large energy consumption of data centers.
2. **E-Waste**: Disposal of electronic devices contributes to environmental pollution.
3. **Carbon Footprint**: Increased energy consumption leads to higher carbon emissions.
4. **Resource Depletion**: Mining of materials for hardware production can deplete natural resources.

(d) **Moral Dimensions of ICT Ethical, Social, and Political Issues (6 marks)**

1. **Privacy**: The right to control personal information.
2. **Intellectual Property**: Issues around the ownership and usage of digital content.
3. **Digital Divide**: Unequal access to technology and its implications for society.