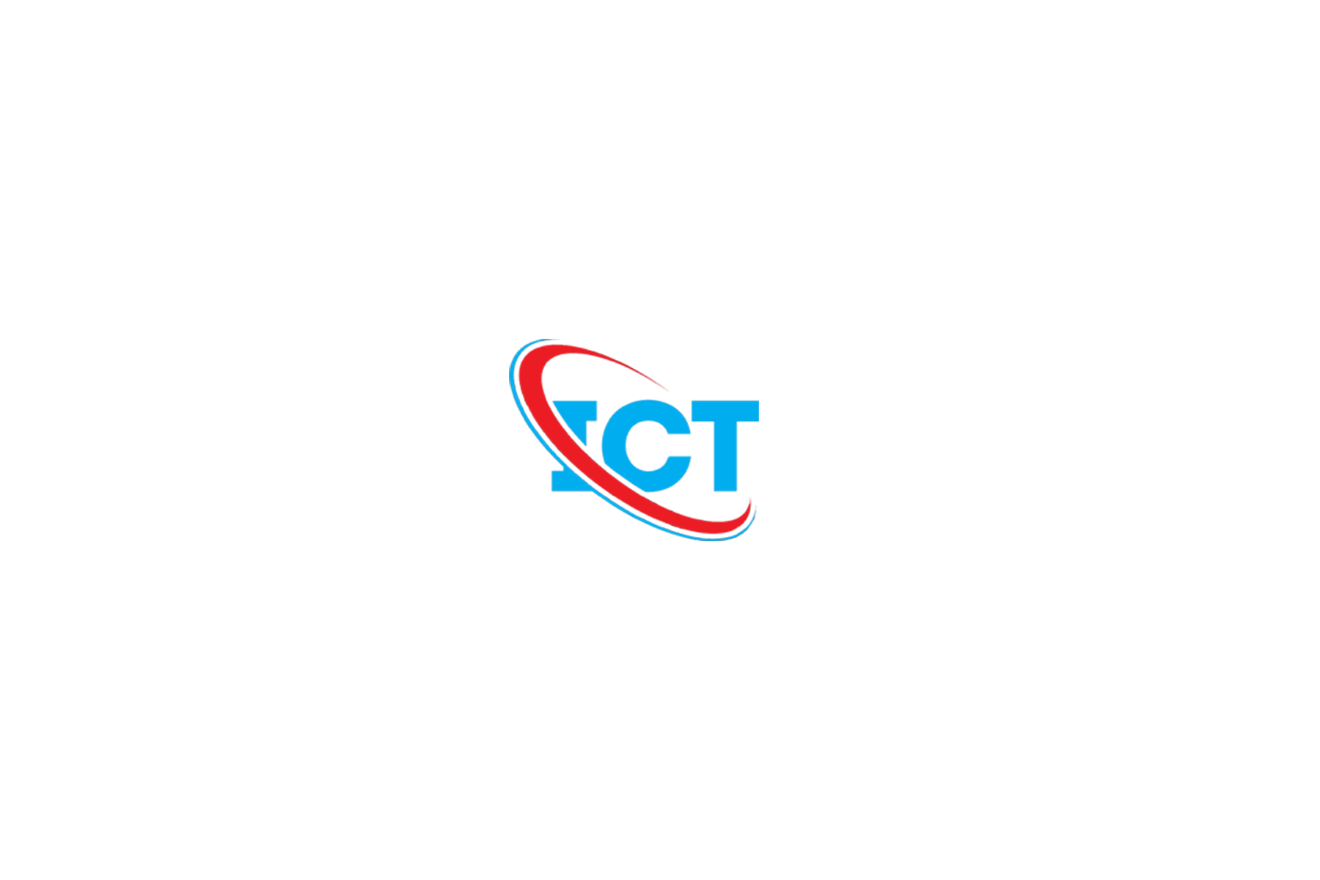
**KABS ICT RESOURCE CENTER**

**Uganda Advanced Certificate Of Education**

**SUB ICT PAPER 1 - MARKING GUIDE**

**1. (a) Explain the term digital data.**

**Answer**: Digital data refers to information represented in binary format (0s and 1s) and processed by digital devices like computers.

**Additional Explanation**: Digital data includes text, numbers, images, audio, and video that computers encode for storage, processing, or transmission.

**(b) Differentiate between structured data and unstructured data, providing an example of each.**

* + **Structured Data**: Organized data in a predefined format (e.g., databases, spreadsheets).
    - **Examples**: Employee records, financial transactions, inventory data.
  + **Unstructured Data**: Data without a defined format.
    - **Examples**: Emails, social media posts, videos, images, audio files.

**Explanation**: Structured data is easy to analyze using tools like SQL, while unstructured data requires advanced analytics like AI and machine learning.

**2. (a) Identify two safety precautions when setting up a computer laboratory.**

* + Avoid overloading electrical sockets to prevent fire hazards.
  + Install fire extinguishers and smoke detectors.
  + Ensure proper ventilation to prevent overheating.
  + Use anti-static mats or carpets to reduce static electricity.
  + Arrange cables neatly to avoid tripping hazards.

**(b) State three ways to protect computer equipment from power surges.**

* + Use surge protectors.
  + Install an Uninterruptible Power Supply (UPS).
  + Use voltage stabilizers.
  + Disconnect devices during thunderstorms.
  + Ensure proper grounding of electrical systems.

**Explanation**: Power surges can damage sensitive electronic components, and these measures help mitigate the risk.

**3. (a) Define a utility program and give one example.**

* + **Answer**: A utility program is a type of software designed to perform maintenance tasks that optimize or protect computer operations.
    - **Examples**: Disk Cleanup, Task Manager, Antivirus software, File Compression tools (e.g., WinZip), Backup utilities.

**(b) Explain the importance of the following system software:**

* + **(i) Antivirus Software**:
    - Protects systems from viruses, malware, and ransomware.
    - Ensures secure data and file integrity.
    - Prevents unauthorized access to sensitive information.
  + **(ii) Backup Tools**:
    - Protect against data loss during system failures.
    - Enable recovery of critical information after accidental deletion or cyberattacks.
    - Automate data redundancy for reliable storage.

**Explanation**: These tools are essential for maintaining system health and ensuring data security.

**4. (a) List four types of computer ports commonly found on a motherboard.**

* + USB (Universal Serial Bus).
  + HDMI (High-Definition Multimedia Interface).
  + Ethernet Port (RJ-45).
  + Audio Jack (3.5mm).
  + VGA (Video Graphics Array).
  + DisplayPort.
  + Thunderbolt Port.
  + Serial Port (RS-232).

**(b) Describe the function of the following hardware components:**

* + **(i) Network Interface Card (NIC)**:
    - Enables communication with networks via wired or wireless connections.
  + **(ii) Power Supply Unit (PSU)**:
    - Converts electricity from the outlet into usable power for internal components like the CPU and GPU.

**Explanation**: NICs facilitate network connectivity, while PSUs ensure the components receive stable power.

**5. (a) What is meant by "primary memory"?**

* + **Answer**: Primary memory is fast, volatile memory directly accessed by the CPU for storing data and instructions during execution.
    - **Examples**: RAM, Cache Memory.

**(b) Compare secondary storage devices and offline storage devices, providing one example of each.**

* + **Secondary Storage**: Internal or external storage for long-term data storage.
    - **Examples**: HDD, SSD, Optical Drives.
  + **Offline Storage**: Portable storage not always connected to the system.
    - **Examples**: USB Flash Drives, External Hard Drives, SD Cards.

**Explanation**: Secondary storage integrates with the system, while offline storage offers portability and data transfer capabilities.

**6. (a) Outline the role of an Internet Service Provider (ISP).**

* + Provides internet access to homes and businesses.
  + Supplies network hardware like modems and routers.
  + Offers technical support for internet-related issues.
  + Manages bandwidth allocation for customers.
  + Ensures secure and stable internet connections.

**(b) List three advantages of using fiber-optic internet connections over DSL.**

* + Faster data transfer speeds.
  + Higher bandwidth for simultaneous usage.
  + More reliable connections with minimal interference.
  + Longer lifespan and durability.
  + Better support for HD video streaming and online gaming.

**Explanation**: Fiber-optic cables use light signals, which are less prone to disruption and allow for higher data throughput.

**7. (a) Explain the concept of Virtual Private Network (VPN).**

* + **Answer**: A VPN creates a secure, encrypted connection over the internet, ensuring privacy and bypassing regional restrictions.

**(b) Identify two scenarios where a VPN would be useful.**

* + Accessing region-specific content (e.g., streaming services).
  + Securing connections on public Wi-Fi networks.
  + Protecting sensitive company data during remote work.
  + Bypassing government censorship in restricted countries.

**(c) Give one example of a VPN.**

* NordVPN
* ExpressVPN
* ProtonVPN
* CyberGhost

**Explanation**: VPNs ensure data encryption and anonymity, making them essential for secure communication.

**8. (a) Differentiate between data communication and networking.**

**Answer:**

* **Data Communication:** The process of transferring data between devices using communication media (e.g., wired or wireless).
* **Networking:** The interconnection of multiple devices (e.g., computers, printers) to share resources and communicate.

**(b) List three benefits of computer networks.**

* Share files and resources (e.g., printers, storage).
* Enable communication via email, chat, or video calls.
* Enhance data access through centralized storage.
* Support collaborative work among users.
* Provide internet access across multiple devices.

**Explanation:** Networking simplifies resource sharing and communication, making it essential in modern environments like schools and businesses.

**9. (a) What is encryption?**

* + **Answer**: Encryption is the process of converting plaintext into ciphertext using an algorithm to prevent unauthorized access.

**(b) Outline two reasons why encryption is important in computer networks.**

* + Protects sensitive data such as passwords and financial details during transmission.
  + Prevents unauthorized access to confidential information.
  + Ensures secure communication between devices over public networks.
  + Safeguards data stored in databases from breaches.

**Explanation**: Encryption is a cornerstone of cybersecurity, especially for securing online transactions and sensitive communications.

**10. (a) Define emerging technologies in the context of ICT.**

* + **Answer**: Emerging technologies are innovative ICT advancements that have the potential to transform industries, businesses, and societies.

**(b) Provide three examples of emerging technologies in business.**

* + Artificial Intelligence (AI): Automating tasks like customer service and data analysis.
  + Blockchain: Securing transactions in finance and supply chain.
  + Internet of Things (IoT): Connecting devices for smart homes and industries.
  + Augmented Reality (AR): Enhancing customer experiences in retail.
  + Big Data Analytics: Making data-driven business decisions.

**Explanation**: Businesses leverage emerging technologies to improve efficiency, enhance customer engagement, and create new opportunities.

**11. The table below shows a summary of computer storage usage:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Storage Type** | **Capacity (GB)** | **Used Space (GB)** | **Free Space (GB)** |
| SSD | 500 | 300 | 200 |
| HDD | 1000 | 750 | 250 |

**(a) Calculate the total storage capacity of the system in GB.**

* + **Answer**: 500 GB (SSD) + 1000 GB (HDD) = **1500 GB**.

**(b) Calculate the percentage of free space available on the HDD.**

* + **Answer**: Free Space Percentage = (Free Space / Total Capacity) × 100 = (250 / 1000) × 100 = **25%**.

**(c) Suggest two ways to optimize storage space usage.**

* + Delete unnecessary or duplicate files.
  + Use file compression tools like WinZip.
  + Transfer old files to external or cloud storage.
  + Uninstall unused software.

**Explanation**: Efficient storage management ensures enough space is available for important files and enhances system performance.

**12. (a) Give two advantages and one disadvantage of using cloud storage.**

* + **Advantages**:
    - Accessibility from anywhere with an internet connection.
    - Automatic backups and synchronization.
    - Reduces the need for physical storage devices.
  + **Disadvantage**:
    - Requires a stable internet connection for access.
    - Potential risk of data breaches or hacking.

**(b) Name two types of flash storage devices.**

* + USB Flash Drive.
  + SD Card.
  + MicroSD Card.
  + Solid State Drive (SSD).

**Explanation**: Flash storage devices are portable, fast, and reliable, making them ideal for personal and professional use.

**13. (a) Explain the term proprietary software.**

* + **Answer**: Proprietary software is owned by a company or individual and requires a license for use.  
    **Examples**: Microsoft Office, Adobe Photoshop.

**(b) Suggest two reasons why businesses may prefer proprietary software over open-source software.**

* + Offers dedicated customer support and updates.
  + Provides a polished and user-friendly interface.
  + Ensures higher compatibility with industry standards.
  + Comes with security guarantees.

**Explanation**: While open-source is cost-effective, proprietary software offers stability and professional support, which businesses often prioritize.

**(c) List two examples of situations where shareware is more suitable than freeware.**

* When users need advanced features during a trial period (e.g., trial versions of antivirus software).
* For businesses that want to evaluate software before purchasing the full version.
* When users require professional support for the software during testing.

**Explanation**: Shareware allows users to try before committing, making it ideal for evaluation.

**14. (a) Define the term packet switching.**

* + **Answer**: Packet switching is a data transmission method where information is broken into packets and sent over a network, reassembling at the destination.

**(b) Explain the role of a router in data communication.**

* + Directs data packets between networks.
  + Connects devices within a local network to the internet.
  + Provides firewall security for incoming and outgoing traffic.

**(c) Identify one limitation of wireless communication networks.**

* + Prone to interference from physical objects or other signals.
  + Limited range compared to wired connections.
  + Lower speeds than fiber-optic networks.

**Explanation**: While wireless networks offer convenience, their performance can be affected by environmental factors.

**15. (a) Suggest three roles of ICT in the health sector.**

* + Digital record-keeping for patient data.
  + Telemedicine platforms for remote consultations.
  + Automated reminders for medication and appointments.
  + Diagnostic tools using AI and imaging technologies.

**(b) Outline two ethical concerns related to the use of ICT in healthcare.**

* + Breach of patient confidentiality and data privacy.
  + Misuse of medical data for non-health-related purposes.

**Explanation**: ICT in healthcare must prioritize data security and ethical considerations to protect patient trust.

**16. (a) Match the following terms to their correct uses:**

|  |  |
| --- | --- |
| **Term** | **Use** |
| Trojan | Malware disguised as legitimate software. |
| Firewall | Prevents unauthorized access to or from a network. |
| Bluetooth | Enables short-range wireless data transmission. |

**17. (a) State the difference between a data bus and an address bus.**

* + **Data Bus**: Transfers data between components of a computer.
  + **Address Bus**: Transfers memory addresses required to fetch or store data.

**(b) List three examples of output devices used in communication.**

* + Monitor.
  + Printer.
  + Speakers.
  + Projector.

**(c) Give two examples of hardware that supports parallel processing.**

* + Multi-core processors.
  + Graphics Processing Units (GPUs).

**18. (a) What is a URL (Uniform Resource Locator)?**

* **Answer**: A URL is the unique address of a resource on the World Wide Web, such as a webpage, image, or video.

**(b) Identify two components of a URL.**

* Protocol (e.g., HTTP or HTTPS).
* Domain name (e.g., [www.example.com](http://www.example.com/)).
* Path to the resource (e.g., /about.html).

**(c) State two uses of URLs.**

* Accessing specific web pages or online resources.
* Sharing web links with others.
* Bookmarking websites for quick access later.

**Explanation**: URLs are essential for navigating the web, as they provide the precise location of resources on the internet.

**19. (a) Explain the term "disk partitioning" in computer storage.**

* + **Answer**: Dividing a hard disk into separate sections to manage data efficiently.

**(b) Outline the benefits of using external hard drives for backups.**

* + Portability for off-site data storage.
  + High storage capacity.
  + Can store large multimedia files.

**(c) Suggest one software used for creating bootable drives.**

* + Rufus.
  + UNetbootin.
  + Etcher.

**20. (a) List three advantages of using animation in presentations.**

* + Enhances audience engagement.
  + Helps emphasize key points.
  + Makes complex ideas easier to understand.

**(b) Suggest two documents that can be produced using spreadsheet software.**

* + Budget reports.
  + Financial statements.
  + Inventory records.

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