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QUESTION 1

a. Define a computer and explain its four major functions.

A computer is an electronic device that accepts data as input, processes it according to predefined instructions (programs), stores it, and produces meaningful information as output. It operates based on the principles of logic and automation, enabling it to perform complex calculations and tasks at high speed and accuracy. Modern computers range from small handheld devices to powerful supercomputers, all designed to handle different types of data and applications across various fields such as education, business, healthcare, and research.

Fundamentally, a computer system integrates hardware and software components to function effectively. The hardware consists of physical parts like the keyboard, monitor, and processor, while software includes the programs and operating systems that control the hardware. Together, they enable the computer to perform essential operations that form the basis of all computing activities.

The four major functions of a computer are:

1. **Input Function**: This involves receiving data and instructions from the user or external sources through input devices such as keyboards, mice, scanners, or microphones.
2. **Processing Function**: The computer processes the input data using the Central Processing Unit (CPU), where calculations, comparisons, and decision-making operations are carried out.
3. **Output Function**: After processing, the computer presents the results or information to the user through output devices like monitors, printers, or speakers.
4. **Storage Function**: The computer stores data, instructions, and results for future use, either temporarily (RAM) or permanently (hard drives, SSDs, or external storage devices).

b. Describe the basic components of a computer system with examples

A computer system is made up of interconnected components that work together to perform data processing tasks efficiently. These components combine physical devices (hardware) and logical instructions (software) to enable the system to accept input, process data, store information, and produce output. Each component plays a specific

role, and the overall performance of a computer depends on how well these parts function together.

At the core, the basic components of a computer system include input devices, output devices, the central processing unit (CPU), memory/storage, and software. These components ensure that data flows systematically from input to processing and finally to output, while also allowing storage for future use.

The basic components of a computer system are:

1. **Input Devices**: These are devices used to enter data and instructions into the computer. Examples: Keyboard, mouse, scanner, microphone.
2. **Central Processing Unit (CPU)**: The CPU is the "brain" of the computer that performs calculations and processes data. It consists of the Arithmetic Logic Unit (ALU) and the Control Unit (CU). Examples: Intel Core i5 processor, AMD Ryzen processor.
3. **Memory / Storage Devices**: These components store data and instructions either temporarily or permanently. Examples: RAM (temporary memory), hard disk, solid-state drive (SSD), flash drive.
4. **Output Devices**: These devices display or present the processed information to the user. Examples: Monitor, printer, speakers, projector.
5. **Software**: Software refers to the programs and operating systems that control the computer's operations and enable users to perform tasks. Examples: Windows OS, Microsoft Word, web browsers like Chrome.

QUESTION 2

a. Differentiate between hardware and software

Hardware and software are the two fundamental components of a computer system, but they serve different roles. Hardware refers to the physical parts of a computer that can be seen and touched, such as electronic and mechanical devices. These components are responsible for executing tasks like input, processing, storage, and output. Without hardware, a computer system cannot physically function.

Software, on the other hand, consists of the programs, instructions, and data that tell the hardware what to do. It is intangible and exists as coded information that directs the operations of the computer. Software enables users to interact with the hardware and

perform specific tasks, making the hardware useful and functional. Without software, hardware would be idle and incapable of performing meaningful operations.

Differences between Hardware and Software:

1. **Nature**
    i. **Hardware:** Physical and tangible components.
    ii. **Software:** Intangible programs and instructions.
2. **Function**
    i. **Hardware:** Performs actual operations and tasks.
    ii. **Software:** Provides instructions that guide hardware operations.
3. **Dependency**
    i. **Hardware:** Cannot function without software.
    ii. **Software:** Cannot operate without hardware.
4. **Examples**
    i. **Hardware:** Keyboard, monitor, CPU, hard drive.
    ii. **Software:** Operating systems (Windows), applications (Microsoft Word), browsers (Chrome).
5. **Durability**
    i. **Hardware:** Subject to wear and tear over time.
    ii. **Software:** Does not wear out physically but may require updates or become obsolete.

b. Explain the two main types of software, giving at least three examples each.

Software is broadly classified into two main types based on the roles they perform within a computer system. These are system software and application software. Each type serves a distinct purpose but works together to ensure the computer operates efficiently and meets user needs.

System software is designed to manage and control the computer hardware while providing a platform for running application programs. Application software, on the other hand, is developed to help users perform specific tasks such as writing documents, browsing the internet, or analyzing data.

The two main types of software are:

1. **System Software**: This type of software manages the computer's hardware and creates an environment for other software to run. It acts as a bridge between the user, applications, and hardware.
   Examples: Operating systems like Windows, Linux, and macOS; utility programs like antivirus software; device drivers.
2. **Application Software**
   This software is designed to help users perform specific tasks or activities. It runs on top of system software and is user-oriented.
   Examples: Microsoft Word (word processing), Microsoft Excel (spreadsheet), Google Chrome (web browser).

QUESTION 3

a. Explain the concept of booting

Booting is the process by which a computer starts up and loads the operating system into memory (RAM) after it is powered on or restarted. When the power button is pressed, the system activates a sequence of instructions stored in firmware (such as BIOS or UEFI) to check the hardware components and prepare the system for use. This initial check is known as the Power-On Self-Test (POST), after which the operating system is located and loaded, allowing the computer to become fully functional.

There are two main types of booting: cold booting and warm booting. Cold booting occurs when a computer is started from a completely powered-off state, while warm booting (or rebooting) happens when the system is restarted without turning off the power completely. Both processes ensure that the system is properly initialized, but warm booting is usually faster because some processes are already in memory.

b. Describe the step-by-step booting process of a computer system.

The booting process of a computer system is a sequence of operations that takes place from the moment the computer is powered on until it becomes ready for use. This process ensures that all hardware components are functioning correctly and that the operating system is properly loaded into memory. It is controlled initially by firmware (BIOS or UEFI) and then handed over to the operating system.

The process follows a logical and structured order to guarantee system stability and proper initialization. Each stage plays a critical role in preparing the computer to accept user commands and run applications.

Step-by-step booting process of a computer system:

1. **Power On**: The user presses the power button, supplying electricity to the computer system and activating the hardware components.
2. **BIOS/UEFI Initialization**: The firmware (Basic Input/Output System or Unified Extensible Firmware Interface) is activated and begins controlling the startup process.
3. **Power-On Self-Test (POST)**: The system performs a diagnostic test to check essential hardware components such as RAM, keyboard, and storage devices to ensure they are working properly.
4. **Boot Device Selection**: The BIOS/UEFI identifies and selects the bootable device (e.g., hard drive, SSD, or USB) based on the configured boot order.
5. **Bootloader Execution**: The bootloader program (such as Windows Boot Manager or GRUB) is loaded from the selected device. It is responsible for loading the operating system.
6. **Loading the Operating System**: The bootloader loads the operating system kernel into RAM and begins the initialization of system files and drivers.
7. **System Initialization**: The operating system configures hardware components, loads drivers, and starts essential background services.
8. **User Login / Desktop Display**: The system presents the login screen or desktop interface, indicating that the computer is ready for user interaction.

QUESTION 4

a. Define file management

File management refers to the process of organizing, storing, retrieving, and maintaining files and data within a computer system. It involves the use of an operating system or file management software to ensure that data is properly arranged for easy access, security, and efficient usage. Effective file management helps users locate information quickly, prevents data loss, and improves overall system performance.

It also includes creating a logical structure for storing files, such as using folders and directories, as well as controlling how files are accessed, modified, or shared. Proper

file management is essential in both personal and organizational settings to maintain order, enhance productivity, and ensure data integrity.

b. Explain five common file operations and their importance.

1. **Creating Files**: This operation involves generating new files to store data or information.
   Importance: It allows users to save new work, documents, or data for future use.
2. **Opening Files**: This involves accessing an existing file to view or edit its contents.
   Importance: It enables users to retrieve and work on stored information whenever needed.
3. **Saving Files**: This operation stores changes made to a file.
   Importance: It ensures that updated information is not lost and remains available for future access.
4. **Renaming Files**: This involves changing the name of a file without altering its content.
   Importance: It helps in organizing files and making them easier to identify and retrieve.
5. **Deleting Files**: This operation removes files from storage.
   Importance: It helps free up storage space and eliminates unnecessary or outdated data.

QUESTION 5

a. Discuss the applications of computers in healthcare or animal health services.

Computers play a critical role in healthcare and animal health services by improving efficiency, accuracy, and service delivery. In human healthcare, computers are used for electronic medical records (EMR), where patient data such as medical history, diagnoses, and prescriptions are stored and easily retrieved. They also support diagnostic processes through imaging technologies like X-rays, CT scans, and laboratory systems that analyze test results quickly and accurately. In addition, computers enable telemedicine, allowing doctors to consult with patients remotely, which is especially useful in underserved or rural areas.

In animal health services (veterinary practice), computers are equally important. They are used to manage animal health records, track vaccinations, and monitor disease

outbreaks in livestock. Farmers and veterinarians use computer-based systems for breeding management, feed formulation, and monitoring animal productivity. Furthermore, computers assist in research and data analysis related to animal diseases, improving treatment methods and disease prevention strategies. Overall, computers enhance decision-making, reduce errors, and promote better health outcomes in both human and animal healthcare systems.

b. Highlight four common computer problems and their solutions

Four common computer problems and their solutions are:

1. **Slow System Performance**

   Problem: The computer runs slowly due to too many programs, insufficient memory, or malware.

   Solution: Close unnecessary applications, uninstall unused programs, upgrade RAM if possible, and run antivirus scans to remove malware.

2. **Computer Virus or Malware Infection**

   Problem: Malicious software can corrupt files, steal data, or disrupt system operations.
   Solution: Install reliable antivirus software, perform regular system scans, avoid downloading from untrusted sources, and keep software updated.

3. **System Freezing or Crashing**

   Problem: The computer becomes unresponsive or shuts down unexpectedly.
   Solution: Restart the system, check for overheating, update drivers and operating system, and ensure sufficient memory and storage space.

4. **Hardware Failure (e.g., keyboard, mouse, or hard drive issues)**

   Problem: Physical components stop working or malfunction.
   Solution: Check connections, replace faulty devices, update drivers, and seek professional repair if necessary.