

OJEE 2026 May 9 Shift 3 MCA

Question Paper with Solutions (Memory-Based)

Conducted by Odisha Joint Entrance Examination Committee (OJEEC)



General Instructions

- (i) The examination will be conducted in Computer-Based Test (CBT) mode.
- (ii) OJEE MCA 2026 Question Paper consists of 120 questions.
- (iii) A total of 480 marks to be attempted in 2 hours.
- (iv) Each correct answer carries +4 marks, and there is a negative marking of 1 for incorrect answers.

1. Who is known as the father of modern computer?

- (A) Charles Babbage
- (B) Alan Turing
- (C) John von Neumann
- (D) Bill Gates

Correct Answer: (B) Alan Turing

Solution:

Step 1: Understanding the Question:

The question seeks the individual widely credited as the pioneer of modern computing, focusing on the person who established the theoretical principles that underpin today's computers and artificial intelligence.

Step 2: Detailed Explanation:

- **Alan Turing's Contribution:** Alan Turing is hailed as the father of modern computer science due to his 1936 paper introducing the "Turing Machine." This abstract machine provided a mathematical model for universal computation, forming the theoretical basis for every digital computer that followed.
- **Practical and Theoretical Impact:** Beyond theory, Turing was instrumental in World War II, where he led the effort to break the German Enigma cipher at Bletchley Park. His design for the Automatic Computing Engine (ACE) was a pioneering blueprint for stored-program computers.
- **Pioneering Artificial Intelligence:** Turing also proposed the "Turing Test," a foundational concept in artificial intelligence used to gauge a machine's ability to exhibit human-like intelligent behavior.
- **Clarifying Historical Roles:** Charles Babbage is known as the "Father of the Computer" for his 19th-century designs of mechanical computers like the Analytical Engine. However, the term "modern computer" specifically refers to the electronic, programmable devices whose logical framework was established by Turing in the 20th century.
- **Other Notable Figures:** John von Neumann developed the "von Neumann architecture," the structural design used in most modern computers, while Bill Gates co-founded Microsoft and was a key figure in the personal computer revolution. Neither holds the foundational title of "father" in the same way as Turing.

Step 3: Final Answer:

The correct answer is Alan Turing, as his groundbreaking theoretical concepts, particularly the Turing Machine, provide the essential blueprint for how all modern computational devices function.

Quick Tip: Remember the key difference: Charles Babbage conceived the mechanical computer (a hardware concept), while Alan Turing developed the mathematical and logical theory (a software concept) that powers modern computation.

2. Which component of a computer is responsible for processing data?

- (A) Monitor
- (B) CPU
- (C) Keyboard
- (D) Printer

Correct Answer: (B) CPU

Solution:

Step 1: Understanding the Question:

The question asks to name the central hardware unit within a computer that is tasked with executing instructions and performing calculations on data.

Step 2: Detailed Explanation:

- **The Central Processing Unit (CPU):** The CPU is frequently called the "brain" of the computer because it executes commands from both software and hardware. It handles virtually every operation, from a simple mouse click to a complex scientific calculation.
- **Core Components:** The CPU itself is composed of several key parts: the Control Unit (CU), which orchestrates the flow of data; the Arithmetic Logic Unit (ALU), which executes mathematical and logical operations; and Registers, which provide high-speed temporary storage.
- **Operational Cycle:** The CPU functions on a fundamental "Fetch-Decode-Execute" cycle.

It retrieves (fetches) an instruction from memory, interprets (decodes) what needs to be done, and then performs (executes) the required action.

- **Analyzing Other Options:** The other choices are peripheral devices. A monitor is an "output" device for displaying information visually. A keyboard is an "input" device for entering user commands. A printer is an "output" device for creating physical copies. None of these components perform the core data processing.
- **Measuring Performance:** A computer's overall processing capability is heavily influenced by the CPU's clock speed (in GHz) and the number of cores (individual processing units) it has.

Step 3: Final Answer:

The CPU is the correct choice, as it is the component fundamentally responsible for processing all data and instructions within a computer system.

Quick Tip: Use this analogy: The CPU is the chef (processing), the keyboard is the recipe book (input), and the finished meal on a plate is the monitor (output). The processing is the crucial middle step where the work happens.

3. Which generation of computers used transistors?

- (A) First Generation
- (B) Second Generation
- (C) Third Generation
- (D) Fourth Generation

Correct Answer: (B) Second Generation

Solution:

Step 1: Understanding the Question:

The question asks to identify the historical period in computing, known as a "generation," that was defined by the adoption of transistors as the core electronic component.

Step 2: Detailed Explanation:

- **Computer Generations Overview:** The history of computers is divided into generations, each defined by a major technological leap in its underlying electronics.
- **First Generation (approx. 1940s-1950s):** These computers were built using "Vacuum Tubes." They were enormous in size, prohibitively expensive, consumed immense power, and were notoriously unreliable due to the heat they generated.
- **Second Generation (approx. 1950s-1960s):** This era was defined by the switch from vacuum tubes to "Transistors." Transistors were a revolutionary invention—they were smaller, faster, more power-efficient, and far more reliable. This advancement made computers smaller and more accessible. Famous examples include the IBM 1401.
- **Third Generation (approx. 1960s-1970s):** This period was marked by the invention of the "Integrated Circuit" (IC), which placed numerous transistors onto a single silicon chip, further reducing size and cost.
- **Fourth Generation (approx. 1970s-Present):** This generation is based on the "Microprocessor," which integrates millions or billions of transistors onto a single chip (a concept known as VLSI). This innovation paved the way for the personal computer.
- **The Importance of Transistors:** The move to transistors during the second generation was the critical first step towards the miniaturization and increased power that define modern computing.

Step 3: Final Answer:

The second generation of computers is the correct answer, as this era was defined by the transition from vacuum tubes to transistors, a pivotal advancement in computing technology.

Quick Tip: Memorize the technological progression: 1st Gen: Vacuum Tubes → 2nd Gen: Transistors → 3rd Gen: Integrated Circuits (ICs) → 4th Gen: Microprocessors. Each step represents a leap in miniaturization and power.

4. What type of software is used to perform specific tasks for users?

- (A) System Software
- (B) Application Software
- (C) Utility Software
- (D) Programming Software

Correct Answer: (B) Application Software

Solution:**Step 1: Understanding the Question:**

The question aims to classify the type of software specifically designed to help end-users accomplish particular tasks, such as writing a document, creating a spreadsheet, or browsing the internet.

Step 2: Detailed Explanation:

- **Defining Application Software:** Application software consists of programs created for end-users to carry out specific, productive functions. These applications run "on top of" the underlying system software.

- **Common Examples:** Everyday examples of application software include word processors (e.g., Google Docs), web browsers (e.g., Firefox), spreadsheet programs (e.g., Excel), and video games. Each is designed to help a user achieve a specific goal.
- **Comparison with System Software:** In contrast, system software (like an operating system such as Windows or macOS) manages the computer's hardware resources and provides the platform upon which applications can run. Its purpose is to manage the computer itself, not to perform user-facing tasks directly.
- **Understanding Utility Software:** Utilities are a type of system software focused on system maintenance and optimization. Examples include antivirus software and disk cleanup tools. They support the computer's health rather than user productivity.
- **Programming Software Explained:** This category includes tools like code editors, compilers, and debuggers, which are used by software developers to create other programs.

Step 3: Final Answer:

Application software is the correct classification because its primary function is to provide tools that directly enable users to complete their desired tasks.

Quick Tip: A simple rule: If it's a program you consciously start to do a task (e.g., write, browse, calculate), it's Application Software. If it's the underlying program that makes the computer work (e.g., the OS), it's System Software.

5. What is the main purpose of a computer's hard disk?

- (A) To process data
- (B) To store data permanently

(C) To display images

(D) To connect to the internet

Correct Answer: (B) To store data permanently

Solution:

Step 1: Understanding the Question:

The question is asking for the main function of a computer's hard disk, which can be either a traditional Hard Disk Drive (HDD) or a modern Solid-State Drive (SSD).

Step 2: Detailed Explanation:

- **Long-Term Storage:** A hard disk is a "non-volatile" storage device. This critical feature means it retains all stored data even when the computer's power is turned off, making it ideal for permanent storage.
- **Function in the System:** The hard disk holds the computer's operating system, all installed software, and all user files (documents, music, photos, etc.). When a user "saves" a document, the data is transferred from volatile RAM to the non-volatile hard disk.
- **Underlying Technology:** While older HDDs store data magnetically on spinning platters and modern SSDs use flash memory chips, their fundamental purpose of long-term data retention remains the same.
- **Evaluating the Other Options:** Processing data (A) is the responsibility of the CPU. Displaying images (C) is the role of the graphics card and monitor. Connecting to the internet (D) is handled by a network adapter (like a Wi-Fi card or Ethernet port).
- **RAM vs. Hard Disk:** The hard disk provides vast storage capacity for long-term use. This contrasts with RAM (Random Access Memory), which offers much faster but smaller

and temporary storage for data the computer is actively working with.

Step 3: Final Answer:

The fundamental purpose of a hard disk is to serve as the permanent, long-term storage location for all the software and data on a computer.

Quick Tip: Think of RAM as a workbench where you have your current project laid out (temporary, fast access). The Hard Disk is the workshop's storage room where you keep all your tools and completed projects safely (permanent, large capacity).

6. What does the term HTTP stand for?

- (A) Hyper Text Transfer Protocol
- (B) High Text Transfer Program
- (C) Hyper Transfer Text Program
- (D) High Transfer Text Protocol

Correct Answer: (A) Hyper Text Transfer Protocol

Solution:

Step 1: Understanding the Question:

The question requires the complete expansion of the abbreviation HTTP, which is a core protocol of the World Wide Web.

Step 2: Detailed Explanation:

- **Full Form and Purpose:** HTTP stands for **Hyper Text Transfer Protocol**. It is the foundational set of rules that governs the transfer of data, especially hypermedia documents like HTML web pages, between web servers and clients (like web browsers).

- **Client-Server Model:** HTTP functions on a request-response basis. A client (your web browser) sends an HTTP request to a web server to ask for a resource (like a webpage). The server then processes this request and sends back an HTTP response containing the requested content.
- **Breaking Down the Terms:**
 - **Hypertext:** Refers to text that contains links (hyperlinks) to other pieces of text or resources.
 - **Transfer:** Describes the action of moving this data across a network.
 - **Protocol:** A standardized set of rules that allows different systems to communicate.
- **HTTP vs. HTTPS:** A modern variant is HTTPS (Hyper Text Transfer Protocol Secure). It is essentially HTTP with an added security layer (SSL/TLS) that encrypts the data, ensuring a secure and private connection.
- **Historical Note:** HTTP was developed by Tim Berners-Lee in the early 1990s as a key component of his invention, the World Wide Web.

Step 3: Final Answer:

The correct expansion is Hyper Text Transfer Protocol, as it precisely describes its role in transferring hypertext documents across the internet.

Quick Tip: Break down the acronym: 'HyperText' is the content (web pages), 'Transfer' is the action (moving it), and 'Protocol' is the set of rules for doing so. This logic helps you remember the full name.

7. What is the main purpose of an algorithm?

(A) To store data

- (B) To solve a problem step by step
- (C) To design hardware
- (D) To connect networks

Correct Answer: (B) To solve a problem step by step

Solution:

Step 1: Understanding the Question:

The question seeks to define the primary function of an algorithm within the field of computer science and general problem-solving.

Step 2: Detailed Explanation:

- **Core Definition:** An algorithm is a well-defined, ordered sequence of instructions or rules designed to solve a specific problem or perform a task. It serves as a logical blueprint for reaching a solution.
- **Essential Properties:** A valid algorithm must be finite (it must eventually terminate), unambiguous (each step must be clear and precise), and effective (each step must be feasible to execute). It typically takes input and is guaranteed to produce an output.
- **Role in Software Development:** Before writing a single line of code, programmers first design an algorithm to structure the logic of their program. This plan can be represented visually with a flowchart or textually with pseudocode.
- **An Everyday Analogy:** A recipe for baking a cake is a perfect real-world example of an algorithm. It specifies the ingredients (input), provides a clear, ordered set of steps to follow, and results in a finished cake (output). Following the steps out of order would lead to a failed result.
- **Distinguishing from Other Concepts:** Storing data (A) is the function of memory

or a database. Designing hardware (C) is a task for computer engineers. Connecting networks (D) is achieved using networking protocols and devices like routers.

Step 3: Final Answer:

The main purpose of an algorithm is to provide a clear, finite, and ordered set of steps to guarantee a correct and efficient solution to a problem.

Quick Tip: Think of an algorithm as the "recipe" and the code as the "cooking." The same recipe can be cooked in different kitchens (programming languages), but the underlying logical steps remain the same.

8. Which language is directly understood by the computer?

- (A) High-Level Language
- (B) Assembly Language
- (C) Machine Language
- (D) English Language

Correct Answer: (C) Machine Language

Solution:

Step 1: Understanding the Question:

The question asks to identify the programming language that a computer's processor can execute directly, without requiring any intermediate translation or interpretation.

Step 2: Detailed Explanation:

- **Machine Language (Binary Code):** This is the most fundamental level of programming language, consisting entirely of binary digits (0s and 1s). It is the only language that a computer's CPU can understand and execute natively, as these binary values directly

correspond to the ON/OFF states of the transistors in its circuitry.

- **The Language of Hardware:** Each sequence of 0s and 1s in machine language is a specific command that tells the CPU to perform a basic operation, such as adding two numbers or moving data. It is nearly impossible for humans to read or write effectively.
- **The Need for Translation for Other Languages:**
 - **High-Level Languages:** Languages like Python, Java, and C++ use human-readable syntax. To be executed, they must first be translated into machine language by a special program called a "compiler" or an "interpreter."
 - **Assembly Language:** This is a low-level language that uses mnemonic codes (e.g., 'MOV', 'ADD') as a more readable substitute for binary. It still requires an "assembler" to convert it into machine code.
- **Processor-Specific:** Machine language is not universal; it is specific to the architecture of a particular processor. Machine code for an Intel CPU will not work on an ARM CPU, and vice versa.

Step 3: Final Answer:

Machine Language is the correct choice because it is the native, binary format that computer hardware is designed to execute directly.

Quick Tip: Imagine the computer's CPU only speaks one language: Binary. All other programming languages are like translators that convert human-friendly instructions into the binary that the CPU can actually understand and act upon.