IAS MIND

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COMPLETE NOTES FOR UPSC EPFO · EO/AO & APFC

COMPUTER AWARENESS & AI MCQ BOOK

Chapter-wise MCQs · Answers Explained Option by Option

16 Chapters
From computer fundamentals to cyber security, cloud, digital payments and AI

UPSC Pattern
Single-answer, statement, match and Assertion-Reason questions

Explained in Depth
The concept behind each answer and why each option is right or wrong

Key Facts
A revision box at the end of every chapter

Aligned with the UPSC EPFO syllabus: Computer Awareness

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About this Book

This book presents a comprehensive bank of multiple-choice questions on Computer Awareness and Artificial Intelligence for the UPSC EPFO examination, arranged chapter by chapter: fundamentals, hardware, memory, number systems, software, networking, cyber security, office tools, DBMS, digital payments, multimedia and AI. Every question is solved with the concept behind the answer and the reason each option is right or wrong.

It is a companion volume to the IAS MIND books for UPSC EPFO (Enforcement Officer / Accounts Officer and Assistant Provident Fund Commissioner) and follows the same structure and design.

Section	Purpose
Chapter Opener	The topics of the chapter and the number of questions
Solved Questions	Question, options, correct answer, the concept behind it and the reason each option is right or wrong
Key Facts to Remember	Short revision box at the end of each chapter

How to Use this Book

- **First reading:** go chapter by chapter and attempt each question before reading the answer.
- **Second reading:** attempt each question before reading the answer and explanation.
- **Final revision:** use the Key Facts boxes at the end of each chapter.
- **Numbers:** learn every number, year, section and abbreviation shown in bold; EPFO tests them directly.

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Video lectures, daily practice and updates for UPSC EPFO are shared on the IAS MIND channels listed at the foot of every page: YouTube (@iasmind2026), Telegram (t.me/iasmind2026) and Instagram (@iasmind2026).

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Chapter 1

Computer Fundamentals and the History of Computers

16 questions in the UPSC EPFO pattern, each solved option by option



This chapter carries **16** questions. Attempt each question first, then read the answer, the concept behind it and the reason each option is right or wrong.

1. The Abacus, one of the earliest known calculating devices, is traditionally associated with which period and region?

(a) c. 1617 AD, Scotland
(b) c. 3000 BC, ancient China
(c) c. 1642 AD, France
(d) c. 1890 AD, USA

Answer: (b) c. 3000 BC, ancient China

- The abacus is a manual calculating frame in which beads slid along rods or wires represent units, tens, hundreds and so on, allowing addition, subtraction and, with skill, multiplication and division. Its precise origin is uncertain, with early counting boards known from Mesopotamia, but standard Indian textbooks date it to about 3000 BC and associate it with ancient China, where the bead-frame suanpan became widespread.
- **(a)** Incorrect – 1617 in Scotland is the date and place of John Napier's numbering rods, known as Napier's Bones, not the abacus.
- **(b)** Correct – the abacus is conventionally dated to about 3000 BC and linked with ancient China, making it the earliest known calculating aid.
- **(c)** Incorrect – 1642 in France marks Blaise Pascal's mechanical adding machine, the Pascaline, which came more than four thousand years after the abacus.
- **(d)** Incorrect – 1890 in the USA refers to Herman Hollerith's punched-card tabulating machine used for the US Census, an electromechanical device.

2. Napier's Bones, invented in 1617, is primarily a device for:

(a) measuring atmospheric pressure
(b) simplifying multiplication, division and extraction of roots
(c) weaving patterns using punched cards
(d) predicting ocean tides

Answer: (b) simplifying multiplication, division and extraction of roots

- Napier's Bones, described by the Scottish mathematician John Napier in 1617, is a set of numbered rods (originally of bone or ivory) carrying multiplication tables. Placing the rods side by side lets the user read products by adding adjacent diagonal digits, which reduces multiplication to addition and division to subtraction; the rods could also assist in extracting square roots. Napier had earlier published his work on logarithms in 1614.

- **(a)** Incorrect – atmospheric pressure is measured by the barometer, invented by Evangelista Torricelli in 1643, which has no link with Napier's rods.
- **(b)** Correct – Napier's numbered rods simplify multiplication, division and the extraction of roots by turning them into simple additions and subtractions.
- **(c)** Incorrect – weaving patterns using punched cards describes the Jacquard loom of 1804, which later inspired Babbage's use of punched cards.
- **(d)** Incorrect – tide prediction was done by mechanical analog machines such as Lord Kelvin's tide-predicting machine of 1872, not by Napier's Bones.

3. The Pascaline (1642), developed partly to assist with tax calculations, was primarily designed to perform:

(a) addition and subtraction
(b) multiplication and division only
(c) statistical analysis
(d) text processing

Answer: (a) addition and subtraction

- Blaise Pascal built the Pascaline in 1642, at the age of about nineteen, to help his father, a tax supervisor in Rouen, with lengthy calculations. It used toothed gears and wheels, one for each decimal place, with an automatic carry mechanism that advanced the next wheel after every complete turn. It could add and subtract directly; multiplication and division were possible only by repeated addition or subtraction, so its design purpose was addition and subtraction.
- **(a)** Correct – the Pascaline's geared wheels with an automatic carry were built to perform addition and subtraction directly.
- **(b)** Incorrect – the Pascaline could multiply or divide only through repeated addition or subtraction; direct multiplication came with Leibniz's Stepped Reckoner of 1673.
- **(c)** Incorrect – statistical analysis on a mechanical scale came only with Hollerith's tabulating machines in 1890, long after the Pascaline.
- **(d)** Incorrect – text processing requires symbolic manipulation by programmable electronic computers; a seventeenth-century gear calculator could handle only numbers.

4. The 'Mill' and the 'Store' — components comparable to the modern CPU's arithmetic unit and memory respectively — belonged to:

(a) ENIAC
(b) Babbage's Analytical Engine
(c) Hollerith's Tabulating Machine
(d) UNIVAC I

Answer: (b) Babbage's Analytical Engine

- Charles Babbage designed the Analytical Engine in 1837 as a general-purpose, programmable mechanical computer. Its Mill carried out arithmetic, corresponding to the modern ALU and CPU, while its Store held numbers and intermediate results, corresponding to memory. Instructions and data were to be supplied on punched cards borrowed from the Jacquard loom, and output was by a printer, so the design anticipated every major unit of a modern computer.
- **(a)** Incorrect – ENIAC (1945) was an electronic machine built from about 18,000 vacuum tubes; it used accumulators, not components called the Mill and the Store.
- **(b)** Correct – the Mill (processing) and the Store (memory) were the two central components of Babbage's Analytical Engine design of 1837.
- **(c)** Incorrect – Hollerith's Tabulating Machine (1890) counted census data from punched cards using electrical contacts and had no Mill or Store.
- **(d)** Incorrect – UNIVAC I (1951) was an electronic stored-program computer using mercury delay-line memory, not Babbage's mechanical Mill and Store.

5. Ada Lovelace is widely regarded as the first computer programmer because in 1843 she published:

(a) the design of the first mechanical calculator

(b) an algorithm to calculate Bernoulli numbers for Babbage's Analytical Engine

(c) the first compiler, named A-0

(d) the stored-program concept

Answer: (b) an algorithm to calculate Bernoulli numbers for Babbage's Analytical Engine

- In 1843 Augusta Ada King, Countess of Lovelace, translated L. F. Menabrea's paper on Babbage's Analytical Engine and added extensive Notes. Note G set out a step-by-step method for computing Bernoulli numbers on the Engine, regarded as the first published computer program. She also foresaw that such machines could manipulate symbols such as music, not just numbers. The US Department of Defense named its programming language Ada after her.
- **(a)** Incorrect – the first mechanical calculator was designed by Wilhelm Schickard (1623) or Blaise Pascal (1642), long before Ada Lovelace's work.
- **(b)** Correct – her 1843 Notes contained an algorithm for computing Bernoulli numbers on the Analytical Engine, considered the first computer program.
- **(c)** Incorrect – the A-0 compiler was developed by Grace Hopper in 1952 for the UNIVAC I, more than a century after Lovelace.
- **(d)** Incorrect – the stored-program concept was described in John von Neumann's 1945 First Draft of a Report on the EDVAC.

6. The punched-card tabulating system used to process the 1890 US Census was developed by:

(a) Charles Babbage

(b) Herman Hollerith

(c) Vannevar Bush

(d) Konrad Zuse

Answer: (b) Herman Hollerith

- Herman Hollerith, a US Census Bureau employee, designed an electromechanical tabulating machine for the 1890 US Census. Data were recorded as holes in punched cards; when a card was pressed, metal pins passed through the holes into cups of mercury, completing circuits that advanced counters. The census was tabulated in about a year instead of the expected eight. His Tabulating Machine Company (1896) merged in 1911 into CTR, renamed IBM in 1924.
- **(a)** Incorrect – Charles Babbage designed the Difference Engine and the Analytical Engine in the nineteenth century; he did not build census tabulators.
- **(b)** Correct – Herman Hollerith developed the punched-card tabulating system for the 1890 US Census, and his company became part of IBM.
- **(c)** Incorrect – Vannevar Bush built the Differential Analyzer (1931), a mechanical analog computer for solving differential equations, not a census tabulator.
- **(d)** Incorrect – Konrad Zuse was a German engineer who built the Z1 (1938) and the Z3 (1941), the first working programmable computers.
- **Note on the question:** Typo in option (c): 'Vanncer Bush' corrected to 'Vannevar Bush'.

7. Match the early computers (Column I) with their developers (Column II):

Column I	Column II
A. Z3 (1941)	1. Howard Aiken with IBM
B. Colossus (1943–44)	2. J. Presper Eckert and John Mauchly
C. Harvard Mark I (1944)	3. Konrad Zuse
D. ENIAC (1945–46)	4. Tommy Flowers and British wartime team

Codes:

(a) A–3, B–4, C–1, D–2

(b) A–4, B–3, C–1, D–2

(c) A–3, B–1, C–4, D–2

(d) A–2, B–4, C–1, D–3

Answer: (a) A–3, B–4, C–1, D–2

- The Z3 (1941) was built in Germany by Konrad Zuse as the first working programmable, fully automatic digital computer, using telephone relays. Colossus (1943–44) was built by Post Office engineer Tommy Flowers at Bletchley Park to break the German Lorenz cipher. The Harvard Mark I (1944), or IBM ASCC, was designed by Howard Aiken and built by IBM. ENIAC (1945–46) was built at the University of Pennsylvania by J. Presper Eckert and John Mauchly. Hence A–3, B–4, C–1, D–2.
- **(a)** Correct – Z3 with Zuse, Colossus with Flowers, Harvard Mark I with Aiken and IBM, and ENIAC with Eckert and Mauchly.

- **(b)** Incorrect – it pairs Z3 with Tommy Flowers and Colossus with Zuse, reversing the German and British machines.
- **(c)** Incorrect – it links Colossus with Howard Aiken and the Harvard Mark I with Flowers, swapping the British and American projects.
- **(d)** Incorrect – it credits Eckert and Mauchly with Z3 and Zuse with ENIAC, which reverses the German and American machines.

8. Consider the following statements about ENIAC:

1. It used approximately 18,000 vacuum tubes.

2. It used decimal arithmetic.

3. Initially, programming involved switches and cables rather than a stored-program system.

4. It was the first stored-program computer.

(a) 1 only

(b) 1 and 2 only

(c) 1, 2 and 3

(d) 1, 2, 3 and 4

Answer: (c) 1, 2 and 3

- ENIAC (Electronic Numerical Integrator and Computer), completed in 1945 and unveiled in February 1946, used about 17,468 (roughly 18,000) vacuum tubes, weighed about 30 tonnes and worked in decimal, not binary. It was programmed by setting switches and plugging cables, a task that could take days. Statement 4 is wrong: ENIAC was not originally a stored-program computer; the Manchester Baby first ran a stored program on 21 June 1948. Statements 1, 2 and 3 are correct.
- **(a)** Incorrect – statement 1 is correct, but statements 2 and 3 are also correct, so this option is incomplete.
- **(b)** Incorrect – it omits statement 3, although ENIAC was indeed programmed through switches and patch cables rather than a stored program.
- **(c)** Correct – ENIAC had about 18,000 vacuum tubes, used decimal arithmetic and was programmed by switches and cables; statement 4 alone is false.
- **(d)** Incorrect – statement 4 is false because the first stored-program execution was by the Manchester Baby in 1948, not by ENIAC.

9. Which machine first successfully executed a program stored in electronic memory (on 21 June 1948)?

(a) EDSAC

(b) Manchester Baby (SSEM)

(c) UNIVAC I

(d) Colossus

Answer: (b) Manchester Baby (SSEM)

- The Small-Scale Experimental Machine, known as the Manchester Baby, was built at the University of Manchester by Frederic Williams, Tom Kilburn and Geoff Tootill. On 21 June 1948 it ran a 17-instruction program, written by Kilburn, to find the highest proper factor of 2^18, which was held in its Williams-Kilburn cathode-ray-tube memory. It was the first electronic stored-program computer to run a program, and it led to the Manchester Mark 1 and the Ferranti Mark 1.
- **(a)** Incorrect – EDSAC at Cambridge, built by Maurice Wilkes, ran its first program on 6 May 1949; it was the first practical stored-program computer in regular service.
- **(b)** Correct – the Manchester Baby (SSEM) executed the first program stored in electronic memory on 21 June 1948.
- **(c)** Incorrect – UNIVAC I was delivered to the US Census Bureau in 1951, three years after the Manchester Baby ran its stored program.
- **(d)** Incorrect – Colossus (1943–44) was programmed by switches and plugs for codebreaking and did not store its program in memory.

10. The computer delivered to the US Census Bureau in 1951, often called the first commercial computer in elementary textbooks, was the:

(a) EDSAC (b) UNIVAC I

(c) IBM 701 (d) Ferranti Mark 1

Answer: (b) UNIVAC I

- UNIVAC I (Universal Automatic Computer), designed by J. Presper Eckert and John Mauchly, was delivered to the US Census Bureau in March 1951 and is commonly called the first commercial computer in textbooks. It used mercury delay-line memory and magnetic tape, and became famous for predicting the 1952 US presidential election. The Ferranti Mark 1, delivered in February 1951 in Britain, was in fact the first commercially available general-purpose computer, so the question correctly qualifies its claim.
- **(a)** Incorrect – EDSAC (1949) was a research computer at Cambridge University, built by Maurice Wilkes, and was never sold commercially.
- **(b)** Correct – UNIVAC I, delivered to the US Census Bureau in 1951, is the machine textbooks usually describe as the first commercial computer.
- **(c)** Incorrect – the IBM 701 (1952) was IBM's first commercial scientific computer, delivered a year after UNIVAC I and not to the Census Bureau.
- **(d)** Incorrect – the Ferranti Mark 1 (1951) was a British commercial computer delivered to the University of Manchester, not to the US Census Bureau.

11. The transistor (1947), which became the principal technology of second-generation computers, was invented at:

(a) MIT, USA
(b) Bell Labs, by Bardeen, Brattain and Shockley
(c) CERN, by Berners-Lee
(d) IBM, by Aiken

Answer: (b) Bell Labs, by Bardeen, Brattain and Shockley

- The point-contact transistor was invented in December 1947 at Bell Telephone Laboratories, New Jersey, by John Bardeen and Walter Brattain, with William Shockley developing the junction transistor soon after; all three shared the 1956 Nobel Prize in Physics. Transistors replaced vacuum tubes in second-generation computers (about 1956–63), making machines smaller, faster, cheaper, more reliable and lower in power consumption and heat output.
- **(a)** Incorrect – MIT developed Whirlwind and magnetic-core memory, but the transistor was invented at Bell Labs, not at MIT.
- **(b)** Correct – Bardeen, Brattain and Shockley invented the transistor at Bell Labs in 1947 and received the 1956 Nobel Prize in Physics.
- **(c)** Incorrect – Tim Berners-Lee at CERN proposed the World Wide Web in 1989, which has nothing to do with the transistor.
- **(d)** Incorrect – Howard Aiken worked with IBM on the electromechanical Harvard Mark I (1944), which used relays rather than transistors.

12. The integrated circuit, the defining technology of third-generation computers, was developed during 1958–59 by:

(a) Jack Kilby and Robert Noyce
(b) Gordon Moore and Andy Grove
(c) Seymour Cray and William Norris
(d) Steve Wozniak and Steve Jobs

Answer: (a) Jack Kilby and Robert Noyce

- Jack Kilby of Texas Instruments demonstrated the first working integrated circuit, made of germanium, in September 1958, and Robert Noyce of Fairchild Semiconductor independently developed a practical silicon planar IC in 1959. An IC places transistors, resistors and capacitors on a single semiconductor chip. ICs defined the third generation of computers (about 1964–71), typified by the IBM System/360. Kilby received the Nobel Prize in Physics in 2000.
- **(a)** Correct – Jack Kilby (1958) and Robert Noyce (1959) independently invented the integrated circuit, the basis of third-generation computers.
- **(b)** Incorrect – Gordon Moore and Andy Grove were Intel leaders; Moore's Law (1965), not for inventing the IC.
- **(c)** Incorrect – Seymour Cray and William Norris founded supercomputing at Control Data Corporation; they did not invent the integrated circuit.
- **(d)** Incorrect – Steve Wozniak and Steve Jobs founded Apple in 1976 and built the Apple I and II personal computers, not the IC.

13. Match the computer generations (Column I) with their defining technologies (Column II):

Column I	Column II
A. First generation	1. Microprocessors and VLSI
B. Second generation	2. Vacuum tubes
C. Third generation	3. Integrated circuits
D. Fourth generation	4. Transistors

Codes:

(a) A-2, B-4, C-3, D-1

(b) A-4, B-2, C-3, D-1

(c) A-2, B-3, C-4, D-1

(d) A-3, B-4, C-2, D-1

Answer: (a) A-2, B-4, C-3, D-1

- Computer generations are classified by their switching technology. The first generation (about 1940–56) used vacuum tubes; the second (1956–63) used transistors; the third (1964–71) used integrated circuits; the fourth (1971 onwards) uses microprocessors built with LSI and VLSI. The fifth generation focuses on artificial intelligence using ULSI, parallel processing and natural-language interfaces. Hence A-2, B-4, C-3, D-1.
- **(a)** Correct – vacuum tubes, transistors, integrated circuits and microprocessors with VLSI define the first to fourth generations respectively.
- **(b)** Incorrect – it places transistors in the first generation and vacuum tubes in the second, reversing the historical order.
- **(c)** Incorrect – it puts integrated circuits in the second generation and transistors in the third, although transistors came before ICs.
- **(d)** Incorrect – integrated circuits did not exist in the first generation and vacuum tubes were not used in the third.

14. Regarding early supercomputing:
Assertion (A): The CDC 6600 (1964) is frequently described as the first successful supercomputer.
Reason (R): It was designed by Seymour Cray using advanced transistor-based circuitry and multiple peripheral processors.

(a) Both A and R are true, and R is the correct explanation of A

(b) Both A and R are true, but R is not the correct explanation of A

(c) A is true, but R is false

(d) A is false, but R is true

Answer: (a) Both A and R are true, and R is the correct explanation of A

- Assertion: the CDC 6600, delivered by Control Data Corporation in 1964, was about three times faster than the IBM 7030 Stretch and is widely described as the first successful supercomputer. Reason: it was designed by Seymour Cray using fast silicon transistors, a compact design with Freon cooling, and ten peripheral processors that handled input-output so the central processor could focus on computation. Since this design explains its record speed, R correctly explains A.
- **(a)** Correct – both statements are true, and Cray's transistor-based design with peripheral processors explains why the CDC 6600 was the first successful supercomputer.
- **(b)** Incorrect – R is not an unrelated fact; the design features it lists are the very reason for the machine's superior performance.
- **(c)** Incorrect – R is true, since Seymour Cray designed the CDC 6600 using transistors and ten peripheral processors.
- **(d)** Incorrect – A is true, because the CDC 6600 is generally accepted as the first successful supercomputer, holding the speed record from 1964 to 1969.

15. Match the titles (Column I) with the persons (Column II):

Column I	Column II
A. Father of the Computer	1. Alan Turing
B. Father of Computer Science	2. Ada Lovelace
C. First computer programmer	3. Charles Babbage
D. Compiler pioneer (A-0, COBOL)	4. Grace Hopper

Codes:

(a) A-3, B-1, C-2, D-4 (b) A-1, B-3, C-2, D-4

(c) A-3, B-2, C-1, D-4 (d) A-2, B-1, C-3, D-4

Answer: (a) A-3, B-1, C-2, D-4

- Charles Babbage is called the Father of the Computer for designing the Difference Engine (1822) and the Analytical Engine (1837). Alan Turing is the Father of Computer Science for his 1936 Turing Machine model of computation. Ada Lovelace wrote the first published algorithm in 1843. Grace Hopper developed the A-0 compiler (1952), led work on FLOW-MATIC that shaped COBOL (1959) and popularised the term debugging. Hence A-3, B-1, C-2, D-4.
- **(a)** Correct – Babbage, Turing, Lovelace and Hopper are matched with their correct titles.
- **(b)** Incorrect – it calls Turing the Father of the Computer and Babbage the Father of Computer Science, reversing the two titles.
- **(c)** Incorrect – it calls Lovelace the Father of Computer Science and Turing the first programmer, which reverses their contributions.

- **(d)** Incorrect – Ada Lovelace is not the Father of the Computer and Babbage was not the first computer programmer.

16. Consider the following statements:

1. The computer mouse prototype was built around 1964 and demonstrated publicly by Douglas Engelbart in 1968.

2. The Intel 4004 (1971) was the first commercially available single-chip 4-bit microprocessor, with about 2,300 transistors.

3. The IBM Personal Computer (1981) used the Intel 8088 microprocessor.

(a) 1 only
(b) 1 and 2 only
(c) 1, 2 and 3
(d) 2 and 3 only

Answer: (c) 1, 2 and 3

- All three statements are correct. Douglas Engelbart and Bill English built the wooden mouse prototype at the Stanford Research Institute around 1964, and Engelbart showed it publicly in the 'Mother of All Demos' on 9 December 1968. The Intel 4004, released in November 1971, was the first commercial single-chip 4-bit microprocessor, with about 2,300 transistors. The IBM PC Model 5150, launched in August 1981, used the 4.77 MHz Intel 8088.
- **(a)** Incorrect – statement 1 is correct, but statements 2 and 3 are equally correct, so this option is incomplete.
- **(b)** Incorrect – it omits statement 3, although the IBM PC of 1981 did use the Intel 8088 microprocessor.
- **(c)** Correct – all three statements about the mouse, the Intel 4004 and the IBM PC are historically accurate.
- **(d)** Incorrect – it leaves out statement 1, although Engelbart did build the mouse prototype around 1964 and demonstrated it in 1968.

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Key Facts to Remember

- The abacus (about 3000 BC, associated with China) is the earliest calculating aid, followed by Napier's Bones (1617) and Pascal's Pascaline (1642), which could add and subtract.
- Charles Babbage, the Father of the Computer, designed the Difference Engine (1822) and the Analytical Engine (1837), whose Mill and Store anticipated the CPU and memory.
- Ada Lovelace published an algorithm for Bernoulli numbers in 1843 and is regarded as the first computer programmer.
- Herman Hollerith's punched-card tabulator processed the 1890 US Census, and his company later became part of IBM (1924).
- ENIAC (1945–46, Eckert and Mauchly) used about 18,000 vacuum tubes and decimal arithmetic; the Manchester Baby first ran a stored program on 21 June 1948.
- Generations: vacuum tubes (1940–56), transistors (1956–63, invented at Bell Labs in 1947), integrated circuits (1964–71, Kilby and Noyce), microprocessors and VLSI (1971 onwards), and AI with ULSI in the fifth.
- The Intel 4004 (1971) was the first commercial single-chip 4-bit microprocessor with about 2,300 transistors; the IBM PC (1981) used the Intel 8088.
- The CDC 6600 (1964), designed by Seymour Cray, is regarded as the first successful supercomputer.