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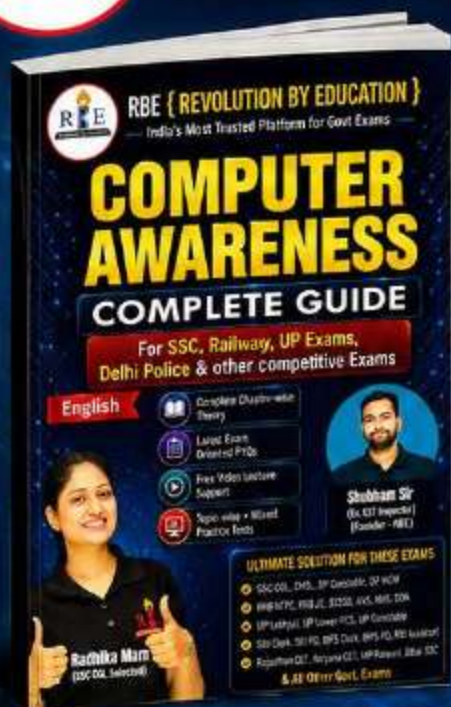
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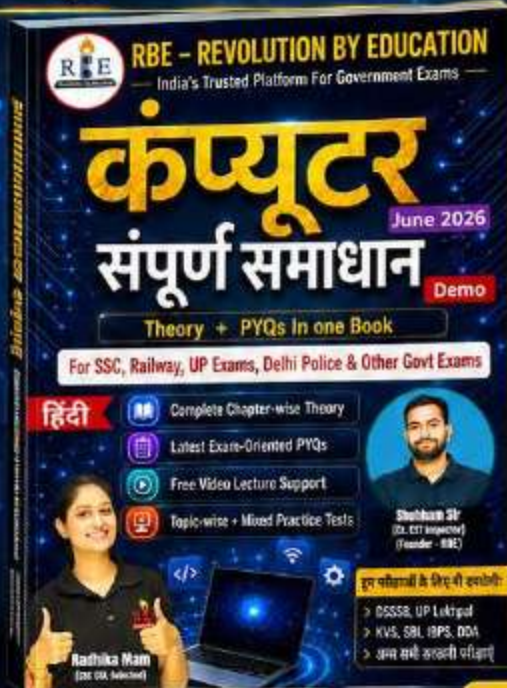
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(Ex. CST Inspector)
(Founder - RBE)



कंप्यूटर संपूर्ण समाधान

June 2026

सभी सरकारी परीक्षाओं के लिए एकमात्र संपूर्ण पुस्तक



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PREFACE



In today's competitive landscape, Computer Awareness is no longer just an optional subject; it is a critical tie-breaker in nearly every major government examination.

Whether you are aiming for SSC Exams (CGL, CHSL), Delhi Police, UP Lekhpal, RRB NTPC, DSSSB, KVS or various State Government roles, a solid grasp of digital fundamentals is essential to securing your place in the final merit list.

This book is born out of the "Revolution By Education" (RBE) philosophy—to provide high-quality, exam-oriented content that is accessible to every aspirant. Having mentored lakhs of students, I understand that the biggest challenge is not the lack of information, but the lack of relevant information.

Key features of this book include:

- **Radhika Mam classes:** Content aligned with her highly effective YouTube video modules, making it easier to transition from video learning to self-study.
- **Exam-Focused Precision:** Concise, to-the-point explanations built around the latest exam patterns and PYQs for maximum scoring efficiency.
- **Proven Expertise:** Strategies and insights from a platform led by an SSC CGL-selected educators.

Our goal is to simplify the complex world of bits, bytes, and logic gates, turning a technical subject into your highest-scoring section. Let's embark on this journey to digital literacy and career success together.

*Your success is our mission.
Let's crack these exams—together!*

Team RBE - Revolution By Education

ACKNOWLEDGEMENT

This book is a collective effort, and I am deeply grateful to everyone who helped bring this vision to life.

First and foremost, my heartfelt gratitude goes to the lakhs of students and aspirants associated with RBE. Your constant feedback and success stories are the primary reasons this book exists.

A very special mention to Radhika Mam. Her deep expertise and dedication to teaching Computer Awareness have been instrumental in shaping this book. By translating her classroom success into these pages, she has ensured that every aspirant—regardless of their technical background—can master this subject with ease.

I am also thankful to the entire RBE Team for their tireless work in research, data analysis, and content verification. Their commitment ensures that every page adds tangible value to your preparation.

- *Free Video Classes: Radhika Mam*
- *Published by: Revolution By Education (RBE)*
- *Designed & Edited by: RBE Editorial & Content Team specially Faiz, Shivam, Kumkum, and Abhishek.*

To you, the reader: thank you for trusting RBE. You have taken a vital step toward securing your future. I am honored to be a part of your journey.

Shubham Jain (Founder, RBE)

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First Edition: 2026

HOW TO USE THIS BOOK

This book is designed not just to be read, but to be completed with discipline and strategy. If followed properly, it can become your complete roadmap for Computer Awareness preparation.

- **Start with Video Classes for Clear Understanding**

Before reading any chapter, watch the corresponding video lecture available on YouTube. This will help you build strong conceptual clarity and make learning easier and faster.

- **Study the Book Line by Line**

After watching the video, study the chapter carefully from the book. Every single point is important — these are not random lines, but exam-focused facts, many of which have been directly asked in previous exams.

- **Follow a Chapter-wise Approach**

Do not jump between topics. Move chapter by chapter and complete the theory first. The theory part covers the maximum portion of the syllabus, making your foundation strong.

- **Practice Questions for Mastery**

After completing theory, solve all the questions. Questions contain unique and tricky concepts that may not appear frequently but can make a huge difference in your final score.

- **Consistency Over Speed**

Do not rush to finish the book in one go. It is normal if it takes time. Focus on understanding, retention, and revision, not just completion.

- **Revise and Strengthen**

Revision is the key to success. Go through important points multiple times to ensure they stay in your memory till the exam.

A Special Note for You from Radhika Ma'am

I have always received immense love and support from all of you, which keeps me going. I hope this book inspires you the same way—keep working hard, never lose hope, and remember the timeless words of Sohan Lal Dwivedi ji.

नन्हीं चींटी जब दाना लेकर चलती है
चढ़ती दीवारों पर, सौ बार फिसलती है
मन का विश्वास रगों में साहस भरता है
चढ़कर गिरना, गिरकर चढ़ना न अखरता है
आखिर उसकी मेहनत बेकार नहीं होती
कोशिश करने वालों की हार नहीं होती

*The little ant marches on with a grain of food,
Climbing walls, slipping a hundred times.
Faith in the heart infuses courage in the veins,
Climbing and falling, falling and climbing—never deterred.
In the end, her hard work is never wasted:
Those who keep trying never truly fail.*

You will achieve success only if you keep trying. All the very best!

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Computer awareness is becoming a major scoring section in competitive exams -- and this batch is designed to make you 100% exam-ready from basics to advanced.

- What will you get in this batch?
 - Complete Computer Syllabus Coverage - topic by topic
 - Concept Classes with clear explanations
 - Every topic followed by PYQ (Previous Year)



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A computer is an electronic device that accepts data (input), processes it according to given instructions (processing), produces results (output), and stores information for future use (storage). The word "computer" comes from the Latin word "computare," meaning "to calculate."



Functions of Computer

A computer performs four fundamental functions that work together in a cycle known as the Input-Process-Output-Storage (IPOS) cycle:

1. INPUT

Input is the process of entering data, instructions, and commands into the computer system

2. PROCESSING

Processing is the core function where the computer performs operations on the input data according to given instructions to convert it into meaningful information.

The Central Processing Unit (CPU), also called the "brain of the computer," handles all processing tasks.

3. OUTPUT

Output is the process of presenting processed data (results) to the user in a human-readable form.

4. STORAGE

Storage is the function of saving data, instructions, and information for future use.

Characteristics of Computer

✓ SPEED

Computers operate at extremely high speeds, executing millions or billions of instructions per second.

- Modern CPUs process billions of instructions per second (measured in GHz)

- Performs calculations in nanoseconds (billionths of a second)
- **Example:** A computer can perform millions of calculations in the time it takes you to blink once.

✓ ACCURACY

Computers provide highly accurate results with virtually zero errors if given correct input and instructions

- Error rate is almost negligible
- Follows the principle: "Garbage In, Garbage Out" (GIGO) - accuracy depends on correct input
- **Example:** A calculator always gives the correct answer to 523×789 instantly.

✓ AUTOMATION

Once programmed, computers can work automatically without human intervention.

- Follows stored instructions independently
- Requires minimal human supervision during operation
- **Example:** Scheduled backups, automatic software updates, alarm systems.

✓ VERSATILITY

Computers can perform a wide variety of tasks across different domains.

- Can handle calculations, data processing, communication, entertainment, design, etc.
- Adapts to different applications by changing software
- **Example:** The same computer can be used for gaming, office work, video editing, and online shopping.

✓ DILIGENCE

Computers work continuously without getting tired, bored, or losing concentration.

- Can perform repetitive tasks with same efficiency
- No decrease in performance over time
- **Example:** A computer can process payroll for thousands of employees without fatigue.

✓ **NO FEELINGS**

Computers have no emotions, biases, or feelings.

- Make decisions based purely on logic and programmed instructions
- Consistent output regardless of external factors
- Example: A computer treats all users equally and doesn't discriminate.

✓ **RELIABILITY**

Computers are highly reliable and produce consistent results.

- Perform the same operation repeatedly with identical results
- Rarely make mistakes if hardware is functioning properly
- Example: ATMs reliably dispense cash 24/7 without errors.

✓ **POWER OF REMEMBERING**

Computers can store and retrieve vast amounts of data accurately for long periods.

- Never forgets stored information
- Can recall data instantly when needed
- Example: Database systems remember customer information for years.

✓ **NO IQ**

Computers lack intelligence and creativity; they only follow programmed instructions.

- Cannot think independently or make decisions without programming
- Cannot learn from experience (unless programmed with AI)
- Example: A computer cannot solve a new problem unless given specific instructions.

(History of Computer)

IPOS Cycle: The functioning of a computer follows the Input – Processing – Output – Storage cycle.

Computer speed is measured in **IPS** (Instructions Per Second) and **MIPS** (Million Instructions Per Second).

CPU speed is measured in cycles per second, expressed in **Hertz** (Hz).

Early Computing Devices

- **Abacus:** Invented around (2500-3000) BC, it is considered one of the **first manual calculating devices**. It was first used in **ancient Mesopotamia** and later developed in **China**.
- It uses **beads on rods** to perform **addition** and **multiplication** efficiently.
- **Napier's Bones:** A manual calculating device invented by John Napier (1550–1617) to simplify **multiplication and division**.
 - It was based on Napier's method called **Rabdologia**.
 It was one of the earliest tools to apply the **decimal system** in practical computation.
- **Pascaline:** Invented by Blaise Pascal in 1642 to perform **addition and subtraction**. It is considered the **first mechanical adding machine**, operating through a system of **gears and a clock-style mechanism**.
- **Joseph Marie & Jacquard Loom:** Invented by Joseph Marie Jacquard, it used **punched cards** to control weaving patterns.



History

1. The history of computing began with the **Abacus**, one of the **earliest manual calculating devices**, first used in **Mesopotamia around 2500–3000 BC**. It consisted of a wooden frame with rods or wires on which beads were moved to perform **basic arithmetic operations (addition, subtraction, multiplication, division)**.
 - The Chinese later developed their own version called the **Suanpan**.



2. In 1642, Blaise Pascal developed the **Pascaline**, the **first mechanical calculator** used for addition and subtraction.
3. In 1822, **Charles Babbage** began developing the **Difference Engine**, the **first automatic mechanical calculator** designed to compute mathematical tables. Between 1833 and 1837, he designed the **Analytical Engine**, which included memory, arithmetic, and logical operations, making it the **first true concept of a programmable modern**



computer.

The **Analytical Engine** used **counter wheels** as part of its mechanical design.

Charles Babbage created the first conceptual design of a computer, while **John von Neumann** contributed the most to modern computer architecture.

4. **In 1890, punched cards** (used in the **Tabulating Machine**) were most famously **used by Herman Hollerith** for data processing in the U.S. Census and also called **Census Tabulator**. These punched cards became an **early method of data storage and processing**, forming the foundation of modern data-processing systems. **IBM (International Business Machines)** widely **popularised the use of punch cards in computers**, especially for data input and storage in early computing systems.

5. **Atanasoff-Berry Computer (ABC)**: Developed by **John Atanasoff** and **Clifford Berry**, it was the **first electronic digital computer** that used **45 vacuum tubes** to solve **simultaneous linear equations**.

6. **Mark I Computer**: Designed by **Howard Aiken** and built by **IBM**, the **Harvard Mark I** could **multiply two 10-digit numbers in about 5 seconds**, making it one of the earliest electromechanical computers.

7. **In 1945, the ENIAC (Electronic Numerical Integrator and Computer)**, a high-speed electronic computer, was developed by



John Presper Eckert and **John W. Mauchly** with their team at the Moore School of Electrical Engineering, University of Pennsylvania. It was formally unveiled in 1946.

ENIAC is regarded as the **first general-purpose electronic digital computer**.

- It was about 1,000 times faster than earlier electromechanical computers.
- It used approximately 18,000 vacuum tubes for its operation.

8. EDVAC (1947)

EDVAC (Electronic Discrete Variable Automatic Computer) was developed in 1947 by **John von Neumann**, **John Mauchly** and **J. Presper Eckert**. It is important because it was the **first computer designed to use the Stored Program Concept**, where both data and instructions were stored in memory.

9. EDSAC (1949)

EDSAC (Electronic Delay Storage Automatic Calculator) was developed in 1949 by **Maurice Wilkes** at the **University of Cambridge**. It was one of the **first practical stored-program computers** to become fully operational.

Around 1950, magnetic core memory and transistor-based circuit elements began to be used in digital computers, replacing bulky vacuum tubes and greatly improving speed, reliability, and energy efficiency.



10. UNIVAC-1 (1951)

UNIVAC I (Universal Automatic Computer) was developed in 1951 by **J. Presper Eckert** and **John Mauchly**. It was the **first commercially produced electronic computer** and was used for business and government applications.

11. Microprocessor (1971)

The first microprocessor, **Intel 4004**, was developed in 1971 by **Intel Corporation**, led by **Federico Faggin**, **Ted Hoff**, and **Stanley Mazor**. It placed the **entire CPU on a single chip**, marking the beginning of the **Fourth Generation of computers**.

12. CRAY-1

CRAY-1 was developed in 1976 by **Seymour Cray**. It was one of the **first successful supercomputers**, designed for high-speed scientific and engineering calculations.

13. APPLE II

Apple II was introduced in 1977 by **Apple Inc.**, designed by **Steve Wozniak**. It was one of the **first highly successful mass-produced personal computers**, helping popularize home computing. During the **1980s**, the large-scale manufacturing and mass production of semiconductor chips expanded rapidly, leading to smaller, faster, and more affordable computers.

Facts:

1. First computer programme was developed by Lady Ada Augusta, a student of Babbage.
2. **December 2** is observed as **Computer Literacy Day**.
3. First computer made in India was **Siddharth**, which was manufactured by **Electronics Corporation of India**.



4. The first computer in India, the **HEC-2M**, was installed at the **Indian Statistical Institute (ISI)** in Kolkata in **1955**.
5. First super computer of the world is **CDC 6600** released in 1964.

Moore's Law states that the **number of transistors** on an integrated circuit (**IC**) **doubles approximately**

every 2 years.

As a result, the **cost per transistor (or per chip)** becomes **half every 2 years**, making computing power cheaper and more efficient over time

Era/Device	Approx. Year	Inventor/Developer	Key Feature
Abacus	~2500–3000 BC	Mesopotamia (later developed in China)	Manual calculating device
Napier's Bones	1617	John Napier	Multiplication, division
Pascaline	1642	Blaise Pascal	Addition, subtraction
Jacquard Loom	1804	Joseph Marie Jacquard	Punched cards concept
Difference Engine	1822	Charles Babbage	Mechanical calculator (Babbage)
Analytical Engine	1833(concept) 1837(design)	Charles Babbage	First general-purpose computing concept
Hollerith Tabulating Machine	1890	Herman Hollerith	Used punched cards in US Census
Harvard Mark I	1944	Howard Aiken	Electromechanical computer
ENIAC	1946 (developed 1945)	Mauchly & Eckert	First electronic, general-purpose computer
EDVAC	1947	John von Neumann (concept), Mauchly & Eckert (development)	First Computer to use Stored Program Concept
EDSAC	1949	Maurice Wilkes	First practical stored-program computer developed by University of Cambridge
UNIVAC I	1951	Eckert & Mauchly	First commercial electronic computer
IBM System/360	1964	IBM	Mainframe, integrated circuits
Microprocessor Era	1971	Intel	Computers became personal devices
Modern Supercomputer	Present	Seymour Cray / various	High-speed computation, parallel processing

(Generations of Computer)

1st Generation Computer

Timeline	1940 – 1956
Type of Computer	Digital Computer
Technology Used	Vacuum tubes (invented by Ambrose Fleming in 1904)
Language Based	Machine Language only
Example	ENIAC, EDVAC, UNIVAC I
Additional Information	Vacuum Tubes are the devices to Control & Amplify Electronic Signals, Speed measured in Milliseconds .

2nd Generation Computer

Timeline	1956 – 1963
Type of Computer	Digital Computer
Technology Used	Transistors by John Bardeen and William Shockley
Language Based	Assembly Language
Example	Honeywell 400, IBM 7030, CDC 1604 etc..
Additional Information	They are Smaller than first generation and generate less heat. Speed measured in Microseconds .



3rd Generation Computer

Timeline	1964 – 1971
Type of Computer	Digital Computer
Technology Used	Integrated Circuit (IC) by Jack Kilby & Robert Noyce
Language Based	High Level Languages (FORTRAN, COBOL, BASIC, PASCAL)
Example	PDP 8, Honeywell 6000
Additional Information	Speed measured in Nanoseconds.

4th Generation Computer

Timeline	1971–1980s
Type of Computer	Digital Computer
Technology Used	Large Scale Integration (LSI), Very Large-Scale Integration (VLSI), Micro Processors
Language Based	High Level & 4GL Languages (C, C++, SQL, etc.)
Example	IBM PC, Apple Macintosh, IBM PC-XT, Microprocessor-based personal computers, STAR 1000 etc..
Additional Information	- The first microprocessor, the Intel 4004, was developed in 1971 by Intel Corporation, led by Ted Hoff, along with Federico Faggin and Stanley Mazor. - Speed measured in Gigahertz or Picoseconds.

5th Generation Computer

Timeline	1989-PRESENT
Type of Computer	Digital Computer
Technology Used	ULSI + Artificial Intelligence (AI)
Language Based	PROLOG, LISP, AI-based languages
Example	Laptop, AI systems, expert systems, robotics, modern computers
Additional Information	Based on Artificial Intelligence (AI), Parallel Processing, Knowledge-based systems



Types of Terminals in Computer Organisation

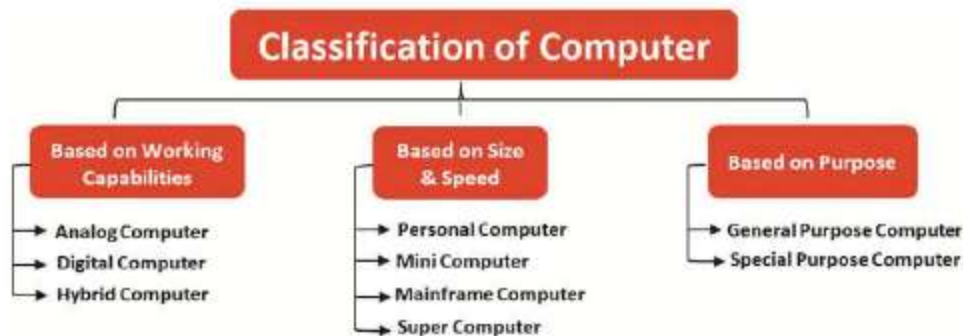
1. Dumb Terminal

- A dumb terminal has **no processing power and no memory**.
- It can **only input and display data** — all processing is done by the main computer/server.
- Essentially behaves like a **keyboard + monitor** connected to a central system.

2. Intelligent Terminal

- Intelligent terminals **do have their own processor and memory**, but they depend on a central system for heavy processing.
- It can process some tasks locally before sending data to the main computer.
- Examples:**
 - ATMs
 - Point-of-Sale (POS) machines

- Devices using **microprocessors** for basic local processing



On the basis of working capabilities, there are three types of computers:

- ❖ Analog computer
- ❖ Digital computer
- ❖ Hybrid computer

Analog Computer

- These involve data that **continually changes** and does not have discrete values. Eg: **Voltmeter, Ammeter, Mercury thermometer, Speedometer**
- Work with physical quantities and measure real world phenomena in real time.



Digital Computer

- These accept the raw data as input, done in binary numbers (0 and 1). Eg: **Laptop, Desktops, Smart phones** etc.
- Widely used in modern computing like calculations, editing, browsing, games.



Hybrid Computer

- These have features of both digital and Analog computers. These can process both discrete and continuous data.
- Eg: Processors used in **petrol pumps** (as they calculate both quantity and price).
- Used in specialized applications needing real time data and precise results like medical systems (heart rate monitoring), weather forecasting and flight simulations.



On the basis of size and speed there are following types of computers:

- ❖ Micro / Personal computer
- ❖ Minicomputer
- ❖ Main frame
- ❖ Super computer

Personal Computer or Microcomputer

- A **Personal Computer (PC)**, also known as a **Microcomputer**, is a small, single-user computer designed for general-purpose tasks such as word processing, browsing, programming, and data management.
- It operates at **high processing speeds** using modern microprocessors and is suitable for both **personal and professional use**.
- A personal computer uses a **microprocessor as CPU**.
- **Example:** Laptop, Desktop Computer, Notebook Computer, Personal Digital Assistant (PDA), Workstation.



Mini Computer

- A **Mini Computer** is a medium-sized computer that is more powerful than a microcomputer and is designed to support multiple users simultaneously.
- It is more powerful than microcomputers and support multiple users and can handle higher data processing workloads efficiently.
- Mostly used in **schools, factories, offices, research labs, and small business organisations** for managing databases, accounting, and production systems.
- **Examples:** IBM AS/400, DEC PDP series, VAX systems.

Mainframe Computer



- A **Mainframe Computer** is a large and powerful computer system designed to process vast amounts of data and support a large number of users simultaneously.



- It has very **high processing speed and large memory capacity**, capable of handling complex calculations and heavy workloads continuously.
- It supports **more than 100 users at the same time** through **time-sharing and multi-tasking techniques**, allowing different users to work on separate terminals.
- Mainly used in **banks, government agencies, insurance companies, airlines, and telecom organisations** for large-scale transaction processing and database management.

Super Computer

- A Supercomputer is the **most powerful type of computer designed to perform extremely complex and large-scale calculations at very high speeds**.
- Its performance is measured in **FLOPS** (Floating Point Operations Per Second), which indicates how many mathematical calculations it can perform per second.
- It is the **fastest and most powerful category of computers**. Supercomputers use advanced parallel processing techniques and thousands of processors to handle highly complex scientific computations and simulations.
- The first successful supercomputer, **CDC 6600 (1964)**, was developed by Seymour

Cray and was the fastest of its time. The Cray-1 (1976), also by Seymour Cray, introduced vector processing. **India's first supercomputer, PARAM-8000 (1991)**, was developed by the Centre for Development of Advanced Computing (C-DAC).

- Mainly used in **weather forecasting, climate research, nuclear simulations, space exploration, defense research, and scientific modelling**. These systems are generally used by **government and research organizations**.
- **Examples:** Cray-1, PARAM-8000, Fugaku, Summit.

On the basis of purpose there are two types of computers:

- ❖ General Purpose
- ❖ Special Purpose

General Purpose

- A **General-Purpose Computer** is a versatile computing device designed to perform a wide variety of tasks rather than a single specific function.
- These systems support applications like word processing, internet browsing, gaming, programming, and office work, **making them suitable for both personal and professional use**.
- **Laptop, Desktop Computer, Smartphone, Tablet.**

Special Purpose

- A **Special Purpose Computer** is a computing system specifically designed and optimized to perform a **single dedicated task or a limited set of tasks**.
- **Examples:** ATM machines (banking transactions), weather forecasting systems, MRI scanners (medical diagnosis), industrial robots (manufacturing).

Summary Table of Key Characteristics

Computer Type	Size	Users Supported	Primary Use	Example Devices/Systems
Supercomputer	Very Large	Single/multiple tasks	Complex scientific simulations	PARAM (India), Summit (USA)
Mainframe	Large	Hundreds to thousands	Bulk data processing	IBM zSeries, Hitachi Z800, IBM zSeries
Minicomputer	Medium	4 to 200	Medium-scale institutional use	PDP-11, VAX
Microcomputer	Smallest	Single user	Personal and office tasks	Desktop, Laptop, Tablet, Smartphone

S.No	Indian Super Computers & Series	Details
1.	PARAM Ganga (2022)	- PARAM Ganga is under NSM (new system). - Installed at IIT Roorkee. - Speed: 1.66 Petaflops.
2.	PARAM Pravega (2022)	- Commissioned under National Supercomputing Mission (NSM). - Installed at IISc Bengaluru. - Speed: 3.3 Petaflops (one of India's most powerful).
3.	PARAM Siddhi – AI (2020)	- India's HPC-AI supercomputer. - Jointly developed by MeitY & C-DAC. - Ranked in Top 100 supercomputers (Ranked 63rd in TOP500 (Nov 2020)). - Used for AI, medicine, weather & climate.
4.	Cray-1 (1976)	- One of the world's most famous early supercomputers. - Developed by Cray Research.
5.	PARAM 8000 (1991)	- India's first supercomputer (developed by C-DAC). - India's first Giga-scale supercomputer.
6.	PARAM 10000 (1998)	- Developed by C-DAC. - Speed: 100 Giga-flops.
7.	PARAM Padma (2002)	- India's first teraflop supercomputer. - One of the early Indian systems in TOP500 list (Rank 171).
8.	PARAM Yuva (2008)	- Capacity: 54 Teraflops. - Ranked 69 globally in 2008.
9.	PARAM Yuva-II (2013)	Speed: 529 Teraflops.
10.	PARAM Biochrome	- HPC cluster for Bio-informatics. - Capacity: 5 Teraflops.
11.	PARAM Bio-Blaze (2014)	- Performance: 10.65 Teraflops. - Developed under C-DAC.
12.	PRATYUSH (2018)	- India's first multi-petaflop supercomputer. - Installed at IITM + NCMRWF for weather prediction.
13.	EKA (2007)	- It was Asia's fastest at that time. - Built by CRL (Tata) & Hewlett-Packard.
14.	Father of Indian Supercomputers	Dr. Vijay Bhatkar (C-DAC Founder).
15.	SEAC (1950)	- Standards Eastern Automatic Computer. - Early American computer, built by NBS (USA).
16.	Sun Microsystems	- Founded by Vinod Khosla, Scott McNealy & Andy Bechtolsheim. - Later acquired by Oracle.
17.	Apple Inc. (1976)	- Founded by Steve Jobs, Steve Wozniak, Ronald Wayne. - First computer: Apple I. - Introduced iPad in 2010.
18.	Alan Turing	- Father of Modern Computers. - Introduced Turing Machine concept.
19.	Microsoft (1975)	Founded by Bill Gates & Paul Allen.
20.	ENIAC (1946)	- Electronic Numerical Integrator And Computer. - World's first general-purpose electronic computer. - Built by J. Presper Eckert and John Mauchly.

Previous Year Questions

Q1. A computer performs millions of calculations in a fraction of a second. Which characteristic is primarily demonstrated here?

RRB NTPC 2025-26 (Mar 2026)

- (a) Storage (b) Speed
(c) Versatility (d) Accuracy

Ans: b

Solution:

- A computer can perform **millions of calculations in a fraction of a second**, which shows its **high speed**.
- **Speed** means the computer can process data and complete tasks very quickly.
- **Storage** refers to saving data, **Versatility** means doing different kinds of work, and **Accuracy** means giving correct results.
- Therefore, the characteristic mainly demonstrated here is **Speed**.

Q2. A major characteristic of computer systems is Diligence. Which of the following scenarios primarily highlights a limitation of the computer system that is not overcome by its diligence?

RRB NTPC 2025-26 (Mar 2026)

- (a) A computer is used to book flights in the morning and write code in the afternoon.
(b) A computer continues processing data for 72 hours straight without any loss of attention.
(c) A computer generates incorrect output because the initial data entered was flawed.
(d) A computer performs trillions of calculations a second, much faster than any human.

Ans: c

Solution:

- **Diligence** means a computer can work for long hours **continuously without getting tired, bored, or losing concentration**.
- But diligence **cannot correct wrong input data**. If the data entered at the beginning is incorrect, the computer may still produce wrong output.
- This shows the limitation called **GIGO (Garbage In, Garbage Out)**, which means wrong input leads to wrong result.
- Therefore, the scenario that highlights a limitation not overcome by diligence is **incorrect output due to flawed initial data**.

Q3. Movie studios use powerful computers to create special effects and animations. This is an application of computers in:

RRB NTPC 2025-26 (Mar 2026)

- (a) Accounting (b) Entertainment
(c) Banking (d) Scientific research only

Ans: b

Solution:

- Movie studios use computers to create **special effects, animation, sound editing, and video**

production, which comes under the field of **entertainment**.

- In the entertainment industry, computers are widely used in **films, cartoons, gaming, music, and digital media**.
- **Accounting** is related to financial records, **banking** is related to money transactions, and **scientific research only** is not the correct category here.
- Therefore, the correct answer is **Entertainment**.

Q4. Apple II is an example of _____ Generation of computer.

CHSL Exam 2022 Tier I

- (a) First (b) Fourth
(c) Second (d) Third

Ans: b

Solution:

- Apple II computer belongs to the **Fourth Generation** of computers.
- Fourth Generation computers used **microprocessors** as their central processing unit, which made them smaller, faster, and more efficient.
- Apple II was one of the first successful **personal computers (PCs)** developed using microprocessor technology, launched in the late 1970s.

Q5. Which of the following is a second-generation system?

CHSL Exam 2022 Tier I

- (a) Sun workstations (b) Apple II
(c) IBM notebooks (d) Honeywell 400

Ans: d

Solution:

- **Honeywell 400** is an example of a **Second-Generation** computer system.
- Second Generation computers primarily used **transistors** instead of vacuum tubes, which made them smaller and more reliable.
- Honeywell 400 was a transistor-based mainframe computer from the 1950s-60s era.

Q6. Which among the following is not an example of the 4th Generation of Computer?

CHSL Exam 2022 Tier I

- (a) STAR 1000 (b) TRS-80
(c) ICL 2900 (d) Apple II

Ans: c

Solution:

- **ICL 2900** is **not** an example of the **Fourth Generation** of computers.
- ICL 2900 belongs to the **Third Generation**, which used **integrated circuits (ICs)** but not microprocessors.
- Fourth Generation computers use **microprocessors**, which made computers smaller, faster, and more affordable.



- STAR 1000, TRS-80, and Apple II are examples of Fourth Generation computers using microprocessor technology.

Q7. Who among the following is the Originator of binary logic and arithmetic in Computer programming?

RRB NTPC Stage-I 12/03/2021 (Shift-I)

- (a) Claude Shannon (b) Noam Chomsky
(c) Leslie Lamport (d) John Backus

Ans: a

Solution:

- The correct answer is **Claude Shannon**.
- Claude Shannon is widely regarded as the **originator of binary logic and arithmetic in computer programming**.
- In his 1937 master's thesis, Shannon showed how **Boolean algebra** could be used to simplify and design **digital circuits** — this laid the **foundation of digital computing**.

Q8. From the given options, select the developer of 'PARAM 10000', a supercomputer of Indian origin.

RRB NTPC Stage-I 08/02/2021 (Shift-II)

- (a) IIT Kharagpur (b) C-DAC Pune
(c) IIT Kanpur (d) TATA

Ans: b

Solution:

- The supercomputer **PARAM 10000** was developed by **C-DAC Pune** (Centre for Development of Advanced Computing).
- It was launched in **1998** as a part of India's National Supercomputing Mission.
- PARAM 10000 was a significant upgrade from the earlier **PARAM 8000**, and it placed India among the top countries in supercomputing technology at the time.

Q9. Who among the following is known as the 'Father of Indian Supercomputers'?

RRB NTPC Stage-I 22/02/2021 (Shift-I)

- (a) Jayant Narlikar (b) RA Mashelkar
(c) Nandan Nilkeni (d) Vijay Pandurang Bhatkar

Ans: d

Solution:

- The correct answer is **(d) Vijay Pandurang Bhatkar**.
- **Dr. Vijay Bhatkar** is widely known as the **'Father of Indian Supercomputers'** for leading the development of India's first indigenous supercomputer **PARAM 8000**.
- He was the founding director of **C-DAC (Centre for Development of Advanced Computing)**, which played a crucial role in India's supercomputing mission.

Q10. Which of the following is not a series of the supercomputer PARAM that was developed by Indian scientists?

RRB NTPC Stage-I 08/02/2021 (Shift-I)

- (a) PARAM MITRA (b) PARAM 8000
(c) PARAM BRAHMA (d) PARAM 8600

Ans: a

Solution:

- The **PARAM series** is a line of Indian supercomputers developed by the **Centre for Development of Advanced Computing (C-DAC)**.
- The first machine in the series was **PARAM 8000**, launched in **1991**.
- Other well-known supercomputers in this series include **PARAM 8600**, **PARAM Padma**, **PARAM Yuva**, **PARAM Brahma**, etc.
- **PARAM MITRA** is **not a part of the official PARAM series** developed by Indian scientists. It is a fabricated or non-existent name in the context of PARAM supercomputers.

Q11. Which of the following is NOT a type of personal computer?

RRB NTPC Stage-I 09/02/2021 (Shift-II)

- (a) Desktop Computer (b) Mainframe Computer
(c) Palmtop Computer (d) Laptop

Ans: b

Solution:

- **Mainframe Computer** is **not** a type of personal computer; it is a powerful system used by large organisations for bulk data processing.
- **Desktop, Palmtop, and Laptop** are all types of **personal computers**, designed for individual use.
- Personal computers are generally used for tasks like document editing, browsing, or entertainment.

Q12. Which among the following type of computer is also known as notebook?

CGL 2022 Tier II Paper I

- (a) Multi Core (b) Laptop Computer
(c) Work Station (d) Micro Computer

Ans: b

Solution:

- **Laptop Computer** is also known as a **notebook**.
- It is a portable personal computer designed for mobile use with a built-in screen, keyboard, and battery.
- Laptops are lightweight and compact, making them convenient for use on the go.

Q13. Global weather forecasting is done by using.

RRB NTPC Stage-I 07/04/2021 (Shift-II)

- (a) Mini Computers (b) Hybrid Computers
(c) Micro Computers (d) Super Computers

Ans: d

Solution:

- **Super Computers** are used for **global weather forecasting** because they can process massive amounts of data at very high speeds.
- Weather models involve complex mathematical calculations and real-time data from satellites, which require the immense processing power of supercomputers.
- These systems can simulate climate patterns and predict natural phenomena like storms and cyclones.

Q14. Which of the following is not a part of a personal computer?

- RRB NTPC Stage-I 16/01/2021 (Shift-I)**
- (a) CPU (b) USB
(c) RAM (d) ROM

Ans: b

Solution:

- **USB (Universal Serial Bus)** is an interface or port, not an actual component of the internal architecture of a personal computer.
- It is used to **connect external devices** like pen drives, keyboards, or printers to the computer.
- Components like **CPU, RAM, and ROM** are internal and essential parts of a personal computer.

Q15. Modern computers follow a set of instructions to perform any task. These instructions can be better known as.

- RRB NTPC Stage-I 25/01/2021 (Shift-II)**
- (a) Commands (b) Programs
(c) Language (d) Guidelines

Ans: b

Solution:

- Modern computers perform tasks by following a set of instructions called **Programs**.
- A **program** is a collection of coded instructions written in a programming language that the computer can understand and execute.
- These programs control the behaviour of the computer to perform specific operations like calculations, data processing, or system control.

Q16. Which of the following chemical element, Tetravalent Metalloids, is used to make an integrated circuit (IC) chip used in computers?

- RRB NTPC Stage-I 30/04/2016 (Shift-I)**
- (a) Gold (b) Silver
(c) Silicon (d) Copper

Ans: c

Solution:

- The element used to make **Integrated Circuit (IC) chips** is **Silicon**.
- Silicon is a **tetravalent metalloid**, meaning it has four valence electrons and shows properties of both metals and non-metals.
- It is widely used in the electronics industry due to its excellent **semiconducting properties**, making it ideal for manufacturing microchips and processors.

Q17. What is the name of tablet computer developed by Database, whom India's government promoted for a part of E-learning?

- RRB NTPC Stage-I 04/04/2016 (Shift-II)**
- (a) SAKSHAAT (b) INDRA DHANUSH
(c) AAKASH (d) PARAM

Ans: c

Solution:

- The tablet computer developed by **DataWind** and promoted by the **Government of India** for **e-learning** purposes was named **Aakash**.
- It was launched as the **world's cheapest tablet**, aimed at providing affordable access to technology for students.

- The initiative was a part of the **National Mission on Education through ICT (NMEICT)** under the **Ministry of Human Resource Development (MHRD)**.

Q18. Any person known as "computer literate". If he is capable only-

- RRB NTPC Stage-I 19/01/2017 (Shift-II)**
- (a) To run important applications
(b) To make anti-virus softwares
(c) To write programs
(d) To hack the computers

Ans: a

Solution:

- A person is considered "**computer literate**" if they are capable of **running important applications** like word processors, spreadsheets, browsers, and other commonly used software.
- Computer literacy means having **basic knowledge and skills** to operate a computer effectively in daily tasks.
- It does **not require programming or hacking skills**.

Q19. Which of the following is not related to the given group?

- RRB Group-D 12/12/2018 (Shift-III)**
- (a) Hard dish (b) Basin Buddy
(c) CPU (d) Motherboard

Ans: b

Solution:

- Among the given options, **Basin Buddy** is **not related to computer hardware**.
- **Hard disk, CPU, and Motherboard** are all essential components of a computer system.
- **Basin Buddy** is a **non-technical term**, possibly referring to a household item or cleaning tool, and has **no association with computing or electronics**.

Q20. In a microprocessor, when interference in CPU then-

- RRB SSE 21/12/2014**
- (a) Microprocessor stops execution of specification
(b) Make the branches of subroutine accepting the blockage
(c) Does not continue execution of specification after accepting the blockage
(d) Continue execution of specification after accepting the blockage

Ans: d

Solution:

- In a microprocessor, when an **interference or interrupt** occurs, the CPU **temporarily halts the current execution** and responds to the interrupt by executing a predefined **interrupt service routine (ISR)**.
- After completing the ISR, the CPU **returns to the original task and continues execution of the specification** from where it left off.
- Therefore, the correct behaviour is: **continue execution after accepting the blockage (interrupt)**.

Q21. For which purpose India's fastest and the first multi-PetaFlops (OF) supercomputer 'Pratyush' used.

RRB NTPC Stage-I 17/02/2021 (Shift-II)

- (a) Weather forecasting (b) Pharmaceutical development
(c) Seismic data analysis (d) Scientific data processing

Ans: a

Solution:

- India's supercomputer 'Pratyush' is primarily used for **weather forecasting**.
- It helps in predicting weather patterns, cyclones, and climate modeling with high accuracy.
- It is one of the fastest multi-PetaFlops supercomputers in India dedicated to meteorological studies.
- Other options like pharmaceutical development, seismic data analysis, and scientific data processing are important but not the primary purpose of Pratyush.

Q22. What type of computer working system does a calculator operate on?

बनारस exam (11 dec 2015)

- (a) Hybrid Computer (b) Analog Computer
(c) Digital Computer (d) None of these

Ans: c

Solution:

- The correct answer is (c) **Digital Computer**, as a calculator works on **digital signals (0 and 1)**.
- It performs calculations using **binary number system**, which is the basis of digital computing.
- Calculators process **discrete numerical data**, not continuous signals like analog computers.
- Hybrid and analog computers are used for **specialised purposes**, not simple arithmetic operations like calculators.

Q23. What name was given to the first supercomputer built in India?

Junior engineer technician exam (27 dec 2015)

- (a) Akash (b) Param
(c) Arjun (d) Siddharth

Ans: b

Solution:

- The correct answer is (b) **Param**, which was India's first indigenous supercomputer.
- It was developed by **C-DAC (Centre for Development of Advanced Computing)** in 1991.
- PARAM was built after India was denied access to foreign supercomputers, showing **self-reliance in technology**.
- Other options like Akash, Arjun, and Siddharth are **not related to India's first supercomputer**.

Q24. During which period was the second generation of computers seen?

व्यायाम प्रश्नोत्तर exam (16 sep 2018)

- (a) 1940–1956 (b) 1963–1972
(c) 1956–1963 (d) 1973–Present

Ans: c

Solution:

- The correct answer is (c) **1956–1963**, which is the period of the **second generation of computers**.
- This generation used **transistors instead of vacuum tubes**, making computers smaller and more efficient.
- It marked improvement in **speed, reliability, and reduced power consumption** compared to the first generation.
- Other periods correspond to different generations: **1940–1956 (First)**, **1963–1972 (Third)**, **1973–Present (Fourth)**.

Q25. Who among the following is known as the 'Father of Computing'?

Lower Exam – (01 nov 2019)

- (a) Charles Babbage (b) Tim Berners-Lee
(c) Philip Don Estridge (d) J.S. Kilby

Ans: a

Solution:

- The correct answer is (a) **Charles Babbage**, who is known as the **"Father of Computing"**.
- He designed the **Analytical Engine**, which is considered the first concept of a modern computer.
- His ideas introduced key components like **input, output, memory, and processing**, forming the base of computing systems.
- Other options contributed in different fields: **Tim Berners-Lee (WWW)**, **J.S. Kilby (Integrated Circuit)**, **Estridge (IBM PC development)**.

Q26. What was the name of the first computer built without any mechanical parts by J.W. Mauchly and J. Presper Eckert in 1943?

ग्राम विकास अधिकारी (22 dec 2018)

- (a) ENIAC (b) Mark I
(c) Mark II (d) EDVAC

Ans: a

Solution:

- The correct answer is (a) **ENIAC**, which was the **first fully electronic computer without mechanical parts**.
- It was developed by **J.W. Mauchly and J. Presper Eckert in 1943–46** at the University of Pennsylvania.
- ENIAC used **vacuum tubes** for processing and was much faster than earlier electromechanical computers.
- Options like **Mark I and Mark II** were partially mechanical, while **EDVAC** was a later stored-program computer.

Q27. The concept of "stored-program architecture", which greatly influenced modern computing, was first articulated by which of the following pioneers?

UPSSSC X-Ray Technician exam (15 dec 2024)

- (a) Grace Hopper (b) John von Neumann
(c) Steve Jobs (d) Bill Gates
(e) None of the above

Ans: b

Solution:



- The correct answer is **John von Neumann**, who introduced the concept of **stored-program architecture**.
- In this model, **both data and instructions are stored in the same memory**, which made computers more flexible and efficient.
- This architecture became the **foundation of modern computers**, known as the **Von Neumann architecture**.
- It allowed programs to be **easily modified and executed**, unlike earlier fixed-program machines.

Q28. The second generation of computers was based on _____.

UPSSSC Computer Operator exam (10 jan 2020)

- (a) Integrated Circuits (b) Transistors
(c) VLSI Chips (d) Vacuum Tubes

Ans: b

Solution:

- The correct answer is **(b) Transistors**, which formed the basis of **second generation computers**.
- Transistors replaced **vacuum tubes**, making computers **smaller, faster, and more reliable**.
- This generation also saw the use of **assembly language and early high-level languages** like FORTRAN.
- Other options belong to different generations: **Vacuum Tubes (First)**, **Integrated Circuits (Third)**, **VLSI Chips (Fourth)**.

Q29. India's most powerful supercomputer 'Pratyush' of IITM (Indian Institute of Tropical Meteorology) was established in _____.

राज्य मंडी परिषद परीक्षा (30 may 2019)

- (a) Hyderabad (b) Roorkee
(c) Kanpur (d) Pune

Ans: d

Solution:

- The correct answer is **(d) Pune**, where the supercomputer **Pratyush** is installed at IITM.

- IITM stands for **Indian Institute of Tropical Meteorology**, located in Pune.
- Pratyush is used for **weather forecasting, climate modelling, and monsoon prediction** in India.
- It is one of the **most powerful supercomputers in India**, supporting advanced scientific research.

Q30. What are the two main components of a computer system?

UPSSSC प्रवर्तन कांस्टेबल परीक्षा (11 may 2025)

- (a) Memory and Storage (b) Hardware and Software
(c) Processor and Network (d) Input and Output
(e) None of the above

Ans: b

Solution:

- The correct answer is **(b) Hardware and Software**, which are the two main components of a computer system.
- **Hardware** refers to physical parts like CPU, keyboard, monitor, etc.
- **Software** refers to programs and instructions that control the hardware and perform tasks.
- Both are **interdependent**; without software hardware is useless, and without hardware software cannot run.

Q31. The term GIGO in computer terminology refers to:

UP LEKHPAL 2026

- (a) Global Input, Global Output
(b) Garbage In, Garbage Out
(c) General Input, General Output
(d) Good Input, Good Output
(e) None of the above

Ans: b

Solution: GIGO stands for **Garbage In, Garbage Out**. It is a principle in computing that states if invalid or poor-quality data is input into a system, **the output will also be invalid or poor-quality**.

One Line PYQ Questions (Asked in Latest SSC, Railway and other exams)

Q1. Video Graphics Array connectors are those which connect the monitor to a computer's video card and has _____ holes.	15
Q2. Who among the following is not related to Apple in. as its co-founder?	Mark Zuckerberg
Q3. Who is considered to be the Father of Modern Computers?	Alan Turing
Q4. Who is first world programmer?	Ada Lovelace
Q5. Which generations of Computer used vacuum tubes?	Fourth Generation
Q6. Which generation of computers used machine code as the programming language?	First
Q7. PARAM supercomputer belongs to which generation of computers?	Fifth
Q8. The PARAM 8000 supercomputer was released in which year?	1991
Q9. What was India's first supercomputer called?	PARAM 8000

Q10. What is the full form of ATM?	Automated Teller Machine
Q11. In which year did Apple launch the monochrome logo which is using the present time?	1998
Q12. The first mechanical computer designed by Charles Babbage was called?	Analytical Engine
Q13. ENIAC, the first general-purpose electronic computer, stands for:	Electronic Numerical Integrator and Computer
Q14. The name of the 1st electronic digital computer of the world is:	ENIAC
Q15. What was the first computer created by JW Mauchly and J Presper Eckert with NO mechanical parts?	ENIAC
Q16. An integrated circuit is commonly known as:	Chip
Q17. In which generation were computer vacuum based and costly?	First generation
Q18. In a computer system which does not require any storage devices known as-	Analog
Q19. In which generation of computer mechanical language has been used?	First
Q20. Who is considered the father of computers?	Charles Babbage
Q21. Meaning of MIPS in computer dictionary is-	Million instruction per sec
Q22. What is the second name of computer chip?	Microchip
Q23. Data transmission speed is generally measure in which unit?	Bits per second
Q24. The speed of a microprocessor is known as:	Clock Speed

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Chapter 2

Organization of Computer



Types of Computer Organization Architecture

Von Neumann Architecture (1945):

- Uses the same memory and bus for data and instructions.
- Instructions executed sequentially.

Harvard Architecture:

- Separate memories/buses for data and instructions.
- Allows faster execution due to parallel access.

A computer is organized into three basic units



Also, A computer has mainly two main parts:

1. Hardware
2. Software



results.

Registers are **limited in size and number**, but they operate at the highest speed among all memory components.

CPU (3 Main Components)

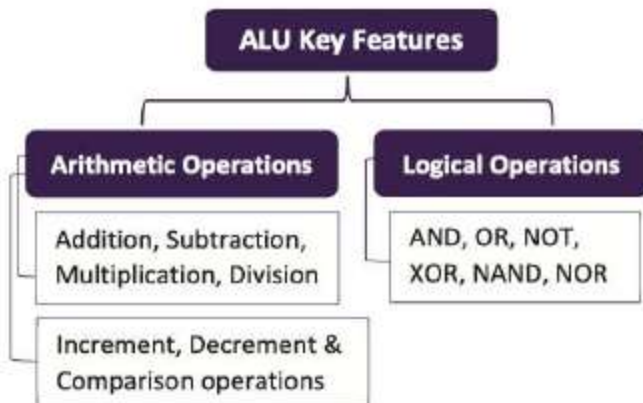


Arithmetic and Logic Unit (ALU)

- The ALU (**Arithmetic and Logic Unit**) is a key functional block of the CPU responsible for performing **all arithmetic operations** (addition, subtraction, multiplication, division) and **logical operations** (AND, OR, NOT, comparisons).
- It is considered the **core computational engine** of the computer, since all calculations and decision-making tasks are carried out here.
- The ALU works closely with **registers** to receive input data, process it, and return the result for storage in registers or main memory.

Central Processing Unit (CPU)

- The CPU is known as the “**brain of the computer**” because it controls all operations and processes every instruction given through programs.
- Fetch → Decode → Execute Cycle
- When a program runs, the CPU **fetches instructions and data from the main memory (RAM)**, performs **arithmetic and logical operations**, and then **stores the results back into memory**.
- The CPU uses very fast internal storage called **registers**, which temporarily hold **data, instructions, addresses, and intermediate**



Control Unit (CU)

- The **Control Unit (CU)** manages and coordinates the entire operation of the computer. It **controls the sequence of instruction execution**, interprets each instruction, and directs the flow of data between the **CPU, memory, ALU, and input/output devices**.
- The CU performs the essential cycle of **fetch** → **decode** → **execute**, ensuring that every instruction is correctly understood and carried out by the system.
- It does **not perform calculations**; instead, it **issues control signals** that tell the ALU, registers, memory, and I/O devices what to do and when to do it.
- The CU is responsible for:
 - Managing instruction flow
 - Coordinating data movement
 - Synchronising all CPU operations
 - Controlling timing and execution of micro-operations

Types of control unit

- ❖ **Hardwired Control Unit**
Implemented using **fixed logic gates, flip-flops, and circuits**, this unit is physically wired to perform specific operations.
- ❖ **Microprogrammed Control Unit**
This unit uses a **sequence of micro-instructions** stored in a special control memory to execute commands.

Registers

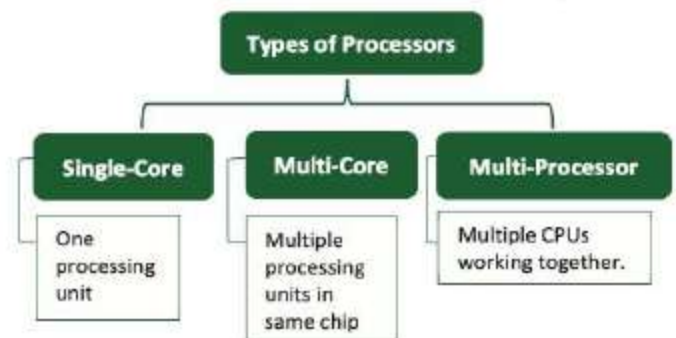
- Registers are high-speed storage locations inside the CPU** that temporarily hold data, instructions, addresses, and intermediate results during processing.
- They provide **very fast access**, much faster than cache or main memory, allowing the

CPU to work efficiently without waiting for data.

- Register size is measured in **bits** (8-bit, 16-bit, 32-bit, 64-bit etc.), and this size determines the **word size** of the CPU — i.e., how much data the CPU can process at once.

Registers Used in CPU

- PC (Program Counter):** Address of next instruction.
- MAR (Memory Address Register):** Address of memory location to read/write.
- MBR/MDR (Memory Buffer/Data Register):** Data being read from or written to memory.
- IR (Instruction Register):** Current instruction being executed.
- Accumulator:** Stores operands & results for ALU operations (used for data operation).



1. Single-Core Processor

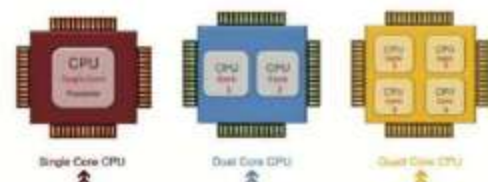
- Contains **one processing unit (one core)**.
- Can handle **one task at a time** efficiently.

2. Multi-Core Processor

- Contains **multiple cores in a single chip** (Dual-core, Quad-core, etc.).
- Can process **multiple tasks simultaneously**.

3. Multi-Processor System

- Uses **two or more separate CPUs** working together.
- Used in **servers, high-performance systems**.



Instruction Set Architecture

RISC (Reduced Instruction Set Computer)

- RISC** is a processor design approach that uses a **small set of simple instructions**.

- Each instruction is designed to **execute very fast**, usually in **one clock cycle**.

CISC (Complex Instruction Set Computer)

- CISC is a processor design approach that uses a **large set of complex instructions**.
- One instruction can perform **multiple operations**.

Architectural Relationship

- RISC → Hardwired Control Unit → Faster
- CISC → Microprogrammed Control Unit → Flexible

Motherboard

- Motherboard** is the **main circuit board (PCB)** of a computer that connects and controls all hardware components such as **CPU, RAM, storage devices, and input/output units**. It is also known as the **system board**.
- It provides a platform for **communication between components** and distributes **power** to them. The working of the computer depends on the proper functioning of the motherboard.
- The main parts of the motherboard include **CPU socket, RAM slots, chipset, BIOS/UEFI, expansion slots, and I/O ports**, which together ensure smooth operation of the system.

Some important facts

- First popular motherboard → **IBM PC (1981)**
- Early name → **Planar board**
- BIOS** → Now replaced by **UEFI** in modern systems
- Modern trend → **Maximum integration + high-speed communication**
- Chipset** → **Brain of motherboard communication**

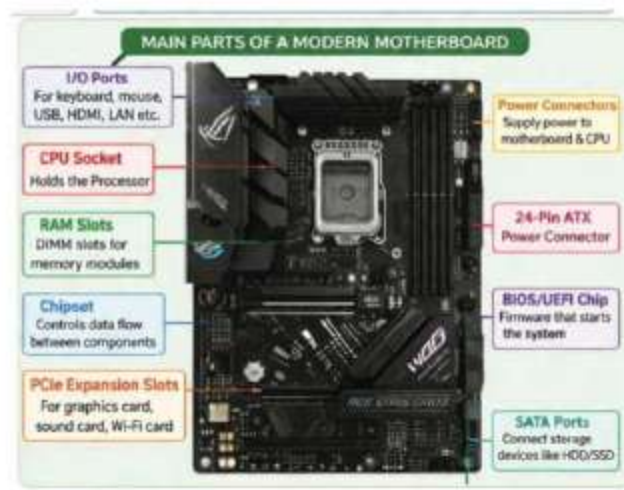
Development Timeline

- 1980s: Basic motherboards, external components
- 1990s: Introduction of **chipsets** and better integration
- 2000s: Built-in features like **audio, LAN, USB ports**
- 2010s onwards: **High integration + UEFI, SSD support, high-speed buses**

Types of Modern Motherboards

- ATX** → Standard size (most common)
- Micro-ATX** → Smaller, fewer slots
- Mini-ITX** → Compact systems

- E-ATX** → High-end systems (servers/gaming)



Printed Circuit Board (PCB)

- A **Printed Circuit Board (PCB)** is a **flat board made of insulating material** that supports and connects electronic components using **conductive pathways (tracks)**.
- It provides a **mechanical base and electrical connections** for components like resistors, capacitors, and integrated circuits, ensuring proper functioning of electronic devices.
- PCBs are widely used in devices such as **computers, mobile phones, televisions, and other electronic systems**.



Types of PCB:

1. Single-Layer PCB

- Copper on only one side
- Used in simple devices (e.g., calculators, toys)

2. Double-Layer PCB

- Copper on both sides
- More complex circuits

3. Multi-Layer PCB

- Multiple copper layers (4, 6, 8, etc.)
- Used in computers, smartphones, motherboards

4. Flexible PCB

- Can bend and twist
- Used in modern compact devices

Previous Year Questions

Q1. What is the primary role of the Control Unit (CU) within the Central Processing Unit (CPU)?

RRB NTPC (2025-26) (Mar 2026)

- (a) It provides the system's primary volatile storage for active programs.
 (b) It permanently stores the operating system and basic boot instructions.
 (c) It manages and coordinates the flow of instructions and data throughout the computer system.
 (d) It performs all the arithmetic and logical calculations on data.

Ans: c

Solution:

- The **Control Unit (CU)** controls and coordinates the **flow of instructions and data** inside the computer system.
- It tells other parts of the CPU and hardware **what to do and in what order**.
- It does **not** perform calculations directly, because that work is done by the **ALU (Arithmetic Logic Unit)**.
- Therefore, the correct answer is **It manages and coordinates the flow of instructions and data throughout the computer system**.

Q2. Which metric indicates the average number of instructions a CPU executes per clock cycle?

RRB NTPC (2025-26) (Mar 2026)

- (a) IPC (Instructions Per Cycle)
 (b) Bus speed
 (c) Core count
 (d) Clock speed

Ans: a

Solution:

- **IPC (Instructions Per Cycle)** is the metric that shows the **average number of instructions** a CPU executes in **one clock cycle**.
- It is an important measure of **CPU efficiency**, because a processor with higher IPC can do more work in the same cycle.
- **Clock speed** tells how fast the cycles occur, but **IPC** tells how much work is done in each cycle.
- Therefore, the correct answer is **IPC (Instructions Per Cycle)**.

Q3. Computer can not work without-

RRB NTPC Stage-I 27/04/2016 (Shift-II)

- (a) Scanner (b) Internet
 (c) Mouse (d) CPU

Ans: d

Solution:

- A computer **cannot function without the CPU (Central Processing Unit)**, which is the **core component** responsible for processing instructions.
- The CPU performs all major tasks like calculations, decision-making, and managing data flow.
- Without the CPU, the computer is **non-operational**, as it has no way to execute commands.

Q4. _____ is the oldest type of Central Processing Unit (CPU).

CGL 2022 Tier II Paper I

- (a) Triple Core (b) Dual Core
 (c) Quad Core (d) Single Core

Ans: d

Solution:

- The **Single Core** processor is the oldest type of Central Processing Unit (CPU).
- Single Core CPUs have only one processing unit to execute instructions at a time.
- Later generations introduced Dual Core, Triple Core, and Quad Core CPUs to improve performance by handling multiple tasks simultaneously.

Q5. From the following options, identify the name of the user interface element that is found on desktop as a small blinking symbol or an arrow.

RRB NTPC Stage-I 03/02/2021 (Shift-II)

- (a) Shortcut (b) Task-bar
 (c) Icons (d) Cursor

Ans: d

Solution:

- The **Cursor** is the small blinking symbol (usually a vertical line or arrow) on the screen that indicates where the user's next action will take place.
- It appears in text areas as a blinking line and on desktops as an arrow or pointer for navigating.
- It helps users interact with the user interface, like selecting icons, typing, or highlighting text.

Q6. In the architecture of a Central Processing Unit (CPU), which statement accurately distinguishes the

function of the Arithmetic Logic Unit (ALU) from that of the Control Unit (CU)?

RRB NTPC CBT-1 2025 (Graduation Level)

- (a) CU executes arithmetic operations, and ALU controls program instructions
- (b) ALU handles calculations and logic functions; CU manages instruction flow and coordination
- (c) CU interacts directly with peripheral devices, and ALU stores temporary data
- (d) ALU decodes instructions, while CU handles data storage tasks

Ans: b

Solution:

- The correct answer is **(b) ALU handles calculations and logic functions; CU manages instruction flow and coordination.**
- The **Arithmetic Logic Unit (ALU)** performs all arithmetic operations (like addition, subtraction) and logical operations (like AND, OR, NOT).
- The **Control Unit (CU)** does **not perform calculations** but instead directs and coordinates the operations of the CPU by interpreting program instructions.

Q7. What is the primary purpose of virtual memory in a computer system?

RRB NTPC CBT-1 2025 (Graduation Level)

- (a) To extend CACHE memory for storage
- (b) To provide backup for data
- (c) To extend RAM capacity by using disk space
- (d) To increase physical storage capacity

Ans: c

Solution:

- The correct answer is **(c) To extend RAM capacity by using disk space.**
- **Virtual memory** is a section of a computer's hard drive that is set up to emulate RAM.
- When the system runs out of actual physical RAM, it uses this disk space to temporarily hold data that would otherwise be kept in RAM.

Q8. What is the primary function of the CPU in a computer system?

RRB NTPC CBT-1 2025 (Graduation Level)

- (a) Store data permanently
- (b) Connect input and output devices
- (c) Execute instructions and process data
- (d) Manage the power supply

Ans: c

Solution:

- The correct answer is **(c) Execute instructions and process data.**
- The **Central Processing Unit (CPU)** is responsible for carrying out the instructions of a computer program by performing basic operations like arithmetic, logic, control, and data manipulation.

- It processes the data received from input devices or memory and sends the result to output devices or memory.

Q9. Which of the following best encapsulates the fundamental difference between the von Neumann and Harvard architectures in computer systems?

RRB NTPC CBT-1 2025 (Graduation Level)

- (a) The von Neumann architecture is primarily used in modern microcontrollers, while the Harvard architecture is prevalent in general-purpose computers
- (b) The von Neumann architecture utilises separate address spaces for instructions and data, while the Harvard architecture uses a single address space
- (c) The Harvard architecture allows simultaneous fetching of instructions and data, potentially improving performance, while the von Neumann architecture typically fetches them sequentially from the same memory space
- (d) The Harvard architecture employs a more complex control unit compared to the von Neumann architecture

Ans: c

Solution:

- The correct answer is **(c) The Harvard architecture allows simultaneous fetching of instructions and data, potentially improving performance, while the von Neumann architecture typically fetches them sequentially from the same memory space.**
- In **von Neumann architecture**, a single memory and bus system is shared for both data and program instructions, leading to the **von Neumann bottleneck** (slower processing due to sequential access).
- In **Harvard architecture**, instructions and data are stored in **separate memory units** and accessed through separate buses, allowing simultaneous access and faster processing.

Q10. What is the significance of pipelining in CPU architecture?

RRB NTPC CBT-1 2025 (Graduation Level)

- (a) Executes multiple instructions simultaneously by overlapping stages
- (b) Stores instructions in memory
- (c) Transfers data between registers
- (d) Increases clock speed using multiple cores

Ans: a

Solution:

- The correct answer is **(a) Executes multiple instructions simultaneously by overlapping stages.**
- **Pipelining** is a technique used in CPU architecture to improve instruction throughput by breaking down the execution pathway into several stages (like fetch, decode, execute, etc.) and processing multiple instructions at different stages simultaneously.

- While one instruction is being executed, another can be decoded, and a third fetched, all at the same time.

Q11. Which of the following best encapsulates the concept of a 'stored-program computer' as introduced by the Von Neumann architecture?

RRB NTPC CBT-1 2025 (Graduation Level)

- (a) A computer where both data and instructions are stored in the same primary memory for sequential execution
- (b) A computer that utilises separate memory units for data and instructions to optimise processing speed
- (c) A computer that relies primarily on external storage devices for program execution
- (d) A computer that can only execute a fixed set of instructions hardwired into its circuitry

Ans: a

Solution:

- The correct answer is **(a) A computer where both data and instructions are stored in the same primary memory for sequential execution.**
- The **stored-program concept**, introduced by **John von Neumann**, revolutionised computing by allowing instructions (program code) and data to reside in the same memory space.
- This design enables the CPU to fetch and execute instructions one by one in a sequential manner from memory.

Q12. Which of the following components is/are NOT a part of the Central Processing Unit (CPU)?

RRB NTPC CBT-1 2025 (Graduation Level)

- (a) Control Unit (CU)
- (b) Graphic Card
- (c) Registers
- (d) Arithmetic Logic Unit (ALU)

Ans: b

Solution:

- The correct answer is **(b) Graphic Card.**
- A **Graphic Card** (also called GPU – Graphics Processing Unit) is an external component responsible for rendering images, videos, and animations, especially in gaming and graphic-intensive tasks.
- It is **not** a part of the CPU but a **separate hardware component** connected to the motherboard.

Q13. In modern motherboards, which component is directly connected to the CPU to facilitate high-speed communication?

RRB NTPC CBT-1 2025 (Graduation Level)

- (a) PCB
- (b) Northbridge
- (c) GPU
- (d) ROM

Ans: b

Solution:

- The correct answer is **(b) Northbridge.**

- The **Northbridge** is a chip on the motherboard that is **directly connected to the CPU** and handles high-speed communication between the CPU and other key components like **RAM (memory), PCIe (graphics card), and sometimes the Southbridge.**
- It plays a critical role in managing the data flow at high speed between the CPU and performance-intensive components.

Q14. Consider a scenario where a user is interacting with a graphical application. Which component of the computer system is primarily responsible for rendering the visual elements displayed on the monitor?

RRB NTPC CBT-1 2025 (Graduation Level)

- (a) Motherboard chipset
- (b) Random Access Memory (RAM)
- (c) Graphics Processing Unit (GPU)
- (d) Central Processing Unit (CPU)

Ans: c

Solution:

- The correct answer is **(c) Graphics Processing Unit (GPU).**
- The **GPU** is a specialised processor designed to **handle and render visual elements**, such as images, videos, animations, and graphical interfaces, on the monitor.
- It is optimised for **parallel processing**, which is crucial for rendering complex visuals in real-time.

Q15. Which of the following statements about Printed Circuit Boards (PCBs) is INCORRECT?

RRB NTPC CBT-1 2025 (Graduation Level)

- (a) Complex devices may use multilayer PCBs to fit more circuitry
- (b) PCBs serve only desktop computers and not portable devices
- (c) PCBs provide a base to support and organize hardware parts
- (d) PCBs hold and connect electronic components using conductive tracks

Ans: b

Solution:

- The correct answer is **(b) PCBs serve only desktop computers and not portable devices, which is INCORRECT.**
- **PCBs (Printed Circuit Boards)** are used in **both desktop and portable devices**, including smartphones, tablets, laptops, watches, and many embedded systems.
- They are essential in nearly all electronic devices for mechanically supporting and electrically connecting components.

Q16. Consider a computer system with a multi-core processor. What is the primary advantage of having multiple cores compared to a single-core processor?

with the same clock speed when executing multiple independent tasks simultaneously?

RRB NTPC CBT-1 2025 (Graduation Level)

- (a) Increased capacity for the system's main memory (RAM)
- (b) Improved ability to handle and execute multiple separate processes concurrently
- (c) Enhanced speed for executing a single, heavily threaded application
- (d) Reduced power consumption for the overall system

Ans: b

Solution:

- The correct answer is **(b) Improved ability to handle and execute multiple separate processes concurrently.**
- A **multi-core processor** has multiple processing units (cores) within a single chip, allowing the system to **run multiple independent tasks or processes at the same time**, especially when those tasks are not dependent on each other.

Q17. Which of the following best describes the role of the Control Unit within the Central Processing Unit?

RRB NTPC CBT-1 2025 (UG)

- (a) It stores data and instructions temporarily during processing.
- (b) It performs all mathematical and logical calculations.
- (c) It displays the processed output to the user.
- (d) It directs and coordinates the activities of all components of the computer.

Ans: d

Solution

- The **Control Unit (CU)** is one of the two main parts of the **Central Processing Unit (CPU)**, the other being the **Arithmetic Logic Unit (ALU)**.
- The primary function of the **Control Unit** is to **direct and coordinate** all activities within the computer system.
- It controls the flow of data between the CPU, memory, and input/output devices by sending control signals.
- Hence, option **(d) It directs and coordinates the activities of all components of the computer** is correct.

Q18. During the Instruction Cycle, which specific register holds the instruction that is currently being decoded and executed by the CPU?

SSC CGL 2025 Tier 2

- (a) Program Counter (PC)
- (b) Memory Address Register (MAR)
- (c) Accumulator (AC)
- (d) Instruction Register (IR)

Ans: d

Solution:

- The correct answer is **(d) Instruction Register (IR).**
- During the **Instruction Cycle**, the **Instruction Register (IR)** holds the instruction that has been

fetched from memory and is currently being decoded and executed by the CPU.

Q19. What is the primary architectural advantage of a Microprogrammed Control Unit over a Hardwired one?

SSC CGL 2025 Tier 2

- (a) Faster execution speed
- (b) Reduced physical gate count
- (c) Ease of instruction set updates
- (d) Lower power consumption

Ans: c

Solution:

- The correct answer is **(c) Ease of instruction set updates.**
- A **Microprogrammed Control Unit** uses microinstructions stored in memory to control the CPU, making it **flexible and easy to update or modify the instruction set** without redesigning hardware. In contrast, a **Hardwired Control Unit** requires physical changes to update instructions.

Q20. Which of the following is the function of the Central Processing Unit (CPU) in a computer?

RRB NTPC CBT-1 2025 (UG)

- (a) It sends output to printers and monitors.
- (b) It processes data and controls operations of all parts of the computer.
- (c) It stores all user files permanently.
- (d) It receives input from the keyboard and mouse only.

Ans: b

Solution

- The **Central Processing Unit (CPU)** is the **main processing unit** of a computer, often called the **brain of the computer**.
- Its primary function is to **process data** according to the given instructions and **control the operations** of all hardware components.
- It performs all major tasks such as **fetching, decoding, executing, and controlling instructions**.
- Hence, the correct answer is **(b) It processes data and controls operations of all parts of the computer.**

Q21. Which of the following are main subsystems of the Central Processing Unit (CPU)?

RRB NTPC CBT-1 2025 (UG)

- (a) Arithmetic Unit, Memory Unit and Output Unit
- (b) Logic Unit, Input Unit and Storage Unit
- (c) Control Unit, Arithmetic Unit and Logic Unit
- (d) Arithmetic Unit, Graphics Unit and Control Bus

Ans: c

Solution

- The **Central Processing Unit (CPU)** is composed of three main subsystems: the **Control**



Unit (CU), Arithmetic Unit (AU), and Logic Unit (LU).

- Together, the **Arithmetic and Logic Units (ALU)** perform all arithmetic operations (like addition, subtraction) and logical operations (like comparison and decision-making).
- The **Control Unit** manages and coordinates all the activities within the computer by sending control signals to other components.
- Hence, the correct answer is **(c) Control Unit, Arithmetic Unit and Logic Unit**.

Q22. Which of the following best describes the role of the Control Unit within the Central Processing Unit?

RRB NTPC CBT-1 2025 (UG)

- (a) It stores data and instructions temporarily during processing.
- (b) It performs all mathematical and logical calculations.
- (c) It displays the processed output to the user.
- (d) It directs and coordinates the activities of all components of the computer.

Ans: d

Solution:

- The **Control Unit (CU)** is one of the main components of the **Central Processing Unit (CPU)**.
- Its primary role is to **direct and coordinate** the activities of all parts of the computer system.
- It controls the flow of data and instructions between the CPU, memory, and input/output devices through **control signals**.
- Hence, the correct answer is **(d) It directs and coordinates the activities of all components of the computer**.

Q23. Which of the following are needed for Skype to function on a computer?

1. A web cam 2. A microphone 3. A speaker

CHSL Exam 2024 Tier I

- (a) Only 1 and 3
- (b) 1, 2 and 3
- (c) Only 2 and 3
- (d) Only 1 and 2

Ans: b

Solution:

- For Skype to function properly on a computer, **all three** components are needed:
 - A **webcam** to show your video to others.
 - A **microphone** to capture your voice for calls.
 - A **speaker** to hear the other person during the conversation.
- Skype is a video calling and messaging application, so all these hardware devices work together for effective communication.

Q24. Pick the odd one out in Central Processing Unit (CPU) of a computer.

CHSL Exam 2022 Tier I

- (a) Output Unit
- (b) ALU and Control Unit both
- (c) Control Unit
- (d) ALU (Arithmetic Logic Unit)

Ans: a

Solution:

- The **Output Unit** is the odd one out because it is **not part of the Central Processing Unit (CPU)**.
- The CPU mainly consists of the **Arithmetic Logic Unit (ALU)** and the **Control Unit (CU)**, which handle processing and control tasks.
- The Output Unit is a separate component responsible for displaying or sending out processed data from the CPU to external devices.

Q25. _____ is a high-speed device used in CPU that is utilised to store data temporarily during processing.

CGL 2022 Tier II Paper I

- (a) Auxiliary Memory
- (b) Arithmetic and Logic Unit (ALU)
- (c) Registers
- (d) Control Unit

Ans: c

Solution:

- **Registers** are high-speed storage devices within the CPU used to temporarily store data during processing.
- They hold data, instructions, and addresses that the CPU needs immediate access to while executing programs.
- Registers operate much faster than other types of memory like RAM or auxiliary memory.

Q26. Which among the following statements is incorrect about Central Processing Unit?

CGL 2022 Tier II Paper I

- (a) Control Unit controls the order in which instructions enter and leave the processor and how the instructions are executed.
- (b) Arithmetic Logic Unit is also known as the mathematical brain of a computer.
- (c) Control Unit directs and manages operation sequences.
- (d) Arithmetic Logic Unit is responsible for taking the input, converting it into a signal, and storing it for further processing.

Ans: d

Solution:

- Option **(d) Arithmetic Logic Unit** is responsible for taking the input, converting it into a signal, and storing it for further processing is **incorrect** about the Central Processing Unit (CPU).
- The **Arithmetic Logic Unit (ALU)** is responsible for performing arithmetic and logical operations, not for taking input or storing data.
- Taking input, converting it into signals, and storing data is typically handled by input devices and memory units, not the ALU.

Q27. Which among the following registers in Instruction Cycle holds the last instruction fetched?

CGL 2022 Tier-II Paper I

- (a) Memory Address Register (MAR)
- (b) Program Counter (PC)
- (c) Instruction Register (IR)
- (d) Memory Buffer Register (MBR)

Ans: c

Solution:

- The correct answer is (c) **Instruction Register (IR)**.
- During the **Instruction Cycle**, once an instruction is fetched from memory, it is stored in the **Instruction Register (IR)**.
- The IR then holds this instruction so that the **Control Unit** can decode and execute it.

Q28. Which of the following components is NOT part of the CPU?

RRB NTPC CBT-1 2025 (Graduation Level)

- (a) Hard Disk Drive (HDD)
- (b) Cache memory
- (c) Control Unit (CU)
- (d) Arithmetic Logic Unit (ALU)

Ans: a

Solution:

- The correct answer is (a) **Hard Disk Drive (HDD)**.
- A **Hard Disk Drive** is a **secondary storage device**, used to store data and programs permanently.
- It is **not** part of the CPU. The CPU only processes data and contains internal components like the ALU, CU, and cache.

Q1. What does CPU stand for in computer systems?

Central Processing Unit

Q2. The speed of a CPU can be measured in _____.

Megahertz (MHz)

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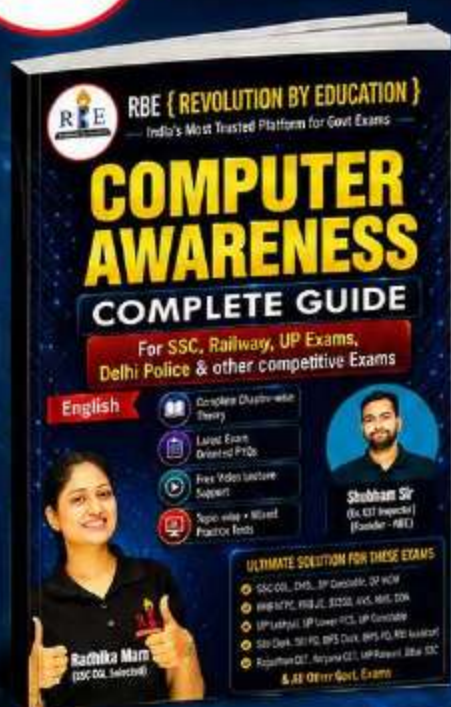
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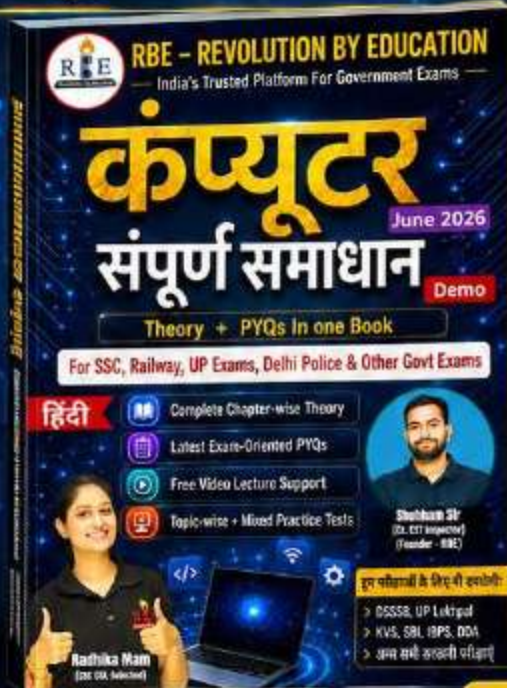
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