

# COMPUTER KNOWLEDGE

---

for SBI/ IBPS Clerk/ PO/ RRB/ RBI/ SSC/ Insurance Exams

---



## **In the interest of student community**

Circulation of softcopy of Book(s) in pdf or other equivalent format(s) through any social media channels, emails, etc. or any other channels through mobiles, laptops or desktops is a criminal offence. Anybody circulating, downloading, storing, softcopy of the Book on his device(s) is in breach of the Copyright Act. Further Photocopying of this book or any of its material is also illegal. Do not download or forward in case you come across any such softcopy material.

## DISHA Publications Inc.

45, 2nd Floor, Maharishi Dayanand Marg,  
Corner Market, Malviya Nagar, new Delhi -110017  
Tel: 49842349/ 49842350

© Copyright DISHA Publication Inc.

All Rights Reserved.No part of this publication may be reported in any form without prior permission of the publisher, The author and the publisher do not take any legal responsibility

for any errors or misrepresentations that might have crept in.

We have tried and made our best efforts to provide accurate up-to-date information in this book.

### Typeset By

DISHA DTP Team

### Buying books from DISHA

## Just Got A Lot More Rewarding!!!

We at DISHA Publication, value your feedback immensely and to show our appreciation of our reviewers, we have launched a review contest.

To participate in this reward scheme, just follow these quick and simple steps:

- Write a review of the product you purchase on Amazon/Flipkart.
- Take a screenshot/photo of your review.
- Mail it to [disha-rewards@aiets.co.in](mailto:disha-rewards@aiets.co.in), along with all your details.

Each month, selected reviewers will win exciting gifts from DISHA Publication. Note that the rewards for each month will be declared in the first week of next month on our website.

<https://bit.ly/review-reward-disha>.



Write To  
Us At

[feedback\\_disha@aiets.co.in](mailto:feedback_disha@aiets.co.in)



# Contents

---

1. Fundamentals of Computer	1-19
2. Components of Computer System	20-35
3. Memory Organisation	36-58
4. Computer Software	59-85
5. Computer Hardware	86-95
6. Basics of Internet Technology	96-120
7. Computer Networks	121-138
8. Operating System	139-146
9. Microsoft Windows	147-168
10. Microsoft Office	169-208

11. Computer & Network Security	209-221
12. Programming Language	222-230
13. Database Management System	231-244
14. Technologies and Terms used in Internet Banking	245-257
15. Latest Development in IT Related to Banking	258-274
16. Abbreviations	275-281
17. Glossary	282-296



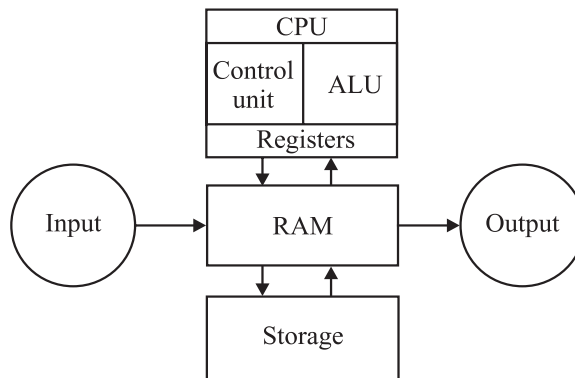
# Fundamentals of Computer

C - Common; O - Operating; M - Machine; P - Particularly; U - Used for; T - Trade; E - Education; R - Research.

*In this age of computers there is no such activity that cannot be achieved without computers. Computer has become an indispensable and multipurpose tool. We are breathing in the computer age and gradually computer has become such a desirable necessity of life that it is difficult to imagine life without it. This book will help you to gain an understanding of the basic as well as advanced concepts of computers. It will cover a foundational study of the computer hardware, software, operating systems, Internet Technology, DBMS (Database Management system) & computer Network & Its security, or more.*

## CONCEPT OF COMPUTER SYSTEM

A computer is an advanced electronic device that takes raw data as input from the user and processes this data under the control of set of instructions (called program) and gives the result (output) and saves output for the future reference and usage.



**A basic computer system**

To know about the working of a computer, first need to understand various terms such as Data, Processing and Information. First of all, let's start with three basic terms:-

1. **Data :** **Data** is a collection of basic facts and figure without any sequence. This data is also called as raw data. When the data is collected as facts and figures, there is no meaning to it, at that time, for example, name of people, names of employees etc.

In other words computer data is information processed or stored by a computer. This information may be in the form of text documented images, audio clip, software programme or other type of data.

2. **Processing :** **Processing** is the set of instructions given by the user to the related data that was collected earlier to output meaningful information. The computer does the required processing by making the necessary calculations, comparisons and decisions.
3. **Information :** **Information** is the end point or the final output of any processed work. This meaningful output data is called information.

The computer performs basically five major operations of functions irrespective of their size and make. These are 1) it accepts data or instruction by way of input, 2) it stores data, 3) it can process data as required by the user, 4) it gives results in the form of output, and 5) it controls all operations inside a computer. We discuss below each of these operations.

1. **Input:** this is the process of entering data and programs into the computer system. Ex: Keyboard , Mouse, Light Pen, Optical/magnetic Scanner , Touch Screen , Microphone for voice as input, Track Ball.
2. **Control Unit (CU):** The process of input, output, processing and storage is performed under the supervision of a unit called 'Control Unit'. It decides when to start receiving data, when to stop it, where to store data, etc. It takes care of step -by-step processing of all operations in side the computer.
3. **Memory Unit:** Computer is used to store data and instructions.
4. **Arithmetic Logic Unit (ALU):** The major operations performed by the ALU are addition, subtraction, multiplication, division, logic and comparison.
5. **Output:** This is the process of producing results from the data for getting useful information. Ex . Monitor (Visual Display Unit) , Printers , Plotter, Speakers.

The ALU and the CU of a computer system are jointly known as the central processing unit (CPU). You may call CPU as the brain of any computer system.

## CHARACTERSTICS OF COMPUTER

The major characteristics of computers are the following:

- **Speed :** A powerful computer is capable of executing about 3 million calculations per second.
- **Accuracy :** A computer's accuracy is consistently high; if there are errors, they are due to errors in instructions given by the programmer.
- **Reliability :** The output generated by the computer is very reliable as long as the data is reliable.
- **Memory/Storage Capacity :** The computer can store large volumes of data and makes the retrieval of data an easy task.
- **Versatility:** The computer can accomplish many different things. It can accept information through various input-output devices, perform arithmetic and logic operations, generate a variety of outputs in a variety of forms, etc.
- **Automation:** Once the instructions are fed into computer it works automatically without any human intervention.
- **Diligence :** A computer will never fail to perform its task due to distraction or laziness.
- **Convenience :** Computers are usually easy to access, and allow people to find information easily that without a would be very difficult.
- **Flexibility :** Computers can be used for entertainment, for business, by people who hold different ideals or who have varied goals. Almost anyone can use a computer, and computers can be used to assist with almost any goal.

## GOALS OF COMPUTERS

1. Problem-solving techniques using the computer.
2. Analysis of complex problems and the synthesis of solutions .
3. Comprehension of modern software engineering principles.
4. A vast breadth and depth of knowledge in the discipline of computer science.

## COMPUTER CAPABILITIES

Like all machines, a computer needs to be directed and controlled in order to perform a task successfully. Until such time as a program is prepared and stored in the computer's memory, the computer 'knows' absolutely nothing, not even how to accept or reject data. Even the most sophisticated computer, no matter how capable

it is, must be told what to do. Until the capabilities and the limitations of a computer are recognized, its usefulness cannot be thoroughly understood.

In the first place, it should be recognized that computers are capable of doing repetitive operations. A computer can perform similar operations thousands of times, without becoming bored, tired, or even careless.

Secondly, computers can process information at extremely rapid rates. For example, modern computers can solve certain classes of arithmetic problems millions of times faster than a skilled mathematician. Speeds for performing decision-making operations are comparable to those for arithmetic operations but input-output operations, however, involve mechanical motion and hence require more time. On a typical computer system, cards are read at an average speed of 1000 cards per minute and as many as 1000 lines can be printed at the same rate.

Thirdly, computers may be programmed to calculate answers to whatever level of accuracy is specified by the programmer. In spite of newspaper headlines such as 'Computer Fails', these machines are very accurate and reliable especially when the number of operations they can perform every second is considered. Because they are man-made machines, they sometimes malfunction or break down and have to be repaired. However, in most instances when the computer fails, it is due to human error and is not the fault of the computer at all. In the fourth place, general-purpose computers can be programmed to solve various types of problems because of their flexibility. One of the most important reasons why computers are so widely used today is that almost every big problem can be solved by solving a number of little problems-one after another.

Finally, a computer, unlike a human being, has no intuition. A person may suddenly find the answer to a problem without working out too many of the details, but a computer can only proceed as it has been programmed to.

## **HISTORY OF THE DEVELOPMENT OF COMPUTERS**

In beginning, there were no computers. To add or subtract, man used his fingers and toes. Abacus is known to be the first mechanical calculating device. The main purpose of abacus was that additions and subtraction could be performed quickly. Abacus was developed by the Egyptians in the 10th century B.C, but the final structure was given in the 12th century A.D. by the Chinese educationists. Abacus is made up of a frame in which rods are fitted across with round beads sliding on the rod.

### **Napier**

Napier's Bones is an Abacus invented by John Napier. Napier used the bone rods for counting purpose where numbers were printed on them. With the help of these rods, one could do addition, subtraction, multiplication and division speedily.

### **Pascal's calculator called 'Pascaline'**

In the year 1642, Blaise Pascal a French scientist invented an adding machine called Pascal's calculator, which represents the position of digit with the help of gears in it. Though these machines were early forerunners to computer engineering, the calculator failed to be a great commercial success.

### **Leibniz Calculator**

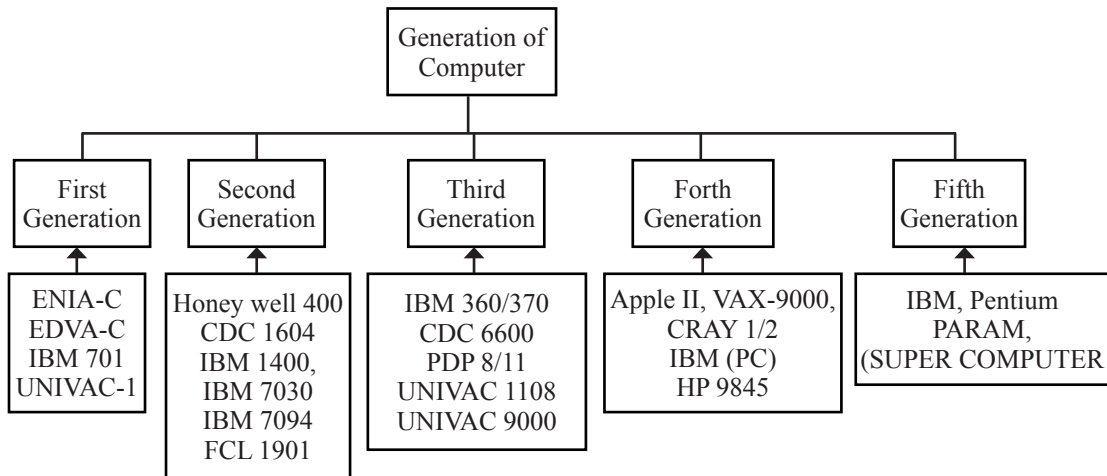
Leibniz was successfully introduced as a calculator into the market in the year 1646. It was designed further in 1673 but it took until 1694 to complete. The calculator could perform the basic mathematical operations such as add, subtract, multiply, and divide. Wheels were placed at right angles which could be displaced by a special stepping mechanism.

### **Analytical Engine "The first Computer"**






This analytical engine, the first fully-automatic calculating machine, was constructed by British computing pioneer Charles Babbage (1791-1871), who first conceived the idea of an advanced calculating machine to calculate and print mathematical tables in 1812. This Analytical Engine incorporated an arithmetic logic unit, control flow in the form of conditional branching and loops, and integrated memory, making it the first design for a general-purpose computer that could be described in modern terms as Turing-complete.

## GENERATIONS OF COMPUTERS

There are five Generation of Computer, these are :



## COMPUTER GENERATIONS

Generation	Device	Hardware feature	Characteristics	System names
First (1942-1959)		<ul style="list-style-type: none"> <li>▶ Vacuum Tubes</li> <li>▶ Punch Cards</li> </ul>	<ul style="list-style-type: none"> <li>▶ Support machine language only</li> <li>▶ Very costly</li> <li>▶ Generate lot of heat</li> <li>▶ Huge size</li> <li>▶ Consumed lot of electricity</li> </ul>	<ul style="list-style-type: none"> <li>▶ ENIAC</li> <li>▶ EDVAC</li> <li>▶ IBM 701</li> <li>▶ UNIVAC-1</li> </ul>
Second (1959-1965)		<ul style="list-style-type: none"> <li>▶ Transistors</li> <li>▶ Magnetic Tapes</li> </ul>	<ul style="list-style-type: none"> <li>▶ Batch operating system</li> <li>▶ Faster, smaller and reliable than previous generation</li> <li>▶ Costly</li> </ul>	<ul style="list-style-type: none"> <li>▶ Honeywell 400</li> <li>▶ CDC 1604</li> <li>▶ IBM 7030, IBM1400</li> <li>▶ IBM 7094</li> <li>▶ ICL 1901</li> </ul>
Third (1965-1975)		<ul style="list-style-type: none"> <li>▶ ICs</li> <li>▶ Large capacity disk and Magnetic Tapes</li> <li>▶ Size 1/4 of Sq. INCH</li> </ul>	<ul style="list-style-type: none"> <li>▶ Time Sharing OS</li> <li>▶ Faster, smaller and reliable cheaper</li> <li>▶ Easier to update</li> </ul>	<ul style="list-style-type: none"> <li>▶ IBM 360/370</li> <li>▶ CDC 6600</li> <li>▶ PDP 8/11</li> <li>▶ UNIVAC 1108</li> <li>▶ UNIVAC AC9000</li> </ul>
Fourth (1975-1988)		<ul style="list-style-type: none"> <li>▶ ICs with LSI &amp; VLSI Technology</li> <li>▶ Semiconductor Memory</li> <li>▶ Magnetic tapes and floppy as portable</li> <li>▶ Micro processor based</li> </ul>	<ul style="list-style-type: none"> <li>▶ Multiprocessing &amp; GUI OS</li> <li>▶ Object oriented programs</li> <li>▶ Small, affordable, easy to Use</li> <li>▶ Easier to update</li> </ul>	<ul style="list-style-type: none"> <li>▶ Apple II</li> <li>▶ VAX 9000</li> <li>▶ CRAY 1/2</li> <li>▶ IBM PERSONAL COMPUTER (PC)</li> <li>▶ HP 9845</li> </ul>
Fifth (1988-Present)		<ul style="list-style-type: none"> <li>▶ ICs with ULSI Technology</li> <li>▶ Large capacity hard disk with RAID Support</li> <li>▶ Optical disks as portable read-only storage media</li> <li>▶ powerful servers, internet, Cluster computing</li> <li>▶ Artificial Intelligence based</li> </ul>	<ul style="list-style-type: none"> <li>▶ Powerful, cheaper, reliable, easy to use, portable</li> <li>▶ Rapid software development possible</li> </ul>	<ul style="list-style-type: none"> <li>▶ IBM</li> <li>▶ Pentium</li> <li>▶ PARAM</li> <li>▶ SUPER COMPUTER</li> </ul>



### A. First Generation of Computers (1942-1959)

The beginning of commercial computer age is from UNIVAC (Universal Automatic Computer). The first generation computers were used during 1942-1959. They were based on vacuum tubes. Examples of first generation computers are ENIVAC and UNIVAC-1.

#### Advantages :

- Vacuum tubes were the only electronic component available during those days.
- Vacuum tube technology made possible to make electronic digital computers.
- These computers could calculate data in millisecond.

#### Disadvantages :

- The computers were very large in size.
- They consumed a large amount of energy.
- Non-portable.
- Limited commercial use.
- Very slow speed.
- Used machine language only.
- Used magnetic drums which provide very less data storage.

### B. Second Generation Computers (1959-1965)

The **second generation computers** used transistors. The size of the computers was decreased by replacing vacuum tubes with transistors. The examples of second generation computers are **IBM 7094 series, IBM 1400 series and CDC 1604** etc.

#### Advantages :

- Smaller in size as compared to the first generation computers.
- Used less energy and were not heated.
- Better speed and could calculate data in microseconds
- Used faster peripherals like tape drives, magnetic disks, printer etc.
- Used Assembly language instead of Machine language.

#### Disadvantages :

- Cooling system was required
- Constant maintenance was required
- Only used for specific purposes
- Costly and non-versatile

### C. Third Generation Computers (1965-1975)

The **Third generation computers** used the integrated circuits (IC). The first IC was invented and used in 1961. The size of an IC is about  $\frac{1}{4}$  square inch. A single IC chip may contain thousands of transistors. The computer became smaller in size, faster, more reliable and less expensive. The examples of third generation computers are **IBM 370, IBM System/360, UNIVAC 1108 and UNIVAC AC 9000** etc.

**An integrated circuit (IC)**, sometimes called a chip or microchip, is a semiconductor wafer on which thousands or millions of tiny resistors, capacitors, and transistors are fabricated.

#### Advantages :

- Smaller in size as compared to previous generations.
- More reliable.

- Used less energy.
- Better speed and could calculate data in nanoseconds.

**Disadvantages :**

- Air conditioning was required.
- Highly sophisticated technology required for the manufacturing of IC chips.

**D. Fourth Generation Computers (1975-1988)**

The **fourth generation computers** started with the invention of Microprocessor. The Microprocessor contains thousands of ICs. The LSI (Large Scale Integration) circuit and VLSI (Very Large Scale Integration) circuit was designed. It greatly reduced the size of computer. The size of modern Microprocessors is usually one square inch. It can contain millions of electronic circuits. The examples of fourth generation computers are **Apple Macintosh & IBM PC**.

**Advantages :**

- More powerful and reliable than previous generations.
- Small in size
- Microprocessor was started in use.
- Fast processing power with less power consumption
- Fan for heat discharging and thus to keep cold.
- Cheapest among all generations
- All types of High level languages C, C++ and Java can be used in this type of computers

**Disadvantages :**

- Very advanced technology was required to fabricate the ICs.

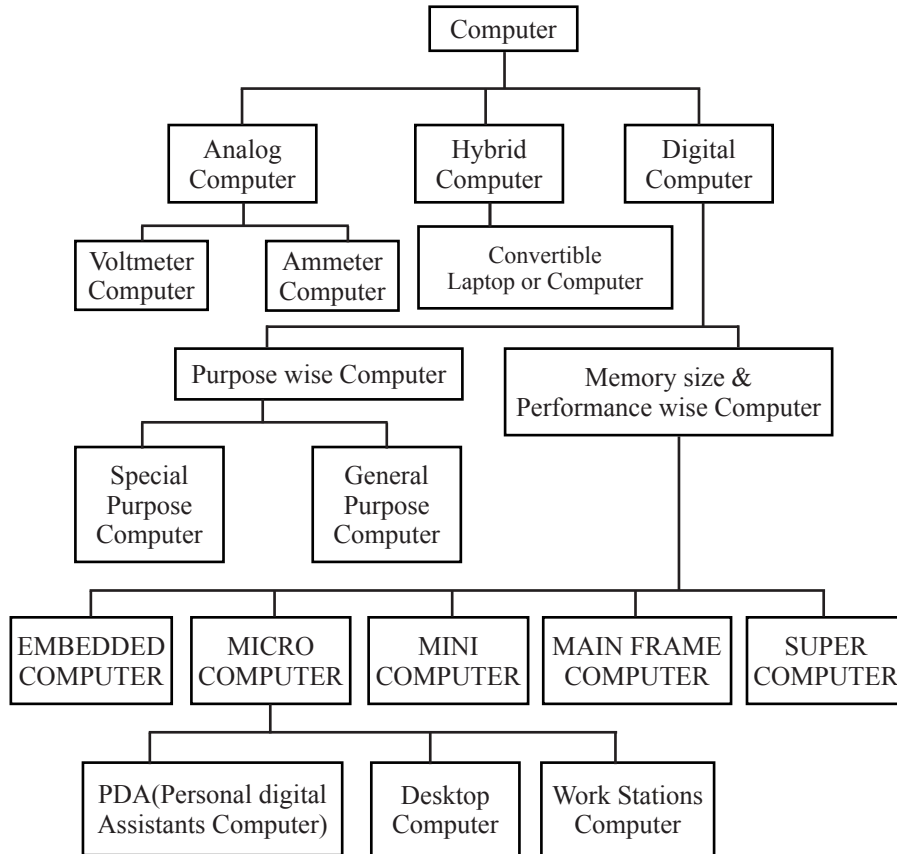
**E. Fifth Generation Computers (1988 to Present)**

Scientists are working hard on the **5<sup>th</sup> generation computers** with quite a few breakthroughs. It is based on the technique of Artificial Intelligence (AI). Computers can understand spoken words & imitate human reasoning. IBM Watson computer is one example that outsmarts Harvard University Students.

**ADVANTAGES**

- Main electronic component: based on artificial intelligence, uses the Ultra Large-Scale Integration (ULSI) technology and parallel processing method.
  - **ULSI** – millions of transistors on a single microchip
  - **Parallel processing method** – use two or more microprocessors to run tasks simultaneously.
- Language – understand natural language (human language).
- Power – consume less power and generate less heat.
- Speed – remarkable improvement of speed, accuracy and reliability (in comparison with the fourth generation computers).
- Size – portable and small in size, and have a huge storage capacity.
- Input / output device – keyboard, monitor, mouse, trackpad (or touchpad), touchscreen, pen, speech input (recognise voice / speech), light scanner, printer, etc.
- Example – desktops, laptops, tablets, smartphones, etc.

**CLASSIFICATION OF COMPUTERS**



Computers can be classified according to the following types:

**(a) Analog**

The analog computers are computer systems that measure variations in quantities such as temperature, voltage, speed, etc. Analog computers are known to measure the data that varies continuously. Other examples of analog computers include Voltmeter and Ammeter.

**(b) Digital**

Digital computers are the computer systems that count things by manipulation of certain discontinuous numbers and letters through representation of binary digits (also called bits) in contrast to analog computers that measures the variations in quantities. In other words texts and graphics are treated numerically.

Today the digital computers have replaced the analog ones .Examples of digital computers are desktop , personal computers, workstations,tablet PC etc

**(c) Hybrid**

Hybrid computers as the name suggests are a good mix of analog as well as digital computers, using an analog computer front-end, which is then fed into a digital computer’s repetitive process. Hybrid computers are used for scientific calculations, in defence and systems.

## **DIGITAL COMPUTER ARE DIVIDED INTO TWO PART**

- (1) Based on Purpose
- (2) Based on Memory size and Performance

### **1. Based on Purpose**

On the basis of purpose, computers are categorised as follows –

#### **(i) General Purpose**

These computers are designed to work on different types of applications. In these types of computers the programs are not stored permanently rather programs are input at the time of their execution. Personal computers, including desktops, notebooks, smart phones and tablets, are all examples of general-purpose computers. Various tasks can be accomplished by using general purpose computers : For example writing and editing (word processing), manipulating different facts and figures in various databases, tracking manufacturing inventory, making scientific calculations, controlling organization's security system, electricity consumption, building temperature etc.

#### **(ii) Special Purpose**

Special-Purpose computers are task specific computers and are designed to solve a particular problem. They are also known as dedicated computers, because these computers are dedicated to perform a single particular task repetitively. Examples of such computer systems include the traffic control system ,they are also used in video games ,navigational systems in an aircraft, weather forecasting, satellite launch tracking, oil exploration, and in automotive industries, keeping time in a digital watch, or Robot helicopter.

### **2. Based on Memory Size and Performance**

Computers can be classified by memory size and performance as follows –

#### **(i) Micro Computer**

A microcomputer is a computer that uses a microprocessor as its central processing unit. Microcomputers are physically smaller in size as compared to mainframe and minicomputers. Many microcomputers when equipped with a keyboard and screen for input and output respectively can be used as personal computers (in the generic sense) .Microcomputers are easier to use and also inexpensive as the memory used by them i.e microprocessors and semi conductors have become cheaper in the last few years.

**E.g. :** The various micro computers widely available are IBM pcs , APPLE mac etc.the small types of PCs like the palmtop and handheld are now becoming readily available.

#### **(ii) Minicomputer**

It is a midsize computer. In the past few years the difference between large minicomputers and small mainframes has decreased significantly just like the distinction between small minicomputers and workstations. A minicomputer can support upto 200 users at the same time.

**E.g. :** The various machines widely available are vax series 8200 and 8300, honeywell(xps-100), icl's series 36 level 20,50,60 galaxy-21, hcl-4, nelco-5000 and others.

#### **(iii) Mainframe**

Mainframe computers known as the “Big Iron” are computers that are used primarily by corporate and governmental organizations . Modern mainframe design is generally defined by the following features:

- High reliability and security
- Extensive input-output facilities with the ability to offload to separate engines
- Strict backward compatibility with older version of software

#### (iv) Supercomputer

Supercomputer is a term used for one of the fastest computers that exist today. They are deployed for specialized applications that require processing of highly critical data and immense amounts of mathematical calculations.

E.g. :- Weather forecasting requires a supercomputer.

Year	Supercomputer	Rmax (TFlop/s)	Location
2022	Cray/HPE Frontier	1,102,000.0	Oak Ridge, U.S.
2020	Fujitsu Fugaku	442,010.0	Kobe, Japan
2018	IBM Summit	148,600.0	Oak Ridge, U.S.
2018	IMB/Nvidia/Mellanox Sierra	94,640.0	Livermore, U.S.
2016	Sunway TaihuLight	93,444.5	Wuxi, China
2013	NUDT Tianhe-2	61,444.5	Guangzhou, China
2019	Dell Frontera	23,516.4	Austin, U.S.
2012	Cray/HPE Piz Daint	21,230.0	Lugano, Switzerland
2015	Cray/HPE Trinity	20,158.7	New Mexico, U.S.
2018	Fujitsu ABCI	19,880.0	Tokyo, Japan
2018	Lenovo SuperMUC-NG	19,476.6	Garching, Germany

- PARAM is a series of supercomputers designed and assembled by the Centre for Development of Advanced Computing (C-DAC) in Pune, India. The latest machine in the series is the PARAM Ananta.
- The US's Frontier system is the fastest supercomputer in the world.

## PERSONAL COMPUTERS

Personal Computers are computers that are designed for an individual user. These computers are small and a relatively cheaper. In price, personal computers can range anywhere from a few hundred pounds to over five thousand pounds. Personal Computers use the microprocessor technology as they enable manufacturers to put an entire CPU onto one chip. They serve myriad purposes and can be put to use by various businesses for word processing, accounting, desktop publishing, and for running spreadsheet and database management applications. People across the globe use internet for playing games, surfing net and other online applications at their homes and personal use.

### Types of Personal Computers

Personal computers can be classified on the basis of its size. There are two basic types of the traditional designs i.e. the desktop models and tower models. There are several variations on these two basic types also.

#### (i) Tower model

This model of personal computer refers to a computer in which the power supply, motherboard, and other mass storage devices are stacked on top of each other in a cabinet.

**(ii) Desktop model**

Desktop model means computer that are designed to fit comfortably on top of a desk, with the monitor sitting on top of the computer. Desktop model computers as compared to the tower model are broad and low, whereas tower model computers are narrow and tall.

**(iii) Notebook computer**

Also called ultra book. These are extremely popular because they are extremely lightweight and portable. Because of their small size ,typically less than 6 pounds or lesser than that,they have become so popular. These flat-panel technologies can produce a lightweight and non-bulky display screen. The quality of notebook display screens also differs considerably. Modern notebook computers are very similar to personal computers in terms of computing power.

**(iv) Laptop computer**

Laptop are now a days also called notebook computers .These are small and portable .You can make them sit on your lap and work on them.

**(v) Subnotebook computer**

Subnotebook computers are portable computers that are even lighter and smaller than a full-sized notebook computer. They are light weight because they use a small keyboard and screen as compared to a notebook computer.

**(vi) Hand-held computer**

These computers are portable enough to be carried in one's hand. They are extremely convenient for use but due to extremely small size of their keyboards and screens they have still not succeeded in to replacing notebook computers.

**(vii) Palmtop**

These computers as the name suggests fit in your palm. Due to extremely small size their use is limited to phone books and calendars .

**(viii) PDA**

PDA's have electronic pens rather than keyboards for inputs unlike laptop. They also incorporate handwriting recognition features. and voice recognition technologies i.e can also react to voice input . PDAs are also called palmtops, hand-held computers and pocket computers.

**(ix) Smart phones**

Smart phones are cellular phones that function both as a phone and a small pc. They may use a pen or may have a small keyboard. They can be connected to the internet using wifi (wireless fidelity). Apple, Samsung, Sony are some manufacturers of smart phones.

**(x) Tablet Computers**

Like laptops, tablet computers are designed to be portable. However, they provide a different computing experience. The most obvious difference is that tablet computers don't have keyboards or touchpads. Instead, the entire screen is touch - sensitive, allowing you to type on a virtual keyboard and use your finger as a mouse pointer.

**(xi) Notebook**

**A notebook is basically just another name for a laptop, which is basically a computer that is which is into a very small package.** It includes a flip down screen and a keyboard with a touchpad.

## USES OF COMPUTERS

Computers have their application or utility everywhere. Some of the prominent areas of computer applications are:

### A. In the Field of Education

Computers have taken the education systems in the entire world to a different level altogether. Following are the uses of computers in education-

1. **Making classrooms effective :** The traditional classes have become modern and high-tech with the advent of computers. Students now see multimedia presentations, clips, images, etc. with the help of computers. This gives them a better experience of education as compared to the monotonous blackboard teaching. This way, the power of students to remember or recollect the taught concepts increases as the classroom learning becomes interesting.
2. **Providing online education :** Computers not only strengthen the traditional education system but also provide a new mode of pursuing educational courses and degrees. This mode is called as online training mode of education. Online education system offers several benefits to the students which they can't avail in traditional education system.
3. **Helps in research work :** Computers help students of schools, colleges and universities in their research works. Gone are the days when students would go to libraries, and other Knowledge processing units to complete their research work. With the help of computers students now pursue their research work with ease and get ample amount of information for the same with easy clicks.

### B. In the Field of Office

1. **Document Management system :** Document Management system consists of different applications like word processing, desktop publishing, spreadsheets etc.
  - **Word Processing :** is used to create documents electronically. It is used to produce high-quality letters, proposals, reports and brochures etc.
  - **Desktop Publishing :** is used to make these documents attractive with photos and graphics etc. it is used to publish the documents.
  - **Spreadsheet Application :** is used to maintain records and calculate expenses, profits and losses. It is also used to perform mathematical, statistical and logical processing.
2. **Office Support System :** It is used to coordinate and manage the activities of a workgroup. The members of a workgroup can share their work and coordinate with one another. Groupware and desktop organizers are examples of this system.

### C. In the Field of Medicine

1. **Hospital Administration :** Hospital is an important organization. We can use computer for the administration of a hospital. We can computerize the accounting, payroll and stock system of the hospital. We can keep the record of different medicines, their distribution and use in different wards etc.
2. **Recording Medical History :** Computer can be used to store medical history of patients. We can store important facts about patients in computer we can keep record if his past treatment, suggested medicines and their results. Such systems can be very effective and helpful for doctors.
3. **Monitoring systems :** Some serious patients must be monitored continuously. Monitoring is needed especially in operation theatres and intensive care units. Many computerized device are used to monitor the blood pressure, heartbeat and brain of the patients.
4. **Life Support System :** life support systems are used to help the disabled persons. Many devices are used that help deaf person to hear, scientists are trying to create a device to help blind person to see.
5. **Diagnosis of Diseases :** Different software are available to store data about different diseases and their symptoms. Diagnosis of disease is possible by entering the symptoms of a patient. Different computerized devices are used in laboratories for different tests of blood.

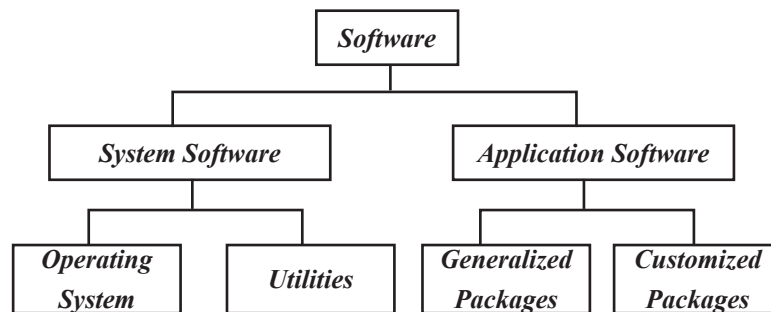
## D. In the Field of Defence

There are many uses computers in defence such as:

1. Computers are used to track incoming missiles and help slew weapons systems onto the incoming target to destroy them.
2. Computers are used in helping the military find out where all their assets are (Situational Awareness) and in Communications/Battle Management Systems.
3. Computers are used in the logistic and ordering functions of getting equipment to and around the battlefield.
4. Computers are used in tanks and planes and ships to target enemy forces, help run the platform and more recently to help diagnose any problems with the platforms.
5. Computers are used as gateways between different computer networks and to host security functions (crypto systems).

## SOFTWARE

As you are aware, computer cannot do anything on its own. It is the user who instructs computer; what to do, how to do and when to do. In order to perform any task, you have to give a set of instructions in a particular sequence to the computer. These sets of instructions are called Programs. Software refers to a set of programs that makes the hardware perform a particular set of tasks in particular order. Software can be classified mainly into following categories and sub-categories are shown in Figure .



### System Software

System software connect the user and the hardware of the computer to interact with each other. System software provide the basic functionalities required to operate the computer system. These type of software provide an environment or platform for the other software to work on system software run in the background.

**Example:** Operating systems (e.g., Window, Linux, Android, etc.). Device Drivers, Firmware, and Utility software.

### Application Software

Application software are customized software designed for personal use. These type of software help users for performing basic tasks such as online research, setting an alarm, designing, or even playing games. The application software runs in the frontend and mostly used by the end-users. Therefore, these are also called end-user programs.

**Example:** Word Processors, Multimedia Software, Web Browsers, Graphics Software, Photoshop Software, etc.



## Past Exercise

1. Which of the following are computers that can be carried around easily ? **[SBI Clerk, 2009]**
  - (a) Minicomputers
  - (b) Supercomputers
  - (c) PCs
  - (d) Laptops
  - (e) None of these
2. The basic goal of computer process is to convert data into **[SBI Clerk, 2009]**
  - (a) files
  - (b) tables
  - (c) information
  - (d) graphs
  - (e) None of these
3. Which of the following refers to the fastest, biggest and most expensive computers ? **[SBI Clerk, 2009]**
  - (a) Personal Computers
  - (b) Supercomputers
  - (c) Laptops
  - (d) Notebooks
  - (e) None of these
4. A central computer that holds collections of data and programs for many PCs, workstations and other computers is a(n) — **[SBI Clerk, 2009]**
  - (a) supercomputer
  - (b) minicomputer
  - (c) laptop
  - (d) server
  - (e) None of these
5. A \_\_\_\_\_ is an electronic device that process data, converting it into information. **[SBI Clerk, 2009]**
  - (a) computer
  - (b) processor
  - (c) case
  - (d) stylus
  - (e) None of these
6. Processor's speed of a computer is measured in **[SSC CGL, 2010]**
  - (a) BPS
  - (b) MIPS
  - (c) Baud
  - (d) Hertz
7. The first computer made available for commercial use was: **[SSC CGL, 2011]**
  - (a) MANIAC
  - (b) ENIAC
  - (c) UNIVAC
  - (d) EDSAC
8. Personal computers can be connected together to form a **[IBPS PO, 2011]**
  - (a) server
  - (b) supercomputer
  - (c) network
  - (d) enterprise
  - (e) None of these
9. A \_\_\_\_\_ is a large and expensive computer capable of simultaneously processing data for hundreds or thousands of users. **[SBI Clerk, 2011]**
  - (a) handheld computer
  - (b) mainframe computer
  - (c) personal computer
  - (d) tablet computer
  - (e) None of these
10. Super computer developed by Indian scientists **[IBPS Clerk, 2012]**
  - (a) Param
  - (b) Super301
  - (c) Compaq Presario
  - (d) Cray YMP
  - (e) Blue Gene
11. A computer used at supermarkets, departmental stores and restaurant etc is called \_\_\_\_\_ terminal **[IBPS Clerk, 2012]**
  - (a) P-O-S (Point of scale)
  - (b) Dumb
  - (c) Intelligent
  - (d) Smart
  - (e) calculating
12. Supercomputers \_\_\_\_\_ **[SBI Clerk, 2012]**
  - (a) are smaller in size and processing capability than mainframe computers
  - (b) are common in majority of households
  - (c) contain thousands of microprocessors
  - (d) are rarely used by researchers due to their lack of computing capacity
  - (e) are of the same size as laptops
13. What type of information system would be recognised by digital circuits ? **[SSC CGL, 2013]**
  - (a) Hexadecimal system
  - (b) Binary system
  - (c) Both hexadecimal and binary system
  - (d) Only Roman system
14. Which of the following is contained on chips connected to the system board and is a holding area for data instructions and information? (processed data waiting to be output to secondary storage) **[IBPS Clerk, 2014]**
  - (a) program
  - (b) mouse
  - (c) Internet
  - (d) memory
  - (e) modem
15. Codes consisting of lines of varying widths or lengths that are computer-readable are known as \_\_\_\_\_ **[IBPS Clerk, 2014]**
  - (a) an ASCII code
  - (b) a magnetic tape
  - (c) an OCR scanner
  - (d) a bar code
  - (e) None of these

16. Help Menu is available at which button?  
[IBPS Clerk, 2014]  
(a) End (b) Start  
(c) Turnoff (d) Restart  
(e) Reboot
17. Which of the following is true ?  
[SBI Clerk, 2014]  
(a) Byte is a single digit in a binary number.  
(b) Bit represents a grouping of digital numbers  
(c) An eight-digit binary number is called a byte.  
(d) An eight-digit binary number is called a bit.  
(e) None of these
18. Information on a computer is stored as  
[SBI Clerk, 2014]  
(a) analog data (b) digital data  
(c) modern data (d) watts data  
(e) None of these
19. When a \_\_\_\_\_ is deleted, the original application, folder, or file is not deleted.  
[SBI Clerk, 2014]  
(a) Option (b) Task  
(c) Shortcut (d) Suite  
(e) None of these
20. Who among the following introduced the world's first laptop computer in the market?  
(a) Hewlett-Packard [SSC CGL, 2014]  
(b) Epson  
(c) Laplink travelling software Inc  
(d) Microsoft
21. How many generations of computers we have?  
[IBPS Clerk, 2015]  
(a) 6 (b) 7  
(c) 5 (d) 4  
(e) None of these
22. \_\_\_\_\_ controls the way in which the computer system functions and provides a means by which users can interact with the computer.  
[IBPS Clerk, 2015]  
(a) The operating system  
(b) The motherboard  
(c) The platform  
(d) Application software  
(e) None of these
23. Which of the following is NOT a component of the Central Processing Unit of the computer?  
(a) Universal Serial Bus [IBPS Clerk, 2015]  
(b) Uninterrupted Power Supply  
(c) CU  
(d) Both A & B  
(e) None of these
24. \_\_\_\_\_ Is a mechanism by which all the content in a specified storage areas are written as output.  
[IBPS Clerk, 2015]  
(a) Scheduling (b) Logging  
(c) Chumping (d) Dumping  
(e) None of these
25. VLSI technology is used in \_\_\_\_\_ generation computers.  
[IBPS Clerk, 2015]  
(a) First (b) Second  
(c) Third (d) Fourth  
(e) None of these
26. Different types of modern digital computers come under which generation.  
[IBPS Clerk, 2015]  
(a) Forth (b) Third  
(c) Second (d) Fifth  
(e) None of these
27. The operating system does all of the following EXCEPT:  
[IBPS Clerk, 2015]  
(a) provide a way for the user to interact with the computer.  
(b) enable users to perform a specific task such as document editing.  
(c) manage memory and storage  
(d) manage the central processing unit (CPU)  
(e) None of these
28. Which of the following is machine independent program?  
[SBI Clerk, 2015]  
(a) High level language  
(b) Low level language  
(c) Assembly level language  
(d) Machine language  
(e) None of these
29. Transformation of input into output is performed by \_\_\_\_\_.  
[SBI Clerk, 2015]  
(a) Peripherals (b) Memory  
(c) Storage (d) CPU  
(e) None of these
30. The operating system determines the manner in which all of the following occurs except  
[IBPS PO, 2015]  
(a) user creation of a document  
(b) user interaction with the processor  
(c) printer output  
(d) data displayed on the monitor  
(e) None of these
31. CPU Scheduler is also known as \_\_\_\_\_.  
[SSC CGL, 2016]  
(a) Job Scheduler  
(b) Resource Scheduler  
(c) Short-term Scheduler  
(d) Process Scheduler

32. China now has more of the world's fastest supercomputers than other countries. Which among the following is a Chinese super computer? **[IBPS PO Mains, 2016]**  
(a) BlueGene/Q system  
(b) Cray XC30  
(c) Shaheen II  
(d) Fujitsu's K
33. Which among the given options is IBM's Supercomputer? **[IBPS PO Mains, 2016]**  
(a) Tihane-2  
(b) SunwayTaihu Light  
(c) Watson  
(d) Shasra-T  
(e) Brain
34. Which of the following character set supports Japanese and Chinese font? **[IBPS Clerk Mains, 2016]**  
(a) EBCDIC (b) ASCII  
(c) BCD (d) EDCBI  
(e) None of these
35. Why do you log off from your computer when going out from your office? **[IBPS Clerk Mains, 2016]**  
(a) Someone might steal your files, passwords etc.  
(b) In order to save electricity  
(c) Logging off is essential to increase performance  
(d) Logging off is mandatory you before go out  
(e) Logging off is a good exercise to perform regularly
36. Which of the following is not responsible for the performance of the computer? **[IBPS Clerk Mains, 2016]**  
(a) no of keys in the keyboard  
(b) Name of the video/graphics card  
(c) Memory in the video/graphics card  
(d) The clock speed of the processor  
(e) No of cores available in the processor
37. Integrated Chips or IC's were started to be in use from which generation of Computers? **[IBPS Clerk Mains, 2016]**  
(a) 1st Generation (b) 2nd Generation  
(c) 3rd Generation (d) 4th Generation  
(e) 5th Generation
38. Which among the following is the smallest unit in an image in a computer screen? **[IBPS Clerk Mains, 2016]**  
(a) Unit (b) Pixel  
(c) Array (d) Resolution  
(e) Clip
39. Which among the following cycle consists of an Input, processing, output and storage as its constituents? **[IBPS Clerk Mains, 2016]**  
(a) Processing (b) Output  
(c) Input (d) Storage  
(e) Data
40. Which of the following system is a function of dedicated PCs? **[IBPS Clerk Mains, 2016]**  
(a) Meant for a single user  
(b) meant for the single task  
(c) Deal with single software  
(d) Deal with only editing  
(e) Deal for music purpose
41. BCC in the Email refer to **[IBPS RRB, 2016]**  
(a) Blind Carbon Copy  
(b) Black Carbon Copy  
(c) Blank Carbon Copy  
(d) Blue Carbon Copy  
(e) None of these
42. What is called, a concentric circle on a disk? **[IBPS RRB, 2016]**  
(a) Sector  
(b) Track  
(c) Section  
(d) Arc  
(e) Directory
43. Which function key is used to refresh the current window? **[IBPS RRB, 2016]**  
(a) F1 (b) F5  
(c) F3 (d) F6  
(e) F4
44. JPEG stands for – **[IBPS RRB, 2016]**  
(a) Joint Photographic Expert group  
(b) Joint Photographic Expert graphics  
(c) Join Photographic Expert group  
(d) Join Photographic Expert graphics  
(e) None of these
45. 1000000 bytes =? **[IBPS RRB, 2016]**  
(a) TB (b) KB  
(c) MB (d) GB  
(e) None of these
46. ICMP stands for \_\_\_\_\_ **[IBPS RRB, 2016]**  
(a) Internet Communication Message Protocol  
(b) Internal Communication Message Protocol  
(c) Internal Control Message Protocol  
(d) Internet Control Message Protocol  
(e) Intranet Control Message Protocol

47. Which of the following type of computer could be found in a digital watch? **[IBPS RRB, 2016]**  
 (a) Handheld Computer  
 (b) Tablet  
 (c) Personal Computer  
 (d) Mainframe Computer  
 (e) Embedded Computer
48. To access a mainframe or super computer, users need \_\_\_\_\_ **[IBPS RRB, 2016]**  
 (a) Node (b) Laptop  
 (c) Tablet (d) CPU  
 (e) Terminal
49. Which of the following shortcut is used to repeat the last action performed? **[IBPS RRB, 2016]**  
 (a) F3 (b) F4  
 (c) F5 (d) F6  
 (e) F2
50. Microprocessor was introduced in which generation of computer? **[IBPS RRB Office Astdt. 2021]**  
 (a) 2nd Generation (b) 5th Generation  
 (c) 3rd Generation (d) 4th Generation  
 (e) None of these
51. JS kilby developed which chips? **[IBPS RRB Office Scale 2021]**  
 (a) Silicon (b) Silica  
 (c) Integrated (d) Iron oxide  
 (e) None of these
52. First Super computer of World is \_\_\_\_\_ **[IBPS RRB Office Scale 2021]**  
 (a) PARAM (b) Siddhart  
 (c) IBM -370 (d) CRAY-1  
 (e) None of these
53. Which one is true about generation of computers? **[IBPS RRB Office Scale 2021]**  
 (a) The first generation (1942-1954)  
 (b) The second generation of computer (1954- 1964)  
 (c) Third generation of computer (1965-71)  
 (d) Fourth generation of computer (1975-1984)  
 (e) None of these
54. Which Operating System is used in Third Generation Computer? **[IBPS RRB Office Scale 2021]**  
 (a) Batch  
 (b) Time Sharing System  
 (c) Real-Time System  
 (d) GUI Interface  
 (e) None of these
55. Which of the following hardware was used by the first generation computers? **[June, 2019]**  
 (a) Transistors  
 (b) Vacuum tubes  
 (c) VLSI  
 (d) Integrated circuits
56. Consider the following technologies : **[2020 (First Shift)]**  
 (A) Microprocessor  
 (B) Transistor  
 (C) Vacuum Tube  
 (D) Artificial Intelligence  
 Arrange the above technologies of different computer generations in the order they have been used. Start from the technology that was used in first generation.  
 Choose the correct answer from the options given below:  
 (a) (C), (A), (B), (D) (b) (C), (B), (A), (D)  
 (c) (B), (C), (A), (D) (d) (C), (B), (D), (A)
57. Which one of the following technology was developed during Fourth Generation of Computers? **[RBI Astdt. Main 2020]**  
 (a) Artificial Intelligence  
 (b) VLSI  
 (c) Integrated Circuits  
 (d) VALVE  
 (e) None of these

## Practice Exercise

- Which of the following is NOT associated with Computers?  
(a) Bit (b) Binary  
(c) Pencil (d) Mouse  
(e) Screen
- The first computer which provides storage is  
(a) EDSAC (b) EDBAC  
(c) MARK-I (d) ACE  
(e) None of these
- Microcomputer hardware consists of three basic categories of physical equipment \_\_\_\_\_.  
(a) keyboard, monitor, hard drive  
(b) system unit, input/output, memory  
(c) system unit, input/output, secondary storage  
(d) system unit, primary storage, secondary storage  
(e) None of these
- The benefit of using computers is that \_\_\_\_\_.  
(a) Computers are very fast and can store huge amounts of data  
(b) Computers provide accurate output even when input is incorrect  
(c) Computers are designed to be inflexible  
(d) All of these  
(e) None of these
- In latest generation computers, the instructions are executed  
(a) Parallel only  
(b) Sequentially only  
(c) Both sequentially and parallel  
(d) All of above  
(e) None of these
- Computers gather data, which means they allow users to \_\_\_\_\_ data.  
(a) present (b) store  
(c) output (d) input  
(e) None of these
- Which of the following is not the major function of a computer?  
(a) Processing data into information  
(b) Storing data or information  
(c) Gathering data  
(d) Analysing data or information  
(e) None of these
- When your computer stops working suddenly, it is referred to as a \_\_\_\_\_.  
(a) crash (b) die  
(c) death (d) penalty  
(e) None of these
- First supercomputer developed in India is  
(a) PARAM (b) ARYA BHATT  
(c) BUDDHA (d) SHIVA  
(e) None of these
- Consider the following :  
I. C II. C++  
III. COBOL  
Which among the above is/are high-level languages (HLL)  
(a) Only I (b) I & II  
(c) II & III (d) I, II & III
- What do we call an input/output device on a computer, reserved for communication between the computer operator or maintenance engineer and the computer?  
(a) EDP Device (b) Console  
(c) Jokey (d) Link Device
- Dynamic Ad-hoc Wireless Networks (DAWN) usually comes under \_\_\_\_?  
(a) 2G (b) 3G  
(c) 4G (d) 5G
- A \_\_\_\_\_ is a small hand-held computer that helps you surf the Web and perform simple tasks.  
(a) desktop computer (b) mobile phone  
(c) notebook computer (d) minicomputer  
(e) PDA
- A portable, personal computer, small enough to fit on your lap, is called a \_\_\_\_\_.  
(a) notebook computer  
(b) handheld computer  
(c) mainframe computer  
(d) desktop computer  
(e) super computer
- Computers manipulate data in many ways, and this manipulation is called  
(a) upgrading (b) processing  
(c) batching (d) utilising  
(e) downloading

16. Microprocessor was introduced in which generation of computer?  
(a) Second Generation  
(b) Fourth Generation  
(c) Both (a) and (b)  
(d) Fourth Generation  
(e) None of these
17. Compatibility in regard to computers refers to  
(a) the software doing the right job for the user  
(b) it being versatile enough to handle the job  
(c) the software being able to run on the computer  
(d) software running with other previously installed software  
(e) None of the above
18. The first computers were programmed using  
(a) assembly language  
(b) machine language  
(c) spaghetti code  
(d) source code  
(e) None of the above
19. \_\_\_\_\_ are specially designed computer chips that reside inside other devices, such as your car or your electronic thermostat.  
(a) Server  
(b) Embedded computers  
(c) Robotic computers  
(d) Main frames  
(e) None of these
20. Every computer has a(n) \_\_\_\_\_; many also have \_\_\_\_\_.  
(a) operating system; a client system  
(b) operating system; instruction sets  
(c) application programs; an operating system  
(d) application programs; a client system  
(e) operating system; application programs
21. The computer's capability of distinguishing spoken words is called  
(a) voice analysis  
(b) speech acknowledgment  
(c) voice recognition  
(d) speech interpretation  
(e) vocalisation
22. What is an embedded system?  
(a) A program that comes wrapped in a box.  
(b) A program that is permanent part of a computer  
(c) A computer that is part of a larger computer  
(d) A computer and software system that controls a machine or appliance  
(e) None of these
23. All computers must have  
(a) a word processing software  
(b) an operating system  
(c) an attached printer  
(d) a virus checking program  
(e) None of these
24. Computers excel at  
(a) performing the same action(s) over and over the same way.  
(b) keeping track of large numbers of small details.  
(c) providing creative solutions to problems.  
(d) working in fractions of seconds.  
(e) All of these
25. Choose the odd one out.  
(a) Microcomputer  
(b) Minicomputer  
(c) Supercomputer  
(d) Notebook computer  
(e) Digital computer
26. A computer system that is old and perhaps not satisfactory is referred to as a(n)  
(a) Ancient system      (b) Historical system  
(c) Age old system      (d) Legacy system  
(e) Legal system
27. Analog computer works on the supply of  
(a) continuous electrical pulses  
(b) Electrical pulses but not continuous  
(c) Magnetic strength  
(d) Physical strength  
(e) Natural strength
28. \_\_\_\_\_ is not a microcomputer  
(a) Desktop computer  
(b) Tablet PC  
(c) Handled computer  
(d) Mainframe computer  
(e) Laptop
29. General purpose computer are used for  
(a) Accounting  
(b) Creating a small database  
(c) Performs calculation  
(d) All of the above  
(e) None of these

30. Which is not the example of special purpose computer ?
- (a) Automatic Aircraft Landing
  - (b) Word Processor
  - (c) Multimedia computer
  - (d) All of the above
  - (e) None of these
31. Palmtop computer is also known as
- (a) Personal computer
  - (b) Notebook computer
  - (c) Tablet PC
  - (d) Handled computer
  - (e) None of these

<b>ANSWER KEYS</b>																			
<b>Past Year Solutions</b>																			
1.	(d)	7.	(c)	13.	(b)	19.	(c)	25.	(d)	31.	(c)	37.	(c)	43.	(b)	49.	(b)	55.	(b)
2.	(c)	8.	(c)	14.	(d)	20.	(b)	26.	(d)	32.	(c)	38.	(b)	44.	(a)	50.	(d)	56.	(b)
3.	(b)	9.	(b)	15.	(b)	21.	(c)	27.	(b)	33.	(c)	39.	(a)	45.	(c)	51.	(c)	57.	(b)
4.	(d)	10.	(a)	16.	(b)	22.	(a)	28.	(a)	34.	(e)	40.	(b)	46.	(d)	52.	(d)		
5.	(b)	11.	(a)	17.	(c)	23.	(d)	29.	(d)	35.	(a)	41.	(a)	47.	(e)	53.	(c)		
6.	(d)	12.	(c)	18.	(b)	24.	(d)	30.	(b)	36.	(a)	42.	(b)	48.	(e)	54.	(c)		
<b>Practice Solutions</b>																			
1.	(c)	5.	(c)	9.	(a)	13.	(c)	17.	(d)	21.	(c)	25.	(d)	29.	(d)				
2.	(a)	6.	(d)	10.	(d)	14.	(a)	18.	(b)	22.	(d)	26.	(d)	30.	(b)				
3.	(b)	7.	(d)	11.	(b)	15.	(b)	19.	(b)	23.	(b)	27.	(a)	31.	(d)				
4.	(a)	8.	(a)	12.	(d)	16.	(d)	20.	(e)	24.	(e)	28.	(d)						



# 2

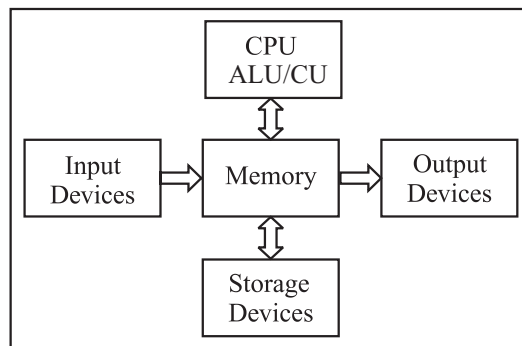
## Components of Computer System

Any computer system consists of the four basic units; namely input unit, storage unit, central processing unit and output unit. Central Processing unit consists of Arithmetic logic unit and Control unit.

Full form of 'Computer' : Common Operating Machine Particularly Used for Trade, Education & Research.

A computer performs five major functions no matter what size they are of as follows:

- Data or Instructions are accepted as input,
- Data and Instruction are stored
- Processing of data as per the instructions,
- Control of all operations inside the computer
- Result in the form of output.



Functional Unit of a computer

### BASIC COMPONENTS OF COMPUTER SYSTEMS

Following are the various components of a computer system–

#### Input Unit

Data and instructions must enter the computer system before any computation can be performed on the supplied data. The input unit that links the external environment with the computer system performs this task. An input unit performs the following functions :

- It accepts (or reads) the list of instructions and data from the outside world.
- It converts these instructions and data in computer acceptable format.
- It supplies the converted instructions and data to the computer system for further processing.

#### Output Unit

The job of an output unit is just the reverse of that of an input unit. It supplied information and results of computation to the outside world. Thus it links the computer with the external environment. As computers work with binary code, the results produced are also in the binary form. Hence, before supplying the results to the outside world, it must be converted to human acceptable (readable) form. This task is accomplished by units called output interfaces.



Following functions are performed by an output unit.

- It accepts the results produced by the computer which are in coded form and hence cannot be easily understood by us.
- It converts these coded results to human acceptable (readable) form.
- It supplied the converted results to the outside world.

**Storage Unit**

The data and instructions that are entered into the computer system through input units have to be stored inside the computer before the actual processing starts. Similarly, the results produced by the computer after processing must also be kept somewhere inside the computer system before being passed on to the output units. The Storage Unit or the primary / main storage of a computer system is designed to do all these things. It provides space for storing data and instructions, space for intermediate results and also space for the final results.

The specific functions of the storage unit are to store:

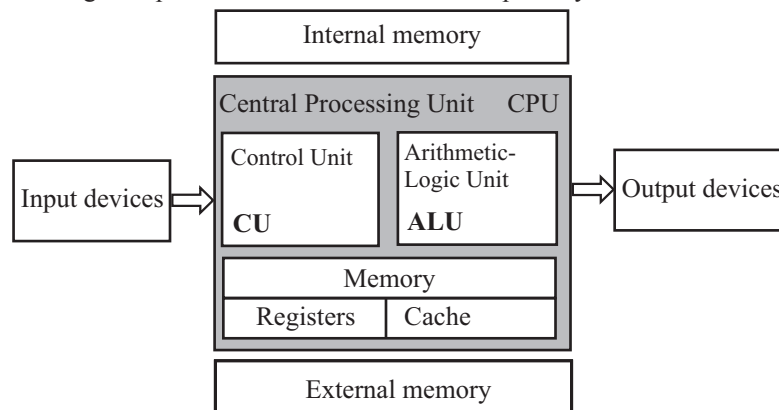
- All the data to be processed and the instruction required for processing (received from input devices).
- Final results of processing before these results are released to an output device.
- Intermediate result of processing.

**CENTRAL PROCESSING UNIT (CPU)**

**Central Processing Unit**

The main unit inside the computer is the CPU. This unit is responsible for all events inside the computer. It controls all internal and external devices, performs “Arithmetic and Logical operations”. The operations a Microprocessor performs are called “instruction set” of this processor. The instruction set is “hard wired” in the CPU and determines the machine language for the CPU. The more complicated the instruction set is, the slower the CPU works. Processors differ from one another by the instruction set. If the same program can run on two different computer brands they are said to be compatible. Programs written for IBM compatible computers will not run on Apple computers because these two architectures are not compatible.

The control Unit and the Arithmetic and Logic unit of a computer system are jointly known as the Central Processing Unit (CPU). The CPU is the brain of any computer system. In a human body, all major decisions are taken by the brain and the other parts of the body function as directed by the brain. Similarly, in a computer system, all major calculations and comparisons are made inside the CPU and the CPU is also responsible for activating and controlling the operations of other units of a computer system.



**Arithmetic and Logic Unit (ALU)**

The arithmetic and logic unit (ALU) of a computer system is the place where the actual execution of the instructions take place during the processing operations. All calculations are performed and all comparisons

(decisions) are made in the ALU. The data and instructions, stored in the primary storage prior to processing are transferred as and when needed to the ALU where processing takes place. No processing is done in the primary storage unit. Intermediate results generated in the ALU are temporarily transferred back to the primary storage until needed at a later time. Data may thus move from primary storage to ALU and back again as storage many times before the processing is over. After the completion of processing, the final results which are stored in the storage unit are released to an output device.

The arithmetic and logic unit (ALU) is the part where actual computations take place. It consists of circuits that perform arithmetic operations (e.g. addition, subtraction, multiplication, division over data received from memory and capable to compare numbers (less than, equal to, or greater than).

### Control Unit

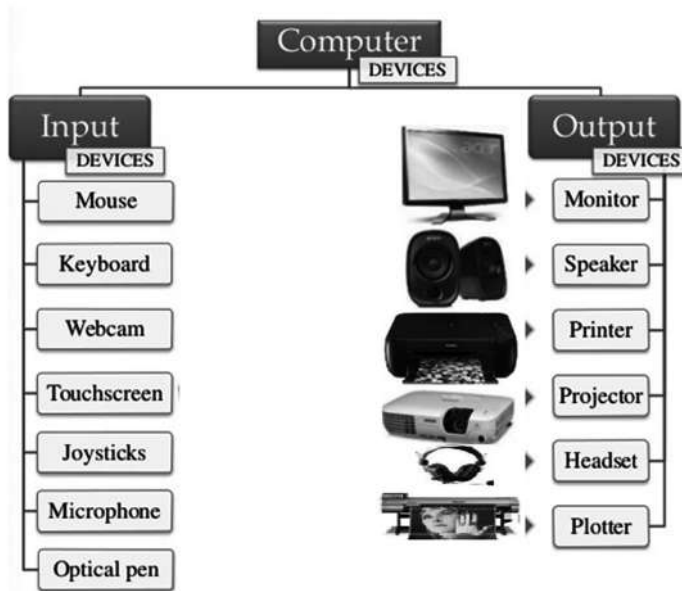
The control unit directs and controls the activities of the internal and external devices. It interprets the instructions fetched into the computer, determines what data, if any, are needed, where it is stored, where to store the results of the operation, and sends the control signals to the devices involved in the execution of the instructions.

by the help of control unit, ALU known what should be done with the data, once it is received data then, how is it that only the final results are sent to the output devices and the control unit is also able to maintain order and directs the operation of the entire system.

**Register :** In a computer, a register is one of a small set of data holding places that are part of a computer processor. A register may hold a computer instruction, a storage address, or any kind of data (such as a bit sequence or individual characters).

## COMPUTER DEVICES

Computer devices are divide into two parts : (i) Input Device (ii) Output Device



Functional of Computer Devices Components

### Input Devices

Input devices include those devices with the help of which we enter data into computer as they make a link between user and computer. These devices translate the human readable information into the form understandable by computer. The various devices are as follows –

- 1. Keyboard :** Keyboard is used to input the data to the computer. In traditional times the typewriter was used. The keyboard has the layout similar to that of a typewriter but some additional keys are present that have additional functions.

The keys are following :

Sr. No.	Keys	Description
1	Typing Keys	These keys include the letter keys (A-Z) and digits keys (0-9) .
2	Numeric Keypad	It is used to enter numeric data or cursor movement. It has a set of 17 keys that are in the same layout as that of calculators.
3	Function Keys	There are twelve functions keys present on the keyboard. These are arranged in a row along the top of the keyboard. Each function key has unique meaning and is used for some specific purpose.
4	Control keys	These keys are used to provide cursor and screen control. It includes four directional arrow key. Control keys also include Home, End, Insert, Delete, Page Up, Page Down, Control(Ctrl), Alternate(Alt), Escape(Esc).
5	Special Purpose Keys	Keyboard also contains some special purpose keys such as Enter, Shift, Caps Lock, Num Lock, Space bar, Tab, and Print Screen.

- 2. Mouse :** Mouse is a cursor controlling device. It is a pointing and drop device. Its size is good enough to fit the palm. It has a palm size box with a round ball at its base .It senses the movement of mouse and sends corresponding signals to CPU on pressing of the buttons. There are two buttons that provide the left click and the right click. A scroll bar is present in the mid .Mouse is only used to control the position of cursor on screen.
- 3. Joystick :** Just like the mouse , Joystick is also a pointing device, which is used to move cursor position on a monitor screen. It has a stick that has a spherical ball at its both lower and upper ends. The lower spherical ball moves in a socket. The joystick can be moved in four directions. It is mainly used in Computer Aided Designing (CAD) and playing computer games.
- 4. Light Pen :** Light pen is also a pointing device. Its structure is similar to that of a pen. It is based on an optical system placed in a small tube. It is used to select a displayed menu item or draw pictures on the monitor screen. When light pen's tip is moved over the monitor screen and pen button is pressed, its photocell sensing element, detects the screen location and sends the corresponding signal to the CPU.
- 5. Track Ball :** Track ball are used mostly in notebook or laptop computer. This is a ball, which is half inserted and by moving fingers on ball, pointer can be moved. A track ball requires less space than a mouse as the whole device is not moved. A track ball can come in various shapes like a ball, a button and a square.
- 6. Scanner :** Scanner is an input device, which works on a similar principle of a photocopy machine. It is used when some information is available on a paper and it is to be transferred to the hard disc of the computer for further manipulation.  
Scanner captures images from the source which are then converted into the digital form that can be stored on the disc. These images can be edited before they are printed.
- 7. Touch Screen :** A touchscreen is an electronic visual display that the user can control through simple or multi-touch gestures by touching the screen with a special stylus/pen and-or one or more fingers. Some touch screens use an ordinary or specially coated gloves to work while others use a special stylus/pen only. The user can use the touchscreen to react to what is displayed and to control how it is displayed (for example by zooming the text size).

8. **Digitizer** : Digitizer is an input device which converts analog signal from the television camera into a strings of binary digits that can be stored in a computer. It converts the analog information into a digital form. Digitizer is also known as Tablet or Graphics tablet. They can be used by the computer to create a picture of whatever the camera had been pointed at.
9. **Magnetic Ink Card Reader (MICR)** : We see in banks, libraries etc using MICR as an input device . As large number of cheques are processed everyday MICR serves a very useful purpose. A special type of ink that contains particles of magnetic material that is machine readable, is used to read the code number and cheque number that are printed on the cheques in banks. This reading process is called Magnetic Ink Character Recognition (MICR). The main advantage of MICR is that it is highly accurate and fast in reading.
10. **Optical Character Reader (OCR)** : OCR is an input device that is used to read a printed text. The role of OCR is to scan the text optically character by character by converting them into a machine readable code and store the text on the system. The OCR is used for the preparation of electricity bills, insurance premium, telephone bills.
11. **OMR (Optical Mark Recognition)**: Optical mark recognition (also called optical mark reading and OMR) is the process of capturing human-marked data from document forms such as surveys and test.
12. **SCR (Smart Card Readers)**: A small electronic device about the size of a credit card that contains electronic memory, and possibly an embedded integrated circuit (IC). Smart cards containing an IC are sometimes called Integrated Circuit Cards (*ICCs*).  
Smart cards are used for a variety of purposes, including:
  - Storing a patient’s medical records
  - Storing digital cash
  - Generating network IDs (similar to a token)
 To use a smart card, either to pull information from it or add data to it, you need a smart card reader, a small device into which you insert the smart card.
13. **Bar Code Readers** : Bar Code Reader is a device used for reading bar coded data (data in form of light and dark lines). Bar coded data is generally used in labelling goods, numbering the books, etc .Bar Code Reader scans a bar code image by converting it into an alphanumeric values . This value is then fed into the computer to which bar code reader is connected.
14. **Microphone** : A microphone, is an acoustic-to-electric transducer or sensor that converts sound in air into an electrical signal. Microphones are used in many applications such as telephones, hearing aids, public address systems for concert halls and public events, motion picture production, live and recorded audio engineering, two-way radios, megaphones, radio and television broadcasting, and in computers for recording voice, speech recognition, VoIP, and for non-acoustic purposes such as ultrasonic checking or knock sensors.
15. **Webcam** : A webcam is a video camera that feeds or streams its image in real time through a computer network. When “captured” by the computer, the video stream may be saved, viewed or sent on to other networks via systems such as the internet, and email as an attachment. When sent to a remote location, the video stream may be saved, viewed or on sent there. Unlike an IP camera (which connects using Ethernet or Wi-Fi), a webcam is generally connected by a USB cable, or similar cable, or built into computer hardware, such as laptops.

## Output Devices

An output device is that component of computer hardware that communicates the results of data that is processed by the computer and converts the digital information into a form easily read and understood by humans. Various Output devices are used in Computers.

1. **Monitors** : Monitor or the Visual Display Unit (VDU) is the main output device of a computer. It forms images in the form of tiny dots, known as pixels. The sharpness of the image can be determined by the number of the pixels.

Two kinds of viewing screens are used for monitors:

- Cathode-Ray Tube (CRT)
- Flat-Panel Display

**(a) Cathode-Ray Tube (CRT) Monitor :** In the CRT, display consists of small picture elements known as pixels and determine the resolution of the image. Smaller are the pixels the better is the image clarity or resolution. Finite number of characters can be displayed on a screen at once. The screen can be divided into a series of character boxes that serve as a fixed location on the screen where a standard character can be placed.

Most screens are capable of displaying 80 characters of data horizontally and 25 lines vertically. CRT has some disadvantages as

- (i). It is large in Size
- (ii). Has a high power consumption.

**(b) Flat-Panel Display Monitor :** The flat panel displays overcome the disadvantages of CRT as they have reduced volume, weight and power requirement compared to the CRT. They come in different shapes and size. You can hang them on walls or wear them on your wrists. They are used in all modern day calculators, video games, monitors, laptop computer, graphics display etc as displays.

**The flat-panel display are of two main types :**

**(i) Emissive Displays :** The emissive displays convert electrical energy into light. Example are plasma panel and LED (Light-Emitting Diodes).

**(ii) Non-Emissive Displays :** The Non-emissive displays use optical effects to convert sunlight or light from some other source into graphics patterns. Example is LCD (Liquid-Crystal Device).

**(c) 3-D Monitors:** It is a television that conveys depth perception to the viewer. 3-D describes an image that provides the perception of length. When 3-D images are made interactive then user feel involved with the scene and this experience is called virtual reality.

**2. Printers :** Printer is among the most common output device, which is used to print information on paper.

There are two types of printers:

- Impact Printers
- Non-Impact Printers

**(a) Impact Printers :** The printers that print the characters by striking against a ribbon and then onto the paper, are called impact printers.

Impact Printers are low cost but they happen to be very noisy. Due to their low cost they are useful for bulk printing. There is physical contact with the paper to produce an image.

Impact printers can be further divided into two types:

**(i) Character printers :** These printers print one character at a time. These further divided into two such as the Dot Matrix Printer and the daisy wheel printer.

**Dot matrix printer (DMP) :** They are the most popular printers because of their ease of printing features. They come at a low cost.

Each character is printed in the form of pattern of Dot's and head .These dots and heads consist of a matrix of pins of size (5\*7, 7\*9, 9\*7 or 9\*9) that result in forming a character. Hence they are called as Dot Matrix Printer.

Disadvantage of Dot Matrix Printer are

- (i). Slow Speed
- (ii). Poor Quality.

**Daisy Wheel :** These are known as daisy wheel printers as the head lies on the wheel and Pins correspond to characters like petals of Daisy flower. These printers are used for word-processing

in offices and offer very nice quality representation. Disadvantage of Daisy wheel Printer (i) it is Slower than DMP, Noisy. (ii) More expensive than DMP.

- (ii) **Line Printers** : Line printers are printers, which print one line at a time. Speed of line printers is limited by the speed of cartridge used.

These can be divided into two types: The drum printer and the Chain printer

**Drum Printer** : This printer looks like a drum in shape that's why it is called a drum printer. The Drum surface has a number of tracks. Total tracks are equal to size of paper, i.e., for a paper width of 132 characters, Drum will have 132 tracks. A character set is embossed on track. The different character sets available in market are 48 character set, 64 and 96 characters set. One rotation of drum leads to printing of one line. These printers print between 300 to 2000 lines per minute. Hence they have a very high speed.

Disadvantage of this Printer are: (i) It is very expensive. (ii) Character fonts can't be changed.

**Chain Printer** : In this printer because chain of character sets are used hence they are called as Chain Printers. A standard character set may have 48, 64, 96 characters.

Advantage of chain Printer is character fonts can easily be changed & different language can be used with same printer, less noisy than drum printer.

- (b) **Non-impact Printers** : These printers print the characters without the physical contact with the paper i.e. without striking against the ribbon and onto the paper. These printers print one complete page at a time, and are also called as Page Printers. It supports many fonts & different character size, high quality printing, not noisy, faster than impact printer.

These printers are of two types: Laser Printers and the Ink-jet Printers.

- (i) **Laser Printers** : These are non-impact page printers. They use laser lights to produce the dots needed to form the characters to be printed on a page.

- (ii) **Inkjet Printers** : Ink-jet printers are new technology non-impact character printers. They print characters via spraying small drops of ink onto paper. Ink-jet printers produce very high quality output with presentable features.

They are noiseless printers and have many styles of printing modes available. These are also called as the coloured printers. Models of Ink-jet printers can produce multiple copies of printing also.

3. **Headphones** : Headphones are referred to as earphones, headphones are a hardware device that either plugs into your computer (line out) or your speakers and allow you to privately listen to audio without disturbing anyone else. The picture is an example of a USB headset from Logitech with a microphone and a popular solution for computer gaming.
4. **Speaker** : A hardware device connected to a computer's sound card that outputs sounds generated by the computer. It needs a sound card connected to a CPU, that generates sound via a card. These are used for listening music, for being audible in seminars etc.
5. **Projector** : A projector is an output device that can take images generated by a computer and reproduce them on a large, flat (usually lightly colored) surface. For example, projectors are used in meetings to help ensure that all participants can view the information being presented.

#### Some important points –

- External devices such as printers, key boards and modems are known as peripherals.
- The higher the resolution of a monitor the closer together the pixels.
- The rate at which scanning is repeated in a CRT is called refresh rate. Best position for
- Tail towards the user is the best position for operating the mouse.